



NCUR 2025 Proceedings

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The National Conference on Undergraduate Research (NCUR)

What is NCUR?

The National Conference on Undergraduate Research (NCUR) is the premier annual event celebrating undergraduate achievement across all disciplines. Each year, thousands of students from institutions across the country gather to present original research, scholarship, and creative work. Unlike other conferences, NCUR is dedicated to celebrating undergraduate scholars from all institutions of higher learning from all disciplines. NCUR offers a unique platform where students can share their work with peers, faculty, and professionals from a wide array of fields.

The NCUR experience offers more than visibility—it provides a transformative experience where students:

- Build confidence and communication skills.
- Receive meaningful feedback from peers, faculty, and professionals across disciplines.
- Engage in cross-disciplinary learning by attending sessions beyond their field.
- Expand their academic and professional networks with mentors, collaborators, and recruiters.
- Discover new pathways through the Future Fair.

NCUR also supports the growth of institutions by equipping faculty, staff, and administrators to:

- Celebrate and mentor the next generation of researchers.
- Connect with colleagues to exchange best practices in undergraduate research.
- Stay informed on emerging trends and innovations in student scholarship.

NCUR began in 1987 at the University of North Carolina at Asheville with more than 400 students in attendance. In 2010, NCUR officially merged with the Council on Undergraduate Research (CUR), joining forces to advance undergraduate research on a national scale. Since then, it has grown into the largest undergraduate research conference in the world, with more than 4,000 in attendance.

For questions or further information about NCUR, contact NCUR@CUR.org. To learn more about upcoming conferences, visit CUR.org/NCUR.

About These Proceedings

This document features a comprehensive list of student presentations from this year's NCUR, organized by the primary presenter's last name. Each entry includes:

- Presenter's name
- Their institution (with state)
- Discipline of the presentation
- Additional authors (if applicable)
- Title of the presentation
- Abstract

This information was submitted by the student presenters during the NCUR application process.

Sadie Aaron

KY - University of Kentucky

Discipline: Environmental Science and Sustainability

Authors:

Abstract Name: The Ripple Effect: How Tourism Affects Marine Debris

"Each year 180 million Americans make 2 billion visits to beaches –more than twice as many as to all national and state parklands combined" (Center for Conservation Biology). As more tourists travel to the beach for leisure, the negative impacts on beach and coastal ecosystems worsen, particularly through waste production. This research examines the environmental consequences of tourism, focusing on waste generated by beachgoers. The study employs a mixed-methods approach, including surveys of beachgoers and expert interviews with environmental professionals and beach management authorities. The surveys explore the types of waste produced, the frequency of littering, and the influence of transportation choices—such as personal vehicles and public transit—on waste patterns. According to the US Environmental Protection Agency, "Tourists produce up to twice as much waste than residents." The findings highlight the role of consumer behaviors, particularly the use of single-use plastics and non-biodegradable items, in contributing to waste accumulation on beaches. The study also examines how different travel methods, such as driving or flying, influence the overall environmental impact. To address these issues, the study suggests several strategies to reduce consumerism in beachgoing behavior. Ultimately, the findings aim to foster a shift toward more responsible and eco-conscious behavior among beachgoers to protect fragile coastal ecosystems and reduce the environmental footprint of tourism.

Ben Aaron

PA - Swarthmore College

Discipline: Engineering

Authors:

#1 Fiona O'Donnell

Abstract Name: Spatial Variation in Structural Lumber Strength: Experimental Testing and Probabilistic Model

The natural growth of wood leads to significant variation in the mechanical properties of structural lumber among an ensemble of boards and within a single board. As such, the safe and efficient use of wood in structural applications requires a process to assess the probabilistic nature of wood properties. Current processes neglect within-member variation and utilize uniform design properties for a given species and grade. This paper presents a framework for a high-fidelity treatment of within-member strength variation to enable higher precision uncertainty characterization of strength. The model incorporates clearwood strength variation and the strength reduction of knots. The model is adapted to incorporate two distinct functions for knot strength reduction, providing information for the comparison of the two calculation methods and demonstrating the model's adaptability as knot interaction continues to be studied. Simulated boards are graded by knot frequency and locations, and comparison is made between modelling results by grade and published experimental design values. The modelling method is also compared to experimental data of beams in bending to demonstrate the modelling process. Experimental failure of beams in bending is compared to the modelled failure location. The developed framework can be employed in computational analyses, such as reliability studies, to support improved material efficiency of structural lumber and large engineered wood products, like cross laminated timber. The tensile strength models were calibrated to Eastern hemlock but

could be applied to other softwood species of interest. Incorporating a high-fidelity description of material variation in the fabrication of mass timber products could support material efficiency and promote the use of traditionally low-value wood species in high-value structural applications.

Zarah Abatcha

CA - Los Medanos College

Discipline: Biology

Authors:

#1 Emma Pasic

#2 Arielitzzy Vieyra

#3 Muhsana Rahman

Abstract Name: Examining Effects of Indole-3-Acetic Acid And Phosphorus Deprivation On Root And Shoot Growth In Brachypodium Distachyon

The world of the study of plant growth is vast and full of potential for research, namely the effects of different hormones on plant growth. One such plant hormone, indole-3-acetic acid (IAA), has existing but limited information about its usefulness in reinforcing plants against removal of phosphorus, an essential plant growth mineral. To remedy this gap in research, the focus of this study was to discover the potential of plant growth when assisted by IAA under different conditions. Over the course of several weeks, Brachypodium distachyon, a model grass plant with a simple genome and short growth period, was monitored within EcoFABs under varying conditions. Ecosystem Fabrications, or EcoFABs, are devices used to simulate an ecosystem without the use of soil, thereby maximizing visibility of plant roots. To test the effectiveness of IAA, a research question was put into action: “Can (IAA) protect against phosphorus loss in plants?”. The rescue group (treated with phosphorus removal and IAA at 0.2µg/µL) was successful in growth capacity of roots compared to plants grown in phosphorus deprived media and plants treated only with IAA, having an average percent increase of 50.19%. Additionally, the IAA treated group showed significant growth in shoots, with an average 32.62% increase. In future studies, the true growth potential of IAA must be pursued. While it was useful in helping with B. distachyon growth, there are many avenues future studies could focus on, such as various IAA concentrations used on a variety of other plants. The general increase of growth in groups treated with this hormone supports future studies to fully understand the growth potential of IAA on plants in distress. Overall, this success has many unrealized pathways to be explored for the sake of global environmental support in a rapidly changing agricultural environment.

Leslee Abbott

OK - University of Central Oklahoma

Discipline: Education

Authors:

Natalie Rippy

Kristen Reis

Abstract Name: Implementing Strong Thinking in The Classroom

Strong thinking is asking students to look at an art piece and not only critique it, but to use their own imagination as to what they think the piece is saying. By observing the piece, working through the purpose it was created, and exploring what the artwork means to them, they are able to think of what the artist may be

trying to say to them. Strong Thinking is a tool that can be used in any classroom setting. Our research was compiled on an art classroom setting. We will take you step by step through the strong thinking process. Teachers can use strong thinking to help students critically assess their own work as well as their peers. This challenges them to create meaningful art and allows them to use art as a voice of advocacy.

Monica Abdelmassih

PA - Thomas Jefferson University

Discipline: Psychology

Authors:

#1 Monica Abdelmassih

Abstract Name: Developing Patient-Centered Educational Tools for Wisdom Tooth Pain Management

The current study addresses the design and development of evidence-based education materials on pain following surgery, which is the first phase of a to-be-implemented preemptive cognitive analgesia strategy for oral surgery patients. The purpose of this study is to educate the patients on the types of pain they can expect following surgery, to mitigate preoperative anxiety, enhance preparation for the procedure, and boost compliance with postoperative care. Data was collected from 10 patients who were going to undergo wisdom tooth extraction. Patients were asked to keep a pain diary after surgery, as well as engaging in a post-study interview to assess their narrative experiences in dealing with their pain, including strategies that were effective in reducing pain, and factors that led to increased pain. These responses were used to create written education materials. Materials were fashioned to be visually appealing and linguistically at an approximately eighth grade level, employing infographics, outlines, and case scenarios for engagement. Refinements were made in response to feedback from dental practitioners and patient focus groups to ensure clarity, accessibility, and usefulness. The current study serves to underscore the potential significance of preoperative education about pain in reducing psychosocial barriers to effective pain management, reducing pain related fear, thereby enhancing the patient experience. This project illustrates the need to incorporate educational strategies into the practice of dentistry- especially for procedures that are associated with high anxiety levels and significant pain. This study underscores the importance of integrating patient-centered educational tools into clinical dentistry to enhance procedural outcomes and patient well-being.

Malak Abdelrahman

TN - Middle Tennessee State University

Discipline: Psychology

Authors:

#1 Fabiola Vasquez

#2 Tiffany Rogers

Abstract Name: The Effects of Antibiotic-Oxytocin Interactions on Social and Motivational Behavior

Oxytocin is a neuropeptide that plays a role in many parts of the body; and is well known for its role in social behaviors. Antibiotics are a staple in the modern world, with nearly 50 million yearly prescriptions given to people under the age of 20 (Center for Disease Control, 2024). To date, no studies have examined the drug interaction of oxytocin and antibiotics and its effect on social motivation. Mice were used as model organisms to study these behavioral effects. The experimental groups included both sexes and four drug groups: saline (control), oxytocin, antibiotics, and oxytocin with antibiotics. After 14 days of drug administration, 3

behavioral assays were conducted to examine social motivation effects. The results of this study found that the oxytocin-antibiotics group had lower social avoidance than the other groups. No sex effects were found in any social behavior analysis and no social approach differences were found between groups.

Nelly Abdelwahed

EGY - The American University in Cairo

Discipline: Psychology

Authors:

#1 Nelly Abdelwahed

#2 Nour Heikal

#3 Mariam Kharboush

#4 Nour Dabbour

Nour Heikal

Mariam Kharboush

Abstract Name: The Effects of the Devaluation of the Egyptian Pound on AUC Student Happiness

The aim of the research project was to investigate and understand if there is a significant relationship between paying the full tuition fees at the American University in Cairo (AUC) or being on financial aid/ scholarship and happiness with the current devaluation of the Egyptian Pound. The researchers conducted a literature review that consisted of thirteen sources and they found that there are five key determinants for the happiness of university students such as financial satisfaction, academic performance, leisure time, social support, and high levels of self-confidence and esteem. The researchers used these five factors in their conceptual framework as well as the utility theory. This study was executed through an online Google Forms survey that the researchers sent out to students on WhatsApp and Facebook groups, as well as by going around campus with a QR code of the survey for students to scan. The survey consisted of questions from the PERMA Survey, the Student Life Satisfaction Scale, the Student Academic Scale, and the Financial Satisfaction Scale. The researchers used the Statistical Package for Social Sciences (SPSS) to analyze whether there is a significant relationship within the data, to determine which category of students from the two is happier with the devaluation of the Egyptian Pound. The results of SPSS exhibited no significant relationship between either category of students and happiness

Nihal Abdi

MN - Hamline University

Discipline: Chemistry

Authors:

#1 Nihal Abdi

#2 Francesca M. Ippoliti

Abstract Name: Photochemical Generation of Benzyne

Benzyne, a highly reactive strained cyclic intermediate, is instrumental in the synthesis of a variety of complex molecules, such as natural products, materials, and pharmaceuticals. Benzyne generation is commonly approached through the Kobayashi method which relies on a fluoride base and prevents the use of functional groups that are unstable to fluoride, making the development of alternative methods desirable. Furthermore, the current method for photochemical generation, photolysis of N-acetyl-N-methyltriazene

benzoic acid, results in the extrusion of two equivalents of gas and limited substrate scope due to the broad range of functional groups activated by harsh UV light. The purpose of this project is to develop a new method of benzyne generation using o-phenylsulfonyl benzoic acid as a readily synthesized starting material. o-Phenylsulfonyl benzoic acid was successfully synthesized from iodobenzoic acid and sodium benzenesulfinate through a dual photoredox/nickel-catalyzed cross-coupling reaction. NMR analysis confirmed product formation. We are developing a photochemical reaction using visible light, a transition metal, and o-phenylsulfonyl benzoic acid to generate benzyne and subsequently trap with a diene in a Diels–Alder reaction. We will be using various iron (III) species to coordinate to the carboxylic acid and become excited by light to undergo ligand-to-metal charge transfer (LMCT). Experimental conditions, including solvent choice, reagent ratios, and light wavelength, will be varied to optimize the process. This method is expected to be tolerant to a wider range of functional groups and minimize gas production, allowing for broader use in complex molecule synthesis and offering a safer alternative to current methods.

Hanan Abdi

MN - Hamline University

Discipline: Biochemistry

Authors:

Abstract Name: Investigating the Catalysis and Substrate Specificity of Guanylurea Hydrolase

Metformin is a widely used drug for treating type 2 diabetes, but patients excrete a large amount of it and its byproduct, guanylurea (GU), which enter wastewater treatment plants as pollutants. Guanylurea is more toxic than metformin, negatively affecting the reproduction and growth of aquatic organisms. The degradation pathway of metformin as it is currently understood, reveals that the enzyme Guanylurea hydrolase (GuuH), plays a key role in converting guanylurea into guanidine, a harmless compound commonly found in living organisms. Research on the biochemical mechanism and substrate specificity of GuuH is essential for potential environmental applications, specifically to engineer this enzyme to degrade pollutants similar to guanylurea. One such pollutant is biuret, which is toxic to plants and commonly found as an impurity in fertilizers and pharmaceuticals. Biuret is structurally similar to guanylurea, differing only by an oxygen atom replacing one of GU's nitrogen atoms. However, the molecular determinants that enable GuuH to distinguish between guanylurea and similar compounds like biuret are not well understood. This project aimed to investigate how mutations in the substrate binding site of GuuH affect its ability to differentiate between guanylurea and analogs like biuret. Site-directed mutagenesis was used to create two GuuH mutants, N141K and E211Q, which were purified through affinity chromatography. Ammonia release assays were conducted to assess the activity of the wild-type and mutant enzymes with both guanylurea and biuret. The N141K mutant exhibited activity similar to the wild type for both substrates, while the E211Q mutant showed no significant activity, indicating that the E211 residue is crucial for guanylurea binding. Future research will focus on exploring the combined effects of a double mutant (N141K, E211Q) on the activity of GuuH, with the ultimate goal of enhancing its potential for environmental applications.

Joseph Abdo

NY - SUNY Brockport

Discipline: Computer Science

Authors:

Abstract Name: BportGo: Efficacy of a Campus Navigation Mobile Application for SUNY Brockport

SUNY Brockport campus currently offers only a high-level PDF map of all buildings on campus. It is time consuming for new students, faculty, staff or visitors to accurately locate the correct room in the correct building. BportGo, a campus navigation mobile application, aims to address the challenges by supplying its users with an indoor and outdoor navigation system. This work takes advantage of Flutter, an open-source UI SDK created by Google, which is used to develop cross-platform applications from a single codebase. For outdoor navigation, the app leverages location services to provide real-time directions across the campus using the Google Maps API, ensuring accessibility. The app incorporates an improved search bar created using the Google Places Autocomplete API which provides an enhanced prediction algorithm to search for locations. For indoor navigation, university's static floor plans are made interactive using Mappedin to provide effortless navigation and optimized time management. Although the basic indoor and outdoor navigation in the app is complete, I plan to integrate more features for better accessibility options such as the implementation of artificial intelligence for better accuracy and real-time updates. The AI can process real-time data from the Wi-Fi infrastructure of the campus to adjust routes, provide prompt updates, and determine better routes for users with mobility challenges. I also plan to introduce voice navigation to assist people that are visually impaired or have other disabilities. The expected result will be a fully functioning app that can help users navigate indoors and outdoors, reducing the need for physical maps and improving campus mobility. BportGo represents a step toward a more technologically integrated campus environment, facilitating both routine navigation and special event logistics. Lastly, to determine if students will adopt to BportGo, I plan to conduct a usability testing for user feedback through an iterated design approach.

Aya Abdouni

TN - Middle Tennessee State University

Discipline: Biology

Authors:

#1 Cole Easson

Abstract Name: Genetic Barcoding of darters in Middle Tennessee

In a world where freshwater ecosystems as well as biodiversity are in jeopardy, understanding the genetic diversity of hyper diverse darter species can help us properly strategize conservation efforts. Darters play an essential role in their habitats being integral to the stability of freshwater ecosystems as these organisms can reflect the overall condition of habitat as indicator species. With darters, these organisms are crucial in stability of biodiversity and setting a foundation for future studies. Loss of these species would also remove a vital system for studying evolutionary processes and development of species rich lineages. Our study around genetic analysis of preserved darter species which came from local Middle Tennessee waters is incredibly important for providing insight in revealing to evolutionary history within the south. We sequenced the genetic barcodes of darter species and will be generating genetic profile for the darters to be placed in database in our study. We will also compare these genetic barcodes to morphological features for each darter, and we hypothesize though gene sequencing that we will see a correlation in barcode sequences between variation and distinct morphological patterns used as comparative analysis in these darter species. To achieve this, DNA was extracted from 48 preserved darter samples to analyze their genetic makeup. We then used PCR to amplify part of the cytochrome oxidase I gene, followed by PCR clean up. Results of the current study are still pending. The project will undergo series of measuring expected band products, and determining size of DNA fragments to nucleotide sequence.

Rusul Abdulrazzaq

VA - George Mason University

Discipline: Engineering

Authors:

#1 Hana Al Shawi
#2 Patrick King
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#5 Mahdia Popal
#6 Seiyon Lee
#7 Kevin Lybarger
#8 Samuel Acuña

Abstract Name: Capturing Lived Experiences of Chronic Pain through a Listening Experience Model

Approximately 51 million Americans (more than 1 out of 5 Americans) suffer from chronic pain. Chronic pain patients often have symptoms that lack a clear cause of identifiable physical pathology, and traditional pain assessment methods, which focus on clinical history and physical examinations, tend to overlook the unique lived experiences of these patients. These experiences encompass the daily challenges, routines, personal needs, and aspirations disrupted by chronic pain. Current documentation practices, including clinician notes and patient-completed medical intake forms, offer a limited perspective and fail to capture the patient's voice fully. Similarly, patient-reported outcomes may not genuinely reflect the patient's experience, potentially omitting vital information relevant to their clinical status and overall well-being. Although clinicians desire to capture this patient information, it has remained impractical to collect, analyze, and summarize all the salient information of a patient's lived experiences. However, emerging machine learning technologies, such as Natural Language Processing (NLP), show promise for examining the language and expression used to describe their pain and allow for efficient analysis over large datasets. This method could provide insights often overlooked by traditional documentation, promoting a holistic and patient-centered approach. The objective of this ongoing study is to collect and analyze first-hand narratives of patients' lived experiences with chronic pain using NLP. This research aspires to foster better communication between patients and healthcare providers, ultimately leading to more personalized and effective pain management strategies.

Aliya Abildayeva

PA - University of Pittsburgh

Discipline: Engineering

Authors:

Abstract Name: Silicon cell retrieval from bifacial and mono-facial solar panels

This study presents methods for silicon cell recovery from both mono-facial and bifacial panels. While pyrolysis has proven effective in removing encapsulant (EVA) and back-sheet films from photovoltaic (PV) modules, silicon cells often emerge broken due to several factors, including mismatches in the coefficient of thermal expansion, gas build-up from EVA, rapid heating rates, and sample collection methods. This paper also discusses various sample preparation methods, thermal treatments under anaerobic and vacuum conditions, and the measurement of emitted gases such as HF and acetic acid. To minimize damage, sample preparation techniques such as water jet cutting and hot knife removal of back-sheets and EVA films are applied. In the present research, we focus specifically on bifacial solar panels and the extraction of silicon cells. For this, we employ water jet cutting to separate each individual cell, followed by exposure to a muffle furnace for thermal treatment. This approach enables us to extract intact silicon cells without breakage. Thermal treatments are designed to assess crack formation and gas release dynamics, revealing key insights into stress alleviation and reduced emissions under controlled heating rates and vacuum conditions. Pyrolysis

experiments further confirm the optimal conditions for organic material removal, allowing for the successful retrieval of undamaged silicon cells.

Karam Abilmouna

FL - Florida International University

Discipline: Nursing and Public Health

Authors:

#1 Tomas Guilarte

#2 Alexander Rodichkin

#3 Jennifer Dziedzic

#4 Ritishka Kapoor

Abstract Name: Assessment of neurodegeneration in the cerebellum of Slc39a14-Knockout mice

Over the last decade, several clinical reports outlined cases of autosomal recessive mutations of the manganese transporter gene SLC39A14 in humans resulting in elevated blood and brain concentrations of manganese and childhood-onset dystonia-parkinsonism. However, the pathophysiology of this disease has yet to be fully delineated, and it is our lab's goal to do so. Previous pathophysiological studies done by our lab using Slc39a14-Knockout (KO) mice have found that this genetic murine model of the human disease is associated with a dysfunctional but structurally intact nigrostriatal dopaminergic system. They have also proven that these changes happen early on in life, with no progression by aging. However, the presynaptic deficit in dopamine release is unlikely to explain the totality of symptoms of the behavioral phenotype and points to the involvement of other neuronal systems and brain regions in the pathophysiology of the disease. To delineate this idea further, a histological characterization of microglial populations was performed. In the brains of Slc39a14-KO mice, there was an overall increase in microglia density in select parts of the hindbrain in the context of highly elevated cerebellar manganese levels. Additionally, a Sholl analysis assessing the morphological activation of the cerebellar microglia demonstrated an increase in activation within the Slc39a14-KO mice. Lastly, when investigating the expression of cleaved caspase-3 (cCASP3), a biomarker of cell apoptosis, immunofluorescent staining revealed significantly elevated cCASP3 levels within the Purkinje cell layer of the cerebellum in Slc39a14-KO mice, indicating the presence of neurodegeneration within this area. In conclusion, this data begins to suggest that neurodegeneration is in fact occurring within the cerebellum of Slc39a14-KO mice, allowing us to better understand the pathophysiology of manganese-induced dystonia-parkinsonism. My specific contributions to this project were colony maintenance, genotyping, tissue slicing, brain perfusions, assistance with immunohistochemical staining, and the Sholl analysis.

Andrea Abraham

MD - Bowie State University

Discipline: Biology

Authors:

#1 Brenda Cortes-Ramos

#2 Juniorine Azobou

#3 Esther Olawunmi

#4 Avrianna Blackshear

#5 Subhechha Rijal

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Abstract Name: Copper-Induced Gene Expression in *Shewanella oneidensis* MR-1: Investigating the role of mtrC and mtrF in Bioremediation

Bioremediation is utilizing biological processes of microorganisms to transform environmental contaminants into harmless compounds. *Shewanella* sp. is a facultative anaerobic bacteria that has been confirmed to be able to reduce heavy metals such as copper under anaerobic conditions. In this experiment, *Shewanella oneidensis* MR-1 is used to investigate the mtrC and mtrF gene expressions in 2& 4mM copper acetate wastewaters 24h after bioremediation process. This experiment aims to determine whether there is a significant change in gene expression due to the bioremediation process. The results showed that mtrF and mtrC expressions increased ~4-6 times as compared to the original expression rate, indicating that these genes are actively involved in copper bioremediation process.

Andrea Abraham

MD - Bowie State University

Discipline: Biology

Authors:

#1 Zachary Goldring

#2 Subhechha Rijal

#3 Faezeh Fatemi

#4 Abolfazl Dadkhah

#5 Supriyo Ray

Subhechha Rijal

Abstract Name: Analysis of mtr Gene Expressions in *Shewanella oneidensis* MR-1 during Copper Bioremediation Process

Shewanella sp. can remove heavy metal pollutants like copper from industrial wastewater. In situ bioremediation process starts after the bacteria accept electrons from the anoxic media. The electron is then transported and released within the intracellular oxidative catabolic reactions to the terminal electron acceptors through the extracellular electron transfer (EET) pathway. Studies on *Shewanella oneidensis* MR-1 have implicated genes within the mtr cluster. Cytochromes, particularly type c, are well-established in bioremediation, especially MtrC and MtrF. These outer membrane cytochrome proteins are essential in electron shuttling and heavy metal ion reduction. In this study, we first identified the presence of the genes through PCR amplification. Next, we analyzed the mtrC & mtrF gene expressions through qRT-PCR analysis 24h after the bioremediation process of wastewaters at 2& 4 mM concentrations of copper acetate. The $\Delta\Delta C_t$ (delta-delta Ct) analysis revealed significant changes in gene expressions following 24 hours of treatment with wastewaters containing 2& 4 mM of copper acetate. The expression of mtrC increased six-fold after exposure to the wastewaters (2& 4mM), indicating a robust transcriptional activation in response to these treatments. Both concentrations of copper acetate contributed to this upregulation, suggesting that mtrC is highly sensitive to the specific conditions or components present in the wastewater. A distinct pattern of upregulation was also observed for mtrF, with its expression increasing four-fold at treatment with 2mM and five-fold with 4mM concentration of copper acetate. This differential expression hints at possible variations in the way mtrF responds to the distinct chemical or biological nature of the two wastewater components. These findings suggest that both mtrC & mtrF are responsive to environmental stimuli from wastewater treatments, with varying degrees of transcriptional activation. This information could provide valuable insights into the roles of these genes in stress response mechanisms or metabolic adaptation to wastewater exposure.

Rachel Abreo

TX - San Jacinto College

Discipline: Biology

Authors:

#1 Rachel Abreo

#2 Alexandria Tennant

#3 Andrea Rummel

#4 Tyler Olivier

Abstract Name: How Bat Activity is Affected Based on the Quality of Urban Habitats.

This study investigates the effects of urban habitats on bat activity in the Houston metro area. Six different transects (Pasadena/Deer Park, Galena Park, 1-Inner 610 West, 2-Inner 610 West, Inner 610 Southeast, and Inner 610 Northeast) were driven twice within seven days to collect acoustic data using an Echo Meter Touch 2 PRO Active Bat Detector. Each transect was rated 1-3 based on characteristics such as green space, water presence, building density, industrial factories, and tree canopy. It is hypothesized that bat activity increases in higher-rated urban habitats (e.g., more water, green space, canopy cover, etc.). Preliminary results suggest differences in bat activity with respect to habitat quality (i.e. habitat rating). Data showed that bats were statistically more active at transect 1 (Inner 610 W) than at transect 3 (Pasadena/DP/Galena Park). However, no difference was found between transect 1 and transect 2 (Inner 610 SE/NE), and there was no difference between transect 2 and transect 3. Acoustic data collection will continue through 2025. Further research is needed to understand better how bats use urban landscapes such as the Houston metro.

Christopher Abruzzo

GA - Emory University

Discipline: Psychology

Authors:

#1 Jennifer McGee

Lucas Friggle

Viraj Shivadevuni

Abstract Name: Δ 8 -THC Use Among Young Adults: Patterns, Perceptions, and Effects

Delta-8 THC, a psychoactive cannabinoid marketed as a milder, legal alternative to Delta-9 THC, has surged in popularity among young adults following the 2018 Farm Bill, which legalized hemp and its derivatives containing less than 0.3% Delta-9 THC. Despite its growing popularity, research on Delta-8 remains sparse, with little understanding of its safety, effects, usage, and societal perceptions. While some studies have explored consumer data and public opinion, this is the first to focus exclusively on adults aged 18–30, the largest demographic of Delta-8 users, and to directly compare their perceptions, usage patterns, and attitudes toward Delta-8 and Delta-9 THC. An online survey of 191 participants aged 18–30, primarily from universities in the American South, Southwest, and West Coast, was conducted. The survey included 61 questions and employed statistical analyses such as chi-square tests and Fisher's Exact Test to evaluate gender differences, reported effects, and legalization support. Key findings revealed significant gender differences in Delta-8 usage, with females more likely to report use than males ($\chi^2(1, 96) = 5.24, p = .022$), while no such difference was observed for Delta-9 usage. Participants reported both positive (e.g., relaxation, euphoria) and adverse (e.g., dry mouth, fatigue) effects of Delta-8, reflecting a nuanced user experience. Although many respondents correctly distinguished Delta-8 from CBD, uncertainty about its safety relative to Delta-9 THC was common, and the majority perceived Delta-8 as less socially acceptable. Support for legalization was

significantly higher for Delta-9 THC than Delta-8 THC ($p = 0.021$). These findings underscore the urgent need for public health education and evidence-based guidelines, particularly as Delta-8 products remain largely unregulated across the United States. As the first study to comprehensively examine Delta-8 THC use in this key demographic, this research provides critical insights into its effects and sets the stage for clinical trials to investigate its safety, efficacy, and broader policy implications.

Giovanna Abucejo

PA - University of Pittsburgh

Discipline: Visual Arts

Authors:

Abstract Name: Crystals and Light Waves: The Structural Color of the Colonial Pearl

Perla del Mar Oriente (Pearl of the Orient Seas) is the title the Spaniards gave the Philippines during their colonial reign. It paid tribute to the archipelago's lands, biodiversity, and culture, all of which were soon dulled by Spanish exploitation. The pearl-diving industry, which once held a thriving position in the Philippines' economy, faced significant decline due to overharvesting and habitat destruction. Pearls manifest as layers of iridescent nacre gradually coat irritants within a mollusk. This gorgeous result is a form of natural resistance, a testament to the power of withstanding invasive, outside forces. In this way, its process feels resonant with peoples who struggle as a result of colonization. Crystals and Light Waves is a body of animated work examining the pearl through research in collection practices, colonized histories, and current art institutional dialogue. Each of the six pieces is a 10-to-32 second looping animation of a well-known pearl. To create them, preparatory research focused on the six pearls' historical records, as well as pearl-centric texts, from laws and treatises to poetry and fiction. Many of the resultant animations are timed to Morse code, reflecting both maritime traditions and the shaping influence of language on pearls. Other animations, digital effects, and visual elements are tailored to the personal origins of each gem. These 'new' pearls simultaneously reveal exoticized, false narratives while also reminding us that resistance is a beautiful power. Crystals and Light Waves was created to take on various presentation formats, like installations, GIFs, and single-channel videos, encouraging the barrier-breaking, action-focused initiatives that museums and related institutions are currently implementing. In doing so, it invites viewers to reimagine the role of art in healing, resistance, and the reclamation of histories.

Mohammed Abu-Salah

MO - University of Missouri - Columbia

Discipline: Biology

Authors:

#1 Dennis Perez-Lopez

#2 David Arnold

#3 Monique Lorson

#4 Christian Lorson

Abstract Name: Examining disease in NEFL+/E396K and NEFLE396K/E396K mouse models of CMT2E

Charcot Marie Tooth (CMT) is one of the most common inherited neurological disorders with a prevalence of ~1:2,500. There are several types of CMT (1-7 and X) that are associated with mutations in many different genes. The two primary types of CMT Type 1 and Type 2 are associated with defects in the myelin sheath or

axonal degeneration, respectively. The focus of these studies concerns CMT2E, that is a result of mutations in the neurofilament light (NEFL) gene that encodes the NF-L protein. CMT2E gives rise to defects in peripheral axons and is clinically classified as an axonopathy. Patients typically present with distal weakness, muscle atrophy, sensory loss, and foot deformities with near-normal motor nerve conduction velocities (MCV) but with reduced compound muscle action potentials (CMAP) upon electrophysiology examination. There are currently no approved CMT2E therapeutics. In order to evaluate therapeutic efficacy, we generated a novel CMT2E mouse model based on the NEFLE396K patient mutation, the most common CMT2E mutation. Initially, we characterized our neflE396K mouse model and these studies are described below. While the mode of NEFLE396K inheritance is autosomal dominant, we evaluated nefl+/E396K and neflE396K/E396K mice to determine whether there were differences in disease pathology that could be leveraged for evaluating therapeutic efficacy. Assessments included fitness (lifespan and weight), motor function assays, electrophysiology measurements, and disease pathology (motor neuron, nerve and muscle). Our results show that nefl+/E396K and neflE396K/E396K mice develop disease phenotypes consistent with CMT2E clinical symptoms. Interestingly, neflE396K/E396K mice demonstrate disease pathology earlier than nefl+/E396K. Progressive muscle atrophy and nerve degeneration are detected that are consistent with decreased mobility. We are able to demonstrate clear differences in electrophysiology recordings between wild-type and nefl mutant animals early in disease pathology.

Jose Aceituno

NJ - Kean University

Discipline: Business

Authors:

#1 Jose Aceituno

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Lina Lorretta

Joceline Guerra

Abstract Name: Cybersecurity Resistance and Small Businesses in the NJ/NY area

Small businesses are vulnerable to cyber threats due to limited resources; therefore, strong cybersecurity measures are necessary to protect their digital assets. Kean University's Center for Cybersecurity offers these assessments free of charge to small businesses in the NJ/NY region. However, the uptake has been limited. Hence, this study seeks to evaluate the motivating factors that influence small business adoption of cybersecurity assessment. With the use of the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), the study examines the effects that performance expectancy, social influence, facilitating conditions, trust, perceived risk, and ease of use have on the decision-making of small businesses taking on these assessments. Survey data will be collected from local businesses, using a Likert scale to test the relationships of these variables vis-a-vis the perceptions of the entrepreneurs, as shown in the conceptual model below: The survey will be distributed in December and January using a multi-pronged distribution strategy, including email, social media, in-person events, and partnerships with regional chambers of commerce. The target is 300-400 responses. The data will be analyzed using partial least squares structural equation modeling (PLS-SEM) and SMARTPLS 4.1 software to assess the hypothesized relationships. The results will identify potential opportunities for data-driven interventions to reverse cybersecurity adoption resistance in small businesses.

Chris Acosta

NY - City University of New York - City College of New York

Discipline: Psychology

Authors:

#1 Ran Cortright

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Damaris Sierra

Abstract Name: Relationship between overconsumption of Short-Form Video and Attention Impairment through Behavioral Data

The rise of clinical depression worldwide has emphasized the importance of promoting pathways to improve quality of life. Among common symptoms like persistent low mood, decreased interest in things once pleasurable, and a lack of energy, people with depression also exhibit significant cognitive impairments in executive functioning. Research has indicated that excessive consumption of short-form videos is associated with higher rates of mood disturbance, poorer memory, and a hindered ability to concentrate. However, many of those findings are solely based on participant's self-report. Our study aims to further explore the link between prolonged short-form video content consumption and poor mental health. This study recruited students from the City College of New York. Participants completed a modified version of the social media use questionnaire, the Depression, Anxiety, Stress Scales DASS survey, the adult ADHD self-report scale (ASRS v1.1). After completing the surveys, participants completed a series of modified Erikson Flanker tasks to measure their selective attention on a computer. The reaction time participants took to respond to each trial and their accuracy in identifying the direction of each target stimulus were recorded. This study will split participants into a high TikTok use group and a low TikTok use group by taking a median split from participant's scores on the modified social media use survey. Then, the study plans to compare the amount of TikTok usage with reports of depression using a simple t-test. To further understand the effect of prolonged TikTok use on possible depression-related attention deficit, this study plans to compare the difference in the adult ADHD self-report scale among the high and low TikTok-use groups. To investigate the behavioral differences among high and low TikTok use groups in their accuracy performance between negative stimulus trials and neutral stimulus trials.

Christina Adam

PA - Duquesne University

Discipline: Nursing and Public Health

Authors:

#1 Urmi Ashar

Abstract Name: Predict, Prevent, Protect: AI's Role in Epidemic Control

Artificial Intelligence (AI) is an emerging topic in society today. AI can simply be defined as the theory and development of computer systems able to perform tasks that typically require human intelligence. Most importantly, AI can be used in healthcare around the world. AI can be used in the early detection of epidemics and overcome the challenges faced by weak health systems. AI can detect epidemic signals much earlier than traditional disease surveillance. AI systems such as ProMED-mail, HealthMap, BlueDot, Metabiota, and EPIWATCH can be used to constantly monitor areas for emerging diseases. AI has aided public health delivery via spatial modeling, risk prevention, misinformation control, public health surveillance, disease forecasting, pandemic/epidemic modeling, and health diagnosis. In addition, Blockchain can be paired with AI to allow for faster, more efficient analysis and communication of information. Blockchain and AI can be used to analyze outbreaks, detect and analyze diseases, develop vaccines, and predict future outbreaks. Blockchain enhances AI's epidemic control capabilities by ensuring secure, tamper-proof data sharing

between healthcare organizations, enabling real-time analysis of disease spread. AI can analyze Blockchain medical information and then distribute that information to clinical labs, hospitals, network operations, social media, and patients. Blockchain works alongside AI to address challenges like data accuracy, privacy, and communication in epidemic management. It makes it an ideal way to record information on how many people are affected by a disease, communicate that information, and then take action to stop the spread. Integrating AI and Blockchain can lead to earlier disease detection, faster outbreak responses, and improved resource allocation to strengthen global epidemic preparedness.

Johanna Adams

VA - Virginia Commonwealth University

Discipline: English and Literature

Authors:

Abstract Name: The Intersection of Identity and Economy

In bell hooks' *Where We Stand: Why Class Matters*, hooks explores the intersectionality of race, class, and gender, demonstrating how privilege and oppression shape our modern societal structure. As she draws on her personal experiences as a young working-class black woman, she critiques the societal structures that perpetuate inequality. This presentation aims to examine the key themes in hooks' work, such as systemic racism and gender-based discrimination, and how these issues present themselves personally and institutionally. As well as addressing the historical roots of these inequalities and their modern manifestations in society today. In the discussion of these challenges, this presentation also addresses interventions, such as DEI and Vivid Counterstereotypic Scenarios need to evolve to successfully bring these issues to an end. It is through reimagining these interventions that we can work to better address these complex intersections and work towards a more just society. This brings us to the creation of the Bias in Action program that would take the form of open dialogue and reflection. By promoting the open exchange of reflection and challenges, the program can confront these issues and address them collectively. Unlike the Vivid Counterstereotypic Scenario and DEI, thus implementing regular check-ins and group tasks to ensure accountability and facilitate growth personally and professionally. This would envision a future where bias is challenged, diversity is celebrated, and individuals feel they can live.

Lillian Adams

FL - University of West Florida

Discipline: Visual Arts

Authors:

Abstract Name: The Art of Inquiry: Exploring Artistic Approaches to Research

By definition, arts-based research is a multifaceted field that explores various methods and techniques for researching to expand artists' knowledge and experience of their artwork. While art-based research is often seen as less academic than STEM research, the main distinction lies in that artists aim to learn and discover during the research process rather than proving a specific idea or theory. More specifically, a survey performed at the University of West Florida found that 69% of art and design students had never heard about research opportunities available, however, 71% were interested in doing research. With this in mind, this project aimed to dispel the stigma around arts-based research and mend the knowledge gap by defining how artists conduct research and creating educational materials for students to understand how they can be

involved with arts-based research. Our central research question was “What is Arts-based research, and how can we make conducting Arts-based research more accessible for students at the University of West Florida?” Answering this involved doing in-depth literature reviews and interviews with the University of West Florida Art and Design faculty to grasp what the art research process looked like for different faculty artists. The interview’s qualitative data was then used to design a zine intended for undergraduate students to better understand arts-based research, what components an art research project should have, and opportunities to get involved in research at the University of West Florida. Although no conclusive results have been measured so far, it is expected that research programs hosted through the university, such as the Summer Undergraduate Research Program, will see a rise in art-based student researchers based on students’ better understanding of how to start an art-based research project.

Johanna Adams

VA - Virginia Commonwealth University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: What is the “Perfect” Woman?

With the rise of the Barbie (2023) movie, more and more individuals are beginning to recognize the role and journey of women that are faced in the United States, but this is not the first form of media to tackle this issue. The portrayal of women in television has significantly evolved over the 1960s to the 2000s, reflecting gender roles, feminist movements, and societal ideals. Through this paper, it examines how key female characters from shows spanning these decades- Laura Petrie from The Dick Van Dyke Show (1961), Maude Findlay from Maude (1972), Clair Huxtable from The Cosby Show (1984), and Claire Dunphy from Modern Family (2009)-- embody the change of the “perfect” woman. Through these characters, television reflects and challenges the definition of femininity. Characters like Laura envisioned the ideal housewife yet also challenged gender roles with her independence and cleverness in the 1960s. Then as the women's movement progressed, Maude confronted social issues, such as abortion, in the 1970s. The 1980s and 1990s saw Clair take back her role as an individual redefining femininity through her success in her career and family. While Claire in the 2000s highlighted the complexities and challenges faced by modern women going through contemporary society via motherhood, marriage, and the workforce. Through analyzing these characters, this paper argues that the representation of women on screen has significantly shaped the role of public perceptions of gender and societal ideals, demonstrating the “ideal woman” is continuously evolving rather than fixed. In conclusion, the portrayal of women in television opens the discussion on feminism and the complexities of womanhood.

David Adaway

TN - University of Memphis

Discipline: Engineering

Authors:

#1 Chrysanthé Preza

Abstract Name: Comparison of Two Three-Dimensional Imaging Approaches for Fluorescence Microscopy

Microscopy is the scientific study of using microscopes to capture magnified images of objects and details too small to be seen by the human eye. Three-dimensional (3D) subjects are difficult to capture because not

all regions can be in focus at once. I researched two different methods of obtaining 3D images of a fluorescent subject (that reflects light), using a ZEISS Axio Imager.Z1 microscope enabled by the ZEISS ZEN software for data acquisition and processing. My presentation will assess both methods using data I acquired from imaging a brine shrimp sample. In widefield microscopy, a 3D image of a subject is captured by taking multiple 2D images using a conventional light microscope focused on different axial depths within the sample. These images include emitted light from all regions of the sample, causing the output to appear blurry. The 3D image is modelled by the 3D convolution of the microscope's point-spread-function and the fluorescence light emitted by the sample. The convolution process is then reversed by performing a deconvolution operation, which makes the images sharper because out-of-focus light is removed and light is reassigned to the location that it originates in the underlying sample. This provides a better approximation for the 3D object. In contrast to widefield deconvolution microscopy, structured illumination microscopy (SIM) is performed by capturing multiple images for each axial depth; each image has a structured illumination (SI) pattern with a different phase projected onto it. The SI pattern modulates a portion of each axial depth, allowing better detection of in-focus light, and in this way it improves the information that can be captured. The ZEISS ApoTome device I used enables capturing and processing of optical-sectioning SIM images, which leads to final images with reduced out-of-focus light at each axial depth in the 3D subject.

Sol Addison

NC - Elon University

Discipline: Sociology

Authors:

#1 Alexis Franzese

#2 Rena Zito

Abstract Name: Authentic Identity and Brands: A Cross-Cultural Exploration into Brand Authentication and Brand Loyalty

Brand preference is primarily determined by a congruence between self-image and symbolic brand-image. Moreover, brand loyalty contributes to a sense of self by creating a brand community that a consumer may identify as part of their “true” self. This study explores how cultural differences in self-construal (whether a culture is collectivist or individualist) influence how individuals use brands to express their “true” identity in two distinct social and cultural regions: the U.S. and China. This study builds upon the authenticity literature by examining social and personal identity performance in two distinct cultures. Furthermore, this study is increasingly important in the era of globalization by laying the foundation to explore how certain social groups may transcend cultural lines allowing social groups to form based on shared meanings ascribed to certain brands. Using survey data collected from a nationally representative sample of individuals in the U.S. and China this study evaluates the levels of personal authenticity, collectivist and individualist orientations, and the degree to which one authenticates oneself through brands and brand communities. Findings indicate that the U.S. and China are culturally distinct in terms of individualist orientation and brand authentication. Unexpectedly, Chinese respondents report greater individualism, and both individualism and collectivism positively predict all forms of brand authentication. Findings also suggest that Chinese respondents are more likely than U.S. respondents to authenticate through brands based on self-image congruity and the brand's ability to express the social self. Additionally, accepting external influence significantly predicts brand authentication through brand communities. By introducing brand authentication as a framework, this research offers a new lens to understand consumer engagement and the broader societal impacts of globalization, particularly how shared meanings ascribed to brands can bridge cultural divides and shape global consumer dynamics.

Temiyemi Adewumi

Discipline: Biology

Authors:

#1 Ferhat Ozturk

Abstract Name: Honey as a Natural Preservative Against Lipid Oxidation in Meat

Preserving and extending the shelf life of meat products remains a key concern for producers, retailers, and consumers alike. This study investigates the effectiveness of various honeys—local beekeeper honeys, commercially available grocery honeys, and Manuka honey—in inhibiting lipid oxidation in beef, a process that leads to rancidity. Fresh beef samples were treated with honey and sodium tripolyphosphate (STPP) on the day of acquisition, and lipid oxidation levels were measured over four days using Peroxide Value and TBARS assays. Results from the Peroxide test revealed that M-256 honey exhibited the highest lipid oxidation inhibition (74.63%), outperforming the synthetic preservative STPP, which achieved 71.64% inhibition. Other honeys, including 23H-50 and 23H-76, demonstrated moderate inhibition levels at 59.70% and 40.30%, respectively. TBARS assay results showed that G-19 honey provided substantial inhibition of lipid oxidation (80.75%), with NJ-15 and SA-31 offering moderate inhibition at 52.07% and 46.73%, respectively. Although STPP exhibited a higher inhibition rate of 95.7%, its use is associated with health risks such as kidney failure and gastrointestinal issues, raising concerns for prolonged consumption. These findings suggest that high-bioactivity honeys could serve as a natural and safer alternative to synthetic preservatives in meat, effectively inhibiting lipid oxidation and potentially extending shelf life without adverse health effects.

Lindsey Adey-Layton

MD - Towson University

Discipline: Psychology

Authors:

Abstract Name: How Social Media has affected the Mental Health of First-time Student Voters in this year's Presidential Election

"How Social Media has affected the Mental Health of First-time Student Voters in this year's Presidential Election" Social media has vastly affected the United States youth in many ways, including how we convince our youth into voting. The methodology for this research consists with a thematic analysis of research articles and interviews of first-time voters pending IRB approval. The timeline for this research is actively being determined. University of South Florida published a research article about voter opinions on inflation, impact of politics on mental health, election distrust and social media use (Johnson, 2024). This study gives this growing field an understanding of the impacts social medias politics has on youth mental health. If social media negatively affects voters' mental health, this is going to deter these voters from attending the voting polls, and it is likely that they will continue to not vote. As of January 31, 2024, "More than a quarter of respondents (26%) say that they rely on social media 'a great deal' to stay informed about politics and current events, while another 34% say that they rely on it at least "a little." (Johnson, 2024) The study showed that "Social media users chose decidedly negative terms to describe the political discussions they meet on social media." With this research, we could harness the power of social media to positively affect first- time voters' mental health and get more young voters involved in the elections. University of Oregon Eden Henry conducted research on An Evaluation of Well-being in College Voters During Election Cycles. This research was a mixed-method approach using literature review as well as case study gathered via social media. One of the results showed "With most students reporting greater stress levels, the distribution of answers shows a considerable skew towards higher stress.

Favour Adibe

MD - Bowie State University

Discipline: Chemistry

Authors:

#1 Adam Carraway

#2 Amen Clark

#3 Bailey Jones

#4 Kerionna Wilson

#5 Carmen Capers

#6 Janiya Davis

Rebecca Allen

Abstract Name: Antacids Buffering Capacity (BC): A measure of effectiveness

Stomach upset, indigestion, and acid reflux occur when the body produces an excess of HCl, which travels to more delicate tissues, causing burning and painful sensations. Antacids, which are mainly basic, are taken to buffer the acid and reduce these effects. This research created a simulated acid environment of 0.1M HCl and a fourteen (14) number. brands of antacids bought over the counter (OTC) and online were used. The pH of the HCl buffered with the antacid was read using the OHAUS PH meter at intervals of 10 minutes for 90 minutes. and subsequent addition of 5 ml of 0.1M HCl at each interval. The rate of the pH change of the resulting solution was measured, and the buffering capacity was calculated. It was shown that some (OTC) antacids had a lower buffering capacity as against the standard of 3.5 for an extended period. This finding will create awareness among the masses and the regulatory bodies on the quality of the commonly sold antacids.

Onyekachi Adigwe

MD - Bowie State University

Discipline: Biology

Authors:

#1 Destinee Hannah

#2 Dominique Haughton

#3 Gia Morgan

#4 Cameryn DuBose

Abstract Name: In Vitro Evaluation of the Antimicrobial Efficacy of Manuka Honey Against *Bacillus cereus* and *Escherichia coli* Using Kirby-Bauer Disk Diffusion Assay

Antimicrobial resistance (AMR) is a significant global health threat, with pathogens such as *Bacillus cereus* and *Escherichia coli* becoming increasingly resistant to conventional treatments. This study investigates the antimicrobial effects of Manuka honey against *E. coli* and *B. cereus* and compares its efficacy to penicillin and tetracycline. Manuka honey was applied to agar plates using filter paper disks, and zones of inhibition were measured after 24 hours of incubation. The results demonstrated that Manuka honey effectively inhibited the growth of *B. cereus*, indicating its potential as an antimicrobial agent, particularly against Gram-positive bacteria like *B. cereus*, which are more challenging to treat.

Nima Aflaki

TN - University of Memphis

Discipline: Chemistry

Authors:

#1 Timothy Brewster

Abstract Name: Mechanistic Investigation of Substrate Docking in a Traceless Tether Catalyst

Our lab has designed a novel, regioselective dock and release system for one-pot C-H functionalization, aimed at producing polysubstituted aromatics more efficiently. We designed a “traceless tether” based on triazolopyridine (tripy) to provide catalyst stability and the correct geometric alignment for substrates to react. Designed catalysts were synthesized and tested for activity under a variety of conditions. In nearly all cases, the desired catalytic reaction was not observed. We then sought to determine the reason for catalyst failure. Equilibrium and kinetic properties of our dock and release system were measured via Fluorine-19 NMR reaction monitoring. We were successfully able to determine the concentrations of our reactants and products at different times during the reaction. Results indicate that the dock/release step of the reaction proceeds successfully with sufficient yields and rates. However, using a pre-formed palladium catalyst, we observe large amounts of metallic palladium even at low temperatures indicating that tripy ligation was not stable enough. Results obtained in this study have pointed us to second-generation systems with more robust metal-ligand binding modes.

Moukarama Afoda

MN - University of Minnesota - Rochester

Discipline: History

Authors:

Ahmed Al Hadeethi

Samantha Nohr

Abstract Name: Deciphering the Past: Examining Patient Records of the Second Minnesota State Hospital through Paleography and Analysis

This project investigates how ethics and personal beliefs played a role in the diagnosis, description, and treatment of mentally ill patients at the Second Minnesota State Hospital in the 1880s. We analyzed patient records of the “insane” from the first 76 unclaimed patients. These patients are buried at Rosemont Cemetery, a location that is still unknown. We delved into additional primary sources such as the superintendent’s reports and newspaper articles relating to the treatment of mentally ill patients. Knowledge on mental illness, let alone how to treat mentally ill patients properly, was lacking. The absence of definitive guidelines for diagnosing patients caused disputes between neurologists and superintendents because the diagnoses given were rarely based on research. The superintendent believed that potential treatments included: (1) physical labor for meager pay or incentives, with clear disparities between male and female tasks; (2) the use of restraints; and (3) certain medications, such as potassium bromide. Ultimately, we discovered that caretakers at the Second Minnesota State Hospital deemed patients mentally ill based on their ethical judgment and morals, rather than distinctly-proven, scientific facts. With this research, we hope to shed light on the unmarked 76 people at Rosemont Cemetery—who were unfortunately born at a time lacking scientific rigor on the study of mental illness—and the mistreatment they received during their time in the Hospital.

Moukarama Afoda

MN - University of Minnesota - Rochester

Discipline: Biology

Authors:

#1 Moukarama Afoda

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Bushra Ali

Muntas Osman

Abstract Name: Paws, Hooves, and a Whole Lot of Poop: A Multi-Animal Parasite Study

Zoonotic diseases, caused by parasites transmitted between animals and humans, are a significant public health concern, especially in environments where animals and humans interact closely. Among domestic animals, cats (*Felis catus*) are of particular interest due to their frequent proximity to humans, both as pets and as free-roaming populations. Parasites in feline feces can pose health risks through direct contact or environmental contamination, making it critical to understand their role as potential reservoirs of zoonotic diseases. This study primarily focuses on the prevalence and diversity of parasites in stool samples from cats while also examining samples from chickens (*Gallus gallus domesticus*), sheep (*Ovis aries*), horses (*Equus caballus*), and cows (*Bos taurus*). Standard parasitological methods were employed to identify and categorize parasites. Cats, as close companions to humans, represent a key species for zoonotic transmission pathways. Investigating the parasites they harbor can provide valuable insights into the risks they pose to human health, especially in urban and rural settings. This research highlights the importance of regular parasitological surveillance in feline populations to guide public health policies and develop effective measures for reducing zoonotic transmission.

Diya Agarwal

CA - California Institute of Technology

Discipline: Engineering

Authors:

#1 Dwayne McDaniel

#2 Munim Rayhan

Abstract Name: A Study of the Boston Dynamics Spot Robot in Extraterrestrial Environments

In planetary exploration, one of the greatest challenges faced by researchers is understanding how rovers will navigate extraterrestrial environments, especially in rocky, unstable terrains and low-gravity systems. Quadruped robots are studied for this reason, as they are better equipped to navigate such terrain much more effectively than wheeled rovers. Methods of virtual simulations using the Boston Dynamics Spot robot, an agile quadruped robot, can be used to test how robotic systems can function in alternate conditions. This project aims to create an open-source code package for the Spot robot's simulation and navigation using the latest versions of ROS2 (Robot Operating System) and Ignition Gazebo, a newer and more advanced robotic simulation software, on rocky terrain that mimics a lunar and/or Martian surface. Basic reinforcement learning (RL) techniques using a preconfigured Proximal Policy Optimization (PPO) algorithm utilized the data collected from experiments conducted in a simulated uneven terrain to enhance the understanding of the robot's navigation in similar extraterrestrial conditions. In future applications, applying this RL algorithm to a simulation of the Spot robot on an accurate lunar will enhance researchers' understanding of quadruped navigation in complex environments

Alex Aguila

FL - Miami Dade College

Discipline: Mathematics

Authors:

#1 Elvis Cabrera

#2 Jyrko Correa-Morris

Abstract Name: Recursive Formula of Constrained Joins in Partitions Lattice

In the lattice of partitions P of a finite set X with n elements, the set of atoms is divided into two groups: red and blue, with m atoms in the red group. In this project, we focus on counting the number ps_j of partitions at the j -th level of P_n that can be expressed as the join of exactly s and m or $s = m$ red atoms. To this end, we propose a recursive formula for ps_j . To derive this formula, we consider the graph G whose vertex set is X , where two elements are connected by an edge if they form a red atom. Then, counting the desired partitions is equivalent to counting the spanning subgraphs of G that satisfy certain additional conditions. This reduction allows us to leverage graph-theoretic techniques to effectively address the lattice-based counting problem. Applications of our formula to reducing the search space associated with consensus problems for partitions, particularly cluster ensemble problems in the context of clustering algorithms, are formally investigated.

Pamela Aguilar

CA - University of California - Merced

Discipline: Nursing and Public Health

Authors:

#1 Alexandra Rivera Gonzalez

Abstract Name: Physician Availability and Social Vulnerability to Disasters in Puerto Rico using the US Census Bureau Community Resilience Estimates (CRE)

Puerto Rico, a U.S. territory susceptible to natural disasters, has been in a crisis due to hurricanes, infectious disease outbreaks, a prolonged economic recession, and more. The situation has contributed to severe shortages of medical professionals, worsening health conditions on the island, and leading to socioeconomic instability. A new measure created by the US Census Bureau, the Community Resilience Estimates (CRE), captures social vulnerability to disasters throughout Puerto Rico. This study aimed to explore how the availability of physicians is associated with this CRE measure by county. We conducted different data analyses using R, including descriptive statistics and simple linear regressions, to reveal if there was a significant correlation between physician availability and community resilience in Puerto Rico. Our results showed that municipal areas of Puerto Rico with fewer physicians exhibited lower levels of resilience, which could worsen the impact of disasters. The findings of this study underscore the crucial role of physician availability since medical professionals are essential for improving health outcomes and enhancing the resilience of the island to respond to natural disasters. To protect the well-being of its residents and mitigate the impacts of future crises, the Puerto Rico health system should prioritize improving physician availability, especially among municipalities with more socially vulnerable populations.

Diana Aguinaga

OK - University of Central Oklahoma

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: History of Femicide and Transfemicide in Mexico

One major issue Mexico has continued to combat is the ongoing cases of both femicide and transfemicide. Within the last few years, there is still an uprising in cases where both women and transwomen are intentionally being killed by their perpetrators. As a result, this has brought major concerns among citizens and experts regarding the government's attempts to resolve and provide solutions to reduce the violence against women and transwomen. This study will examine the history of both femicide and transfemicide by analyzing different elements that contribute to this issue. To further examine this issue one method that will be applied for this study would be secondary data analysis including statistical data, academic journals, books, and websites to obtain more information on the number of deaths of these victims as well as finding other elements that potentially contribute to this ongoing violence against women and trans women. Once gathering this information, the goal is to raise awareness about this issue so other individuals can be informed not only about their rights but the potential resources available to them. Most importantly providing this information could help individuals in detaching themselves from any teachings and behaviors that contribute to both patriarchy and machismo.

Lauren Aguirre

KS - University of Kansas

Discipline: Political Science

Authors:

#1 Brian Lagotte

Abstract Name: Echoes of 1978: A Comparative Analysis of Personal Narratives and Media Coverage During the 1978 World Cup in Argentina

This project explores how six interviewees' collective memories surrounding the 1978 World Cup align with Argentine newspaper reports from 1975 to 1980. During the late seventies, Argentina faced political repression under a military dictatorship while hosting the World Cup. By examining the connections between the tournament and the political climate reflected in newspapers, my research will contribute to existing literature on the socio-political implications of Latin American football. Through comparing recurring themes across personal narratives with Argentine newspaper articles, this research aims to build on previous findings about Latin American football's expansion beyond mere sport. The data will consist of collective narratives from a series of six virtual interviews with individuals who lived in Argentina during the events of the 1978 World Cup. Further investigation will include thematic coding from twenty Argentine newspaper articles covering the World Cup. The findings may reveal gaps between interviewees' collective memory and newspaper reports, offering contradicting accounts of a pivotal moment in the history of football and politics. Ultimately, this research seeks to allow individuals to share their stories and assess the correspondence to Argentine newspapers reporting on the 1978 World Cup.

Alexis Aguirre

Discipline: Biology

Authors:

#1 John Griffis

Abstract Name: Comparison of Macroinvertebrate Taxa and Stream Quality Determinations for Samples in Varying Microhabitats

This study aims to compare differences in macroinvertebrate taxa between freshwater stream microhabitats. Macroinvertebrates are bioindicators used to determine levels of pollution within certain habitats. Microhabitats within streams vary by position, flow, and vegetation and these can affect what benthic macroinvertebrates can live within them. Using a modified protocol derived from the Illinois Riverwatch Citizen Science Program; a low effort sampling strategy using dip nets were taken from 2 sets of 4 different microhabitats, including undercut banks, riffles, snags and macrophytes in Lily Cache Creek in Plainfield, IL. Taxa richness, EPT (insect orders Ephemeroptera, Plecoptera, Trichoptera) taxa richness, Macrobiotic Indices (MBI), Shannon Diversity Indices (SDI), EPT/nonEPT and pollution intolerant/pollution tolerant individuals collected were analyzed to determine if differences existed within as well as between microhabitats. Data from each individual microhabitat was analyzed separately then data for each paired microhabitat was combined for comparisons. Paired microhabitats that were most similar in EPT/nonEPT were the two undercut banks, and the two macrophytes; and for between microhabitats, undercut banks and snags. Pollution intolerant/pollution tolerant comparisons for both paired microhabitats were significantly different, and between microhabitats as well, except undercut banks/riffles. MBI were variable, as were stream quality determination, ranging from good to poor. SDI were similar for most macrohabitat samples, but lowest for macrophytes and a smaller snag. Taxa richness was similar between microhabitats with macrophytes and undercut banks having the lowest EPT taxa. Scuds (C. Crustacea, O. Amphipoda) dominated all microhabitat samples except for riffles. Different microhabitats display variability in macroinvertebrate taxa and stream quality characteristics, likely related to physical factors such as velocity and substrate characteristics, but even similar microhabitats can vary as well. These considerations are important in making accurate assessments of stream quality and macroinvertebrate characteristics.

Suzanne Aguirre

TN - Milligan University

Discipline: Psychology

Authors:

#1 Jenny Padilla

Abstract Name: The Dynamics of Parental Acceptance, Intimacy, and Differential Treatment: Implications for Sibling Delinquency in Mexican-Origin Families

Previous research highlights the role of parental acceptance and warmth in promoting adolescents' psychological well-being and reducing engagement in risky behaviors. Parental warmth, particularly when combined with open communication and consistent involvement, buffers the influence of deviant peers. However, dynamics such as differential treatment based on birth order and sex can negatively impact sibling relationships, leading to resentment, lower self-esteem, and increased delinquent behaviors in the less favored child. Building on this framework, my research examines the contributions of perceived maternal and paternal acceptance, parental intimacy, and parental differential treatment on older and younger siblings' delinquent behavior. Using a preliminary sample of 84 Mexican-origin families in Northern Indiana, we explore how predictors of delinquent behavior may differ for siblings aged 12–18. In alignment with familismo, which emphasizes strong family bonds, we hypothesize that higher parental acceptance and

intimacy will be associated with lower delinquent behaviors, while greater parental differential treatment will correlate with higher delinquent behaviors. Mothers, as primary caregivers, may have their acceptance perceived as more emotionally salient, potentially making differential treatment more impactful for youth. Conversely, fathers, traditionally seen as breadwinners and authority figures, may express less overt acceptance but still exert a powerful influence due to cultural values like *respeto*, which could validate adolescents and reduce risky behaviors. While maternal acceptance has been extensively studied due to mothers' caregiving roles, research on fathers' relationships with their children remains limited, especially in cultural contexts like Mexican-origin families. Preliminary findings suggest that the predictors of delinquent behavior vary between younger and older siblings. Understanding these culturally specific dynamics will inform family-centered interventions tailored to Mexican-origin families, promoting healthier adolescent development and family relationships.

Sophia Ahearn

MD - Naval Academy

Discipline: Chemistry

Authors:

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Louis Lentz

Abstract Name: Developing the Natural Fiber Welding Process for Keratin Fibers: A Study on Wool from a Valais Sheep

Natural Fiber Welding (NFW) is a process where ionic liquids are used to fabricate higher-order, functional biocomposites from biopolymer materials. In this study, we evaluate for the first time how NFW can be applied to weld keratin-based wool fibers. Starting with an industrially-cleaned fleece from a Valais sheep, we first use chemical processes (i.e, soxhlet extraction, base treatment) to remove internal lipids from the fiber surface. Then a series of NFW experiments are performed, systematically exploring the effectiveness of four welding solvents with and without sodium sulfite. Each step of the process is evaluated using scanning electron microscopy, infrared spectroscopy, and thermal gravimetric analysis.

Muhammad Ahmad

WI - University of Wisconsin-Superior

Discipline: Economics

Authors:

Abstract Name: External Debt and Economic Growth: A Cross-Country Analysis on South Asia

This study investigates the relationship between external debt and economic growth in six South Asian countries: Pakistan, India, Bangladesh, Nepal, Sri Lanka, and Maldives. Given the region's distinct economic challenges and high external debt levels, understanding this relationship is critical. A panel data regression analysis was performed using data sourced primarily from the World Bank to assess whether external debt

influences economic growth negatively or non-linearly. A rigorous literature review provided a basis for hypothesizing a negative association, which the regression analysis supports. Findings further reveal that in most of the selected countries, external debt correlates with reduced economic growth, offering valuable insights into regional economic dynamics and policy implications.

Eshel Ahmad

PA - Drexel University

Discipline: Biology

Authors:

Abstract Name: Enhancing CAR-T Cell Function Using Precision Particles

Advancements in cancer research have highlighted the immune system's potential to be used as treatment. Specifically, T cells can be modified to Chimeric Antigen Receptor (CAR) T cells that are engineered with receptors that recognize, bind to, and kill target cancer cells. However, this approach still faces challenges as patients who receive CAR-T cell therapy often relapse and cancerous cells reappear due to CAR-T cell count dropping in vivo. Here, we developed precision biodegradable particles, with antigen and co-stimulation signals attached to the particle surface via DNA scaffolds, which offer a potential route to cell-extrinsic manipulation of CAR-T cells, given optimized stimulation to promote proliferation while reserving their effector function. T cell expansion is also dependent on a third immunomodulatory signal, interleukin-2 (IL-2), a growth and signaling cytokine. We have developed a second particle with IL-2 attached to the surface to dose functional biomaterials to promote T cell expansion in CAR-T cell populations in vitro. Future steps aim to use animal models for in vivo experimentation. Particles will be used to deliver immunomodulatory signals to CAR-T cell populations through a vaccine approach.

Bilal Ahmad

VA - Virginia Commonwealth University

Discipline: Health and Human Development

Authors:

#1 Bilal Ahmad

Abstract Name: Looking into Biomechanical Solutions to Help Improve Intractable Diplopia Induced by Strabismus Surgery in Adults

Intractable diplopia is a side-effect of long-term strabismus misalignments being corrected with strabismus surgery. These long-term strabismus errors end up creating Anomalous Retinal Correspondence (ARC) that creates intractable diplopia for the patients. Additionally, treatment forms like prisms, intraocular opaque lenses (IOLs), Botulinum toxin, and fresnel prisms, among others are popular forms of treatment. The purpose of this research is to propose alternative non-invasive and invasive biomechanical solutions as well as evaluate previous solutions and then speculate their effects and success on patients with intractable diplopia. The first theory is a proposal of using prism diopters to recreate ARC in patients who are displaying symptoms of intractable diplopia after undergoing strabismus surgery. Additionally, the topic of implementing this theory into the daily lives of patients is accounted for along with potential drawbacks and benefits. However, with typical prisms there comes an issue of thickness, which can be solved through various methods. The second proposed solution is analyzing the usage of Gradient Refractive Index (GRIN) Materials in cataract IOLs and the usage of Diffractive Optics in multifocal IOLs and relating them to potential

intractable diplopia treatment. The third proposed solution looks at more nuanced technologies like metamaterials and holographic optics and how they could be potential solutions for patients displaying ARC with intractable diplopia through prism deviation recreation. Metamaterials enable precise control over light propagation, which allows for the creation of ultra-thin designs that still have the enhanced deviation capability of thicker prisms. Holographic optics are capable of allowing dynamic, multifocal corrections in lightweight and adaptable formats. The end goal of this paper is to speculate and propose solutions with the intent of these being incorporated into clinical applications in the near future.

Afsana Ahmadi

VA - George Mason University

Discipline: Political Science

Authors:

Abstract Name: Advancing Human Security Through UNICEF's "Let Us Learn" Initiative

This research examines UNICEF's "Let Us Learn" initiative, launched to provide educational opportunities for children in marginalized conflict-affected regions, with a focus on Afghanistan. The study explores how this initiative contributes to human security by addressing educational inequalities worsened by sociopolitical instability and restrictive policies imposed by the Taliban. Contextually, the research situates the initiative within broader human security frameworks, emphasizing its role in integrating protection and empowerment to mitigate gender-specific vulnerabilities. The methodology involves a qualitative analysis of key program interventions, including Community-Based Education, Accelerated Learning Centers, gender-sensitive teacher training, and financial assistance programs. These interventions are designed to overcome barriers such as cultural constraints, security risks, and economic insecurity, which disproportionately impact Afghan girls' access to education. The study also examines advocacy efforts that amplify the voices of Afghan girls and influence policymaking at local and international levels. The expected findings highlight the initiative's dual impact: restoring educational access for Afghan girls while fostering resilience, economic stability, and gender equality within communities. By addressing systemic barriers and promoting education as a fundamental component of human security, UNICEF's efforts demonstrate how targeted programs can achieve measurable outcomes even in restrictive and unstable contexts. This research contributes to ongoing debates about the intersection of education and human security, presenting evidence that localized interventions can serve as effective tools for social progress and conflict mitigation. The findings underscore the importance of sustained international support and adaptive strategies in advancing education and gender equality in regions affected by persistent instability.

Jakira Ahmed

MI - Wayne State University

Discipline: Art History

Authors:

Abstract Name: Beyond the Binary: Gender and Space in the Art of Helen McNicoll

Explorations of gender and space in nineteenth century French art has been a nexus of flourishing art historical scholarship for decades. However, within recent burgeoning discourse, many scholars have urged for a reworking of its examination, as the binarism perpetuated by separate sphere ideology has led to a lack of nuanced and complex understandings of the relations between gender and space. It is within this context

that my paper is situated as I examine the work of Canadian Impressionist Helen McNicoll (1879-1915) to suggest how her images of female rural laborers break down the rigid, dichotomous nature of gender and space. Scholars on McNicoll have begun exploring this strain of analysis, considering how the depiction of working class women exposes the indeterminate spaces they operate within as a result of their labor. This paper builds upon the scholarship by suggesting further that McNicoll's images of rural working class women complicate the rigid, binary ways of thinking about the spaces that men and women of the nineteenth and early twentieth century occupied. Through a focused examination of her market scenes, I argue that McNicoll breaks down the dichotomy of gendered spaces through her depiction of women exercising their social and economic agency in a space otherwise traditionally deemed as public and for men. Through visual analysis, critical feminist art theory, primary sources, and secondary scholarship, this paper establishes that McNicoll's market scenes collapses the binarisms present in the public/private and urban/rural debates, necessitating a nuanced understanding of how the boundaries and thresholds of spaces are more fluid than we may think.

Essa Ahmed

IN - University of Evansville

Discipline: Engineering

Authors:

#1 Douglas Stamps

Swarup Bhatta

Abstract Name: Effect of Hot-Leg Height with Varying Collector Angle on Thermosiphon Performance

A thermosiphon is a passive water heating system that utilizes maintained temperature differences to provide a constant water density gradient within a closed volume of fluid to drive cyclical flow. This, in turn, generates a reservoir of high-temperature fluid that could be used for heating applications or energy production. The efficiency and simplicity of these systems offer advantages in highly populated or developing regions. This design also avoids the use of mechanical or electrical components. The effect of hot-leg height with a variable collector angle on collector efficiency was explored in the current research. Collector efficiency was defined as the energy absorbed by the working fluid relative to the total energy input to the collector. Key testing parameters included collector angle, variable input power to simulate various levels of sunlight, cold leg height, and hot leg height. Previous research identified local maxima and minima in the collector efficiency as the collector angle varied but research was limited to a single hot leg height. The previous results have important implications to the "latitude rule", which states the collector angle should be set to the collector's installation latitude for fixed collectors. The current research extends the previous research by investigating the effect of different hot leg heights on collector efficiency when the collector angle and input power are varied. This research is needed since some thermosiphon systems have the hot fluid reservoir mounted on top of the collector, or in other words no hot leg height, while other systems have a specified hot leg height. The results of the current research show maxima in the collector efficiency as the collector angle is varied, which indicates it may be beneficial to deviate from the latitude rule to optimize the performance of the thermosiphon.

Aditya Ahuja

MA - Northeastern University

Discipline: Health and Human Development

Authors:

#1 Jawad Rao

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Abstract Name: Expanding an AI Model for Pulmonary Vasculature Segmentation in Robotic Lung Surgery: Application to the Left Lower Lobe

Introduction: Intraoperative vascular injuries during lung resections, particularly those involving the pulmonary artery, can lead to serious complications. Accurate segmentation of pulmonary vasculature is crucial for minimizing these risks. This study expands upon our prior work on pulmonary artery segmentation in the right lower lobe (RLL) and left upper lobe (LUL), testing the model's ability to generalize to the left lower lobe (LLL) for broader clinical applicability. Methods: Robotic lobectomy video clips, focusing on the pulmonary artery and inferior pulmonary vein, were used for training. The XMem model was trained on RLL annotations to generate segmentation masks. The dataset was split into 80% for training and 20% for testing. The model's generalizability was evaluated using unseen LLL pulmonary artery data and inferior pulmonary vein annotations. Performance was assessed using the Mean Intersection over Union (mIoU) metric. Results: The model was trained on 9 RLL pulmonary artery cases, each with approximately 300 frames. It was tested on 6 LLL cases, which contained fewer frames but effectively tested its adaptability. Despite the smaller dataset, the model achieved an average mIoU of 74.8%, with scores ranging from 64.5% to 87.4%. The model performed best with clear anatomical landmarks, while accuracy slightly decreased in frames with occlusions or complex anatomy. Additionally, the model successfully segmented the inferior pulmonary vein, demonstrating its flexibility for multiple vascular structures. Conclusion: This study shows that our AI model, originally developed for RLL and LUL pulmonary artery segmentation, successfully generalizes to LLL pulmonary artery segmentation. These results highlight its potential to enhance intraoperative decision-making by accurately identifying pulmonary vasculature across lobes. Future efforts will focus on refining the model and expanding the dataset to improve its clinical utility

Tasneem Aidabi

WI - University of Wisconsin-Superior

Discipline: Mathematics

Authors:

Abstract Name: Mathematical Analysis of kaleidoscopes in at least 2-Dimensions

This research explores the intersection of mathematics, art, and computer science by examining 2D kaleidoscope generation through the lens of abstract mathematics. It investigates how mathematical principles—such as matrices, group theory, and reflection symmetries, can be applied to create dynamic, visually captivating patterns. Central to the study is the use of geometric group theory, which informs the creation of reflection rules for manipulating and transforming images. The project translated these mathematical concepts into a functional Java program that enables users to upload an image, adjust the angle of reflection, and control the resulting kaleidoscopic effect. The program leverages advanced programming techniques, including pixel manipulation and dynamic reflection methods, to generate intricate and symmetrical patterns. By applying reflection symmetries and matrix transformations, the program allows for the real-time generation of kaleidoscopic visuals, which can be tailored to the user's specifications. The research demonstrates how computational tools abstract mathematics can bridge the gap between them and visual art, offering new perspectives on how mathematical structures can shape digital art. The results underscore the synergy between mathematics, computer science, and artistic creativity, illustrating the potential of computational methods in both artistic expression and educational applications. This work not only contributes to the growing field of mathematical art but also opens up possibilities for further exploration in both creative industries and interdisciplinary education.

Taksheel Aileni

TX - The University of Texas at Dallas

Discipline: Biology

Authors:

#1 Nimit Shah

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Abstract Name: Optimizing Reactive Molecular Species and Immunogenic Cell Death Correlation in Lipid Nanoparticle-Enhanced Photodynamic Therapy

Cancer remains one of the leading causes of death worldwide, highlighting a need for innovative treatment approaches. Photodynamic therapy (PDT), a light-based modality, has gained attention for its ability to treat cancers by generating reactive molecular species (RMS) through photosensitizers activated at specific wavelengths. These RMS induce stress in the tumor microenvironment (TME), triggering immunogenic cell death (ICD) and initiating an immune response. This study examines the correlation between the production of RMS using our photosensitizer and the ICD response. The process that allows safe delivery of our photosensitizer (BPD-PC), is by encapsulating it within Lipid Nanoparticles (LNPs). A key component of the first portion of the study is monitoring Heat Shock Protein 70 (HSP-70) and Calreticulin, which are ICD markers. Under stress from PDT, these proteins relocate to the cell membrane, where helps activate immune

responses. We will measure the levels of expression to assess the ICD response using various LNP formulations, including BPD-PC 20:0, BPD-PC 16:0, BPD-Cholesterol, and Free-BPD. The second portion of the study focuses on measuring the RMS released during PDT. The two main types of RMS produced are hydroxyl radicals and singlet oxygen species. These two RMS are produced in different quantities depending on the LNP formulation. The purpose of this portion is to measure the production for each formulation. Using these two experiments, the data produced from each portion is randomly correlated according to the level of concentration used to induce ICD (IC25, IC50, IC75). The data will then be tested for significance, to determine a relationship between the ratio of RMS produced and the level of ICD induced. The findings will allow us to ascertain which ratio of RMS is the most effective at producing an ICD response, which would result in choosing a formulation that most closely matches that ratio.

Minahal Aisha

VA - University of Virginia

Discipline: Computer Science

Authors:

#1 Andrew Nguyen-Tran

Abstract Name: Predicting ICU Length of Stay with Admission Data Using Neural Networks

This research aims to predict the length of stay (LOS) for patients in intensive care units (ICUs) using only admission data. The central question guiding this study is: Can admission data be utilized effectively to predict ICU LOS and improve resource planning in critical care? Using the MIMIC-IV dataset, the model captures demographic information (e.g., gender, age), admission details (e.g., type and location), and initial diagnoses. Additionally, it includes patient history and dependencies between providers and resources, as well as explore time-series data for dynamic predictions during a patient's stay. Initial results highlight the potential for enhancing the accuracy of LOS predictions, particularly through the integration of provider-resource relationships. This study contributes to predictive healthcare analytics by showcasing the potential of machine learning to address critical operational challenges in healthcare settings.

Paula Akakpo

DC - American University

Discipline: Political Science

Authors:

#1 Gina Lambright

Abstract Name: Retour à l'Authenticité: Traditional Nationalism, Re-Invention, & Post-Colonial Power

Across the African diaspora, political elites have used traditional nationalist rhetoric, personal representation, and policy to display their allegiance to citizens. However, these representations are still poorly understood. Therefore, this paper seeks to answer the question: why do Togolese political elites act as traditional nationalists, whilst having policies, values, and associations that contradict that representation? This question has been answered using post-structuralist analysis in two approaches. Firstly, this project has analyzed official speeches, campaign videos, reporting of events, and a comic book from Togo's National Library. By analyzing these materials—meaning utilizing subject positioning to map the discourses—this study contributes to our understanding of how authoritarian leaders legitimize themselves. The second approach includes an interview component with Togolese citizens. Interviews were conducted through the snowball

sampling method to determine modern interpretations of Togolese traditional and cultural values and whether citizens see those values reflected in their representatives and the political campaigning that occurred in the 2024 election. This data has been supported by the interviews of political candidates that ran for the 2024 election. Ultimately, these interviews demonstrate the fluidity of Togolese traditional values and that a Togolese politician can be viewed positively as a traditional nationalist whilst still being perceived as an authoritarian. Together, these two approaches advance the claim that all Togolese presidents have had traditional representations at one point during their tenure, though their differing method of displaying this representation—pan-Africanist language, personal representation, traditional associations, and policy—serves to strengthen varying desired overall characterizations, for example, savior, pacifist, and even modernizer.

Salaar Akbar

WI - University of Wisconsin-Whitewater

Discipline: Biology

Authors:

#1 Kristen Curran

Abstract Name: Interrogating the Effects of Circadian Genes on Mesoderm Induction and Metabolism Using an Antagonist of REV-ERB α

Intrinsic to every mammalian cell is the circadian clock which consists of transcriptional-translational feedback loops to time 24 hours and influence multiple cellular processes such as metabolism and cellular division. We are interested in the role circadian genes play in early cell fate decisions of the embryo where they are less understood. Early in development, cells are pluripotent and can become any cell type of the embryo; when cells receive instructive signals they differentiate into specific cell types (induction). Circadian genes are expressed but do not oscillate in pluripotent embryonic stem cells, and oscillations only begin as cells differentiate, accompanied by a shift in metabolism. The circadian gene, Rev-erb α , coordinates circadian oscillations with metabolism in differentiated cells. We are seeking to understand if it plays a similar role during early development through use of an antagonist drug, SR8278. We examined somites (precursor cells of skeletal muscle of mesoderm) in *Xenopus laevis* embryos, as REV-ERB α affects myogenesis and depletion or overexpression of other circadian genes (nocturnin) can affect somite size and number. We injected 10nL of a 10 μ M SR8278 solution into one cell of two cell embryos, allowing for comparison of uninjected versus injected somite size and number within the same embryo throughout development using fluorescence microscopy. We observed that injected cells had less defined somite boundaries. Separately, embryos were cultured to blastula stage before animal caps were removed and induced to form mesoderm (muscle) with activin and a 10 μ M SR8278 solution. Gene expression and metabolic activity were assessed for 24 hours using a luciferase-based reporter gene and assay, respectively. We observed decreased nocturnin expression and decreased metabolic activity in the presence of SR8278. Originally, we predicted that nocturnin expression would increase, leading us to conclude that the drug may target a different repressor in an indirect pathway.

Abdussamad Akhter

AR - University of Arkansas

Discipline: Chemistry

Authors:

#1 Yang Tian

#2 Ryan Tian

Abstract Name: Development of an Efficient and Low-Cost Quantitative Electrochemical Method to Fast Screen Titanate-Based Bioscaffold Candidates for Tissue Engineering

Titanate nanofibers exhibit unique physiochemical properties, making them valuable in biomedical engineering and tissue regeneration. However, evaluating bioscaffold performance through in vivo or in vitro methods remains costly and resource-intensive. This project seeks to develop a rapid and low-cost quantitative electrochemical method to predict bioscaffold bio-performance, bridging the gap between material synthesis and application. Specifically, titanate nanofibers doped with valve metals or coated with materials like molybdenum disulfide, boron nitride, or reduced graphene oxide will be analyzed for charge transfer and diffusion properties using cyclic voltammetry and electrochemical impedance spectroscopy. By synthesizing doped/coated nanofibers using a hydrothermal method and characterizing their structure through SEM and XRD, this study ensures consistency in material morphology. Electrochemical techniques will quantify critical parameters, such as bulk resistance, charge transfer resistance, and mass transfer diffusion coefficients, which are key indicators of biophysical properties. Parallely, in vitro tests using C2C12 cell proliferation will validate the correlation between electrochemical data and cellular behavior, including cell distribution and tissue integration. This innovative approach offers a fast-screening alternative for pharmaceutical and biomedical industries, potentially expediting the development of efficient tissue engineering scaffolds. Expected results include a robust correlation between electrochemical parameters and biological performance, providing a predictive model for long-term bioscaffold functionality. This work represents a significant contribution to nanotechnology and biophysical chemistry, paving the way for scalable, low-cost evaluation techniques in biomedical applications.

Keziah Akramah

VT - Norwich University

Discipline: Biology

Authors:

Abstract Name: Exploring the Role of Bacteria in Snail Health and Trematode Infection

Snails are critical hosts for trematode parasites, which can severely affect their health, survival, and ecological functions. These infections disrupt snail populations and have cascading impacts on ecosystems, influencing nutrient cycling and the transmission of diseases to other hosts, including humans and animals. While trematode infections are well-documented, recent research has identified the microbiome of snails as a potential factor influencing their ability to resist or tolerate parasitic infections. Microbial communities, particularly bacteria associated with uninfected snails, may modulate host immunity or directly affect parasite viability. However, the mechanisms governing these interactions remain poorly understood, leaving significant gaps in our knowledge of host-parasite dynamics. This study investigates the role of bacterial communities from uninfected snails in influencing the health, survival, and development of trematodes. By isolating and analyzing bacteria from uninfected snails, the research seeks to determine whether these microbes can impact the lifecycle and success of trematodes. Understanding this interaction may provide insights into the ecological and evolutionary dynamics of parasite-host relationships, as well as the broader role of the microbiome in disease resistance. To explore these interactions, a combination of microbiological techniques, experimental infection trials, and molecular sequencing analyses will be employed. This study has significant implications for both basic science and applied fields. It could inform the development of microbial-based strategies for controlling trematode infections, which are responsible for various diseases in human and animal populations. Moreover, these findings may contribute to a growing body of research on the importance of microbiomes in mediating complex ecological interactions, advancing our understanding of host-parasite-microbiome systems.

Danya Al Nazal

CO - University of Colorado at Boulder

Discipline: Biology

Authors:

#1 Kora Kastengren Kastengren

#2 Chris Link

#3 Charles Hoeffler

Abstract Name: Investigating the Role of Tau in Astrocyte Reactivity and Astrogliosis

Astrocytes are the most abundant type of glial cells in the brain, and they play a role in the immune response. Tauopathies, like Alzheimer's disease (AD), are diseases where tau, a microtubule-associated protein, hyperphosphorylates and misfolds causing it to unbind from microtubules and form aggregates. Astrocytes have a low endogenous expression of tau, and this endogenous tau is thought to affect the reactivity state of astrocytes. Preliminary work from the Link Lab at University of Colorado Boulder has demonstrated that tau knockout astrocytes produced similar gene changes to those seen when wildtype astrocytes undergoing astrogliosis due to exposure to exogenous cytokines. This shows that knocking down tau in astrocytes might cause them to undergo astrogliosis. Whether the similarities in these observations were due to an endogenous immune response initiated by the knockout of tau is unknown. My research proposal is to identify whether astrogliosis markers are present upon tau knockdown in fetal human astrocytes (FHA) and using Sholl analysis to quantify morphological changes. This will aid future treatment developments in regards to the suitability of knocking down tau as a target therapeutic.

Danya Al Nazal

CO - University of Colorado at Boulder

Discipline: Interdisciplinary

Authors:

#1 Colleen Reid

#2 Katie Combs

Abstract Name: Understanding Tuberculosis: Health Literacy and Perception Among Unhoused Individuals in Shelters Guide the Development of an Education Program

Tuberculosis (TB) is a treatable infectious disease that is on the rise globally. Although unhoused individuals are at a higher risk for contracting TB and the rates of homelessness are on the rise nationally, federal funding for TB detection programs in shelters is decreasing. This study, through interviews with shelter staff, aims to understand current TB protocols in shelters as well as the accessibility of the residents to healthcare services. The data will be analyzed using reflexive thematic analysis. Themes pertaining to perceived risk of TB, attitudes toward seeking healthcare services, access to healthcare services, and prevalence of TB education resources will be analyzed alongside the staff's role. The results of the study will be used to develop an educational program in partnership with the TB Clinic in Denver and the Colorado Coalition for the Homeless, organizations which have recognized the urgent need for an educational program to counteract the increasing TB incidence with the rapid increase in people experiencing homelessness.

Iona Alatar

Discipline: Chemistry

Authors:

#1 Lyric Gordon

#2 Mohammad Abdul Halim

Abstract Name: Peptide-based Therapeutics Targeting Amyloid Beta for Alzheimer's Treatment

Alzheimer's Disease (AD) is a neurodegenerative illness characterized by a decline in cognition and memory. In the USA, an estimated 6.7 million adults aged 65 and older are currently affected, with projections of 13.8 million by 2060 if the trend continues. AD-related deaths surged by more than 145% from 2000 to 2019. Shockingly, the CDC ranked Alzheimer's as the 7th leading cause of death in 2019, and it rose to the 5th leading cause in 2023. The Amyloid-Beta ($A\beta$) hypothesis proposes that the accumulation of Amyloid-Beta ($A\beta$) peptides in our cerebral cortex causes the formation of senile plaques leading to neuronal cell death. This research aims to develop potent analogs by modifying previously tested peptides for their ability to bind and inhibit the 1-42 Amyloid-Beta ($A\beta$) peptide. For synthesizing several linear and cyclic peptides, a CEM Liberty Blue peptide synthesizer was utilized to synthesize solid-phase peptides following standard Fmoc procedures and cleaved with 95% trifluoroacetic acid. Peptide characterization was then performed using a mass spectrometer. The peptides in this study were then measured for their binding affinity with Amyloid-Beta ($A\beta$) using selected ion monitoring (SIM) based mass spectrometry assay. The dissociation constants (K_d) for $A\beta$ -peptide interactions were estimated based on the dose response by fixing the $A\beta$ concentration while varying the concentration of the linear and cyclic peptides. The three best linear peptides showed the K_d values of 299, 37, and 8.6 nanomolar (nM), respectively. Moreover, the best cyclic peptide demonstrated a K_d value of 49 nanomolar (nM). This study showed that both linear and cyclic peptides show promise to be excellent therapeutics in inhibiting amyloid beta. Additionally, amyloid fibril formation was significantly reduced once these peptides were incubated with amyloid-beta peptide as measured by ThT (Thioflavin T) fluorescence assay.

Gwen Albers

WI - University of Wisconsin-Eau Claire

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: What changed on the journey? How Chinese food carries culture and its adaptation to the American Market.

This project investigates how cultural products, practices, and perspectives are shaped and evolve through intercultural experiences over time, with a specific focus on Chinese cuisine in the United States. It addresses two central questions: (1) why and how did earlier immigrants adapt Chinese food to cater to the American community? and (2) what is the current development of Chinese cuisine in the U.S., and how does this evolution reflect broader cultural development? The study employed an exploratory approach, combining survey, interview and field observation in a museum. Through a survey of 35 students at a mid-sized Midwestern university and in-depth interviews with 8 Chinese foreign exchange students at the same institution, findings revealed a strong link between food and culture, highlighting how migration and intercultural exchange foster the evolution of traditional practices in a new environment. The findings echo/align with four key themes from existing literature: the impact of food culture, the role of modern innovation, the influence of cultural identity, and the significance of cultural adaptation. The findings illustrate how Chinese cuisine in the U.S. has transformed over time, reflecting a blend of preservation, adaptation, and innovation. This process not only meets local tastes but also challenges perceptions of authenticity in food.

Additionally, the study emphasizes how the creation of hybridized culinary traditions contributes to cultural identity while promoting dialogue between different cultural groups. By examining the historical and contemporary transformations of Chinese cuisine, this research sheds light on the broader dynamics of cultural exchange, globalization, and the role of food as a vehicle for cultural connection and evolution.

Gwen Albers

WI - University of Wisconsin-Eau Claire

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Beijin Guo

Yu Shi

Abstract Name: Is this generation too tired? The cultural impact of Tang Ping and its reflection in western culture.

This study examines the impacts of two cultural practices—tǎng píng (躺平, lying flat) in China and Quiet Quitting in the United States—and their implications for younger generations. Specifically, it investigates how these movements influence college students and educators in both countries. The research explores how American college students perceive and engage with Quiet Quitting and how American teachers and professors interpret, understand, perceive, view) its impact on students' futures. Similarly, it analyzes Chinese college students' views and interactions with tǎng píng (躺平lying flat), as well as Chinese teachers and professors' perspectives on its long-term effects. Adopting an exploratory research design, the study incorporates surveys, interviews, and a comprehensive literature review to investigate whether these trends reflect generational shifts, cultural differences, or a combination of both. By examining attitudes and analyzing the interviewees' view on work-life balance, ambition, and societal expectations, this research sheds light on the cultural and generational dynamics shaping students' transitions into the workforce. Findings reveal significant similarities between tǎng píng (躺平lying flat) and Quiet Quitting, including a shared resistance to traditional notions of success and work ethic. These trends reflect deeper concerns about burnout, disillusionment with societal pressures, and a desire for alternative lifestyles. However, the study also uncovers cultural distinctions in how these cultural concepts/practices are perceived and acted upon in their respective contexts. This research highlights the importance of understanding how these movements impact not only the individual futures of students but also broader societal and workforce trends. It is relevant to students, educators, and those interested in the evolving attitudes of the current generation toward work, education, and societal norms. By drawing connections between these cultural phenomena, the study contributes to the ongoing dialogue about generational change and its implications for global society.

Nathan Albin

IN - Purdue University Main Campus

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: What About the Fans? The Impact of Conference Realignment on Fan Engagement and Loyalty

For over 100 years, the Pac-12 was one of the premier conferences in the United States collegiate sporting world. The west-coast-based conference, consisting of some of the nation's preeminent public and private institutions, won more National Championships collectively than any other conference. However, starting in 2022, media rights uncertainty led to a mass exodus that saw ten of the twelve schools leave the Pac-12 for one of three other major conferences: the Atlantic Coast Conference, Big 10, or Big XII. Within a two-year period, the conference transitioned from an elite athletic powerhouse of the NCAA to the brink of complete dissolution. With it being such a historic conference that represented western America on the national stage and produced figures that transcended sport, the Pac-12's impending demise was certain to leave a mark on the conference's fans, who had no say in any of the proceedings that brought its fall. To better understand the underrepresented, yet crucial perspectives of the fans, I conducted semi-structured, recorded interviews at the final Pac-12 Men's Basketball Tournament in Las Vegas in March 2024. This work is a part of a larger documentary to uplift the voices of the fans, the supposed "lifeblood" of sport. In these interviews, I asked for their histories with the conference, why the Pac-12 mattered to them, what they thought the ramifications of this abrupt change could look like, and other relevant topics of interest. Before the first game tipped, it was clear that many, even if ultimately optimistic, are uncertain about the future of their schools and college sports as a whole and will sorely miss the conference once dubbed "the Conference of Champions." Now, as the landscape of American sport nationwide is more unsettled than ever, understanding the potential implications of seismic shifts such as this is vital.

Jimena Alcala

TX - Lone Star College

Discipline: Biology

Authors:

Abstract Name: Gene variants MAOAuVNTR and 5-HTTLPR as possible indicators of Non-Suicidal Self-Injury (NSSI) and differential expression between Hispanic/Latino and Anglo-American adolescents

With an aim to assess potential genetic predispositions for the development of non-suicidal self-injury (NSSI) in non-Hispanic White and Hispanic/Latino adolescents, this paper examines differential expression of the genetic variants MAOAuVNTR and 5-HTTLPR in individuals from ages 12-18. NSSI, which was added to the Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) in 2013, has been predominantly investigated through psychological and social lenses by scholars such as Olivier Campos and Kristina Eggermont, but very few examinations exist on the biological aspect of NSSI. This study analyzes Kaess et al.'s (2021) meta-analysis that conveys the possibility of NSSI as a result of variants of the MAOA and 5-HTT genes. Wester & Trepal's (2015) study is also investigated in order to determine which ethnicities currently display higher rates of NSSI. A close analysis of these sources revealed no longitudinal studies have been conducted to support the validity of those genetic variations as biological predictors of NSSI. Additionally, no information was found on the prevalence of these genetic mutations in different ethnic groups, likely due to the recent development of a biological approach to NSSI. Ultimately, this research proposes cross-sectional studies should be conducted to examine genetic variations to the development of NSSI in Hispanic and non-Hispanic White teenagers. Future research should aim to provide an optimal timeframe for the prevention of NSSI through therapeutic approaches by conducting additional longitudinal studies, especially due to the novelty of the issue in biology.

Victoria Alemayehu

WI - University of Wisconsin-Madison

Discipline: Health and Human Development

Authors:
#1 Peter Pierre

Abstract Name: Investigating the dietary sources of nutritive and caloric content in nonhuman primates: Evaluating current practices to determine the potential for obesogenic weight gain in macaques (*Macaca mulatta*).

Foraging opportunities are designed to encourage species-typical behaviors, provide cognitive stimulation, and promote the welfare of captive macaques. However, concerns about healthy body weight in captive primates highlight the need for careful dietary management, as foraging enrichment has the potential to introduce additional calories that may not be effectively measured. This study examines the dietary sources of nutrients and caloric content in nonhuman primates to assess whether current feeding practices contribute to obesogenic health trajectories. Currently diets in captive primates include the following 4 sources: nutritively balanced chow titrated to the individual based on body condition, and veterinary evaluation comprises the majority of the diet (adult ~100 kcal/kg), foraging opportunities containing food informed by delivery schedule and suggested portion sizes, treats given when observing animals (e.g., peanuts, raisins), and oral veterinary medicine disguised in a fruit roll-up or yogurt. Our previous research studied chow and enrichment as dietary sources; we will extend these findings to include analysis of all four sources. This expanded approach will provide a more comprehensive understanding of caloric contributions from all dietary sources. We will compare animals identified as clinically at-risk for obesity to sex- and age-matched control animals of normal body weight. By examining the sources of caloric content and how they contribute to overall caloric load, we aim to determine if we can identify sufficient conditions that may act as tipping points to trigger weight gain. This research will be instrumental in shedding light on key drivers of obesogenic health trajectories.

Daphne Alexander

CO - University of Northern Colorado

Discipline: Chemistry

Authors:

Abstract Name: Developing a Nuclear Magnetic Resonance (NMR) Spectroscopy Protocol for Qualitative and Quantitative Analysis of Drugs

Drug analysis has many interdisciplinary applications, from forensic chemistry to pharmaceutical analysis as well as medical testing and diagnostics. In forensic chemistry, substances suspected to be illicit drugs are frequently analyzed to confirm their identity and amount. Findings from such analyses are often applied to criminal cases to determine charges, drug origins, and physical characteristics of new drugs. Paired chromatographic and mass spectrometry techniques are widely considered as the industry standard and as such, many other instrumental methods are not commonly explored. In the present work, we explore the use of Nuclear Magnetic Resonance (NMR) Spectroscopy in drug analysis and create a standard operating procedure using NMR as the main instrumentation. The research work analyzes five over-the-counter drugs, namely, Acetaminophen, Ibuprofen, Naproxen, Aspirin, Caffeine and also mixtures of these drugs. The drugs were first dissolved in deuterated acetone and were analyzed using a Bruker NMR Spectrometer equipped with a topspin data analysis software. Individual samples of each drug were analyzed, and the resulting carbon and proton spectra were employed as references when working with unknown samples. The carbon and proton spectra of individual drug samples and drug mixtures were used to determine identity. Furthermore, integrated proton spectra were used for quantitative determinations. Overall, a standard NMR protocol was developed for both qualitative and quantitative analysis of drugs.

Harrison Alexander

PA - University of Pittsburgh

Discipline: Health and Human Development

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Abstract Name: Examination of Latency in AR Guided Skull Base Surgery

BACKGROUND: The integration of Augmented Reality (AR) in surgical workflows offers potential advantages in surgical efficiency and accuracy. While traditional surgical workflows maintain sterility through dedicated personnel managing non-sterile interfaces, implementation of AR technology could enhance surgeon autonomy. The hands-free virtual interface manipulation enables surgeons to directly control surgical systems and displays without intermediaries, potentially reducing operating room personnel requirements and streamlining workflow efficiency. In practice, system latency – understood as the delay or time it takes for data packets to travel from the sender to the receiver across a network - may impact AR practical implementation in the operating room. **METHODS:** This study evaluated the impact of AR headset latency when used to project endoscopic views during skull base procedures. In a controlled cadaveric study, trained skull base surgeons performed identical procedures (exposure of the sella, carotid, and vidian nerve) using both conventional endoscopic displays and AR-projected holographic displays. Performance was assessed through the comparison of procedure duration and video analysis. Qualitative reflections from the surgeon participants were recorded. **EXPECTED RESULTS/FUTURE IMPACT:** The learning curve for basic AR system proficiency proved manageable, with surgeons typically achieving comfortable operation within 1-3 hands-on experiences under direct guidance, suggesting feasible implementation in surgical practice. Results demonstrated that while system latency was generally negligible, specific conditions - particularly those related to wireless network instability - negatively impacted surgical performance. Beyond validating the basic feasibility of AR integration in the surgical environment, this study establishes a foundation for expanding AR applications in surgical workflows. There is great potential for future applications of integrating additional surgical information systems, imaging data, and controls into the AR environment, enabling surgeons to have immediate and direct control over multiple surgical systems during complex surgical procedures.

Aws Alezzi

TX - San Jacinto College

Discipline: Biology

Authors:

Andrew Klayman

Caley Mittelsted

Abstract Name: Bacteriophages: The Champions Rivaling Antibiotics

Antibiotics have long been the treatment of choice against bacterial infections. However, the rise of resistance to antibiotics is occurring so quickly that it has been referred to as the “silent pandemic.” It is crucial to find

alternative treatments to address this growing crisis. This is where bacteriophages come into play. Bacteriophages are viruses that target, infect, and effectively kill bacteria, including antibiotic-resistant variants. This study aims to increase public awareness about phages, a shortened term for bacteriophages, and to actively contribute our own phages for future clinical applications. A variety of biological samples, such as animal feces, soil, and water from different parks in the Houston area, were gathered. Samples were homogenized and phages were isolated using centrifugation, filtration, and chloroform emulsions to obtain high-quality samples free from impurities. A double-layer agar assay was then performed by mixing a low-percentage agar solution with purified phage samples. To this, 100 µL of the target specimens, namely *E. coli*, *S. aureus*, and *K. pneumoniae*, was added. The assays were incubated overnight at 37°C and checked for plaque formation the following day. When positive results were observed, the samples were retested at smaller bacterial concentrations to confirm that the previous positive results were not false positives. A total of 27 samples have been tested, of which six tested positive against *E. coli*, while one showed a possible positive result against *S. aureus*. Moving forward, samples will undergo further purification, serial dilution analysis, and evaluation for lytic efficiency. Full genome sequencing, along with electron microscopic imaging, is planned for spring. If any of the isolated phages are found to be unique, their genomes will be added to a global database, contributing to the expanding field of bacteriophage research and potentially being used against drug-resistant infections or as eco-friendly bio-sanitizers.

Basil Al-Halaseh

IL - Trinity Christian College

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

Abstract Name: What does the text want to say? Hans-Georg Gadamer's hermeneutical philosophy as a remedy for the originalist/pragmatist split in legal interpretation

Present-day interpretations of the U.S. Constitution are deadlocked in a debate between self-styled “originalists” and “pragmatists” over the appropriate context for textual interpretation: either the authors’ original intent (emphasis on historical context) or the demands of present-day society (emphasis on context of present-day application). Hermeneutical philosopher Hans-Georg Gadamer (1900 - 2002) offers a radical challenge to this apparent dilemma, by problematizing the conventional contrast between the legal historian’s task of understanding the law and the jurist’s task of applying the law. As Gadamer instead emphasizes, these interpreters tacitly presuppose one another’s work, such that the legal historian’s attention is already directed by a sense of the law’s application, while the jurist’s concern with the law’s application is always directed by a sense of historical context. In applying Gadamer’s emphasis on “the hermeneutical priority of the question” to an analysis of the Sixth Amendment (on the right to a fair trial), I will demonstrate the ways in which both originalist and pragmatist ways of interpreting the amendment fall short. On Gadamer’s analysis, “originalist” interpretation, for all its purported objectivity, involves a heavy interpretive bias, since its commitment to an “original” meaning imposes a traditionalist agenda that is not in the text itself. Likewise “pragmatists,” for all their emphasis on the evolving demands of the present moment, also operate with a significant pre-understanding, in treating the text as something completely understandable and applicable in terms of the known “social facts” and intended outcomes of the present time. As I show in my project, Gadamer’s emphasis on “the question” both diagnoses and prescribes a path beyond the deadlock between these two approaches, and opens a way for jurists to appropriately exercise their responsibility to both the text and the people in front of them.

Jia Ali

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

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Shamitha Perumala

Abstract Name: The Effect of Exercise and Vagus Nerve Stimulation on PD Patients with Different BDNF Polymorphisms

Parkinson's Disease (PD) is the second most common neurodegenerative disease and has no known cure (Marsden, 1994). Currently, medications are used to manage symptoms but produce significant side effects (Hayes, 2019). Aerobic exercise, an alternative to medications, has been shown to improve PD symptoms by increasing the production of Brain Derived Neurotrophic Factor (BDNF) (Liu, 2020). Additionally, Vagus Nerve Stimulation (VNS) has potential to improve symptoms through increased BDNF production (Follesa, 2007). A BDNF single nucleotide polymorphism (SNP) can result in decreased BDNF, potentially limiting the benefits of exercise and VNS. Understanding how each individual responds to these treatments, depending on their genotype, can lead to personalized treatment plans for those with PD. 20 participants with PD were randomly assigned to receive 15 minutes of either active or sham non-invasive VNS followed by 30 minutes of exercise, 3 times per week over 4 weeks. Baseline, post-treatment, and four-week follow-up assessments of motor and cognitive function will determine treatment effectiveness. DNA was extracted from participants' blood to assess for the Val66Met polymorphism and its potential effects on participant response. The BDNF SNP at 11p14.1 causes a single amino acid substitution, resulting in three genotypes: Val/Val, Val/Met, or Met/Met, with the Val/Val genotype producing the most BDNF. The hypothesis is that participants who are Met/Met and Val/Met are less likely to produce BDNF compared to Val/Val which would hinder the response to the exercise and VNS. Results regarding the participants' progress through the VNS and exercise can be used to evaluate if they are alternatives to medications. These findings can be used to treat other neurodegenerative disorders by emphasizing exercise that increases factors that nourish neuron health. Information about each genotype's effects on treatment response can be used to create personalized treatment plans according to genotype.

Juveria Ali

MI - Wayne State University

Discipline: Biology

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Abstract Name: Role for KMT2C mutation in endometrial cancer pathogenesis

Endometrial cancer (EC) is the 4th most common cancer to be diagnosed in women. Although EC has reasonable survival rates, there is a disparity gap for African American (AA) women, who are twice as likely to succumb to metastatic EC. They are more likely to develop the more severe subtype, uterine serous

carcinoma (USC), and high-grade EC. HER2-positive USC can be treated with Trastuzumab, but response varies. The KMT2C gene encodes a lysine methyltransferase involved in histone modification and transcriptional coactivation. Through a meta-analysis of multiple datasets, we identified KMT2C as highly mutated in High Grade Serous Endometrial Cancer (HGSEC) tumors from AA patients when compared to Non-Hispanic White patients. KMT2C was the top gene mutated when comparing differential mutation rates from this data. To explore the relationship between KMT2C and EC, we transfected 12Z endometrial epithelial cells with KMT2C siRNA to induce transient knockdown and performed western blots with the transfected protein lysates. Additionally, we transfected cells with plasmids containing green fluorescent protein (GFP), Cas9, and 3 different guide RNAs targeting KMT2C to generate stable knockouts. Flow cytometry isolated the GFP+ cells. Using those isolated 12Z CRISPRCas9 knockouts, we performed another western blot. KMT2C knockdown showed decreased HER2 expression. KMT2C knockdown increased Arid1a expression and minimally increased Snail and Slug expression. GFP expression confirmed successful transfection. CRISPR KMT2C guide 1 silenced some isoforms of KMT2C. Patients who have KMT2C mutations would likely be less responsive to Trastuzumab due to reduced expression of HER2. Arid1a is mutated in about 10% of human cancers and Snail and Slug are markers of epithelial to mesenchymal transition (EMT) so their overexpression in the KMT2C knockdown may have serious implications. More testing should be done related to EC patients with KMT2C mutations and alternate treatment plans need to be explored for this vulnerable subpopulation.

Mushtaq Ali

WI - University of Wisconsin-Madison

Discipline: Biology

Authors:

Abstract Name: Improving Plant Health in Lunar Regolith Using Plant Root Microbes

Interest in space exploration has been rising over the past decades. A sustainable life without plants is impossible; growing healthy plants in the space environment is essential for long-term space missions. However, plants are exposed to unique stresses in space, like lack of gravity and high-energy space radiation. Additionally, Mars and Moon regoliths, soil like dusty material found on the surface of Mars and Moon, lack organic matter that plants would need to grow. On Earth, plants exist together with their specific microbiome that helps them to thrive in various environments. Plant-associated microbes can provide nutrients to plants and improve their tolerance to biotic and abiotic stresses. In this project, we are exploring the potential of plant-root microbe interactions to improve plant health in the Lunar and Martian regoliths. *Brachypodium distachyon* and *Setaria viridis* plants, inoculated with a bacterial synthetic community, were grown in Lunar and Martian regoliths and plants were evaluated for their biomass. We observed how a small synthetic community can improve plant health in the Lunar and Martian regoliths to support their growth. We expect our results to contribute to finding practical solutions to improve plants' health in space.

Shazab Ali

NJ - Kean University

Discipline: Computer Science

Authors:

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#3 Daehan Kwak

Abstract Name: Leveraging Multimodal AI for Medical Image Diagnosis through LLM's and Visual Question Answering

Artificial Intelligence (AI), particularly large language models (LLMs), has significantly advanced medical diagnostics, especially in interpreting medical images. This research explores the application of the LLaVa (Large Language and Vision Assistant) model for medical visual question answering (VQA) in analyzing chest X-rays, with a focus on COVID-19 diagnoses. Accurate, automated diagnostic tools are crucial in healthcare, where rapid and precise analysis is often life-saving. Chest X-rays, essential for diagnosing conditions like COVID-19, require expertise and time to interpret. This study investigates how LLaVa can augment or partially automate these processes, generating accurate responses to clinical queries using LLMs. LLaVa integrates natural language processing and computer vision to generate text responses from image inputs. Leveraging its ability to learn from image-text pairs, LLaVa was fine-tuned for medical VQA to analyze chest X-rays. We utilized the LLaVa 1.5 model, known for its dynamic high-resolution capabilities, enhancing its perception of intricate medical details. To enhance the performance of LLaVa, we extracted mask features of the images using a convolutional neural network (CNN) and integrated these features into the model, enabling it to better capture structural details and improve diagnostic accuracy. A dataset of 7,146 chest X-ray images paired with detailed doctor notes was used for model training, refining LLaVa's ability to associate visual cues with clinical findings. Training spanned 10 epochs on two NVIDIA RTX 3090 GPUs. Hyperparameters, such as learning rate, were optimized to improve accuracy, while a test set of 2,114 images evaluated the model's performance. Preliminary results demonstrate LLaVa's potential in identifying pulmonary infections and handling complex clinical questions. However, challenges remain with nuanced cases and ambiguous visual cues. Further refinement is necessary to improve robustness and accuracy. LLaVa's integration into medical VQA systems shows promise in supporting healthcare professionals, enhancing diagnostic accuracy, and improving patient outcomes.

Mir Ali

MN - University of Minnesota - Duluth

Discipline: Biochemistry

Authors:

#1 Muhammad Ali

Abstract Name: Synthesis of a Novel Quinazolinone as a Potential RAD51 Inhibitor for Cancer Treatment

Homologous recombination (HR) is an important DNA repair pathway for DNA double strand breaks (DSB) and inter strand cross links. RAD51 recombinase is a major HR protein involved in DNA strand exchange and forms nucleoprotein filament on single stranded DNA (ssDNA). The nucleoprotein filament promotes strand exchange between ssDNA and dsDNA called D-loop which serves as a primer and a template for DSB repair. RAD51 is overexpressed in many cancers and its high expression is correlated with high resistance to chemo & radiation resistance and poor patient outcome. There have been a few RAD51 inhibitors reported in the literature but none of the reported candidates inhibit RAD51 potently with good drug-like properties suitable for clinical translation. Recently a quinazolinone derivative have been reported as a RAD51 inhibitor. However, the reported lead candidate contains unfavorable groups such as iodine and free benzyl units. In this regard, we have carried out a structure activity relationship study of a pyridyl quinazolinone and replaced them with pharmacologically favorable structural units. Currently, in vitro biological studies are being carried out.

ANGEL ALICEA-MORALES

Discipline: Biology

Authors:

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#2 Christian Nelson

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Abstract Name: Unveiling Campylobacter Jejuni's Pathogenicity: Insight into AspA Enzyme and Potential Therapeutic Targets

Campylobacter jejuni is a widely recognized pathogenic bacterium responsible for foodborne illnesses globally. The bacteria are typically acquired through consumption of raw or undercooked poultry, contact with animals, untreated water, and other contaminated foods such as seafood, meat, and produce. C. jejuni commonly causes gastrointestinal symptoms, including diarrhea, cramping, abdominal pain, and fever. This project focuses on the enzyme AspA, which is integral to C. jejuni virulence. The objective is to elucidate its catalytic mechanism by substituting potential active site residues. We created mutants using Phusion Site-Directed Mutagenesis and extracted the enzyme through Fast Protein Liquid Chromatography. We are currently purifying recombinant proteins T101, S140, T141, and S319. Characterizing these variants aims to enhance our understanding of C. jejuni's metabolism of L-aspartate. The underlying hypothesis is that if these active sites are critical for enzyme function, their inhibition could hinder the bacteria's energy acquisition. This research seeks to advance our comprehension of C. jejuni pathogenesis and may facilitate the development of novel inhibitors targeting AspA activity.

Srida Aliminati

CA - San Jose State University

Discipline: Engineering

Authors:

Knox Hsieh

Abstract Name: Multi-Electrode DBD Plasma Torch Design with Drug Delivery Option for Wound Healing and Sterilization

Due to its non-thermal properties, Dielectric Barrier Discharge (DBD) plasma has been increasingly utilized in medical applications, particularly for accelerating wound healing and sterilization. DBD plasma jets are generated using a dielectric tube equipped with two electrodes separated by a dielectric material. By applying high voltages (5 kV–10 kV at 30–50 kHz), gases such as helium (He) or argon (Ar) are ionized within the plasma torch to produce a plasma jet. When mixed with air, this jet generates reactive oxygen and nitrogen species (RONS), which play a critical role in promoting accelerated wound healing. Traditional DBD plasma torches, however, face limitations, particularly in controlling RONS production. To address this, a new multielectrode plasma torch was designed and tested. This innovative design incorporates multiple outer electrodes, enabling the modulation of plasma characteristics without altering gas flow rates (~10–15 slpm), thereby offering precise control over RONS generation. Comparative analysis of emission spectra (e.g., nitrogen second positive system, helium, and oxygen lines) demonstrated that the plasma properties vary significantly with the positioning of outer electrodes. The electrode closest to the torch exit exhibited the strongest emission spectrum and highest gas temperatures, while the farthest electrode resulted in weaker emissions and lower temperatures at a constant operating condition. Additionally, the new plasma torch includes a feature for introducing water droplets via a syringe, enabling liquid droplets to pass through the plasma. This functionality explores potential applications in drug delivery directly to wound surfaces while plasma treatment is being performed. The study investigates how droplet size and ejection rates impact

plasma conditions. High-speed imaging was employed to visualize droplet trajectories through plasma, facilitating accurate measurement of droplet sizes under varying operational conditions. Comprehensive experimental results and analyses will be presented at the conference.

Jafer Aljorani

TN - Lipscomb University

Discipline: Biology

Authors:

#1 Amanda Williams

Abstract Name: The Role of Human Alpha Defensin 5 (HD5) in Disrupting Desmoplakin Mediated Epithelial Wound Closure in Crohn's Colitis

Wound healing is a complex biological process requiring the coordinated function of multiple proteins. In chronic inflammatory bowel disease (IBD), particularly Crohn's Colitis (CC), this process is dysregulated, leading to delayed tissue repair and increased disease burden. Prior studies indicate that Human Alpha Defensin 5 (HD5) is over-expressed in the colonic epithelium of CC patients, yet its impact on wound healing remains poorly understood. Our laboratory has identified that HD5 may impair wound healing by modulating key structural and regulatory proteins. Preliminary findings suggest that HD5 reduces the expression and function of desmoplakin, a critical desmosomal protein essential for maintaining epithelial integrity and promoting wound closure. Utilizing an assortment of biological techniques, including wound healing assays, quantitative polymerase chain reaction (qPCR), and Western blotting, we aim to elucidate the mechanistic relationship between HD5 and desmoplakin in epithelial wound healing using NCM460D cells as a model system. We hypothesize that increasing concentrations of HD5 down-regulate desmoplakin protein and mRNA expression, compromising its ability to mediate cellular adhesion and epithelial repair. This disruption is predicted to result in reduced wound closure and impaired epithelial barrier restoration in HD5-treated cells compared to untreated controls. Understanding the interaction between HD5 and desmoplakin provides a novel perspective on the molecular mechanism of IBD-associated epithelial cell damage. This research may lead to the development of targeted therapies aimed at targeting colonic HD5, thereby improving wound healing and reducing disease burden in CC patients.

Zahra Aljuboori

IN - Indiana University South Bend

Discipline: Biochemistry

Authors:

#1 Shahir Rizk

Abstract Name: Fusing PhuZ with GFP and mCherry Fluorescence Proteins Using AI Modeling

Microtubules play a crucial role in cell division and comprise a major drug target for many cancers. However, studying microtubules is challenging as they are hard to cultivate in bacteria like E.coli. PhuZ is a self-assembling, tubulin-like protein found in bacteriophages. It serves as a model system for mammalian microtubules because it's easy to isolate and it has a comparable function in phage replication to microtubules in cell division. By making mutations in PhuZ, we can study which amino acid positions affect the polymerization properties of the protein and apply that knowledge to understanding microtubule dynamics. The current method to track PhuZ's polymerization involves using a chemical fluorescent tag. However,

fluorescent tags are unreliable because they might alter the binding properties of PhuZ. Here, we've engineered a method to track the polymerization of PhuZ without the use of fluorescent tags by fusing a fluorescent protein (GFP and mCherry) to the N-terminus of PhuZ. Using AI-powered molecular modeling, which recently won the Nobel Prize for chemistry, we designed an optimal linker sequence that allowed for attaching the fluorescent protein without hindering PhuZ polymerization. The GFP-PhuZ fusion polymerized with a similar critical concentration as the wild type, making it usable for future testing. MCherry-PhuZ fusion polymerized differently than observed previously, warranting further study. These results demonstrate that making fusions with PhuZ is possible without inhibiting polymerization. Currently, we are working to apply this method to fuse PhuZ with periplasmic binding proteins. The aim is to modify the assembly trigger of PhuZ to respond to a diverse range of molecules and engineer a "plug-and-play" biosensor system where ligand binding is linked to polymerization. In the future, we hope to successfully produce and test PhuZ fusions with an array of periplasmic binding proteins.

Kauthar Al-Khiqany

MN - University of Minnesota - Rochester

Discipline: History

Authors:

Abstract Name: The Forgotten Lives of Rochester State Hospital

This project investigates the history of Rochester State Hospital and the unmarked Rosemont Cemetery, where the hospital buried many of the initial patients who passed away during their treatment from 1879 to 1886. While the hospital originally marked their graves with white wooden crosses, these markers were lost or displaced over time. The central research question focuses on the steps needed to locate, mark, and recognize the lost Rosemont Cemetery in order to address both the historical neglect and the ethical importance of this work. Using primary sources such as patient case records, hospital superintendent reports, and newspaper articles, this research shows the stories of patients whose backgrounds as immigrants or marginalized individuals often determined their treatment. To locate Rosemont Cemetery, we explore techniques like Ground Penetrating Radar and draw on examples from other successful gravesite recognition projects, such as the Remembering with Dignity project. By combining historical analysis and modern technology, this study aims to show the importance of memorializing those who were overlooked and to bring awareness and respect for these patients.

Anjani Allada

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:

#1 Vinitha Ganesan

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#4 David White

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#6 Nusrat Jahan

#7 Ritu Aneja

Abstract Name: Scoping review of the effects of breathwork in women with breast cancer

Patients with breast cancer experience distress, treatment-related discomfort, and fear of recurrence. This study aimed to assess the effects of breathwork interventions on the mental health and quality of life of breast cancer survivors. We searched multiple databases for randomized controlled trials involving breathwork interventions in patients with breast cancer. Of the 5,909 items screened, 16 studies involving 1,726 participants met the inclusion criteria. Breathing interventions included yoga (n=8), qigong (n=4), and other breathing techniques (n=4). Interventions were prescribed daily or weekly, lasting from one week to two years. Outcomes included treatment side effects, fatigue, sleep, quality of life, biomarkers (e.g., inflammatory markers), psychosocial factors, anxiety, and depression. Although positive outcomes were reported in some domains, the wide range of interventions and outcomes complicates firm conclusions. Future research should standardize interventions and outcome measures and include longer follow-up periods to evaluate survival and recurrence.

Nisah Allauddin

VA - Virginia Commonwealth University

Discipline: Chemistry

Authors:

Abstract Name: Effects of Temperature Resistant Buffer Solutions on Biomedical Research Samples

Storing research samples at cryogenic temperatures has become an important part of preserving biomedical research samples because of its ability to halt chemical reactions and prevent protein degradation. Using subzero temperatures to maintain stable proteins is vital to obtaining accurate results from data; however, low temperatures can cause changes in equilibrium, which leads to changes in pH and harms proteins. In order to prevent proteins from denaturing, buffers are incorporated in biomedical research samples because they maintain equilibrium and a stable pH by shifting neutralizing acids and bases according to what is present in excess to the solution. Although buffer solutions resist pH change, some are more effective than others. To continue using cryogenic temperatures for research samples, the most temperature resistant buffer solutions should be found to reduce the shift in pH and better preserve protein structures. By establishing the potential of different buffer solutions to diminish pH changes, the stability of proteins within a solution can also be determined. To measure the effectiveness of different buffer solutions' capability to protect proteins, this paper examines ten peer-reviewed sources on experiments pertaining to buffer solutions' ability of protecting proteins from denaturation. From the ten reviewed experiments, data was narrowed down and the most optimal buffer solution for preserving proteins at cryogenic temperatures was found. The results from analyzing the sources showed that the HEPES buffer is the most resourceful, followed by the carboxylic acid and potassium phosphate buffer, all of which maintained a pH between 6-8 throughout most experiments. Although this paper finds a practical buffer solution, there is still more research to be done to determine an effective buffer solutions that maintains protein stability at a wider pH range.

Hunter Allen

OK - East Central University

Discipline: Chemistry

Authors:

Abstract Name: Titania-Silica Hybrid Aerogel-Like Materials for Catalysis Applications

The widespread use and development of aerogels for catalysis applications is due to their characteristically high surface area. However, the synthesis of typical aerogels is costly and time-consuming, and the need for supercritical drying compounds both these issues. This study serves to further modify our novel synthesis to chemically control binding sites to increase surface area. Our original synthesis involved doping fumed silica with titanyl sulfate hydrate followed by drying and calcining at high temperatures to remove any water and organic molecules. The proposed modification of this procedure involved doping fumed silica with a second, smaller compound prior to adding titanyl sulfate to chemically promote binding at sites away from naturally occurring pores in the fumed silica. Characterization through scanning electron microscopy, BET surface area analysis, and BJH pore size distribution showed that doping the fumed silica prior to adding the titanyl sulfate did result in substantially larger surface area and an increase in nanopores. As surface area is intrinsically tied to catalysis, further developments in high surface area materials results in more efficient catalysts

Joseph Allen

MI - Northern Michigan University

Discipline: Sociology

Authors:

#1 Joseph Allen

Abstract Name: Norm Adherence and Perceived Solidarity in Online Communities

There is currently a gap in understanding how we can research the effectiveness of communication in online communities. This study seeks to understand the relationship between norm adherence and solidarity in online communities. Quantitative discursive analysis and qualitative ethnographic analysis are used in tandem to study the levels and regularity of norm adherence, and its correlation with overall community cohesion and group solidarity. This is done by using ethnographic data to determine the norms of three different online communities, then track their adherence/transgression through quantitative content analysis, the results of this analysis are then compared to survey data on feelings of community cohesion. This study hopes to provide a framework for measuring solidarity in online communities in a way that is lacking in the current literature.

Hannah Allen

KY - University of Kentucky

Discipline: Biology

Authors:

#1 David Weisrock

Abstract Name: Comparative Analysis of Gut Microbiome Diversity Across Three Clades of Rodentia: Species, Gender, and Age-Dependent Variations

This research investigates the variations in gut microbiomes based on sex and age across three rodent species: *Mus musculus* (common mice), *Meriones unguiculatus* (gerbils), and *Acomys* spp. (African spiny mice), which have remarkable regenerative abilities. Gut microbiota plays a vital role in health, affecting metabolism, immune responses, and behavior, but the influence of sex and age on microbiome composition remains underexplored, especially in rodent species with differing physiological traits. Fecal samples and rectal swabs were collected from male and female subjects at juvenile, adult, and senescent stages in each species. We utilized 16S rRNA gene sequencing to profile bacterial communities and perform comparative analyses to uncover significant variations in microbial diversity and composition among the groups. We

hypothesize that sex and age significantly influence gut microbiota composition, with potential variations between species that exhibit regenerative capabilities. Understanding these differences could shed light on how gut microbiota contribute to health and disease, offering new perspectives for regenerative medicine and age-related health conditions. Our study aims to enhance the field of comparative microbiomics, providing insights into how evolutionary adaptations shape gut microbial ecology and informing future research into microbiome-based therapeutic strategies.

Kaleigh Allender

IL - Quincy University

Discipline: Interdisciplinary

Authors:

Abstract Name: Differences in the Male and Female Brain: An opportunity for Modern Medicine Advancement

In the past, sex differences in the brain were used to justify the supremacy of one sex over the other. In modern times, this idea has been largely shunned by the scientific community, leading to a general ignorance of sex differences in science so as to avoid the pushback of being considered sexist. However, the literature consistently points towards differences in the brains of men and women. These differences do not imply certain capabilities of men and women, but are statistically significant enough to make a difference in how medicine is developed and prescribed. The evolutionary psychology perspective is used to identify why there are sex differences to begin with. Then, neuroimaging studies, lab experiments, and quantitative research is used to pinpoint the various ways in which the male and female brain differ. They are different in structure, function, hormonal influences, emotional processing, and neurotransmitter systems. Most shockingly were the significant tendencies towards specific mental illnesses. Men are 4-5 times more likely to be diagnosed with autism. They are also more likely to develop schizophrenia and obtain drug addictions. Simultaneously, women are twice as likely as men to be diagnosed with depression. New technological research has pinpointed specific genes that operate differently depending on the sex. Understanding how these genes react under different circumstances can help scientists tailor medicine to more accurately meet one's needs. Prescribing the same medicine to different people will likely promote side effects that alter depending on the sex. This work promotes the idea that medicine could and should be modified further to accompany the brains that they work on, which could be an alteration to medicine that makes a remarkable impact.

Ezra Alley

VA - Virginia Commonwealth University

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: Digging in a Galaxy Far, Far Away: Colonial Archaeology in Star Wars

Disney's expansion of the Star Wars universe created an outlet for many artists to explore their political expressions beyond George Lucas' original vision. Star Wars Rebels, a four-season series, includes many institutions and practices meant to parallel our world. This comprehensive media review focuses on the anthropological and archaeological practices depicted in Star Wars Rebels, particularly Grand Admiral Thrawn's cultural analyses and the archaeological dig portrayed in Season 4 Episode 12 "Wolves and a Door", as the portrayals follow real-world examples of colonial control over cultural artifacts. Following

Lynn Meskell and Maria Starzmann's claim that archaeology has long been used as a tool within the context of colonial domination, particularly in the Middle East, motivated by religion, security, and the Western concept of civilizing "barbaric" societies, this study highlights contemporary cases of physical occupation of heritage sites, usage of archaeological findings to justify territorial claims or cultural dominance, and implementations of securitization developed for purpose of archaeological discovery. Findings indicate strong parallels between the Star Wars Galactic Empire and real-world colonial powers such as the U.S., the U.K., and Israel. By surveying both Star Wars portrayals and contemporary conditions of archaeology, this study extends the discussion of mere depictions within Star Wars to the broader role of archaeology in shaping historical narratives and cultural identity under imperial occupation.

Halla Al-Moradi

AL - University of Alabama at Birmingham

Discipline: Political Science

Authors:

#1 Halla Al-Moradi

Abstract Name: Understanding Yemeni American Voting Patterns in Alabama

This research explores Yemeni American voting patterns in Alabama, a demographic often overlooked in national political discourse. Recognizing the gap in data, a grassroots census was conducted to estimate the population and voter-eligible Yemenis in Alabama, revealing approximately 1,000 individuals. The study utilized bilingual surveys to assess voting behavior, preferences, and the issues driving voter decisions, comparing responses from English-speaking and Arabic-speaking community members. Pre-election surveys indicated significant generational and gender-based differences: younger, English-speaking women leaned toward third-party candidates, citing dissatisfaction with the Democratic Party, while older, Arabic-speaking immigrants favored Vice President Kamala Harris due to concerns about former President Donald Trump's policies. The study identified Gaza and the economy as top issues influencing Yemeni American voters. Post-election surveys further revealed voter turnout trends, final candidate preferences, and community reflections on the election process. The study concludes with strategies to increase voter engagement and addresses how Yemeni Americans can amplify their political voice in future elections. By providing data-driven insights into this underrepresented community, this research contributes to broader discussions on Arab American voting behavior and highlights the importance of culturally specific outreach in the electoral process.

Daniela Alonzo

CA - California State University - Northridge

Discipline: Biology

Authors:

#1 Cindy Malone

#2 Lesslie Jocol

Sean Fernando

Abstract Name: Maximal Expression of the FOXR1 Gene Promoter Requires Positive Transcription Factor Interaction

During cellular transcription, specific gene regions are copied into a complementary RNA molecule, acting as the genetic blueprint for creating proteins. The transcription process begins at the promoter region, which

controls how much a gene is expressed by providing binding sites for RNA polymerase and other transcription factors. Foxhead Box R1 (FOXR1) is a housekeeping gene that has been found to play essential roles in cellular and developmental processes in the brain. Though the involvement of FOXR1 in regulating stress pathways and neural development has been proven, its underlying transcriptional regulatory mechanisms remain elucidated. To understand transcriptional regulation, mapping the transcription start sites and transcription factor binding sites of FOXR1, will help determine the positive regulators of the FOXR1 promoter. Bioinformatics of the FOXR1 promoter identified a CpG island, associating FOXR1 as a housekeeping gene, predicting it will have a dispersed promoter with multiple transcription start sites. FOXR1 promoter region was directionally cloned into pGL3 basic, a promoterless vector containing a multiple cloning site (MCS), ampicillin resistance gene, and luciferase component to establish which transcription factor binding site is the main positive regulator of FOXR1 gene expression. Deletion constructs of the promoter region will then be developed through site-directed mutagenesis (SDM) to identify the positive regulator by transiently transfecting into human embryonic kidney cells (HEK293T) cells and using a dual luciferase assay to determine where gene expression is positively regulated within its promoter region. Understanding how gene regulation occurs can help guide genomic solutions such as genetic therapies to prevent cancer or neurological diseases associated with this gene.

Serene Alshalabi

NC - High Point University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Bradley Manor

#2 Melike Kahya

Abstract Name: The Impact of Executive Dysfunction on Brain Activity During Postural Control in Older Adults

Executive functioning is critical for maintaining physical performance in older adults, yet its impact on brain activity during postural control, particularly under dual-task conditions, remains underexplored. This study examined the relationship between executive dysfunction and brain activity during postural control in older adults under both normal and dual-task conditions. We hypothesized that older adults with impaired executive functioning would demonstrate decreased alpha power during dual-task standing, as alpha power is linked to executive function. Eighteen participants (age: 73.2 ± 4.5 , 11 female) without executive dysfunction and six participants (age: 82.5 ± 7.3 , 5 female) with executive dysfunction were recruited. Executive dysfunction was defined by a TMT B completion time exceeding 90 seconds. Electroencephalogram (EEG) assessed brain activity, while APDM inertial sensors recorded postural sway metrics during quiet and dual-task standing conditions. The Timed Up and Go (TUG) test assessed mobility. An Independent t-test compared EEG alpha power, mobility, and postural sway outcomes between these groups. The results indicated that individuals with executive dysfunction had significantly lower alpha power while standing quietly ($p=0.01$) and dual-task standing ($p=0.02$). Those with executive dysfunction took longer to complete the TUG test ($p < 0.001$) and had greater postural sway area during quiet standing ($p < 0.001$) and dual-task standing ($p = 0.03$). These findings suggest that executive dysfunction in older adults is associated with decreased alpha power and impaired postural control. Further research is needed to investigate the neurophysiological mechanisms underlying these observed relationships.

Malik Al-shaya

TX - Southern Methodist University

Discipline: Chemistry

Authors:

#1 Nicolay Tsarevsky

#2 Leonel Garcia

Abstract Name: Wavelength-Dependent Photopolymerization of Ethyl Lipoate: Optimizing Conversion Efficiency and Exploring Photoinitiator Effects

The wavelength dependence of the photopolymerization of ethyl lipoate was investigated to elucidate its photochemical behavior and optimize conversion efficiency. UV-visible spectroscopy revealed that bulk ethyl lipoate absorbs light in the range of 220–540 nm, with a maximum absorption (λ_{max}) at 333 nm and an extinction coefficient of $\epsilon_{\text{max}} = 146 \text{ (cm}^{-1} \text{ M}^{-1})$ in both ethyl acetate and tetrahydrofuran. Radical ring-opening polymerization was studied using six monochromatic light sources (380 nm, 405 nm, 425 nm, 450 nm, 475 nm, and 525 nm) at 25 °C. Equilibrium conversion was highest (~85%) at 425 nm, while longer wavelengths yielded lower conversions, likely due to reduced initiation efficiency and slowed depolymerization. To improve polymerization performance at longer wavelengths, camphorquinone, a photoinitiator with $\lambda_{\text{max}} = 470 \text{ nm}$ and $\epsilon_{\text{max}} = 37 \text{ (cm}^{-1} \text{ M}^{-1})$, was incorporated. This addition significantly enhanced both conversion and polymerization kinetics, particularly at 475 nm, resulting in the formation of gel-like polymers. The molecular weights of the resulting polymers ranged from 4,000 to 140,000 g/mol, with dispersity values (M_w/M_n) spanning 1.6 to 18.0. Proposed termination mechanisms include disproportionation of thiyl radicals, yielding thiol and thioaldehyde end groups, as well as radical coupling to form cyclic disulfides. This study highlights the critical role of wavelength selection and photoinitiator choice in optimizing photopolymerization efficiency. Future research will investigate the effects of ester chain length, layer thickness, and biodegradable crosslinkers on polymer properties, alongside the potential of alternative photoinitiators and cationic polymerization systems to enhance reaction dynamics. These findings contribute to advancing the understanding of disulfide-based polymers, emphasizing their degradability and potential applications in sustainable materials and biomedical fields.

Peter Alspaugh

FL - University of South Florida

Discipline: Mathematics

Authors:

#1 Nataša Jonoska

#2 Masahico Saito

Abstract Name: Monoid Motivated by DNA Origami

DNA Origami provides a method to create DNA nanostructures, which have been proposed to be used as scaffolds for nano-electronics and as means for drug delivery systems that can naturally interact within cell environments. Various structures have been experimentally created, including 2D arrays and 3D curves and meshes. However, a mathematical framework and theoretical understanding of DNA Origami shapes and structures is still lacking. A DNA Origami structure consists of a single long cyclic strand called a “scaffold” and numerous short strands complementary to various locations of the scaffold called “staples.” By designing precise annealing locations for the staple strands, the scaffold may be forced to fold into a desired shape. We propose an algebraic system to describe varying staple arrangements within a rectangular fold of the scaffold. For each arrangement, we associate an element of the algebraic system, which we name the Origami monoid, and design its operation to represent concatenation of graphical representations of the origami shapes. We construct the monoid by doubling the generators and relations of the well-studied Jones monoid, then adding relations that describe plausible modifications to DNA Origami nanostructures. We prove several algebraic properties of the Origami monoid, including restrictions on the forms of its elements, facts about its Green’s

classes, and we find and prove an unexpected occurrence of contextual partial commutation between certain generators of the monoid. Besides possible applications to DNA Origami, our approach also provides new ways to build and study algebraic structures.

Zainab Altamimi

PA - Gannon University

Discipline: Engineering

Authors:

#1 Zainab Altamimi

#2 Priyanshi Patel

#3 Liu Cao

#4 Longyan Chen

Abstract Name: Preparation of Alginate Beads for Coliform Bacteria Detection

Each year diarrheagenic strains of *Escherichia coli* cause about 111 million illnesses and 63 thousand deaths worldwide. Total coliforms, a generally harmless and large group of bacteria, are used as initial indicators in water management for determining the presence of such harmful pathogens. Drinking and recreational waters harboring fecal coliforms like *E. coli* imply fecal and sewage contamination that threatens human health. In high numbers, total coliforms also suggest the presence of pathogenic bacteria that cause typhoid fever, shigellosis, bacillary dysentery, cholera, and parasites. Current laboratory detection methods are based on growing bacteria in agar petri dishes, which take at least 24 hours to complete. This renders field detection infeasible, causes overtime, and delays public health response. For decades, few innovative coliform detection methods were standardized for testing drinking water samples and incubation time remain too long for same day results. Those that do significantly reduce time and provide field testing capabilities are unaffordable, especially for regions suffering the highest water sanitation challenges that would benefit the most. In this study, we developed a technique that uses alginate microbeads for the selective detection and identification of coliform bacteria in water. Using a syringe needle system, we prepared microbeads to encapsulate the bacterial cells. We further incubated the bacterial beads under a nutrient medium containing differential dyes. This allows for differentiation of coliform bacteria species by observing the color changes in the microbeads. Preliminary results showed that color change will be observable in 5 hrs. The results can also be scanned using a microplate reader to achieve fast and sensitive detection. We expect that the microdroplet method could improve environmental monitoring for effective disease prevention and advance microbiology research.

Connor Alton

WI - University of Wisconsin-Parkside

Discipline: Biology

Authors:

#1 Jessica Orlofske

Abstract Name: Parasite Communities in Fish Populations of Northern Wisconsin

Fish parasites are vital to aquatic ecosystems, serving as indicators of water quality and ecosystem health while revealing environmental stressors. However, parasites also harm fish health and quality, which can negatively impact the stability of commercial and recreational fisheries. I expect lake size will impact the

intensity of parasites in the fish. I predict that smaller lakes will have a greater intensity of parasites since there could be a greater fish density facilitating parasite transmission. Using traditional hook and line methods, I collected four species of game fish, including *Sander vitreus* (Walleye); *Micropterus salmoides* (Largemouth Bass), *Micropterus dolomieu* (Smallmouth Bass), as well as *Esox lucius* (Northern Pike) from three lakes in Northern Wisconsin. Because of the unpredictability of catching only game fish, I also opportunistically harvested panfish (*Lepomis macrochirus*, Bluegill; *Lepomis gibbosus*, Pumpkinseed; and *Perca flavescens*, Yellow Perch) to obtain an accurate census of fish parasites in these lakes. In addition to the capture location, I also documented environmental characteristics including water temperature and clarity. Overall, I dissected 31 game fish and 22 pan fish (Pike=17, Turner=23, and Amik=13). I recovered parasites from every fish in this study. Among the lakes, most parasite taxa were shared in gamefish; however, intestinal helminth abundance varied (Pike=69.08, Turner=91.2, and Amik=44.88). Contrary to my prediction, the smallest lake had the lowest intensity of parasites per gamefish. A commonality among the three lakes was the presence of the dominant parasite *Neascus* spp. (Blackspot). Furthermore, *Neoechinorhynchus* sp. was a dominant intestinal helminth observed at all three lakes. Further analysis will focus on resolving the parasite community for each fish species. Establishing an initial parasite community for these lakes can be used to help track how communities fluctuate in the future in response to changes in external factors.

Daniel Aluko

PA - Carnegie Mellon University

Discipline: Engineering

Authors:

#1 Lindsey Huff

#2 Rosalyn Abbott

#3 Adam Feinberg

Abstract Name: Computational Fluid Dynamics Modeling of FRESH 3D Printing Mature Adipocytes

Introduction: Livestock farming is one of the largest consumers of land and fresh water globally. The production of lab-cultured meat is a growing industry with potential to solve this issue. Widespread adoption of lab-cultured meat would allow for a 99% reduction in agricultural land use and a 96% reduction in water consumption. Printing fat for cultivated meat has proven difficult due to the large size, fragility, and buoyancy of adipocytes. Here we use fluid flow simulations to optimize Freeform Reversible Embedding of Suspended Hydrogels (FRESH) 3D printing parameters to generate lipid laden tissue. Increased pressure and shear stress during printing results in cell rupture and decreased average cell diameter. Thus, it is necessary to optimize printing parameters (nozzle diameter, bioink viscosity, print speed) using CAD and CFD software. **Methods:** Several simulations were run in SolidWorks CAD and CFD with varying parameter values: 1) Inlet Speed – 4mm/s, 10mm/s, 16mm/s, 2) Bioink viscosity (a function of alginate concentration) – 1%, 4%, 6%, 8%, 10% alginate, and 3) Nozzle diameter – 18-gauge, 22-gauge, 26-gauge. A 3mL BD Syringe was used as the base model for fluid flow CFD. Laminar flow was assumed due to small pipe diameters, low fluid flow speeds, and high viscosities involved, resulting in a low Reynolds number. **Results:** It was found that increasing the inlet speed of the printed bioink led to a linear increase in average shear stress and pressure, while increasing the printing needle gauge and bioink viscosity resulted in a much faster growth of average shear stress and pressure. **Conclusion:** By varying different printing parameters and bioink properties, FRESH 3D printing can result in high fidelity prints that minimize shear and bulk stresses experienced by adipocytes during extrusion, allowing high cell viability to be maintained.

D'Angelo Alvarez

CA - Chapman University

Discipline: Chemistry

Authors:

#1 Jerry LaRue

Stephanie Hoang

Abstract Name: Bimetallic Core-Shell Nanoparticles as Promising Photocatalysts

Nanoparticle structures have become a cornerstone of modern nanoscience and technology due to their tunable properties, which make them highly adaptable for specific needs in the chemistry industry. Their unique ability to undergo controlled surface chemistry enables nanoparticles to function as effective photocatalysts. This process, known as photochemistry, offers a new approach in the petroleum industry and helps mitigate CO pollution. Traditional fuel production methods are energy-intensive and rely heavily on resources like water and CO₂, the latter of which contributes to environmental harm. These methods often exploit and damage the environment, making them inefficient in material usage. The analysis of nanoparticle structures, such as Gold and Titanium Nitride (TiN), reveals a more sustainable and cost-effective way to produce fuel, in contrast to conventional methods. Photocatalysts, activated by light, offer a more energy-efficient alternative, consuming less available energy. The process also yields non-harmful products, with reactions like CO oxidation and CO₂ hydrogenation producing water, methane, and CO₂, all less harmful than CO. These catalysts provide a promising pathway for a greener and more selective approach to chemical production, reducing the consumption of valuable resources. This project investigates the use of viable elements with reliable nanoparticle structures, focusing on bimetallic core-shell nanoparticles with Titanium Nitride as the core metal. Ruthenium, rhodium, and nickel have been used as shell metals in these core-shell structures. The core-shell nanoparticles enhance the catalytic properties of the plasmonic cores due to their unique characteristics. These nanoparticles are synthesized and washed using centrifugation. Microscopy techniques, such as Scanning Electron Microscopy, Energy-dispersive X-ray Spectroscopy, Transmission Electron Microscopy, and Ultraviolet Absorption Spectroscopy, are used to analyze the samples. Future data is expected to demonstrate that photocatalysts offer a more efficient and sustainable alternative to traditional methods in the chemical industry.

Mackenzie Amann

MN - St. Olaf College

Discipline: Environmental Science and Sustainability

Authors:

#1 Kathryn Ziegler-Graham

#2 Katherine Tegtmeyer Pak

#3 Paul Jackson

Cole Monson

Ziling Zhen

Abstract Name: Bibliometric Analysis of Satoyama

Satoyama lacks a consensus definition, encompassing everything from traditional Japanese village-managed landscapes to modern parks. It has captured the interest of many different actors over time, such as social scientists, biologists, and educators. Satoyama ideas shape major policies like the Satoyama Initiative, which promotes sustainable land use and addresses global challenges such as habitat degradation, climate change, and resource overuse. To improve understanding of satoyama as a concept and driver of action, we conducted a bibliometric review of 704 bilingual sources to clarify its historical development and reflection in public policy. Using qualitative analysis, we manually classified English abstracts to identify frequent keywords indicative of integral themes and translated these keywords to automate the classification of Japanese

abstracts. Subsequently, we performed quantitative analyses to examine temporal trends in these themes, resulting in a timeline that captures how conversations around satoyama have shifted from forest management techniques to local and global conservation policies. This analysis will permit collaborators to discuss the literature in connection to shifts in policy and actor engagement over the past 75 years.

Rachel Amicucci

MI - Hope College

Discipline: Linguistics and World Languages

Authors:

#1 Brigitte Hamon-Porter

Abstract Name: Le Chlordécone

Les Antilles sont un archipel de belles îles tropicales qui périclitent de l'intérieur. Un pesticide poudreux blanc, le Chlordécone, s'est infiltré dans le sol, l'eau de la rivière, et les cultures entre 1972 et 1993, provoquant des effets cancérogènes dans les générations multiples des îliens. Le gouvernement français n'était pas seulement consciente des effets dévastateurs, mais a continué de permettre l'utilisation du Chlordécone dans les bananeraies d'îles comme la Guadeloupe et la Martinique même lorsque c'était interdit sur le continent. Au début du 21^e siècle, la France a finalement mis en place des plans pour financer la recherche et de compensation pour les travailleurs agricoles affectés, mais est-ce trop tard de 30 ans? Cette présentation examinera les propriétés chimiques du Chlordécone, expliquant pourquoi il a des effets destructeurs sur l'environnement ainsi que ses conséquences à long terme sur le corps. En plus, nous porterons un regard plus profond jusqu'à la fin de l'histoire de la mise en œuvre du pesticide, l'arrêt de l'utilisation dans les autres pays, les effets en Guadeloupe et en Martinique, et une discussion sur ce que le gouvernement Français fait aujourd'hui pour améliorer la situation.

Sumehra Amin

PA - University of Pittsburgh

Discipline: Biochemistry

Authors:

#1 Violetta Pivtoraiko

#2 Eric Abrahamson

#3 Milos Ikonovic

Abstract Name: Diffusible and membrane-bound amyloid- β oligomers in early and late stages of Alzheimer's disease

Amyloid- β (A β) plaques are a neuropathological hallmark of Alzheimer's disease (AD). A β plaque deposition involves polymerization of diffusible A β oligomers (A β O), primarily involving the aggregation-prone A β 42, into insoluble A β fibrils. The status of presumably neurotoxic A β O during early and late AD stages is not well understood. Commercial ELISA kits were used to assay concentrations of total A β O and soluble A β 42 in occipital cortex from 25 autopsy cases in groups with AD neuropathologic change low (non-AD controls, n=8), intermediate (AD-mild/ADm, n=7), and high (AD-severe/ADs, n=10). Sequential fractionation produced PBS-soluble (diffusible A β) and Na₂CO₃-soluble (membrane-bound A β) fractions. We observed strong associations between PBS- and Na₂CO₃-extracted A β O ($r^2=0.79$, $p<0.0001$) and A β 42 ($r^2=0.61$, $p<0.0001$). A β O concentration was higher in PBS than Na₂CO₃ extracts in controls, while the opposite

was seen in both AD groups. A β 42 was near assay detection limit in both fractions from controls, while in AD groups it was >10-fold higher in Na₂CO₃ compared to PBS extracts. Relative to the ADs group, the ADm group showed significantly higher A β 42 in Na₂CO₃ extracts and higher A β O in both extracts. PBS:Na₂CO₃ ratios for A β O and A β 42 were high in controls and low in the AD groups. These results support a preponderance of membrane-bound vs. diffusible A β O, particularly A β 42, in AD. Highest concentrations of A β O appear to accumulate in cell membranes during early AD, while lower levels in late AD may be due to fibrilization and sequestration of A β O into plaques. Thus, targeting A β O directly may be an efficient therapy strategy only in early AD.

Narcy Amireddy

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Stephanie Fox

#2 Michelle Gray

#3 Rita Cowell

Abstract Name: Impact of Estrogen-related receptor gamma (Esrrg/ERRg) Modulation on Activity-dependent Gene Expression in Drd1 & Drd2-expressing SPNs: Implications for Huntington's Disease

Introduction: Current treatments for Huntington's disease (HD) focus on reducing huntingtin protein (HTT) expression, but this may not suffice to address the cellular effects of HTT repeat expansion. Additional research is needed to explore neuroprotective strategies. Studies on transcriptional regulation show that the transcription factor ERR-gamma (ERRg; encoded by Esrrg) can modulate HD-related gene expression in spiny projection neurons (SPNs). Esrrg/ERRg overexpression in dopaminergic neurons enhances mitochondrial mass, boosts genes for respiration and autophagy, reduces synuclein inclusions, delays neuronal loss, and preserves axonal terminals in synucleinopathy models (relevant to Parkinson's disease). These findings suggest that understanding ERRg's roles in SPNs could inform potential therapeutic approaches in HD. **Methods:** In this study, we evaluated the influence of ERRg knockdown or overexpression on the expression of putative ERRg target genes in SPNs. One robust and reproducible response was for Egr1, an activity-dependent gene, which was reduced with ERRg overexpression and increased with ERRg deletion when measured by rt-PCR in homogenates of striatum. To determine whether the transcriptional changes were happening specifically in SPNs, tissues from both groups underwent small molecule fluorescence in situ hybridization (sm-FISH) protocols to amplify Egr1 in cells positive for Drd1 and Drd2 mRNA signal to define specific SPN populations. Cell Profiler software is utilized to automatically identify the amount of Egr1 expressed in either Drd1 or Drd2 cell types in confocal images. **Results:** While ERRg overexpression was capable of inducing subsets of genes involved in mitochondrial function and protein clearance, it caused a reduction in Egr1 expression. In contrast to overexpression, ERRg deletion caused an increase in Egr1. **Conclusions:** This finding could be explained by ERRg-mediated recruitment of transcriptional co-repressors to the promoter. Future experiments will explore the biology underlying the transcriptional effects of Esrrg/ERRg overexpression to determine whether ERRg activation could be neuroprotective in HD.

Morgan Amos

NY - Pace University

Discipline: Chemistry

Authors:

Abstract Name: Model Studies to Guide Cleanup of Clandestine Methamphetamine Labs: Reproducibility of Wipe Sampling

Clandestine methamphetamine production labs (“Clan Labs”) are found in residential dwellings, motel rooms, garages, automobiles, etc. Law enforcement and first responders remove gross quantities of hazardous materials, but property owners do further remediation. Decontamination processes for residual chemical materials can vary, and the most effective cleaning method is unknown. Dr. Karen R. Caldwell’s research aims to understand how surface properties and interfacial chemical reactions govern the effectiveness of cleaning methods and determine the best method. In our research, a typical sample is obtained by wiping a 10-cm x 10-cm square to which a known quantity of a model compound was applied uniformly. Then, a chemical analysis of the wipe will be performed. Previously, we developed a simple template that prevents leakage of applied solvent when performing the wiping procedure. We also found that wipes based on laboratory filter paper are the best to ensure that all material on the test squares is ultimately analyzed. Preliminary results: (1) Not all material applied is routinely recovered – 60-65% recovery is typical, and (2) Variability of up to 30% recovery is observed when different workers carry out the identical wipe procedure. Current research focuses on what causes these differences. We continue using a model compound that can be analyzed via UV-VIS spectroscopy. Modern computational chemistry approaches are being explored, as is the potential influence of surface roughness on the reproducibility and accuracy of this surface-wiping procedure. Once a well-characterized wipe test protocol is developed, a compound more closely related to methamphetamine will be synthesized and subjected to standard wipe testing and analysis. Progress towards this end will be reported.

Ramlah Amsa

MD - University of Maryland Baltimore County

Discipline: Linguistics and World Languages

Authors:

Abstract Name: The Aesthetics of the Graphic Novels of Guy Delisle and Riad Sattouf

Graphic novels, as a literary genre, teach how to combine text and images effectively. French graphic novels, in particular, explore relatively unknown genres in multiple formats without pagination. They experiment with graphics and narratives with original tones, styles, and content. The research endeavors to examine portrayals of Eastern and Western cultures, linguistic aspects of the French language, and artistic choices in the Francophone world through a comparative analysis of graphic novels by two prolific authors: Guy Delisle, a French Canadian, and Riad Sattouf, a French Syrian. Guy Delisle's graphic novels explain his life in Quebec (his birthplace) and other countries (those he visits for work). On the contrary, Riad Sattouf describes his experiences living in France, Syria, and Libya. The research concludes with the possible biases that the works may have based on the upbringings of the authors and the way that these biases alter the perceptions that the readers have of these countries based on the media.

Su bin An

PA - University of Pittsburgh

Discipline: Psychology

Authors:

#1 Megan Deam

#2 Julianne Griffith

#3 Leslie Horton

Abstract Name: Effect of Caregiver Stress on Perceived Stress of Adolescents with and without Clinical High-Risk for Psychosis

Adolescence is a period of rapid development with changes in brain structure and functions, body, and environmental factors. It is also known as a period during which the risk for psychosis increases and the first episode of psychosis occurs. Perceived stress has emerged as a critical contributor to increasing vulnerability to developing psychosis by worsening psychotic symptoms among adolescents with clinical high-risk for psychosis (CHR-P). CHR-P is identified with the presence of attenuated psychotic symptoms, such as unusual thought content, grandiosity, delusion, hallucination, and disorganized communication, and within 2 years, 20-35% of adolescents at CHR-P may transition to psychosis. A number of studies have indicated that adolescents' relationships with their parents may impact their stress, which plays an important role in psychological outcomes. However, less is known about how caregiver stress influences the relationship quality and perceived stress level of youth with and without CHR-P. Low caregiver-adolescent relationship quality may explain the effect of caregiver stress on adolescent stress. To fill in this gap, the present study examines the effect of caregiver stress on the caregiver-adolescent relationship, as well as perceived stress of adolescents at CHR-P and low-risk controls. It is hypothesized that for all adolescents, (1) higher caregiver stress will be negatively associated with both adolescent and caregiver reported relationship quality, and (2) lower relationship quality will be associated with higher adolescent stress. We will also explore differences in effects between CHR-P and low-risk adolescents. Approximately 30 adolescents (15 CHR-P, 15 controls) and their caregivers will participate in the study. Caregiver stress levels, caregiver-adolescent relationship quality, and adolescent stress levels will be assessed using self-report questionnaires. Findings will advance

knowledge of mechanisms contributing to perceived stress in adolescents at high- and low- risk for psychosis and could inform effects to develop dyadic therapeutic interventions for adolescents and their caregivers.

Shaynah Anderson

MI - Hope College

Discipline: Education

Authors:

#1 Shaynah Anderson

#2 Mihyun Han

Abstract Name: Exploring Teacher Educators' Practices and Challenges in Preparing Preservice Teachers for Emergent Bilingual Students

Emergent bilingual students in K-12 classrooms face unique linguistic and cultural challenges, requiring teachers to employ specialized instructional strategies. Despite this need, teacher preparation programs often lack sufficient emphasis on equipping preservice teachers to effectively support these learners. Vomvoridi-Ivanovic and Chval (2014) observed that many teacher education programs fail to adequately integrate content and language instruction, leaving preservice teachers underprepared to meet the needs of linguistically diverse classrooms. Similarly, Echevarria, et al. (2004) emphasized the importance of structured models, such as the SIOP framework, which are often absent in teacher education curricula. García and Kleifgen (2010) further noted that deficit views held by some teacher educators toward multilingual learners hinder the adoption of inclusive and equitable practices. This multiple case study employs comparative analysis to examine how teacher educators integrate pedagogical language knowledge, strategies, and assessments to prepare preservice teachers for emergent bilingual students. The study focuses on three teacher educators teaching foundational education courses at three teacher preparation programs in the Midwest. Through interviews and syllabi analysis, the research explores key areas, including differentiation, curriculum planning, assessment practices, and professional development. The comparative analysis reveals variations in practices and identifies common gaps between educators' current efforts and their aspirations to fully integrate culturally and linguistically responsive approaches into their courses. Additionally, the study investigates challenges educators face in aligning their teaching with these goals. Findings will incorporate identity-informed perspectives from the researchers, blending insights from both a teacher candidate and a teacher educator. These findings emphasize the importance of intentional planning, the development of bilingual teaching strategies, and fostering advocacy for emergent bilinguals in teacher education courses. By leveraging a comparative analysis approach, this study aims to advance equitable and inclusive practices for diverse learners while promoting the ethical development of preservice teachers as advocates for social justice.

Nathan Anderson

OH - University of Cincinnati Main Campus

Discipline: Biology

Authors:

#1 Rose Ward

#2 Christian Garcia

#3 Eli Salem

#4 Natalie Bennings

Abstract Name: Unwanted Passengers: Level of Influenza Inside College Bars

For many people, drinking and attending college bars is seen as an essential part of the college experience. Large amounts of people flow through these locations regularly, often carrying unwanted passengers (i.e., viruses) with them. Compared to the past, good hygiene and cleanliness are seen as imperative by modern society, and represent key public health interventions or responses that curb the spread of illness. Since the outbreak of COVID-19, good hygiene is an important part of societal health. However, some typical habits, including attending college bars and pubs, go against this focus on hygiene and safety from disease, inviting an increase in risky activities such as sharing drinks. Evidence suggests that there is often a plethora of pathogens found in public spaces (e.g., bars, recreational gyms libraries), however they do not explore college bars specifically, showing the need for studies to explore this location type. This project aims to examine the presence of influenza on several fomites, or surfaces that may contain pathogens, inside of bars and compared to other locations. Influenza may have been transferred to the bar surfaces through direct contact with human hands, or indirectly, through the air or from clothing contact with chairs. Example bar surfaces include handrails, chairs, tables, and toilets. The final results from the bar surfaces will be compared to similar surfaces inside two other locations (student gym, campus library). These locations were chosen because they will contain the same group of interest and are also high traffic. Samples from each bar surface will be compared to an analogous surface of the two other locations. Data collection is ongoing. The expected result is that there will be statistically more influenza present on surfaces inside bars compared to the other two locations. The results from this study can inform illness prevention initiatives in bars.

Abigail Anderson

CA - Occidental College

Discipline: Biology

Authors:

#1 Abigail Anderson

#2 Rajeev Vibhakar

Abstract Name: Targeting the Menin-KMT2A Interaction with SNDX-5613 as a Treatment for Pediatric Medulloblastoma

Medulloblastoma (MB), an embryonal tumor arising from the cerebellum, is the most common CNS malignancy in childhood. Current treatments achieve a 75% five-year survival rate; however, they often result in significant complications or relapse, emphasizing the need for novel therapies. Recent research has identified the Menin-KMT2A interaction as a key driver of tumor progression in various cancers, including MB, making its disruption a promising therapeutic strategy. SNDX-5613, a small-molecule inhibitor, specifically targets the Menin-KMT2A interaction, offering a potential targeted treatment for this malignancy. This study explores the efficacy of SNDX-5613 in pediatric MB cells by examining its impact on cell proliferation, apoptosis, and molecular signaling pathways. D458 MB cells were treated with varying concentrations of SNDX-5613 and cell proliferation was monitored to determine the IC50. mRNA expression of Menin, MLL1, cMyc, and CDK6 was analyzed via RT-PCR, protein levels of key apoptotic and cell cycle regulators were assessed by Western blotting. Flow cytometry was used to evaluate cell cycle progression. Results demonstrate that SNDX-5613 has significant efficacy in targeting the Menin-KMT2A interaction and is accompanied by a decrease in the levels of both Menin and KMT2A individually. Furthermore, treatment not only increases the levels of P21 and other pro-apoptotic factors, but also induces apoptosis in MB cells, highlighting its dual role in inhibiting cell proliferation and promoting cell death. These findings collectively support the therapeutic potential of SNDX-5613 as a targeted treatment for pediatric medulloblastoma.

Dana Anderson

Discipline: History

Authors:

- #1 Ellen Heunisch
- #2 Tylor Rocha
- #3 Reed Ziemer
- #4 Jaden Olski
- #5 Faith Fogarty
- #6 Harry M. Jol
- #7 Martin Goettl
- #8 Philip Reeder
- #9 Joe Reeder

Abstract Name: Surveying and Visualizing Subsurface Anomalies with Ground Penetrating Radar at the Vilkija Cemetery in Vilkija, Lithuania

The Vilkija Jewish Cemetery in Vilkija, Lithuania has found itself in disrepair since the Nazi invasion and Soviet occupation of Lithuania in the 20th Century. The Karnofsky family were prominent Jewish community members in Kaunas, Lithuania when they fled to New Orleans in the early 1900s. In New Orleans, they met Louis Armstrong and developed a deep connection to the Armstrong family. This relationship has sparked international interest in preserving the Vilkija Jewish Cemetery to honor the legacy of the Karnofsky and Armstrong families. Recent community interest in the preservation of the cemetery has welcomed surveyors and researchers to collaborate at the site. Geographic research was conducted in the cemetery using a pulseEKKO Pro 500 MHz antennae ground penetrating radar (GPR) unit with 0.25 m step spacing to image the subsurface. GPR is a non-invasive imaging method that transmits electromagnetic pulses into the ground and reflects off disturbances in natural sedimentary stratigraphy. A Topcon RL-H4C self-leveling laser and receiver are used to rectify the GPR data. The GPR unit collects the data and transfers it to a digital video logger (DVL) to be stored for analysis. Three grids and one line were recorded, 13.5 x 22 m, 5 x 12 m, and 10 x 10 m. In the subsurface of these grids, consistent anomalies equidistant from one another were observed at -0.100 to -0.150 m, -0.300 to -0.350 m, and -0.850 to -0.900 m below the surface. Observed anomalies are yet to be identified though they are currently inferred to be the mourning room and the ritual purification building. Further research on this site will be required to fully image the subsurface and locate structures to satisfy the local Jewish community's desire to preserve local history.

Marshall Anderson

PA - Community College of Allegheny County

Discipline: Psychology

Authors:

Abstract Name: From Grief to Acceptance: Disabled Young Adults & the Transformation of Self

Disabled young adults often find themselves at crossroads in early adulthood, facing a unique set of challenges that can feel overwhelming. They face challenges with job retention, burnout, financial struggles for meds and mobility aids, socialization, and forming connections. Limited transportation and unsupportive environments add to their difficulties. For lifelong disabled individuals, young adulthood can feel like navigating a new world with intensifying disabilities. The lack of resources and economic stability can lead to grief, isolation, and withdrawal, causing frustration, hopelessness, and mental health decline. Unable to engage in past or new activities, they often experience a shift in identity and a sense of loss. I am a Black, disabled college freshman transitioning into adulthood. Inspired by my Psychology of Death and Dying

course, my project explores my experiences as a late-diagnosed, neurodivergent, and chronically ill individual. In my early 20s, these identity aspects became more pronounced, making life navigation harder. I transitioned from being a gifted child to severe burnout in late adolescence, worsening in early adulthood. My struggles with money, events, relationships, and distress led to grief, withdrawal, and a complicated self-relationship. While not universal, this experience is common among many young adults with disabilities. My research examines how childhood disabilities affect identity transformation, grief, mourning, and self-acceptance in young disabled adults. It explores the "death of a previous self" as disabilities worsen, referencing the 1969 Kubler-Ross Grief Model and the birth of a new transformed self. I will also interview seven affected individuals to substantiate my arguments. Through this oral presentation, I aim to provide a platform for sharing and understanding experiences, focusing on acceptance, adaptation, and self-advocacy.

Keone Anderson

MN - Minnesota State University - Mankato

Discipline: Biology

Authors:

#1 Jessica Heinsch

#2 Victoria Greene

Abstract Name: Creating Glypican-3 KO in human Glioblastoma cells using CRISPR

Glioblastoma (GBM) is a grade 4 tumor within the brain, commonly found in the frontal lobe. This form of cancer is challenging to treat due to the blood-brain barrier, the speed of growth, and the invasiveness of the tumor. Mammalian cells often contain six glypicans that operate in cell signaling and growth, the third glypican being the focal point of this study. Here, we have focused on creating a knockout glypican-3 in human GBM cells using CRISPR technology. To do this, we designed a single guide RNA (sgRNA) to guide the Cas9 enzyme to the glypican-3 gene. When doing this, a frameshift mutation will form that inhibits the function of the targeted gene. To obtain a clonal cell line containing the glypican-3 CRISPR edited knockout, we used clonal expansion cell culturing methods. We grew the CRISPR edited GBM cells in culture and diluted them to a concentration of 0.5 cell per 100 μ L in a 96-well plate to produce clones. Clones were grown over several months for harvesting of genomic DNA to determine glypican-3 knockout score in each clonal CRISPR edited cell line through Sanger sequencing. Having a glypican-3 CRISPR edited clonal cell line for GBM tumor cells allows us to examine the role glypican-3 has in GBM tumor progression.

Chrisean Anderson

MD - Bowie State University

Discipline: Chemistry

Authors:

Olorunfemi Ayo-Kolade

Abstract Name: Effect of kiwi and tomato storage on Vitamin C content

This study thoroughly investigates the determination of ascorbic acid (vitamin C) content in commercially available products and food items using titration techniques. The main goal is to establish a reliable and efficient method for determining the ultimate storage conditions that result in the highest concentration of vitamin C, a crucial antioxidant that plays a vital role in human health. The experimental approach involves titrating the samples, employing 2,6-dichloroindophenol (DCIP) as the titrant, chosen for its ability to

exclusively oxidize ascorbic acid without affecting other potential substances. Additionally, DCIP serves as a self-indicator in the titration process. For a substance to function as a self-indicator, it should exhibit one color when in the presence of excess analyte (i.e., ascorbic acid) and a different color when the analyte has completely reacted, which allows for the calculation of the amount of ascorbic acid present in the sample. The study explores the optimization of storage conditions, to enhance the amount of vitamin C concentration. This study aimed to investigate the effect of food storage conditions on the vitamin C content of kiwis and tomatoes. Fruit were subjected to different storage conditions, including refrigeration, and room temperature storage. Samples were collected at regular intervals over some time, and the vitamin C content was analyzed using a standardized titration method.

Chrisean Anderson

MD - Bowie State University

Discipline: Chemistry

Authors:

#1 Leandre Lewis

#2 Jada Carrington

#3 William Fokam

#4 LightofGod Nnaji

#5 Briona Smith

Olorunfemi Ayo-Kolade

Abstract Name: Effect of Kiwi and Tomato Storage Temperature on Vitamin C Content

This study thoroughly investigates the determination of ascorbic acid (vitamin C) content in commercially available products and food items using titration techniques. The main goal is to establish a reliable and efficient method for determining the ultimate storage conditions that result in the highest concentration of vitamin C, a crucial antioxidant that plays a vital role in human health. The experimental approach involves titrating the samples, employing 2,6-dichloroindophenol (DCIP) as the titrant, chosen for its ability to exclusively oxidize ascorbic acid without affecting other potential substances. Additionally, DCIP serves as a self-indicator in the titration process. For a substance to function as a self-indicator, it should exhibit one color when in the presence of excess analyte (i.e., ascorbic acid) and a different color when the analyte has completely reacted, which allows for the calculation of the amount of ascorbic acid present in the sample. The study explores the optimization of storage conditions, to enhance the amount of vitamin C concentration. This study aimed to investigate the effect of food storage conditions on the vitamin C content of kiwis and tomatoes. Fruit were subjected to different storage conditions, including refrigeration, and room temperature storage. Samples were collected at regular intervals over some time, and the vitamin C content was analyzed using a standardized titration method.

Joshua Andrews

MA - Bridgewater State University

Discipline: Engineering

Authors:

Braden Boucher

Abstract Name: Photonic Integrated Circuits

Photonic integrated circuits (PICs) and free space frequency filters are essential components in modern optical communication systems. This report discusses the characterization of these two key elements, focusing on design principles and performance. Moreover, we will discuss the methods and techniques of PIC's. The characterization of PICs encompasses an analysis of the various building blocks, such as waveguides, splitters, and modulators, along with interactions in the integrated circuit. Several key parameters, including insertion loss and power efficiency, are evaluated to assess the performance of PICs and highlight their advantages and limitations. The characterization of free space frequency filters addresses the design considerations and implementation techniques for achieving precise waveguide filtering. There are various types of filters, such as Michelson Interferometers, Mach-Zehnder interferometers, grating-based filters, and other forms of free-space frequency filters. The characterization includes an analysis of key performance parameters, including the filter's bandwidth. Exploring the challenges associated with characterizing both PICs and free space frequency filters, such as the influence of fabrication imperfections, temperature variations, and environmental factors. By providing a comprehensive characterization of both photonic integrated circuits and free space frequency filters, our research aims to enhance the understanding of these components, facilitate their optimization, and enable their efficient integration into advanced optical communication systems. The insights gained from this work will contribute to the development of next-generation photonic devices and pave the way for improved performance and scalability in optical networks.

Shawn Anetekhai

MD - Bowie State University

Discipline: Chemistry

Authors:

#1 Janiya Davis

Aneesa Azar

Abstract Name: Evaluating Acid Neutralizing Capacity (ANC) of selected antacids sold in grocery stores and online.

Heartburn is a symptom that results when the stomach produces too much hydrochloric acid, HCL. This condition, known as hyperacidity, is treated by antacids to neutralize the excess acid and reduce or stop the pain. Various commercial brands of antacids were bought from grocery stores in Maryland and online. A titrimetric method was carried out using 0.1 M HCL and 0.1 M NaOH. The number of moles of acid neutralized per amount of antacid and the cost analysis were calculated. The ANC of all the brands was calculated as the mEq/g. The ability of an antacid to have a high ANC is crucial in assuring its quality and efficiency.

Requel Anglemeyer

WI - University of Wisconsin-Eau Claire

Discipline: Linguistics and World Languages

Authors:

#1 Tomomi Kakegawa

#2 David Jones

Abstract Name: A Mouse, a Plumber, and You: How Disney and Nintendo Brought Japan and the United States Together Post-WWII Through Family Entertainment

Disney and Nintendo are two of the biggest companies in the world. Disney is responsible for a sizable amount of popular animated movies and champions theme parks globally. Nintendo has pioneered the video game market and has greatly influenced positive public perception on gaming. Though both companies market towards children and families, they've found large fan bases with adults. I will be examining the history of Disney and Nintendo, how they have helped the two countries heal animosity from the second World War, and how they have since helped construct the childhoods of Japanese and Americans alike. Disney first took off around the start of WWII when they released Snow White and The Seven Dwarves in 1937. The flood of American entertainment—such as Disney's Snow White and The Seven Dwarves being released in Japan in 1950—introduced a different kind of animation to Japanese children and adults alike. This created a new, thriving animation and entertainment industry in Japan, "anime," which has since been globally recognized. Following WWII, Nintendo (a playing cards manufacturer at the time) found growing success in this new entertainment industry after a striking a partnership with Disney in 1958 to produce disney-themed playing cards. As they moved into the 1970s and 80s, they took the world by storm with revolutionary gaming systems. Now, in modern days, they've come full circle, helping Disney branch into the gaming market by publishing on their consoles. I intend to visit the Tokyo Disney outlet store and Tokyo Disney. I will also visit the Nintendo Store in Kyoto and Super Mario World at Universal Japan. I will focus on a mixture of visitor behavior, interviews, and exhibits/offers/products.

Botshelo Angoma

KY - University of Kentucky

Discipline: Psychology

Authors:

#1 Fidelis Sesenu

#2 Erica Littlejohn

#3 Yang Jiang

Abstract Name: The Impact of Adverse Childhood Experiences on COVID-19-related Stress and Mental Health in Emerging Adults.

Adverse childhood experiences (ACEs) are defined as disruptive and harmful events that are typically chronic in nature taking place within a child's social environment. The COVID-19 pandemic introduced widespread disruption, particularly among emerging adults (18-24 years old), exacerbating mental health issues such as anxiety and depression. Literature suggests ACEs may amplify the impact of trauma experienced during the COVID-19 lockdowns. Enforced confinement may have triggered ACE exposure or painful reminders of past ACEs, increasing vulnerability to mental health concerns. We test the hypothesis: The COVID-19 lockdown serves as a predictive factor in shaping the current mental health outcomes of young adults, amplifying the influence of individual ACEs. Survey data was collected from 81 young adults (aged 18-24) from South Africa (n = 39) and the US (n = 42) using a Qualtrics cross-sectional survey. Respondents were surveyed on their ACEs, pandemic-induced stress, and mental health outcomes. Preliminary findings show the overall sample (44.3% male and 51.9% female) reported relatively low scores (M = 1.17, SD = 1.43) for total ACE burden (score range, 0-7). However, an independent samples t-test indicated that participants residing in South Africa reported significantly higher ACE scores (M = 1.54, SD = 1.68) compared to those residing in the United States (M = 0.83, SD = 1.06), $t(79) = 2.28$, $p = .026$, with a medium effect size ($d = 0.51$). Additionally, a linear regression also showed that ACEs significantly predicted mean negative emotions impacted by COVID-related stressors, showing a weak but positive relationship ($\beta = 0.14$, $t(79) = 2.81$, $p = .006$, $R^2 = .09$). Findings show that exposure to ACE serves as a predictive factor in determining COVID-19-related stressors in emerging adults. Preliminary insights underscore the importance of further research to explore the interplay between ACEs and pandemic-related mental health outcomes, particularly among emerging adults in diverse cultural contexts.

Samantha Ankeny

WI - University of Wisconsin-La Crosse

Discipline: Psychology

Authors:

Abstract Name: That Dang Phone! How phone usage affects stress levels during and after a stressful event

A. This study was designed to assess stress levels during a break from a stressful event while doing nothing, using a smartphone, or practicing mindfulness. Previous research has shown that stress levels decrease while using a smartphone but has failed to reintroduce the stressor after phone usage ends. Reintroducing the stressor is important because many students use phones when stressed but eventually return to their stressor. This study investigated whether phone usage is an effective strategy to mitigate stress once phone usage ends. Sixty participants were told that the study was on job preparedness to keep them unaware of the nature of the study. Participants were connected to biofeedback equipment (Heart Rate Variability and Galvanic Skin Conductance monitors) throughout the experiment. Participants were given five minutes to prepare a speech on why they were the best candidate for a job and were told that their speech will be recorded as they give it from memory. Participants were then given a five-minute wait period in which they were randomly assigned to one of three conditions: doing nothing, free use of phones, or mindful breathing. Once the wait period ended, participants gave their speech to a camera and then completed surveys, including demographics, State/Trait Anxiety Inventory, Profile of Mood States survey, and questionnaires specific to their condition. Data has been collected and analysis will occur in January and February of 2025. I anticipate that phone use will temporarily reduce stress during the wait period, but stress levels will revert upon re-exposure to the stressor. Conversely, it is expected that mindfulness and inactivity will only slightly reduce stress during the waiting condition but result in lower stress levels upon stressor re-exposure. The findings aim to reveal the efficacy of phone use as a stress management tool through avoidance, particularly among college students.

Lisa Ansvananda

NY - Guttman Community College

Discipline: Chemistry

Authors:

#1 Lisa Ansvananda

#2 Michelle Mejia

Abstract Name: Impact of Brewing Temperature on the Available Antioxidant Amount in Coffee

Coffee is among the most widely consumed drinks worldwide, appreciated for its taste and caffeine content and its ability to promote health, notably due to its rich antioxidant levels. This study investigates the relationship between brewing temperature and the total antioxidant capacity of coffee, measured using the Trolox Equivalent Antioxidant Capacity (TEAC) assay. Two coffee types were analyzed: commercially available ground coffee and freshly ground dark-roasted coffee beans. Coffee beans were ground, sieved, and standardized to particle sizes between 0.35 and 1.00 mm, while commercially available coffee was sieved similarly to ensure uniform particle size. The coffee-to-water ratio was set at 5 g/L. Antioxidant levels were determined through %inhibition values at varying concentrations using serial dilutions, with the slope of %inhibition vs. concentration used to calculate the TEAC value. The developed color was measured at 735 nm using the Aquamate 8000 UV-Vis Spectrophotometer. Preliminary findings highlight brewing temperature as a critical factor influencing coffee's antioxidant capacity, with freshly ground coffee exhibiting a stronger temperature-dependent effect than commercial coffee. Detailed results and further insights will be presented during the conference.

Mikaela Anthony

PA - Villanova University

Discipline: Environmental Science and Sustainability

Authors:

#1 Steven T. Goldsmith

#2 Lisa J. Rodrigues

#3 Hannah Feldman

#4 Emma H. Spangler

#5 Tom Clark

#6 Maurine McGeehan

Abstract Name: The impact of land use, discharge events, and plastic bag ordinances on anthropogenic litter abundance in suburban and urban headwater streams

Aquatic plastic pollution is an ever-growing issue with many negative ecological impacts such as harming the digestive health of aquatic organisms and being sources of heavy metals. Despite its substantial effects, few studies have investigated the distribution of macroplastics in riverine environments with even fewer focused in upstream areas. Understanding the sources of plastics to riverine environments could help society take meaningful measures to prevent its introduction, such as single-use plastic ordinances. We collected and categorized litter, including macroplastics (>4mm in diameter), from 20 headwater streams in southeastern Pennsylvania over 6 rounds of sampling from June 2023 to July 2024. Litter was collected along a 50-m longitudinal transect immediately downstream of stormwater outlets. Litter was categorized in accordance with the National Oceanic and Atmospheric Administration (NOAA) marine debris shoreline survey guide. Over 5,000 macroplastics were collected over the study period. Macroplastic totals were compared to potential controlling parameters such as relative land cover, population density, and socioeconomic variables in the upstream area as well as the frequency of high discharge events. We found positive statistically significant relationships ($p < 0.05$) between macroplastic totals and percent impervious surface cover and the number of buildings, as well as macroplastic totals and the frequency of high discharge events. Finally, we tracked the relative effectiveness of multiple municipal plastic bags ordinances in the study area. Our findings support the effectiveness of such policies and highlight other litter categories for similar measures.

Hannah Antrican

TN - Middle Tennessee State University

Discipline: Sociology

Authors:

Abstract Name: Eco-anxiety and pro-environmental behaviors in college students

Climate psychology is an emerging field that studies the impacts that climate change has on mental health. Eco-anxiety, a term used to describe anxiety about climate change and environmental destruction, is of growing concern because of its potential negative effects on pro-environmental behavior. Young people are particularly vulnerable to the effects of eco-anxiety, studies have shown. This study utilizes survey methods to examine relationships between eco-anxiety, pro-environmental behaviors, generalized anxiety, and a variety of demographic factors among the undergraduate population at Middle Tennessee State University. Our hypothesis was that those with low eco-anxiety will engage in fewer pro-environmental behaviors than

the moderate and high eco-anxiety groups, but due to the potential paralyzing effects of eco-anxiety, the moderate group will engage in more pro-environmental behaviors than the high eco-anxiety group. Our results showed that eco-anxiety has a significant positive relationship with pro-environmental behaviors as well as gender.

Amira Anwar

VA - George Mason University

Discipline: Biochemistry

Authors:

#1 Eva-Maria Rudler

#2 Ozlem Dilek

Abstract Name: Spectroscopic characterization of designed fluorescent probes for biomedical research

The development of turn-on fluorescent tools is critical for advancing cellular imaging and improving disease diagnostics. Oxidative stress, caused by an imbalance of reactive oxygen species (ROS), leads to carbonylation of biomolecules—a chemical process associated with cancer, neurodegenerative disorders, and diabetes. Detecting these modifications requires precise and robust tools. We synthesized small-molecule fluorophores capable of selectively targeting carbonyl groups in cells using click chemistry. These probes were designed with essential properties for effective imaging, including high stability, low toxicity, fast reaction kinetics, and favorable photophysical characteristics such as large Stokes shifts and reasonable quantum yields. By introducing these novel probes into cellular systems, we aim to visualize carbonylation processes in various cancer cell lines. This work contributes to understanding oxidative stress mechanisms, advancing diagnostics, and supporting the development of innovative tools for biomedical research.

Leonora Anyango

PA - University of Pittsburgh

Discipline:

Authors:

Abstract Name: ARCHITECTING GLOCAL SCHOLARS: LEVERAGING THE POWER OF INTENTIONAL MENTORING IN UNDERGRADUATE RESEARCH

Embark on a mentor-student odyssey that takes you around the world. Dig deep into a plethora of topics by engaging with global scholars and community leaders to understand myriad problems and issues plaguing our world today. Dive into the wealth of a culturally knowledgeable mentor-scholar as you learn interviewing skills that empower your glocal research. In my teaching, I always strive to being an intentional mentor. Intentional mentoring is important for students in undergraduate research when what the students are doing in the classroom requires more than giving them topical readings to discuss in the classroom. In my case, I always work with students on a semester-long topic of their choice. When they pick their topic, they will stay with it the entire semester, completing different aspects of research. The research they embark on requires them to explore the world through the eyes of refugees, immigrants, international scholars, community leaders, and people from all over the world. This presentation will showcase how students use interviews to strengthen their research. We develop the interview tools together through my cultural knowledge that spans many countries, cultures, and languages. We work together to hone to hone interviewing skills suitable for people from other countries and local leaders working with organizations that serve global citizens. The result

of this is a well-crafted, thematic interview that gives insight on chosen research topics. Students will be present to give examples of some of the interviews they have conducted, and the themes and countries they have traversed while still on their campus. It is hoped that other mentors will gain insight from processes that mentors and students can use to conduct powerful interviews that in turn make undergraduate research more meaningful and robust.

Hector Aponte

VT - Norwich University

Discipline: Political Science

Authors:

Spencer Rada

Abstract Name: The Undergraduate Perspective: National Trends in the 2024 Presidential Election

The 2024 presidential election highlighted the growing importance of college campuses as centers of political engagement and mobilization. Despite increased attention to young voters, limited research examines how the unique environment of four-year college campuses influences undergraduate presidential vote choice. This study addresses this gap by investigating the interplay of demographic characteristics, perceived political issues, and campus culture in shaping undergraduate voting trends. Using a 21-question survey distributed through social media and professional networks, we collected 1,115 responses from students at 1,200 institutions over two-and-a-half months before the 2024 election. Preliminary analysis reveals significant demographic variations in voting behavior, with race, religion, political affiliation, and issue salience emerging as key factors. These findings suggest that the political incubation effect of college campuses not only shapes individual voting decisions but also has broader implications for understanding shifts in the electorate. By exploring these dynamics, this research contributes to a deeper understanding of the evolving role of young voters in American elections and the strategic implications for future campaigns.

Lalitha Appana

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Ksenia Matlawska-Wasowska

#2 Nitesh Sharma

#3 Wojciech Ornatowski

#4 Silpita Paul

Abstract Name: Targeting retinoid X receptor alpha (RXR α) in T-cell acute lymphoblastic leukemia

T-cell acute lymphoblastic leukemia (T-ALL) is an aggressive hematologic malignancy, representing 10–15% of pediatric acute lymphoblastic leukemia (ALL) cases. Despite advances in treatment, the prognosis for relapsed or refractory T-ALL remains poor, with event-free survival rates below 10%. This underscores the need for novel therapeutic approaches. Retinoid X receptor alpha (RXR α), a nuclear receptor regulating gene expression in differentiation, proliferation, and apoptosis, has been implicated in cancers like acute promyelocytic leukemia (APL). However, its role in T-ALL remains unexplored. Analysis of 264 pediatric and young adult T-ALL samples (Liu et al., 2017) revealed RXR α mRNA upregulation in early T-cell precursor (ETP)-ALL phenotypes and pre-cortical maturation stage groups. Validation through quantitative

PCR (qPCR) and western blotting across seven T-ALL cell lines showed variable RXR α mRNA levels, with significant upregulation in KOPTK1 cells. Western blot confirmed RXR α protein presence across all lines, although transcript and protein levels were not consistently correlated. MTS assays using the RXR α agonist 9-cis-retinoic acid (9-cis-RA) demonstrated reduced leukemic cell viability in six T-ALL lines (KOPTK1, ALL-SIL, KARPAS45, JURKAT, LOUCY, PER117) in a dose-dependent manner. The treatment of the derived IC50 value revealed that 9-cis-RA treatment increased apoptosis. Combination treatments of 9-cis-retinoic acid (9-cis-RA) with standard and investigational T-ALL chemotherapy drugs demonstrated synergistic effects with Venetoclax, a Bcl-2 inhibitor, in multiple patient-derived T-ALL samples and cell lines, including LOUCY, ALL-SIL, PER117, and KARPAS45. These findings highlight the therapeutic potential of RXR α as a target in T-ALL treatment. Future research will evaluate the preclinical efficacy of additional RXR α agonists in combination with Venetoclax and investigate the underlying mechanisms contributing to the observed synergistic effects in preclinical models.

Michaela Aquino

CA - Medanos College

Discipline: Chemistry

Authors:

#1 Michaela Aquino

Abstract Name: The Impact of Home-Cooked Shrimp Flavors on Chitin's Effectiveness in Adsorbing Methylene Blue Dye from Wastewater

Dyes in wastewater have a negative environmental impact due to their toxicity. Many dyes, like methylene blue (MB), have complex chemical structures that resist breakdown, leading to their accumulation in water sources. These dyes pose significant risks to humans, microbial life, and the reduction of biodiversity. Shrimp shells offer a promising, eco-friendly solution for removing MB from wastewater. These shells contain chitin, a natural polymer known for its strong adsorption properties, making it effective for dye removal. Using shrimp shells, typically considered waste, provides a sustainable and accessible method for mitigating the impact of residual dyes. Previous research has found raw shrimp shell waste as an effective bio adsorbent, however, this use of raw material is not a realistic approach to sustainable wastewater treatment. This study aimed to assess the effectiveness of brown shrimp shells in removing MB-based preparation and seasoning from a home-cooked meal. Each group of shrimp in the experiment was prepared at home as a dish; boiled in a cilantro sauce (SSBC), grilled with a lemon pepper rub (SSGL), or boiled with no seasoning (SSB), then brought straight to the lab bench after the meal, they were thoroughly cleaned, treated with NaHCO₃, dried, and ground into chitin powder. Duplicate batch adsorption studies were conducted with MB. Results showed that SSGL had the highest percent removal at 35%, followed by SSBC at 30%, then SSB at 15%. This work confirms shrimp shells as a low-cost, environmentally friendly bio adsorbent and that home preparation impacts the efficiency in removing MB dye from wastewater.

Alexander Aranda

FL - Florida Atlantic University

Discipline: Economics

Authors:

#1 Alexander Aranda

Abstract Name: The State of Investing

Amid continuing economic volatility, according to the Aspen Institute, 44 percent of American workers are earning a median hourly wage of \$10.22. What are they going to do with that money is the next question. The theme of this research is to understand individuals' investment strategies. To this end, a 15 question survey was administered using Amazon turk to individuals 18 and older across the United States. The survey examined 150 respondents from a variety of backgrounds, income levels, gender, political party, education levels and age range. I tested two hypotheses. First, is there a significant difference between gender and investment strategy; and second, is there a significant difference between gender and obtaining a retirement account. I used IBM SPSS to analyze the data and found that there is a statistical significant difference in both hypotheses at the one percent level. I found that women are more risk averse, while men tend to be willing to take on more risky investments. For example, 33% of men said they would invest in crypto currency while only 10% of women would invest in this type of investment. Another key finding was that men seem to have a more proactive stance obtaining a retirement account compared to women. Overall, the results of this research look to compare key differences with how men and women think about investing and their exposure to different risk levels.

Aliyah Archer

CO - University of Northern Colorado

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: Assessing Heavy Metals Contamination in Spices and Teas with X-Ray Fluorescence

Spices and herbs are globally utilized for consumption in everything from dishes cooked at home to fancy meals at five-star restaurants. Everyone from children to adults consume spices daily since spices and herbs have been made more readily available by industrialization. However, as our society has grown, the potential for carcinogenic or otherwise toxic materials showing up in our foods and other areas of our lives has increased. In fact, Consumer Reports did a study in 2021 that found around one-third of the products tested had high enough levels of arsenic, lead, and cadmium to pose a health concern. The current project aimed to determine whether or not certain brands and certain spices available locally in Greeley, Colorado contained these heavy metals. Using X-Ray Fluorescence, this project measured elemental concentrations of lead, cadmium, arsenic, and mercury. The spices tested included basil, black pepper, chili, cinnamon, crushed red pepper, coriander, cumin, curry, ginger, onion, oregano, paprika, thyme, and turmeric purchased within the Weld County area from a range of grocery stores and brands. 140 samples of spices and 20 samples of tea were tested for carcinogenic and other toxic inclusions. This study used the Artax software to qualitatively assess the presence or absence of each toxin. The results from this study found that there were no toxic levels of these heavy metals within any of the tested spices. Future studies may investigate nutrient profiles of spices to better understand how they are beneficial to human health and can be more inclusive of cultural health practices and medicinal alternatives while acknowledging the colonial practices that have impacted communities already practicing with this knowledge.

Ivy Archer

OK - University of Central Oklahoma

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: The F Word: An Intersectional Analysis of the FaT GiRL Zine Anthology

This project explores the layered identity, expression, and demographics of the zine collection FaT GiRL and its contributions to the fat liberation movement of the 1990s. I will examine the intersection of identity within the seven-issue series, specifically related to gender, sexuality, and weight. Additionally, I will position the zine series alongside the influence of the pop culture of the time to understand the purpose of the language within the text. Through literary analysis, I explore the common theme within FaT GiRL and reference relevant social history that could contribute to its conceptual framework. With the shift of priority in the Third Wave feminist movement, advocacy goals grew into something different: attempting to be more intersectional in a growing culture of consumerism. FaT GiRL was created out of frustration with mainstream queer culture by self-identified "fat dykes" who wanted to voice issues that were not recognized. Thus, this literary collection that was active from 1994 to 1997 was unashamed as a "zine for fat dykes and the women who want them." There are strong themes of sex positivity that are subversive and attempt to empower the fat, queer readership. Each copy contains information about fat liberation, lesbian personals, sensual writing, and fetish photography, which all challenge the assumption that the demographics featured are not sexually attractive. Upon a surface-level observation, these works emphasize the power of utilizing their readers' intersectional identities to build community. These zines will be accessed from the virtual FaT GiRL Archive, and I will showcase their themes with detailed discussion points and featured artistic imagery from the collection in my presentation.

Michael Archer

PA - Duquesne University

Discipline: Nursing and Public Health

Authors:

#1 Riley Bowers

#2 Angela Karakachian

#3 Jessica Devido

#4 Abigail Hebb

Riley Bowers

Abstract Name: Maternal Child Health Nurses' Experiences Performing Screening With the Edinburgh Postnatal Depression Scale

Postpartum depression (PPD) affects many new mothers, stemming from multiple intersecting factors including hormonal changes, genetics, and environmental factors. Many women, especially those with increased risk factors, go unrecognized. Undetected cases pose severe risks to both mothers and their newborns. Maternal consequences include disturbed relationships with their partner, increased pain, physical limitations after birth, and poor bonding with their infants. Consequences for the newborn range from failure to thrive, poor sleep quality, development of behavioral issues, and increased risks of developing childhood illnesses. Nurses play an essential role in screening for PPD symptoms using the Edinburgh Postnatal Depression Scale. This reliable screening tool consists of 10 questions with higher total scores indicating a greater possibility of depression. However, this tool is not consistently and systematically used in nursing practice. This leads to missed opportunities for identification, intervention, and prevention of poor maternal and infant outcomes. In turn, this may lead nurses to experience distress and yet this critical information is missing in the literature about this experience. Filling this gap is important as it may help us understand systematic and structural issues maternal child health (MCH) nurses face screening for symptoms of depression. Therefore, the purpose of this qualitative phenomenological study is to describe the lived experiences of MCH nurses performing screening of antepartum and postpartum women for symptoms of depression using the Edinburgh scale. We conducted semi-structured interviews with 10 MCH nurses working in a Magnet hospital. Data analysis for this study will be guided by Giorgi's phenomenological descriptive 4-step model. Our presentation will include forthcoming results of our study, and may assist in the development of new tools and/or new processes for screening that may help nurses screen for depressive

symptoms early in order to address the needs of antepartum, and post-partum women who are most vulnerable.

Gabriel Arciaga

MD - Naval Academy

Discipline: Biology

Authors:

#1 Gabriel Arciaga

#2 Isabella Muratore

Abstract Name: Environmental Influence on Social Hygiene Practices in Ants

Ants practice social hygiene via corpse removal and refuse/waste management. Previous studies on their behavior have highlighted that these practices have resulted in an increased survival rate for the colony. Understanding this type of collective decision making in response to environmental changes can help inform policymakers and act as a model for resource allocation during disaster management. In this study we examined the effect of local humidity on collective decisions about nest architecture executed by a colony of *Tetramorium immigrans* “pavement ants”. Colonies were housed in hexagonal 3D printed modular nest sections with interchangeable lower reservoirs to easily alter the colony’s environment. We expected that our subjects will prefer a colder and drier environment for waste storage, possibly with a draft of wind to circulate the area to limit mold and bacterial growth. Future work will involve switching the location of entire cells and reservoirs while recording their movement to observe their response to changes in their environment. In addition, we will note the placement of larvae and pupae relative to humidity differentials within the nest. The success of ant social organization can serve as inspiration to improve the resiliency of our societies to environmental change.

Andrey Arcidiacono

VA - George Mason University

Discipline: Political Science

Authors:

Abstract Name: Institutional Memory in Student Politics: A Study of the Written Recordkeeping Practices of Student Governments

This project focuses on the written recordkeeping practices of student governments and establishes the extent to which they kept written records. In addition to analyzing which records were created and preserved, I looked at the policies, procedures, and positions which governed the creation and preservation of written records. Student governments are unique in the sense that they have naturally high turnover rates which makes knowledge preservation practices and institutional memory especially important. This research involved searching through finding aids, websites, governing documents, and corresponding and meeting with members of several student governments. It also explored the practices of student governments used in the absence of or alongside written recordkeeping such as the use of oral histories and student newspapers to preserve knowledge. Among my findings I identified that while a variety of recordkeeping practices were used, most student governments lacked extensive and consistent records. Student governments which did implement formalized and consistent recordkeeping practices were often larger in their membership. Smaller student governments, and smaller schools, often only maintained minutes, governing documents, a

recordkeeping position, and an organizational email. Those schools which did have archived collections within their university archives did not receive frequent updates. Few student governments had specified procedures to consistently commit records to their university archive. It was observed that practices such as preserving correspondence, using an organizational email, and creating/preserving reports allow for students to continue pursuing policy goals despite the effects on institutional memory due to high turnover.

Ananya Arcot

TN - Middle Tennessee State University

Discipline: Health and Human Development

Authors:

Aubrey von dem Bussche

Chloe Dye

Abstract Name: The Effects of Audiovisual, Visual, and Orthographic Input on Language Learning in College Students

The study compares three conditions of watching a documentary, audiovisual (AV), visual and text (VT), and audiovisual and text (AVT), to determine the highest incidental vocabulary acquisition, the correlation between existing vocabulary skills and vocabulary learning, and the differing perspectives of the documentary based on the three conditions. College students were recruited, and a series of tests were given before and after participants watched a 25-minute selected documentary clip. Currently, the data from 44 participants are getting organized and scored. Data analysis will be performed using repeated measures ANOVA and processed using the SPSS software. Preliminary analyses reveal increases in gain scores after watching the documentary, but there have been no changes in language learned among the three conditions with fill-in-the-blank scores. There have also been preliminary gains in writing definitions of the unfamiliar vocabulary from the pre-test to the post-test.

Robert Arellano

CA - Chapman University

Discipline: Political Science

Authors:

#1 Andrea Molle

Abstract Name: Artificial Intelligence: A New Platform to Influence Elections

Since its inception in 2022, artificial intelligence has impacted education, social relationships, job markets, and politics all while using a system of machine learning through algorithms. The creation of artificial intelligence comes at a pressing time for the United States as this November will be the first presidential election in American history with the presence of artificial intelligence. Some political and business leaders have expressed concerns over artificial intelligence and its lack of regulation and potential to spread misinformation. My research aimed to study the relationship between text-based artificial intelligence programs and voter behavior while monitoring the 2024 United States presidential campaigns. Based on literature and other research conducted, I expected the responses to reveal certain political biases when informing users. To test this relationship, I gathered a random sample of twenty participants in a controlled setting to measure their political views on salient issues of the campaign before and after using ChatGPT through two Likert scale surveys. In between both surveys, participants were each given a booklet with both

presidential candidate's stances on each issue according to ChatGPT. A reading comprehension quiz followed the second survey to incentivize participants to read the booklet. The experiment yielded three results: respondents who follow politics loosely were swayed by ChatGPT, ChatGPT polarized respondents with strong political beliefs, and the language used by ChatGPT tended to favor Joe Biden more than Donald Trump. This research strives to illuminate the biases of artificial intelligence to prevent the spread of misinformation and political polarization.

Antonio Arena

PA - Lafayette College

Discipline: Political Science

Authors:

Abstract Name: Aid and Democracy in Southeast Asia: Comparing the Impact of U.S. and Chinese Foreign Assistance

This paper examines the differential impacts of U.S. and Chinese foreign aid strategies on democratization trends in 11 Southeast Asian countries. Understanding how these competing aid approaches affect recipient domestic politics is becoming more important as China's influence in the region grows. This research will use a mixed-methods approach to analyze the complex relationship between foreign aid and democratization, building on established theories that highlight the role of linkage and leverage, donor intent, and institutional strength. It draws on panel data on democratization scores, foreign aid from the U.S. and China, and indices for domestic institutional strength and donor alignment from 2000 to the present. It will incorporate country-fixed effects and time lags for aid variables to address potential endogeneity. These findings will be supplemented by comparative case studies of Myanmar, Cambodia, the Philippines, and Thailand, which can provide an in-depth evaluation of the specific mechanisms by which aid interacts with various domestic political contexts. I hypothesize that U.S. aid may have a more positive association with democratization, especially in countries with stronger democratic institutions, while Chinese aid may have a negative impact on democracy, potentially entrenching authoritarian institutions. This research contributes to the ongoing debate on foreign aid effectiveness and democracy promotion in Southeast Asia. This study seeks to inform more effective aid policies that benefit humanitarian goals and strategic interests in an increasingly complex and competitive geopolitical landscape by analyzing the connections between donor strategies, recipient institutions, and democratization scores.

Maria Arenas Florez

KY - University of Kentucky

Discipline: Biology

Authors:

#1 Maria Natalia Arenas Florez

#2 Yasminka Jakubek Swartzlander

Abstract Name: Genetic Mosaicism in Appalachia: Geographic Patterns and Their Implications for Cancer Outcomes

Somatic mutations refer to mutations that arise after birth. When a cell acquires a somatic mutation it can expand and give rise to genetic mosaicism, the presence of genetically different cell populations in an individual. Research shows that individuals with detectable clonal mosaicism in their blood are at a higher

risk for hematological malignancies and chronic diseases, while cancer patients with mosaicism tend to have poorer outcomes. Previous studies have linked age and sex to mosaicism rates but often lack geographical data, hindering our understanding of how these rates vary across different populations. This knowledge gap limits our ability to identify US regions with higher mosaicism rates, which may correlate with increased cancer incidence and mortality. Identifying these differences and their molecular causes is essential for improving risk assessment and cancer prevention strategies. This project focuses on studying genetic mosaicism in diverse geographic populations to determine if differences in mosaicism rates mirror cancer incidence rates across these regions. We will use blood sequencing data from the ORIEN network, which includes ~19,000 samples from 16 US states, notably Kentucky, which has the highest cancer rates. We will compare mutation rates across US states adjusting for age, sex, and smoking. We will also contrast mosaicism rates in the Appalachian population of Kentucky to the non-Appalachian Kentucky population. We postulate that the burden of genetic mosaicism will differ across these geographically defined populations, mirroring the cancer burden in these populations. We postulate that samples from high cancer burden populations will have elevated rates of genetic mosaicism due to increased carcinogenic exposures and/or increased rates of inherited cancer risk mutations. The goal is to explore the molecular drivers of cancer disparities in Appalachian Kentucky and enhance our understanding of clonal mosaicism as a biomarker for cancer risk assessment and early cancer detection.

Nate Arens

OH - The Ohio State University

Discipline: Computer Science

Authors:

#1 Nate Arens

#2 Kiran Wijesooriya

#3 Ethan Young

#4 Arnab Nandi

Kiran Wijesooriya

Ethan Young

Abstract Name: Augmented Reality Data Exploration with Large Language Models via a Conversational Interface

The progression of large language models (LLMs) has enabled natural language data-driven interfaces, but their integration with augmented reality remains largely unexplored. This intersection is important because data enables informed choices, and presenting information in an immersive way can reduce the difficulty of making those choices. To address this need, we introduce ARChat, a speech-based data analysis tool using LLMs that blends the real world and data – allowing for natural language commands and responses while providing seamless overlays to the real world. ARChat addresses questions that often arise with real-world objects, including tables and graphs, that cannot be answered through visual analysis alone. This allows the user to understand all information related to an object, including information that may be difficult to gather just by observing the object, such as cost, brand, ingredients, mean, confidence interval, etc. The process begins with the user loading a database or scanning their environment. Then, based on a natural language question provided by the user and combined with the context of the user's environment, ARChat develops a natural language response for the user, displaying additional information as an overlay where necessary. As an example of ARChat's efficiency, it was tested on a dataset of 13 common household items, achieving an accuracy of approximately 91% in interpreting user questions of varying complexity, ranging from simple questions like 'Do users like this product?' to more complex prompts such as 'With a 10% tax, how much will this item cost?'. These results are significant because they show that ARChat can parse object information based on the context of the user's environment with a high degree of accuracy. Ultimately, since ARChat is designed for flexibility, we anticipate it will serve as a foundation for more sophisticated augmented reality-based data exploration tools with potential applications across various disciplines.

Gabriel Arevalo

CT - Eastern Connecticut State University

Discipline: Computer Science

Authors:

#1 Sarah Tasneem

#2 Kehan Gao

#3 Dylan Chamberlin

Abstract Name: Advancing Mars Image Classification: A Comparative Study of CNN Models with Interactive Applications

This study leverages AI to investigate Convolutional Neural Networks (CNNs) for classifying Martian geological images, focusing on a comparative analysis of EfficientNet and VGGNet architectures. These models were tested on two specific NASA datasets. The HiRISE orbital dataset comprises 3820 grayscale images of Mars captured from orbit, categorized into six landmark types. The Mars Science Laboratory (MSL) surface dataset contains over 6,000 images of Martian landscapes classified into 24 categories. This research aims to determine the optimal CNN model for Martian image classification by comparing accuracy, efficiency, and computational requirements. To make these findings accessible, we developed a web application using the Python-based Django framework. The application enables users to interact with the AI models and datasets, fostering a deeper understanding of AI's role in image classification. Users can test the EfficientNet and VGGNet models, explore classification results, and examine evaluation metrics. The application also includes the HiRISE and MSL datasets, allowing users to analyze the data that shaped the models' training and testing processes. A unique feature of the application is an interactive game, "Classifier Clash" Users can challenge the models by attempting to classify Martian images and compare their accuracy against that of the CNN/AI models. This engaging feature helps users understand AI's capabilities and limitations. This innovative project bridges advanced AI research and public engagement, highlighting the importance of deep learning in planetary science. Integrating Django ensures a seamless user experience, transforming complex research into an accessible educational tool. Beyond Martian image classification, this study lays a foundation for using CNNs in broader scientific image analysis tasks. Through its interactive and educational approach, the project promotes understanding and application of AI technologies, preparing users for the expanding role of machine learning in science and beyond.

Caitlyn Arheit

OH - Capital University

Discipline: Psychology

Authors:

#1 Caitlyn Arheit

Abstract Name: Participation in and Perception of a University's Counseling Services

Universities have a responsibility to provide services to help students succeed. This may include mental health services as college students are more likely to develop mental health issues due to the pressures and stresses of being a college student. Counseling services have been shown to have a positive impact on a student's mental health and increase their likelihood of academic success. Past studies have found relationships between participation in counseling and demographic characteristics that point towards

underutilization and disparity based on race and sexual orientation. A total of 289 undergraduate students completed an online survey that assessed their use and perceptions of the services offered by the Center for Health and Wellness. Participants were asked questions about their demographic characteristics, their perception of counseling in general and the university's counseling services specifically, their usage of counseling services, and opinions on potential services offered at the university. It was found that 42% of students currently use or have used the free counseling services at some point, but 30% no longer utilize the services. Underutilization by students who could benefit from counseling was found, but disparity of use within social minorities was not. The results indicated that participants thought counseling could be beneficial for others, but few thought it could be beneficial for themselves. The university's counseling services were found to be beneficial with only 11% of students reporting that services were not beneficial at all. Some of the suggested ways the services could improve were adding more counselors and having more availability for appointments. Based on the results, universities should consider adding counselors to increase appointment availability, improve communication, and add other services and events to benefit a wider range of students, while continuing to monitor for inequities in usage and outcomes based on race and sexual orientation.

Adam Arnett

UT - Utah Valley University

Discipline: Psychology

Authors:

#1 Kristina Oldroyd

#2 Natalia Rubio

#3 Camille Bruner

#4 James Pemberton

#5 Arianna Nelson

Abstract Name: Dance, Meditate, Recover: The Role of Integrated Mind-Body Practices in Enhancing Stress Resilience via RSA Modulation

Respiratory sinus arrhythmia (RSA) is a physiological index reflecting autonomic nervous system flexibility, crucial for resilience to stress. High resting RSA and rapid post-stress recovery are linked to enhanced emotional and physiological regulation, which are core aspects of positive emotions and resilience. This study investigates the effects of a combined dance and fitness meditation practice on stress resilience, as indicated by RSA measures. Participants with sustained engagement (2 years or more) in a structured dance and fitness meditation program were considered in this study. Their RSA was monitored using the Biopac MP160 system, which tracked heart and respiration rates during baseline, high-stress, and low-stress tasks. In the high-stress task, participants learned and performed a 16-measure dance routine, first with video instruction and then independently. Following this, a guided five-minute meditation served as the low-stress task. It is hypothesized that individuals with prolonged involvement in dance and fitness meditation will display elevated baseline RSA values and accelerated RSA recovery following stress exposure compared to their peers without the 2+ years prolonged involvement. These indicators suggest greater autonomic flexibility and heightened resilience to stress. This study makes several contributions to psychological research. It investigates the long-term effects of integrated mind-body practices on RSA, contrasting with most existing research focused on short-term or isolated interventions like yoga or mindfulness. The findings may demonstrate how sustained participation in such practices promotes lasting autonomic and stress-regulation benefits. Moreover, it emphasizes the role of consistent lifestyle habits over temporary interventions in mental health and resilience. Should dance and fitness meditation reliably enhance RSA and resilience, it could offer a dynamic, accessible tool for preventive mental health care and stress management. By addressing the gap in research on prolonged engagement in integrated practices, this study broadens the understanding of their potential for fostering resilience and well-being.

Emma Arrisher

PA - Duquesne University

Discipline: Psychology

Authors:

#1 Emma Arrisher

Abstract Name: Ethical Implications of Gender Disparities in Healthcare Research: A Psychology Approach

Overall, this research aims to analyze the ethical implications of gender disparities in healthcare research while highlighting the physiological and psychological consequences. While examining these disparities, this project advocates for more inclusive medical practices that align with ethical principles, such as justice, beneficence, and nonmaleficence. Despite the plethora of medical advancements, women remain predominantly underrepresented in medical-based trials. This leads to overwhelmingly biased data and gaps in diagnosis, treatment plans, and outcomes. Furthermore, healthcare research historically prominently favored male participants, leading to a uniform approach when treating patients. This uniform approach resulted in treatments that are not as effective for women and, in some cases, even harmful. These disparities bolster systemic inequality and inequity while also negatively impacting women's physical and psychological well-being. This project utilizes a multidisciplinary approach by incorporating analysis of existing statistical data, literature, and case studies to examine the consequences and relevance of gender disparities in healthcare research. The research primarily focuses on cancer treatments, cardiovascular diseases, and mental health, in which disparities are the most significant. This project includes insight from psychological, bioethical, and medical perspectives to examine the integration of these frameworks and their relation to healthcare. Furthermore, this research concludes that gender disparities in healthcare research lead to unequal treatment and negate ethical principles. These disparities have profound psychological effects, for example, a lack of trust in medical institutions by female patients, increased levels of anxiety, and feelings of neglect. This project advocates for more gender-inclusive research in clinical trials and analysis of sex-based treatment differences. By implementing a more inclusive, equitable healthcare system, underserved populations' physical health and psychological well-being can improve.

Emma Arrisher

PA - Duquesne University

Discipline: Psychology

Authors:

#1 Emma Arrisher

Abstract Name: The Psychological and Cultural Legacy of Systemic Racism

This project examines the intersectionality of race, colonialism, and personality to investigate racism within the context of cultural, systemic, and historical factors. It addresses the question of how systemic racism and colonial legacies shape psychological and social constructs within post-colonial societies. It influences an individual's cultural identity, mental health, and personality development. Utilizing cultural-psychological theories and frameworks, this research seeks to analyze the impact of racial hierarchies that were imposed during colonialism and its impacts on marginalized individuals. This study offers a broader discourse, indicating racism as an institutional and systemic phenomenon, instead of the understanding that racism is merely based upon individualistic racial biases and viewpoints. Significant research focuses primarily on overt racist actions, less specified attention is given to how institutional and systemic racism can affect an individual's mental health and personality. Colonial ideologies permeated modern psychological and social constructs, reinforcing generational traumas and inequality. Examples from the United States and South Asia

demonstrate how societies with colonialist pasts indicate racialized experiences, which affect mental health . The methodology in this research draws from cultural psychology, empirical studies regarding the psychological outcomes of racialized experience, historical analysis and reasoning. Analyzing concepts such as systemic racism, intergenerational traumas, and cultural resistance, this project delves into the adaptive traits that may emerge as a result of systemic oppression and dehumanization. This research offers a deeper understanding of the psychological and cultural impacts in post-colonialist societies while discussing insight into social progress for marginalized communities. This research exposes how colonial ideologies create patterns of inequality and trauma, which impacts personality development in marginalized communities. The findings of this research illustrates how resistance and resilient personality traits act as adaptations towards systemic oppression. This study contextualizes the cultural and historical hierarchies, while also aiming towards providing social progress in post-colonial society.

Erin Arroyo

NY - SUNY College at Purchase

Discipline: Psychology

Authors:

Jo-Emma Felix

Abstract Name: Effects of Race, Gender, and Skin Tone on Perceptions of Exonerees

The present research aims to examine the effects of race, gender, and skin tone on perceptions and support for exonerees. Past literature reveals that in 2010, 75% of post-conviction exonerates belonged to a minority group and spent 13 years on average, behind bars for a crime they did not commit. Exonerees—individuals who are wrongfully convicted of a crime and later proved innocent—continue to experience stigma post-incarceration. Further, prior research has found racial and gender biases in stigma experienced by exonerees. For example, landlords are less likely to rent to Black exonerees and participants are more willing to push for integration when exonerees are White. However, prior literature on exonerees is limited since it usually examines race and other social identities (e.g., gender) as independent variables, failing to account for their interaction. Therefore, the present study aims to build on earlier research by applying an intersectional approach to examine the influence of race, gender, and skin tone on perceptions of exonerees. Participants will be presented with news stories discussing the exoneration of individuals who were wrongfully imprisoned for a crime they did not commit. The exoneree's race, gender, and skin tone will vary for each story. Participants will provide character judgments, guilt assessments, support for reintegration services, and the amount they are willing to donate to support exonerees. We predict that perceptions and support for exonerees will vary based on race, gender, and skin tone such that participants will report more positive perceptions and support for White women exonerees relative to all other groups. Further, we predict that light-skin women exonerees, regardless of race, will receive more positive perceptions and support. The implications for the criminal justice system and society at large will be discussed.

Adrian Artsisheuskiy

NY - Brooklyn College

Discipline: Biology

Authors:

#1 Murat Cevher

Abstract Name: A Novel Role for Mediator in Gene Regulation Through its Association with CNBC

Gene regulation is a complex process that takes place through multiple mechanisms with transcription being the primary site of gene regulation. The human Mediator, which consists of 30 tightly associated proteins, is the most critical coactivator complex involved in the regulation of all protein-coding genes. Mediator exerts its main function by bridging enhancer-bound activators with promoter-bound general transcription factors as well as RNA Polymerase II. We recently identified Cellular Nucleic Acid Binding Protein, CNBC, to co-precipitate with the Mediator complex. This protein is involved in various cellular processes including DNA replication, RNA binding and processing as well as transcriptional and translational regulations. Importantly, this protein regulates oncogene expression and promotes cellular proliferation. It can also inhibit apoptosis and its overexpression is associated with tumorigenesis and poor prognosis in cancers. We hypothesize that Mediator directly interacts with this protein to regulate proper cellular processes and aberrant interactions will lead to oncogenesis. In this proposal, we will recombinantly generate CNBC and its mutant forms in a eukaryotic environment and check whether or not they directly interact with the Mediator complex. We will use the eukaryotic Sf9 insect cells for protein expressions so that protein foldings as well as post-translational modifications will be more physiologic. Observing a direct interaction between the Mediator and CNBC will open avenues toward identifying potential interaction surfaces to design inhibitors for future therapeutics

Veronica Aruta

TX - San Jacinto College

Discipline: Mathematics

Authors:

Abstract Name: The Brilliant Mind Behind Calculus—Isaac Newton: His Struggles, Victories, and Legacy Behind the Mathematical Discipline

In science and mathematics, interconnectedness has been evident throughout history. Sir Isaac Newton was heavily influenced by Ancient Greek mathematicians and philosophers (namely Archimedes, Eudoxus, and Pythagoras, among several others) in the same way William Herschel, Michael Faraday, and Albert Einstein's contributions to STEM were all shaped by Newton. This sharedness among the pioneers of STEM shows how theorems, concepts, and disciplines start with one mind and then continually evolve to become a body of foundations as time progresses. The irony is that while he had a group of influences, Newton's solitude played a significant role in the conception of calculus. Newton first devised theories of calculus as a student at Cambridge, where he largely kept to himself and had minimal social interactions. Later, he would finalize the foundational concepts of calculus during the Great Plague of London, where he quarantined and isolated himself in his family home, Woolsthorpe. Derivatives, definite and indefinite integrals, rates of change, infinite series, and many more were the outcomes of the years he spent alone, a testament to the power of individual creativity. Despite Newton working alone when developing calculus concepts, Gottfried Wilhelm Leibniz was actually on the other side of Europe publishing his version of calculus. Although friendship and collaboration would have been expected between similar minds, there was a rivalry and dispute regarding credits instead. This shows how Newton's upbringing and personal struggles drove him to shut himself off from potential companionships. Ultimately, Sir Isaac Newton proves that even in solitude, a single mind can shape the foundations of human knowledge and inspire future generations.

Najely Ascacio

TX - West Texas A&M University

Discipline: Health and Human Development

Authors:

Abstract Name: Comparative Analysis of Muscle Characteristics and its Correlation to Maximal Power Output

Our muscles are composed of several different muscle fiber types, in this research we focused on Type I, Type IIa and Type IIx. To assess the muscles contractile properties, Tensiomyography (TMG) can be used as a non-invasive and accurate method. Type I fibers are abundant in endurance athletes such as cross-country runners. On the other hand, Type IIa and Type IIx are abundant in power athletes such as powerlifters. To record someone's max power output, a Wingate test can be performed. A Wingate is a stationary anaerobic ergometer that measures maximal power output and anaerobic capacity alongside other factors. Previous research has been done within muscle fiber types, the use of TMG, and the use of Wingate but lack of research was seen with the use of both and its correlation. The purpose of this research is by knowing the correlation between muscle characteristics and maximal power output, we're able to determine if an individual has reached their full potential or has room for improvement. In this research 25 participants (8 female and 7 male) ages 18-45 from the general public participated in this study. Participants had their rectus femoris first tested on the TMG followed by a 30 second Wingate test. Results showed statistically significant correlations among power metrics and between body weight and maximal displacement. Highly significant correlations ($p < 0.01$) were found between Peak Power and Average Power as well as Td (Delay Time) and Tc (Contraction Time). As said before, these findings enable us to develop a training regimen that can help determine whether an individual has reached their full potential or if there is room for improvement. This method is not only effective but also simple, fast, and non-invasive.

Maya Asher

PA - University of Pittsburgh

Discipline: Linguistics and World Languages

Authors:

#1 Melinda Fricke

Abstract Name: Gender Non-Conforming Voices in Speech Perception

Traditionally, gender has been understood as a binary construct with categories of man/masculine versus woman/feminine, a concept reflected in various fields of study, including linguistics. Speech perception research typically adopts this framework, assuming that a speaker's gender is processed as a binary variable. Similarly, studies have shown that listeners hold preconceived notions about what voices associated with specific genders should sound like. However, such research largely overlooks gender non-conforming (GNC) individuals, leaving gaps in our understanding of how GNC voices are perceived. This study explores how listeners' understanding of and experiences with non-binary genders influence their perception of speech produced by GNC individuals. Participants complete 3 tasks: a voice similarity rating task, a questionnaire, and a brief exit interview. Each listener's perception of gender in speech is measured implicitly via the voice similarity rating task and explicitly via the questionnaire. This quantitative data is supplemented by the exit interview, which gathers qualitative data regarding the listener's personal experiences and perceptions of gender. We expect that listeners with more diverse gender experiences will exhibit a less binary understanding of gender, which may be reflected in their individual cognitive perceptual spaces. The findings aim to shed light on both the implicit categorization of GNC voices and the impact that societal factors may have on this process. This research contributes to the growing body of linguistic work that recognizes a more nuanced understanding of gender, ensuring that the field accurately represents the lived experiences of diverse individuals.

Jeevita Ashokprabhu

NE - Creighton University

Discipline: Psychology

Authors:

Abstract Name: Antinociceptive Effects of Morphine:Ketamine Mixtures in Female Rats

Pain management is a critical aspect of patient care, with opioids being the gold standard treatment for moderate to severe pain. However, opioids have adverse effects such as abuse, dependence, and overdose. One strategy to mitigate adverse effects of opioids is combining them with non-opioid analgesics. For example, our laboratory previously showed that the NMDA receptor antagonist ketamine selectively enhanced antinociceptive effects of the opioid morphine in adult male rats. The present study aimed to extend our previous findings in male rats to female rats (n=8, Sprague Dawley). A warm water tail withdrawal was used as an assay of pain, and all rats received morphine alone (1.7 – 17 mg/kg), ketamine alone (5.6 – 56 mg/kg), and morphine:ketamine mixtures in ratios of 3:1, 1:1, and 1:3 where the rats received six cycles of injections each session. The first cycle was always saline followed by tail immersion test 13 minutes later. Then another injection was administered after two minutes and repeated for 6 cycles total. Antinociception was assessed using a tail immersion test in water temperatures of 40°C (negative control), 50°C, and 55°C (positive control). Results indicated that both morphine and ketamine, individually and in combination, significantly and dose-dependently increased tail withdrawal latencies in 50°C from approximately 5 sec to 15 sec, with morphine having greater potency as compared to ketamine. Morphine:ketamine mixtures demonstrated comparable efficacy in pain relief to the individual drugs. These findings suggest that morphine:ketamine mixtures may be a viable alternative for pain management, however, its adverse side effects compared to either drug alone are still unknown.

Madina Ashurova

IL - University of Illinois at Chicago

Discipline: Nursing and Public Health

Authors:

#1 Madina Ashurova

Abstract Name: Assessing Differences In Healthcare Experience Of All of Us Research Program Participants With Autoimmune Disease Across Income Levels

Individuals with autoimmune diseases, often managing chronic and unexplained symptoms, are met with unique challenges in healthcare settings. They frequently report feeling as if they are being unheard or dismissed by their providers, and socioeconomic barriers may further compound these difficulties. This study aims to explore the healthcare experiences of those with autoimmune diseases and how they may vary between different socioeconomic levels, utilizing data from the All of Us Research Program, a National Institutes of Health initiative. Partnered with over 800 institutions across the country, this program aims to collect biomedical data from 1 million individuals across diverse backgrounds. Information collected from participants includes electronic health records, surveys, and fitness trackers. In this study, survey data (n=413,360) were analyzed to assess perceptions of healthcare experience across three income groupings of participants with autoimmune diseases and the rest of the All of Us participants. Findings revealed that participants with autoimmune diseases, regardless of income, were more likely than other participants to feel that healthcare providers were not listening to them. However, only autoimmune participants with annual household incomes below \$100,000 were more likely to perceive that their providers were considering them as less intelligent. This suggests that while the overarching challenge of feeling unheard is universal among

those with autoimmune diseases, lower income levels intensify specific experiences within this group. By identifying low-income individuals with autoimmune diseases as a vulnerable population, this study emphasizes the need for interventions to improve physician-patient relationships and promote equity in healthcare experiences. These findings further evidence the challenges that those with autoimmune diseases face in healthcare settings and also underscore the interactions that occur between healthcare experiences and the social determinants of health.

Joshua Asselin

TN - Lipscomb University

Discipline: Biology

Authors:

#1 Kyle Brawner

Abstract Name: Indole Treatment of *C. elegans* Rescues Illness Induced by the Opportunistic Pathogen *Cronobacter sakazakii*

Necrotizing enterocolitis (NEC) is a severe and often life-threatening inflammatory condition of the intestine primarily affecting premature infants. The opportunistic pathogen *Cronobacter sakazakii* (Cs) has been implicated in NEC. While activation of the ligand-dependent transcription factor aryl hydrocarbon receptor (AhR) has been shown to prevent NEC in a mouse model, its potential as a therapeutic target for established NEC remains unclear. We hypothesize here that the AhR ligand indole can reverse Cs-mediated illness in the model organism *Caenorhabditis elegans*. Our results demonstrate that exposure to live Cs, but not heat-killed Cs, significantly impaired worm motility, demonstrating Cs is an effective pathogen of *C. elegans*. Treatment of Cs-infected worms with indole improved motility and enhanced survival under heat stress. These effects were dependent on *ahr-1*, the *C. elegans* ortholog of the human AHR gene. Finally, wild-type worms infected with Cs maintained higher motility scores and heat stress survival rates than their *ahr-1* knockout counterparts, even with no exogenous indole supplied but fed a diet of indole-producing commensal *Escherichia coli* prior to Cs infection. Our findings indicate that indole enhances health outcomes in Cs-exposed worms, suggesting a potential therapeutic avenue for NEC. Further investigation into AhR ligands could reveal new treatment strategies for managing NEC in premature infants.

Lauren Astle

UT - Utah State University

Discipline: Communications

Authors:

Abstract Name: 23andMe and Rhetorical Identity

The research question informing my presentation is how does genetic testing alter how a person identifies themselves, particularly in a rhetorical sense. Specifically, I will examine this question by rhetorically analyzing 23andMe testimonials and interviews regarding ancestor genetic testing. The texts will be analyzed through the lens of Kenneth Burke's theory of identification. Other theorists have drawn on identification theory and Burke to study the links between genetic testing and identity such as Michael Peterson, an English professor at Utah Tech University, who wrote his dissertation on identification theory in family history writing. Another such researcher is Wendy Roth, who has done multiple studies on the link between genetic testing and identity, particularly in the way participants identify themselves before and after receiving their

results. Informed by identification theory, my presentation will examine testimonials and interviews of individuals participating in 23andMe genetic testing. This theory posits that audiences see themselves in the rhetoric they consume. Rhetors can also cultivate that connection with their audience. This provides researchers the opportunity to study how interconnected the rhetor, rhetoric, and audience are. Specifically the connection of identity and how rhetoric can shape and adjust it through the exchanged mentioned above. In the context of these 23andMe testimonials and interviews, I expect to learn that participants will express changes in how they perceive themselves. I also expect to see the testimonials as having been written in a way that will be simple and relatable to encourage readers to identify with the people providing these testimonials to possibly persuade them to participate in a genetic ancestry test as well. The interviews I expect to be more informal while being more detailed. The analysis of these 23andMe testimonials will provide insight into the role that genetic testing plays in the forming of rhetorical identity.

Andrea Astorga

MT - Montana State University - Bozeman

Discipline: Physics and Astronomy

Authors:

#1 Anne Lohfink

Abstract Name: Constraining the nature of the electron distribution in the X-ray corona of active galactic nuclei

During the accretion process, black holes produce abundant radiation, especially in the X-ray band. A lot of this radiation is created in the corona, a region of hot electrons located at the accretion disk's center close to the black hole, where X-rays are being produced through the Compton scattering of accretion disk photons. It is believed that the powering of the corona and its emission from the X-ray continuum are important for the energy balance during the accretion process. But, there is still not much information about the nature and origin of electrons in the black hole's X-ray corona. Over the years, evidence has emerged in black hole X-ray binary systems suggesting that electrons have a hybrid nature, meaning that most of the electrons follow a thermal distribution while the minority follow a non-thermal power-law-like distribution. To date, there are no constraints on the existence of a hybrid corona in accreting supermassive black holes at the center of galaxies. In the work presented here, we placed constraints on a possible non-thermal contribution to the electron distribution by investigating the indirect effects of the enhanced hard X-ray production in the non-thermal case on the interaction of the X-ray continuum with the accretion disk in the X-ray reflection process. To achieve this, we studied the X-ray spectra from two accreting supermassive black holes. Our results are the first constraints of the nature of the electron distribution in accreting supermassive black holes.

Saba Athineos

NY - Brooklyn College

Discipline: Political Science

Authors:

#1 Jeanne Theoharis

Abstract Name: Media Portrayals of Haitian and Ukrainian Immigrants in America

This paper compares and contrasts media portrayals of Haitian and Ukrainian immigrants in the United States. The coverage spans eight years (2017-2025) and two administrations, Presidents Donald Trump and

Joseph Biden. Haitian and Ukrainian immigrants have fled considerable political turmoil in their home countries and received temporary protected status (TPS), allowing them to legally immigrate to America. Despite these similarities, the portrayals of these groups in mainstream media diverge significantly, reflecting broader cross-cultural and political biases. To explore this disparity, this paper focuses on how Haitian and Ukrainian immigrants are covered in the New York Times, one of America's most influential newspapers. My central research questions are: How does the New York Times cover Haitian and Ukrainian immigrants? What do the similarities and differences in coverage reveal? This analysis tracks the Times' coverage by examining the number of articles written about these groups, their placement in the paper, their length, the language used, and the journalists who wrote them. It highlights patterns of bias and their impact on shaping public perception. For instance, the Times tends to characterize Ukrainian immigrants favorably, emphasizing both their escape from the war and their integration into American society. However, Haitian immigrants are described in ways that align with harmful stereotypes, often concentrating on poverty and social chaos. These portrayals perpetuate distinct narratives: Ukrainian immigrants are seen as more deserving and compatible with American values, while Haitian immigrants are framed in a problematic light. In some cases, the Times uses nativist and dehumanizing language towards Haitian immigrants (but never towards Ukrainian immigrants). This affects how these groups are perceived, reinforcing unequal assumptions about their contributions to American society. By unpacking these biases, this paper sheds light on the media's role in perpetuating myths about immigrant groups and shaping public perception.

Hawi Atinafu

MN - Minnesota State University - Mankato

Discipline: Computer Science

Authors:

Bethel Zegeye

Sonia Sherif

Abstract Name: A Comprehensive Review of Deepfake Detection Methods Using Machine Learning

Deepfake technology, driven by advancements in machine learning (ML) and deep learning (DL), has emerged as both a creative tool and a significant threat to privacy, security, and societal trust. While its potential for innovation in fields like entertainment and education is undeniable, its misuse raises critical ethical and practical concerns. This paper offers an in-depth exploration of the evolving field of deepfake detection, synthesizing insights from 40 leading studies conducted between 2020 and 2023. It critically examines the comparative strengths of ML-based detection techniques, which prioritize accessibility and computational efficiency, against DL-based approaches that deliver superior accuracy but require substantial resources. The analysis focuses on key factors like detection accuracy across different datasets, adaptability to real-world scenarios, and resistance to tricks designed to fool detection systems. However, the research also reveals significant challenges. These include a lack of high-quality and diverse training datasets, making it harder for detection systems to perform well across different situations. Another issue is scaling these tools for widespread use, as many methods require powerful computers and advanced technical setups. Additionally, as deepfake techniques grow more advanced, detection systems must evolve to keep up. This research brings together these findings to identify gaps and suggest ways to improve. It offers clear recommendations for creating systems that are accurate, easy to use, and able to handle real-world demands. The ultimate goal is to ensure trust and authenticity in digital content, protecting people from the risks of deepfakes while encouraging the responsible use of this technology.

Carter Attardo

NY - University of Rochester

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: Apollonian Assimilation at Greek Cultural Sites: A Trend in Hellenization

Ever since Fontenrose's revelations on early mythical theory at Delphi, classical scholars have carefully examined the most minute details, both textual and archaeological, to gain covert knowledge regarding heroic origins of Apollo sanctuaries but none have provided a cultural narrative for Apollo's arrival at these sites. I argue that these cases form ubiquitous patterns throughout the Greek world and in doing so elucidate fundamental cultural trends in the construction of a Pan-Hellenic identity. Archaeological evidence including epigraphy from the surrounding areas of Parnassus indicates the presence of local hero cults which Apollo assimilated in both the Late Helladic and Iron ages. Oracular implements at Delphi prior to the introduction of Apollo to the region evidence the long-standing religious heritage of the site. In reexamining texts of Strabo, Pausanias, and Homer, I reveal in this paper a fundamental religious trend towards Olympian pan-Hellenism at Trikala, Delphi and Thusa, a trend which is symptomatic of a larger identity revolution in the north-eastern Mediterranean.

Andrew Attinger

IN - Valparaiso University

Discipline: Sociology

Authors:

Abstract Name: The Tate Phenomenon: Examining Social Media Influencers through the Lens of Max Weber and Sigmund Freud

Though the role of social media influencer is a new phenomenon, its theoretical foundation is not. Since technology now enables a person to become an overnight celebrity through charismatic displays in videos, this kind of fame can be explained through older concepts established by Max Weber and Sigmund Freud. The case of Andrew Tate, a kickboxer turned social media influencer, is illustrative. Despite his misogynistic and discriminatory claims, Tate's radical statements and cult-like following echo Weber's nineteenth-century description of how a charismatic authority and their followers function. While the label of charismatic authority is a start, Weber's theories alone do not sufficiently explain some questions of why anyone would adhere to Tate's claims and how he gained popularity. Fortunately, Sigmund Freud's pleasure principle describes an instinctive desire that is in contention with the reality principle of societal rules. Tate's countercultural statements create a space for people to freely engage under the pleasure principle, making his behavior attractive to many. Further interpretation of the Tate phenomenon can be built through what Verena Wieser, a Weberian sociologist, calls charismatic entrainment. Charismatic entrainment argues that the interaction between a brand leader, consumer-followers, and consumer-critics creates prominent charismatic authorities. Through an online platform, Hustler's University, Tate, the brand leader, allows his immediate fans, the consumer-followers, to spread his message and engage in discourse with others. This discourse often invites those who disagree with Tate, the consumer-critics, to bash Tate for his statements, but these protests produce only more publicity for Tate. These aspects of Tate's rise to fame reflect charismatic entrainment, explaining his rapid popularity. Andrew Tate is not the first influencer to engage in this process, but he will definitely not be the last. Thus, society must understand these processes to halt a more detrimental influencer in the future.

Donovan August

PA - Millersville University

Discipline: Biology

Authors:

#1 Anabelle Vue

#2 Dr. Heather Lehman

Abstract Name: Epithelial-to-Mesenchymal Transition and Other Effects of Vape Aerosols on A549 Lung Cancer Cells.

Lung cancer is one of the leading causes of cancer deaths worldwide, primarily caused by smoking. E-cigarettes and vaping have been advertised as a healthier, safer alternative to smoking and is often used as a smoking cessation tool. If a lung cancer patient or undiagnosed individual begins vaping, this may cause a benign tumor to become metastatic. This project is to determine if vape aerosols will cause lung cancer cells to undergo epithelial-to-mesenchymal transition (EMT) which is indicative of metastasis, and whether differing amounts of nicotine content influences the number of changes seen. Human lung cancer cell line (A549) was grown in DMEM media supplemented with 10% fetal bovine serum and 1% penicillin/streptomycin. The media was exposed to vape aerosols of differing concentrations then applied to

the cells which were observed over the following 72 hours. Results show that cells exposed to any concentration of nicotine vape aerosols caused cell morphology changes indicative of (EMT).

Sara Avila

NE - Creighton University

Discipline: Computer Science

Authors:

#1 Sara Avila

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Cole Krudwig

Kaylee Van Handel

Abstract Name: Advanced Deep Learning Integration of YOLO v11 and SAM2 for Precise Detection of Missing Cochlear Hair Cells

Accurate detection of cochlear outer and inner hair cells is essential for diagnosing auditory impairments. This study presents a deep learning approach that integrates the object detection capabilities of You Only Look Once (YOLO) v11 with the segmentation proficiency of the Segment Anything Model 2 (SAM2) to identify missing cochlear hair cells in high-resolution microscopic images. YOLO v11 features an enhanced backbone and neck architecture that improves feature extraction for precise object detection. Its optimized design achieves a higher mean Average Precision (mAP) on the COCO dataset while utilizing 22% fewer parameters than its predecessor, YOLO v8m, thereby enhancing computational efficiency without compromising accuracy. In this study, YOLO v11 is employed to detect and localize existing cochlear outer and inner hair cells within microscopic images, providing bounding boxes that indicate the presence and positions of these cells. To identify missing hair cells, SAM2 is applied directly to detect regions where outer and inner hair cells are absent. SAM2 extends the capabilities of its predecessor by incorporating a per-session memory module that captures information about the expected morphology of hair cells, enabling it to identify gaps or abnormalities in the cellular arrangement. This architecture allows SAM2 to handle complex visual data through a unified, promptable model that supports real-time processing and zero-shot generalization. By generating precise segmentation masks of missing areas, SAM2 facilitates the direct identification of regions affected by hair cell loss. Experimental results demonstrate that the integration of YOLO v11 and SAM2 significantly enhances the accuracy and efficiency of detecting missing cochlear hair cells. The combined approach leverages YOLO v11's real-time object detection capabilities and SAM2's proficiency in identifying absent structures, providing a comprehensive tool for auditory research.

Moriah Avila

IL - Trinity Christian College

Discipline: Biology

Authors:

Andrew DeBlecourt

Abstract Name: Exploring Elesclomol as a Potential Therapy for Copper Insufficiency

Menkes disease in humans is a genetic disorder that impairs the body's ability to absorb and distribute copper, leading to severe developmental and systemic issues including lethargy, frail bones, and persistent seizures. This disease is caused by a mutation at the ATP7A gene. A comparable mutation in *C. elegans* is located at the CUA-1 gene and mirrors many aspects of copper metabolism dysfunction, making it a valuable model for studying potential treatment options. Through our study, we identified an antibiotic, Elesclomol, that significantly improves the survival and physiological outcomes of mutant *C. elegans* that are exposed to copper. Without this intervention, the mutants exhibited a pronounced stress response, causing dauer formation, a reduced brood size, and lethargic behavior. It seemed that administration of the antibiotic alleviates these phenotypes suggesting that it may redirect copper metabolism pathways or mitigate the toxicity it presents. This was affirmed by the use of the antibiotic on wild type *C. elegans*, as it may cause an overwhelming uptake of copper, killing most of the population. The use of this antibiotic may present an avenue for considering therapeutic strategies for Menkes disease and similar disorders. Further research will focus on determining the specific mode of action of the antibiotic and its potential application in higher organisms.

Iliana Aviles

WI - University of Wisconsin-Whitewater

Discipline: Psychology

Authors:

#1 Hailey Fish

#2 Heather Guiney

#3 Heather Niemeier

Abstract Name: Exploring the relationship between alcohol use and disordered eating attitudes and behaviors in college students.

Intro: The relationship between problematic alcohol use and disordered eating attitudes and behaviors has been noted in college age women. 'Drunkorexia' is a relatively new term used to describe the restriction of food or other eating behaviors that compensate for the calories consumed from alcohol, or alternatively with the intention to optimize the effects of alcohol. Much of the previous research has focused on these relationships in women; this study includes college students of all genders and utilizes updated assessment measures validated in all genders to explore the relationships amongst disordered eating attitudes and behaviors and alcohol consumption in college students to better understand the underlying motivational connections among high-risk behaviors. Methods: Participants are over 300 UW-Whitewater students who completed a Qualtrics survey that included disordered eating attitudes and behaviors questions from the Eating Pathology Symptoms Inventory (EPSI), alcohol frequency and binge drinking frequency measures, and eating behaviors related to alcohol consumption from the Compensatory Eating and Behaviors in Response to Alcohol Consumption Scale (CEBRACS). Students were recruited through email, organizations, professors, social media and posters around campus. Results: Data collection continues through December of 2024; analyses will be conducted in Spring of 2025. Analyses will examine differences amongst genders on all measures. It is predicted that disordered eating attitudes and behaviors will be associated with the use of such behaviors to compensate for calories from alcohol and the enhancement of alcohol effects. It is hypothesized that binge eating will be associated with binge drinking. It is also predicted that bulimia associated behaviors and restriction will be associated with use of eating behaviors to enhance alcohol effects across genders. Results can potentially inform future intervention efforts.

North Awad

TX - The University of Texas at San Antonio

Discipline: Psychology

Authors:

Abstract Name: SSRI's Effects on Reproductive Health and Behavior

Sex is an important part of life; one's sexuality, relationships, and libido are all components of the sexual human nature. Fulfilling sexual desires can provide a sense of emotional, physical, and social wellbeing. The loss of one's sex drive can negatively impact one's quality of life and overall sexual satisfaction. The first line of treatment for major depressive disorder as well as anxiety disorders are selective serotonin reuptake inhibitors (SSRIs). One of the most prevalent side effects of SSRIs is sexual dysfunction. Sexual dysfunction is a disturbance in one's ability to experience sexual pleasure, drive, and/or arousal. The importance of sexual wellbeing is given little attention in the field of clinical psychology, thus eliciting the need for more treatment options for sexual dysfunction. Most mental health professionals (psychologists, psychiatrists, etc.) do not encourage discussions of sexual health with their clients, let alone specialize in sexual dysfunction treatment. Consequently, the lack of treatment for sexual dysfunction due to SSRIs may influence the high rate of non-adherence due to their sexual side effects. This study serves to investigate the prevalence of sexual dysfunction among patients prescribed SSRIs and understand the impact that SSRIs have had upon one's quality of life that leads to non-adherence. There is a critical need for more discussions about sexual discussions and treatments for sexual dysfunction in the field of clinical psychology in order to improve the sexual-wellbeing of patients.

North Awad

TX - The University of Texas at San Antonio

Discipline: Biochemistry

Authors:

#1 Edwin Barea-Rodriguez

Abstract Name: The Pharmacology of Lamotrigine in Crickets

Neurons are specialized cells that are responsible for sending electrical signals throughout the body. The action potential is the mechanism in which there is a temporary change in voltage within the resting membrane potential due to sodium influx and potassium efflux. The electrical firings of action potentials from neurons are crucial for neuronal functioning and cell to cell communication. Depolarization is an event in which the voltage of the membrane increases and this allows voltage gated sodium channels to open and allow the flow of sodium into the cell. This event is crucial for the start of an action potential as it is considered dichotomous, or an "all or nothing event". If the threshold for depolarization is not reached then an action potential will not occur. Lamotrigine (Lamictal) is an anticonvulsant and prescribed as a mood stabilizer. Lamotrigine is an inhibitory 5-HT receptor antagonist. Through its inhibitory and antagonistic effects on voltage gated sodium channels, its mechanism of action decreases the firing rate of a neuron by inhibiting depolarization from occurring, thus regulating 5-HT levels in the synaptic cleft. Neurophysiological experiments were conducted on *Acheta domesticus* (brown crickets) in which extracellular neuronal firings were recorded before and after the administration of Lamotrigine in order to understand the pharmacodynamics of Lamotrigine on neural firing activity. Lamotrigine consistently displayed lower action potential firing rates in comparison to the control trials, thus supporting the hypothesis that Lamotrigine functions as an anticonvulsant and mood stabilizing by impeding the depolarization of the membrane potential and thereby blocking action potentials.

Anthony Aya

IL - Eastern Illinois University

Discipline: Chemistry

Authors:

#1 Hongshan He

Abstract Name: Impact of bidentate ligands on photocatalytic C-N coupling reactions using BODIPY and nickel

Access to affordable medicine is essential for many people's healthy lifestyles. Among numerous medicines, the C-N bond formation is a fundamental step in drug synthesis. A promising new approach for C-N bond formation involves using light as an energy source. Currently, the state-of-the-art method employs a nickel catalyst alongside an iridium photocatalyst. Under light exposure, the photocatalyst transfers energy or electrons to the nickel center, activating the catalytic process. However, iridium is expensive, which can drive up the cost of medications. Moreover, the energy or electron transfer between iridium and the nickel center is inherently inefficient due to the nature of the intermolecular interaction. To address these challenges, we developed a "two-in-one" nickel complex, where an organic photocatalyst (BODIPY dye) is chemically linked to the nickel (II) complex. We hypothesize that this integrated complex will be more efficient than the nickel/iridium combination. Our findings revealed that the ligands used to form nickel complexes significantly influence the C-N cross-coupling between aryl halides and morphine. We plan to present the mechanism of the C-N coupling and explain why bidentate ligands inhibit the photocatalytic reaction. This work was generously supported by the ACS Petroleum Research Fund under Undergraduate Research Grant 66166-UR3

Omobolanle Ayangade

FL - Nova Southeastern University

Discipline: Biology

Authors:

#1 Rajendra Pangen

#2 Braham Dhillon

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Abril Chao

Emily Abraham

Abstract Name: Comparative Genomics across Ganoderma Species to Identify Secondary Metabolite Clusters with Cytotoxic Properties

Fungi in the genus *Ganoderma* have been widely studied in Chinese culture for their medicinal properties and promoting overall health and longevity. Our prior work on eight *Ganoderma* species showed that they contain Secondary Metabolite Clusters (SMCs) that code for multiple terpenes, betalactones, and ribosomally synthesized and post-translationally modified peptides (RiPPs). These compounds are well known for their cytotoxic and anticancer potential. A specialized bioinformatics analysis tool, antiSMASH1, was used to identify and annotate SMCs that produce anticancer compounds in the eight *Ganoderma* genomes. To test the results obtained from the bioinformatics analysis, fungal extracts were prepared from *G. lucidum* and *G. tsugae* by air-drying and powdering the mushroom fruiting bodies, mixing them with 95% ethanol, followed

by lyophilization. Different dilutions of these extracts are being used for proliferation assays on two cancer cell lines, PN528 (Proneural) and patient-derived GSC20 (Glioblastoma stem cells) to assess the cytotoxicity potential of the fungal compounds. Cell counts will be performed along with the assessment of stem cell and apoptotic markers with an expectation that the stem cell and apoptotic markers will be elevated in treated cells. Survival analysis will be performed to evaluate and compare the survival rates of cells over time. In addition, comparative transcriptomic analyses will be performed to identify differentially expressed genes/pathways followed by qRT-PCR. The promise of this study lies in establishing the pharmaceutical and nutritional role of natural products from the genus *Ganoderma* and creating opportunities to develop market-ready health products.

Ozzy Ayebo

MN - University of Minnesota - Rochester

Discipline: Biochemistry

Authors:

#1 Michael Boerrigter

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#8 Davide Povero

Abstract Name: Uridine Homeostasis is Impaired in Obesity and MASLD and Affects Fatty Acid Metabolism

Background: Metabolic dysfunction-associated steatotic liver disease (MASLD) is a common chronic liver disease associated with obesity and diabetes. Disruption of uridine homeostasis has been linked to both obesity and the onset of MASLD. However, the role of uridine in regulation of lipid metabolism remains poorly understood. Our project goal is to elucidate how uridine influences fatty acid metabolism during obesity and MASLD development. Methods: Bioinformatics analyses of omics data was performed with AI-based platform Yotta (DeepSpace Biology). Male C57BL/6 mice fed a chow or obesogenic high fat, fructose, cholesterol (FFC) diet for 8 weeks, received uridine (50 mg/kg) or vehicle for 3 weeks. Metabolic phenotype, liver injury, and tissue homeostasis were analyzed by multi-omics analysis, histological and molecular assays. Results: Unbiased bioinformatics analysis of spaceflight liver metabolomics data revealed a significant enrichment of fatty acids ($p < 0.03$) and depletion of uridine ($\text{LogFC} = -0.85$, $p < 0.02$) in flight vs. ground control mice. Concomitantly, liver expression of uridine 5'-monophosphate synthase (UMPS) was significantly downregulated in flight mice. UMPS was downregulated in human MASLD compared to normal livers ($p < 0.002$). Targeted metabolomics analysis confirmed a significant time-dependent decrease of liver uridine in diet-induced MASLD mice. In vivo, uridine-treated FFC mice exhibited increased metabolic activity without changes in food and water intake, as compared to vehicle-treated FFC mice. In FFC mice, uridine reduced body, liver, and adipose tissue weight, protected from liver and muscle steatosis, and reduced intestinal inflammation, as confirmed by histological assessment. Liver phosphoproteomics analysis identified differential phosphorylation of proteins associated with mitochondrial fatty acid metabolism in FFC mice. Conclusions: Our findings indicate that UMPS downregulation and uridine depletion occur early in MASLD/obesity development and impair fatty acid oxidation, leading to lipid build-up over time. Further elucidation of uridine metabolism may uncover potential novel targets for obesity/MASLD treatment.

Yordanos Ayelework

TX - McMurry University

Discipline: Computer Science

Authors:

#1 Dr. Aravind Mohan

Abstract Name: Interfaith Informatics

Religious misunderstandings often stem from a lack of interfaith awareness. This ignorance leads to conflicts among different religious groups. When people are limited to only one perspective, it could lead to stereotypes and make it hard to find common ground on critical topics; such as abortion, gun control, same-sex marriage, etc., which causes further division. Sharing perspectives, on the other hand, allows people to see the beliefs that guide different communities and identify the overlap between religions. In this project, we bridge the knowledge gap and provide a common perspective between the different religious communities such as Christianity, Hinduism, and Islam. Our platform, Interfaith Informatics, is a user-friendly web interface that helps people explore the perspectives of different religions on different topics. While existing literature has some work done in sharing perspectives on different religions, it is often limited in considering comprehensive data points and not able to provide a better perspective. In this project, we provide three primary features: 1) Information, which displays an overview of our comprehensive dataset that includes multiple sacred texts across religions; 2) Sentiment Analysis, which analyzes the general sentiment of a selected religion on a given topic; and 3) Comparison, which identifies the similarities and differences of the perspectives from two selected religions on a given topic. We used generative AI as a supporting resource for the interpretation and analysis of sacred texts. Finally, we conducted preliminary experiments to demonstrate the efficiency of our tool, which is developed using Web 2.0 and MySQL technology.

Jenna Azar

PA - Moravian University

Discipline: Chemistry

Authors:

#1 Godfred Fianu

Abstract Name: Synthesis of 1-(Diphenylamino)-2-propanone and 1-(phenyl(p-tolyl)amino)propan-2-one for Radical Arylation Studies.

In this study, the synthesis of 1-(diphenylamino)-2-propanone as a model compound for radical arylation studies was carried out. The synthetic pathway involved a multi-step approach, where diphenylamine was reacted with 3-chloro-2-methyl-1-propene in a substitution reaction. Subsequent oxidation was carried out using osmium tetroxide and sodium periodate, providing an efficient route to the desired ketone. The crude product was then purified via column chromatography and characterized using NMR, and GC-MS. This method proved advantageous over alternative synthetic routes because it produced the highest yield of desired product. The synthesized diphenylamino ketone will be used to carry out radical arylation studies to form indoline derivatives, which are basic motifs found in antitumor agents. Although the syntheses of indoline derivatives via the radical arylation of diphenylamino epoxides have been extensively studied, a study on the radical arylation of diphenylamino ketones to form indoline derivatives could also serve as an alternative and synthetically useful pathway. The same synthetic approach was applied to produce 1-(phenyl(p-tolyl)amino)propan-2-one, which will potentially be used to further investigate the regioselectivity of radical additions to arenes.

Faiaz Azmain

OH - College of Wooster

Discipline: Computer Science

Authors:

Habiba Hye

KM Khalid Saifullah

Abstract Name: Sentiment Analysis in Software Engineering: Evaluating Generative Pre-trained Transformers

This study investigates the efficacy of transformer-based models in performing sentiment analysis within the domain of software engineering (SE). Recognizing the limitations of traditional sentiment analysis tools in handling the technical and context-specific language of SE, the research systematically compares bidirectional transformers, such as BERT, with generative pre-trained transformers, specifically GPT-4o-mini. The study explores the interplay between dataset characteristics and model performance by evaluating these models on datasets from GitHub comments, Stack Overflow, Jira, Oracle code reviews, API reviews, and App reviews. The methodology involves fine-tuning the GPT-4o-mini model using SE-specific datasets, adhering to established benchmarks for consistency. Performance metrics, including precision, recall, and F1-scores, are assessed across sentiment categories (positive, neutral, and negative). The findings reveal that fine-tuned GPT-4o-mini matches or exceeds BERT's performance on balanced datasets like GitHub and Jira. Notably, it achieves a macro-averaged F1-score of 0.93 on GitHub and near-perfect scores of 0.98 on Jira. However, on the linguistically complex and imbalanced Stack Overflow dataset, the default GPT-4o-mini model outperforms its fine-tuned counterpart, achieving an 85.3% accuracy compared to 13.1%. The study concludes that generative models like GPT-4o-mini offer significant advantages in SE sentiment analysis, particularly when fine-tuned for structured datasets. However, the challenges posed by imbalanced datasets highlight the need for tailored strategies to optimize model generalization. These findings contribute to the growing understanding of the application of advanced natural language processing tools in SE, providing actionable insights for researchers and practitioners aiming to enhance sentiment analysis accuracy in this specialized domain. The implications of these results emphasize the importance of aligning model architectures with dataset properties to achieve optimal performance.

Emmanuel Babayemi

NJ - Kean University

Discipline: Computer Science

Authors:

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#2 Eric Landaverde

#3 Daehan Kwak

Abstract Name: COVID-19: Retelling the Story Through Topic Modeling and Sentiment Analysis

The COVID-19 pandemic, spanning late 2019 to late 2022, caused global disruption, resulting in over 700 million infections and 7 million deaths, while also greatly impacting economies, healthcare systems, and social life. During this period, social media sites such as X (formerly Twitter) became critical spaces for people to voice their thoughts and opinions concerning the pandemic. The objective of this study is to analyze the evolution of public sentiment and key topics over time using text data from X related to COVID-19. This will be achieved through topic modeling and sentiment analysis, creating a data-driven timeline of public opinions during the pandemic. The first phase of this study is the data collection phase, in which a

containerized web scraping Python program will hydrate tweet IDs from a database to collect millions of COVID-19-related tweets. The second phase focuses on understanding the data through topic modeling and sentiment analysis. Topic modeling will utilize LDA and BERT to identify key topics people discussed and how they developed and changed over time. Sentiment analysis will utilize Vader and Stanza to determine whether people felt positive, negative, or neutral regarding the pandemic and other subtopics. The results of this study will shed light on societal facets such as adherence to social distancing, utilization of healthcare systems, job security, and mask usage that will educate decisions of policymakers and public health officials in times of crisis and provide insights for predicting real-world events related to pandemics (e.g. an economic recession, case spikes). Additionally, this study provides a framework for conducting analyses on social media's informal writing style, advancing machine learning and data science techniques for unstructured text analysis.

Kunj Babla

IA - Iowa State University

Discipline: Engineering

Authors:

#1 Tuhin Mukherjee

Abstract Name: Hierarchical importance of the physical factors influencing the attributes of Laser-Induced Graphene

The hierarchical importance of physical factors influencing the attributes of Laser-Induced Graphene (LIG) remains underexplored, limiting the optimization of its fabrication process. Understanding how these factors interact and contribute to LIG's properties, such as sheet resistance, electrochemical activity, and surface wettability, is crucial for advancing its applications. In this study, we uniquely integrated machine learning techniques with experimental data to analyze and predict the relative significance of these physical factors. Using experimental data complemented by synthetic data generated through neural networks, we applied predictive algorithms to uncover patterns and hierarchical relationships. The machine learning algorithms, logistic regression and decision tree provided consistent findings, which revealed that sheet resistance and microstructure are the two most important process variables that are determinants of LIG's performance, with surface wettability playing a significant yet secondary role. Additionally, the study identified specific conditions under which electrochemical activity is optimized, enhancing LIG's functionality. This research provides a framework for data-driven optimization of LIG fabrication, paving the way for broader applications in electronics and materials science and can guide practitioners to quantitatively identify the most important physical factors to control graphene formation.

Sahana Babu

TX - The University of Texas Health Science Center at San Antonio

Discipline: Health and Human Development

Authors:

#1 Angelique Gonzalez

#2 Yannick Wadop-Ngouongo

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#15 Bernard Fongang
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Abstract Name: Evaluating Digital Pathology Softwares: Performance Comparison Between QuPath and HALO in Tau Pathology Assessment

Image analysis software has become more common in the field of pathology; however, many of these tools have been developed and optimized for cancer samples. Non-neoplastic brain tissue presents unique challenges for these tools due to lower cellularity and variability in tissue morphology. In this study, we evaluated and compared two digital pathology software options' abilities to quantify tau pathology in postmortem brain samples from the hippocampus and middle frontal gyrus (MFG). Immunohistochemistry was used to assess AT8 expression in 36 autopsied brains stratified according to CERAD-NP scores and Braak stages. Slides were digitized using Aperio Scan Scope XT (20x) and analyzed with QuPath and HALO IndicaLabs software. Optical density (OptD), percent positivity, and object density (ObjD) were measured with each. ObjD values were manually determined for each slide and used to validate digital measurements via ordinary least squares regression models. Further analysis included Spearman's correlation and ANOVA ($P < 0.05$). Digital measurements correlated with manual ObjDs in both regions except for HALO-derived OptDs ($P > 0.05$). HALO showed strong relationships between digital and manual ObjDs ($\rho \geq 0.70$) in both regions, whereas QuPath showed a strong relationship between these measurements in the hippocampus only. Significant differences were observed between HALO and QuPath ObjDs and OptDs ($P < 0.01$). Significant differences between Braak stages were found for all QuPath measurements except MFG ObjDs ($P > 0.05$). HALO-derived ObjDs and percent positivity values showed significant differences between Braak stages ($P < 0.05$), but OptDs did not ($P > 0.05$). Digital and manual methods of quantification and scoring significantly correlated in both HALO and QuPath, thus supporting their effectiveness at accurately assessing tau pathology. QuPath demonstrated consistent performance and better differentiation between Braak stages, whereas HALO showed stronger correlations with manual ObjDs, implying a more robust method for object detection and classification.

Erisa Baci

PA - University of Pittsburgh School of Nursing

Discipline: Nursing and Public Health

Authors:

#1 Rachel Brazee
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Kaleigh McGlynn

Abstract Name: Implications for Transitions of Care for Women Diagnosed with Metastatic Breast Cancer at the End-of-Life

Background: Patients and their families with metastatic breast cancer (MBC) experience successive disease progressions and ultimately transition from active treatment to supportive care only at the end of life (EOL). As this occurs, families assume an increasingly greater role in decision-making, providing support, and caregiver responsibilities. Methods: This is a secondary analysis of semi-structured interview data, collected between August 1st, 2020-December 31st, 2020. The designated personal representative (DPR) or family

member of women deceased from MBC (N=167) between October 1, 2016, and March 1, 2020, was contacted for participation in a Quality of Death and Dying (QODD) survey and a subsequent telephone interview to discuss their and their loved ones' EOL experiences. For this secondary analysis, three reviewers examined the transcripts and were analyzed for themes surrounding the caregiver experience. Results: Participants were primarily male (n=13; 81.25%), had a spouse or supportive partner (n=13; 81.25%), and were older than 60 years of age (n=10; 62.5%). Themes identified from the semi-structured interviews (n=16) around caregiver experiences, included the importance of joint decision-making, caregiving challenges, and communication with healthcare providers (HCP). Of the cohort, 62.5% (n=10) participants reported an overall positive experience with their HCP, and 68.7% (n=11) had hospice care services. However, 43.7% (n=7) still reported negative experiences during the transition of care between active treatment and comfort-only support, describing the experience as "lacking compassion, unrealistic, a complete failure, and with very little overall support." Conclusion: While there are designated metrics for poor-quality EOL care experiences, this secondary analysis suggests that one measure of high-quality EOL care is the sensitive management of the transition from active treatment to supportive care only. Care transitions are crucial to high-quality EOL care experiences and bereavement for families. More exploration is needed to provide sensitive, higher quality care.

Christopher Bacidore

TX - Texas Woman's University

Discipline: Engineering

Authors:

#1 Siekleng Chhuon

#2 Jesse Watts

Allyson Williams

Abstract Name: HANDI: Human Advancement through Next-Gen Design and Innovation

Creating a personalized prosthetic requires a cumbersome process involving manual measurements, mold creation, and time-consuming fitting sessions, often leading to delays and imperfections. The HANDI system (Human Advancement through Next-Gen Design and Innovation) helps make this process faster and more accurate by streamlining the customization process using digital assistance, thus providing better precision, fit, and functionality. The HANDI system approach starts by accurately scaling a pre-designed 3D prosthetic model using precise measurements from different parts of the recipient's body. This automation saves time and effort in the production of the prosthetic. On top of using a digital algorithm to automate the scaling and measurements, the HANDI system uses 3D printing technology to automate physical production as well. Using 3D printing to manufacture the prosthetic nearly guarantees that the prosthetic will have higher levels of precision and comfort for the user than a handmade prosthetic would have. The overall goal of the HANDI prosthetic system is to create access, affordability, and personalization of prosthetics for individuals in need. This, in turn, reduces discomfort and allows the recipient to use their prosthetic more effectively to return to their normal mobility and independence in less time. The HANDI system can also be configured to work with remote healthcare settings, providing possible customization and manufacturing of prostheses without the need for an in-person assessment. Besides the practical advantages, this technology opens the door to broadened accessibility. By reducing the need for skilled manual labor, this system can allow for easier access to prosthetics for the individuals who truly need it.

Devin Bae

DC - American University

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

Abstract Name: Towards the Critique of Algorithmic Subjectivity

This article aims to explore a form of algorithmic subjectivity first developed by Luciana Parisi in her 2019 article: "The Alien Subject of AI." Breaking from Parisi's original formulation, I argue that current understandings of "subjectivity" and "Artificial Intelligence" are in need of revisions, predominantly via a rigorous mathematical understanding of algorithmic and computational processes, and an updated conception of postmodern subjectivity to match. Beginning with an overview of the fundamental mathematical and logical bases for modern computational algorithms, I argue that perennial issues plaguing discussions around computation and AI (such as continuity vs. discreteness, determinism vs. stochasticity, and computation vs. intelligence) should be reframed as problems of scale (within which certain boundary conditions delimit the inherent contingency of the universe). Following this, I leverage a critique of the ontological binaries that define current understandings of computation, algorithms, and machine intelligence by situating them within the larger epistemological context of instrumentalization and automation. Using case studies of machine learning algorithms and social media algorithms, I demonstrate that general claims about "algorithms" and "algorithmic subjectivity" from both laypersons and academicians fly in the face of technical understandings, carrying implications for theoretical work in the field.

Nafissatou Bahadio

MN - Minnesota State University - Mankato

Discipline: Mathematics

Authors:

#1 Nafissatou Bahadio

Abstract Name: The MyGov Platform Bridging Technology and Democracy for Accurate Data Collection and Youth Participation

The "MyGov" application is a transformative platform designed to modernize voting systems and demographic data collection, addressing challenges such as data inaccuracies and low youth voter turnout. Traditional methods of data collection and electoral engagement often fail to capture the diversity of populations, particularly in nations like Ivory Coast (West of Africa), where young people face significant barriers to civic participation. "MyGov" leverages cutting-edge technologies, including secure facial recognition, data encryption, and real-time analytics, to provide a user-friendly and inclusive interface that facilitates secure voting, accurate demographic data collection, and enhanced citizen-government interaction. This project integrates advanced data modeling techniques with robust security protocols to ensure reliability and fairness. Features like digital voting, integrated tax management, and real-time feedback mechanisms empower users while providing policymakers with actionable insights. The platform also offers a scalable model for countries seeking to modernize their electoral systems and improve public trust in governance. Drawing on my background in statistics and lived experiences during Ivory Coast's 2010–2011 conflict, to drive societal change through data-driven innovation; this project reflects a commitment to using technology and data-driven solutions to promote social equity, strengthen democratic institutions, and enhance civic engagement. By fostering accessibility and innovation, "MyGov" exemplifies the potential of digital tools to transform governance and empower communities worldwide.

Chunyan Bai

RI - Roger Williams University

Discipline:

Authors:

#1 Chunyan Bai

Felix Wang

Abstract Name: Enhancing Security in Healthcare 5.0 through Fog Computing

Rapidly evolving technology has transformed public healthcare systems from the conventionally disease-oriented healthcare 1.0, to the patient-oriented healthcare 5.0. One focus of the healthcare 5.0 model is to provide the capability of remote diagnoses and treatments through cloud computing, also known as telehealth or smart healthcare. Some examples of these technologies are the IoT (Internet of Things), big data analysis, and artificial intelligence. Telemedicine and virtual care played an important role in the bigger picture of building a smart city with smart healthcare. The COVID-19 pandemic accelerated this transition, showcasing the high functionality of these digital technologies. However, with telehealth growing in the United States by 4,347% annually, significant security and privacy concerns have been revealed. Reported threats included database attacks, privileged-insider attacks, traffic analyses, and DDoS attacks. Since the IoT relies on cloud computing for data processing and storage services, many of its applications suffer from inherited challenges such as unreliable latency and lack of mobility, in addition to the security threats. Fog computing has appeared as an evolutionary solution to these challenges. It can provide optimized latency and cost management, along with enhancing security. In this project, we will study the threat models that have been recently adopted by the US's healthcare 5.0 and discuss its security requirements. We will also review how researchers of the field address security threats by applying various access control schemes. We will then focus on adopting two encryption/decryption schemes, triple-DES (Data Encryption Standard) and AES (Advanced Encryption Standard), in the fog nodes to preserve data confidentiality. Fog computing can reduce security concerns, since the necessity of data transmissions to the cloud is minimized and the security risks are significantly reduced. Allowing the encryption and decryption at the fog nodes will add another layer of security for data integrity and confidentiality.

Havin Baik

DC - The George Washington University

Discipline: Political Science

Authors:

#1 Maryam Deloffre

#2 Alicia Cooperman

#3 Richard Grinker

Abstract Name: Perspectives Today, Casting Visions for Tomorrow: How South Korea's Future Leaders View Division and Reunification

How do the future policymakers and leaders of South Korea view the division of Korea and future reunification? This study investigates the perceptions of elite university students at Seoul National University regarding the division of Korea and the feasibility and desirability of reunification. By focusing on this critical demographic—South Korea's future policymakers and leaders—the research examines how generational shifts, economic challenges, cultural divides, and global influences shape attitudes toward reunification. My findings highlight the erosion of a shared Korean identity among younger South Koreans, compounded by decades of ideological and cultural isolation. Despite broad support for reunification as a long-term goal, participants emphasized the need for gradual and phased approaches, prioritizing economic integration and trust-building initiatives. This research contributes to the literature by addressing the underexplored perspectives of South Korea's elite youth, offering insights into the challenges and

opportunities of reunification in a globalized and generationally shifting context. Policy recommendations include enhancing intergenerational dialogue, fostering cultural exchange programs, and developing transparent economic strategies to engage younger generations and address practical concerns about reunification.

Isabel Baillie

NC - North Carolina State University

Discipline: Engineering

Authors:

#1 Kyla Bosh

#2 Katherine Saul

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Abstract Name: Effects of Brachial Plexus Birth Injury on Bone Resorption in a Rodent Model

Brachial plexus birth injury (BPBI), one of the most common neuromuscular injuries in children, occurs when excessive stretching of the neck during birth damages the brachial plexus nerve bundle innervating the neck and upper trunk. Most newborns affected by BPBI recover within 4-6 weeks, but up to 30% experience long-term muscle deficiencies and some incur permanent nerve damage. Severity of deficiencies depends on injury location relative to the dorsal root ganglion (DRG), either nerve avulsion proximal to the DRG (preganglionic injury) or ruptures distal to the DRG (postganglionic injury). Our previous work in rat models showed that at 8 weeks post-injury, rats with a preganglionic injury had a decreased bone formation rate in the injured limb compared to the uninjured limb. Trabecular bone microstructure in the humeral head was deteriorated in both postganglionic and preganglionic injury groups but was substantially more so with preganglionic injury. In this study, we are examining the effect of BPBI on bone resorption through osteoclast activity. Sprague Dawley rats 3-6 days old underwent preganglionic, postganglionic, or sham neurectomy or disarticulation (mimicking limb disuse without nerve injury) of one forelimb and were sacrificed at 2, 3, 4, 8 or 16 weeks post-injury. Injured and uninjured humeri were harvested, and the proximal growth plate regions were cryosectioned longitudinally, affixed to slides, and stained with tartrate resistant acid phosphatase (TRAP) to assess osteoclast activity. Slides were then imaged and analyzed using MATLAB for percent TRAP staining per bone area. Analysis is ongoing, but preliminary results indicate that preganglionic and postganglionic groups have lower osteoclast activity in their injured limbs compared to uninjured limbs. These findings will provide further insight into the timing of bone metabolism changes following BPBI, which can inform clinical treatments.

Rylee Baire

PA - Susquehanna University

Discipline: Biology

Authors:

#1 Rylee Baire

#2 Sophie Charvet

Abstract Name: The effects of light and prey resource availability on *Cymbomonas tetramitiformis* growth.

Cymbomonas tetramitiformis is a unique marine prasinophyte species for the way in which it can perform both phototrophy, using light as a source of energy, and phagotrophy, using predation to obtain energy. This is

known as mixotrophy, and *C. tetramitiformis* is a mixoplankton, being able to switch between trophic modes under resource limitations. We investigated the limits of light and prey availability for *C. tetramitiformis* to study how it switches between trophic modes. To do so, we created treatments of regular light/regular prey, regular light/low prey, low light/regular prey, and low light/low prey and measured cell density over 5 weeks. Based on prior knowledge that most mixoplankton species do not grow well without light, we hypothesized that growth under standard conditions of regular light and regular prey availability would be the greatest. Initially, the regular light conditions showed the greatest growth, but cells counts decreased quickly. Low light treatments took longer to start growing but eventually showed great growth. Under standard conditions *C. tetramitiformis* appeared to utilize their resources quicker than under constrained conditions, which lead to a shorter lag phase and a quicker stationary and death phase. The longer lag phase in low light/low prey could be because the strain needed more time to switch trophic modes and adjust to the conditions. Once it did, it grew to the same extent as regular light and prey. This indicates the ability of *C. tetramitiformis* to switch trophic modes and adjust to limiting conditions.

Riya Bajpai

VA - Virginia Commonwealth University

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

Abstract Name: Refining the Existing aDBS Ethical Framework to Address Racial Disparities for Black and African American Patients

Adaptive deep brain stimulation (aDBS), also known as closed-loop deep brain stimulation, is a version of DBS that offers improved treatment for movement disorders including essential tremor, dystonia, and parkinson's disease. While aDBS is a promising development, its novelty presents greater ethical risks due to limited research on its mechanisms and clinical applications. Parkinson's disease (PD) is a chronic movement disorder for which aDBS provides avenues for improved care. Despite the favorable potential of aDBS, prior research indicates that African American and Black patients with PD experienced disparities in receiving open-loop DBS treatment. These disparities can translate to aDBS treatment, making considering their presence within ethical approaches imperative. This paper evaluated Baker et al.'s existing ethical framework for aDBS, refining the framework to address disparities for Black and African American patients. To elaborate on these considerations, peer-reviewed literature was evaluated to understand the disparities Black and African American PD patients face when seeking DBS treatment. The ethical challenges faced by Black and African American patients were then identified and addressed within the categories of the ethical framework proposed by Baker et al. Aspects of the existing framework, such as addressing expanded inclusion criteria, were identified for their strengths in acknowledging disparities. However, the framework could be refined to address crucial challenges within informed consent and patient autonomy. These gaps were improved upon by adding more considerations for clinicians and industries to address medical mistrust, implicit and explicit bias, and socioeconomic disparities when providing or considering aDBS treatment. Including more thorough considerations for ethical challenges created by racial disparities can guide improving quality aDBS care. The findings of this paper demonstrate the importance of considering racial disparities within medical policy, innovation, care, and future ethical structures.

Amelia Baker

GA - Kennesaw State University

Discipline: Education

Authors:

#1 Amelia Baker
#2 Caitlin Callahan

Abstract Name: The Relationship Between Undergraduate Research Participation and Educational Outcomes

This study investigates the relationship between participating in funded undergraduate research programs and pre- and post-graduation success among students at Kennesaw State University (KSU). Prior research suggests that engaging in research activities during undergraduate studies contributes to critical thinking skills, hands-on experience, and professional networking, all of which are crucial for career advancement (Seymour et al., 2004). Participation in undergraduate research has been associated with higher rates of employment and acceptance into graduate programs (Seymour et al., 2004). Moreover, involvement in research fosters a sense of professional identity and improves communication skills, further contributing to long-term career success (Jones et al., 2019). This study utilizes retrospective data from KSU's Offices of Undergraduate Research and Institutional Research to analyze pre-graduation success metrics, such as academic progression and retention. In addition, we used LinkedIn profiles to collect data on post-graduation outcomes, including employment status and further education. We analyzed data from 2019 to 2024, with a sample of 980 students who attended KSU and received funding from a KSU Office of Undergraduate Research program. The data includes several different funded programs, such as the First-Year Scholars Program, the Summer Undergraduate Research Program, and the Peer Ambassadors Program, providing a comprehensive view of students' participation in these programs. By assessing the influence of funded undergraduate research, the findings will provide insights to enhance research opportunities and support student success before and after graduation. Additionally, the results will explore whether participation in these research programs contributes to long-term outcomes, such as securing employment, pursuing further education, and overall career development. By examining these relationships, the study aims to provide evidence that can inform the development of initiatives designed to support student success during their academic journey and potentially foster meaningful post-graduation achievements.

Nehal Bakshi

UT - University of Utah

Discipline: Nursing and Public Health

Authors:

#1 Jacob Steenblik
#2 Marina Griffith
#3 Kate Flynn
Mia Sheneman

Abstract Name: Bridging the Knowledge Gap: Assessing Naloxone Awareness and Access in Utah's Opioid Crisis

Opioid use disorder is a significant cause of morbidity and mortality in the United States (Steenblik et al., 2023). Utah has seen an unprecedented rise in overdose incidents in recent years, with opioids emerging as the primary contributors (U.S. Attorney's Office, District of Utah, 2024). Opioid-related deaths in Utah have far surpassed the number of deaths caused by firearms, falls, and motor-vehicle accidents (Utah Office of the Attorney General, 2024). An effective strategy to prevent opioid-related deaths is to increase access and awareness of naloxone—a medication designed to reverse opioid overdose by competitively binding to opioid receptor sites (SAMHSA, 2024). When given quickly and correctly, efficacy of opioid overdose reversal following naloxone administration can range from 75-100% (Rzasa Lynn & Galinkin, 2017). Considering the ongoing opioid crisis in the state of Utah, the purpose of this study is to evaluate the effectiveness of a naloxone distribution program in the University of Utah Emergency Department (UUED) along with the knowledge, perception, and access patients have regarding naloxone. Patients presenting at the UUED were surveyed using convenience sampling, as well as a 30-day follow-up survey via phone. Among

data collected thus far, 55.7% of surveyed patients (n=1,330) said that they did not know what naloxone was. Furthermore, 72.9% of respondents (n=1,324) did not know where they could currently get naloxone. Although effective overdose reversal drugs exist, data from the UUED suggest that patients overwhelmingly don't know what naloxone is or where to get it. This critical gap exposes the need for improved opioid education and naloxone distribution (OEND) programs across the state, and continued efforts to increase the availability of naloxone through free distribution initiatives. Furthermore, it is recommended that investment be made to improve the social perception of OEND programs and mitigate the harmful effects of associated stigma.

Shrijith Balasundararajan

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Jianhua Zhang

#2 Ran Tian

#3 Victor Darley-USmar

Abstract Name: Changes in Mitochondrial Electron Transport Chain Complexes Expression in Postmortem Human AD Brain

Alzheimer's disease (AD) is the most common cause of dementia, with an estimated 6.9 million Americans aged 65 and older currently living with Alzheimer's dementia. Postmortem studies of AD brains have shown that mitochondrial dysfunction plays an important role in the pathogenesis of AD. The electron transport chain (ETC) within mitochondria, comprising five complexes, plays a crucial role in ATP production through oxidative phosphorylation. Recent findings have observed alterations in the function of these complexes in AD brains, leading to impaired energy metabolism and increased oxidative stress. This study aimed to investigate these claims through Western blot analysis of various complexes, using postmortem human brain Broca area 8 tissue from both Alzheimer's disease (AD) and non-disease (ND) models. Our results showed a significant decrease in the protein expression of complexes I, III, IV, and V in the Alzheimer's disease (AD) brain compared to the non-disease (ND) brain. Furthermore, our analysis of sex-based differences revealed no significant variations in complex protein levels between males and females in Broca area 8. Additionally, we will test this on Broca area 22 tissue using our various samples to see if there is a similar trend between AD and ND brains. A comparative study between these two areas will help us understand how AD is affected region by region and see if there is a similar trend in sex-based differences. These findings can contribute to future research on mitochondrial dysfunction in AD, helping to regulate and understand the underlying mechanisms, and identifying new targets for therapeutic development.

Nicole Balay

MD - Bowie State University

Discipline: Computer Science

Authors:

#1 Soo-Yeon Ji

Dayana Ferrufino

Abstract Name: Channel-Based analysis of Neurological Disorders Using Permutation Entropy and Machine Learning

Neurological disorders are conditions that affect the brain and/or the body's nervous system. Often referred to as "invisible" disorders, they are not detectable by any physical indicator, but can be life-hindering to those afflicted. Conducting research on these disorders is a particularly challenging area, because they typically manifest through behavior, thoughts, and emotion— factors hard to quantify. Electroencephalography (EEG) is one of the ways we can measure brain activity data; a subject wears a brain cap with multiple electric sensors to observe the electrical activity of the brain. In our project, we aim to understand the patterns of various neurological disorders by analyzing EEG data to measure the similarities and differences of channels between disorders and healthy conditions. For the comparative analyses, we'll use TDBrain dataset, containing EEG data for each subject recorded with 26 channels in two conditions: one set with eyes open, and one set with eyes closed. First, two types of filtering (i.e., bandpass and notch filtering) are applied to remove noise. Second, we will compare different EEG time segments to determine the optimal window. Representing the patterns as selecting an appropriate segment window is essential for capturing sudden changes associated with various disorders and improving the overall classification accuracy. Third, features will be extracted using permutation entropy to show effectiveness in distinguishing the patterns associated with different neurological disorders and healthy conditions. Additionally, a region-based analysis will be conducted to identify the most significant brain regions linked to the disorders. We will compare data across the two eye conditions, aiming to identify condition-specific channels and their patterns with various disorders from the healthy states. Finally, we will generate a predictive model utilizing machine learning techniques to distinguish neurological disorders from healthy conditions. This research was sponsored by the National Science Foundation under Grant No. (2219634)

Katelyn Balderas

AR - Lyon College

Discipline: Psychology

Authors:

#1 Nikki Yonts

Abstract Name: Language Development: The Social Influences Necessary for Bilingual Language Acquisition in Infants and Adolescents

Language acquisition relies on the biological capacities of children to develop language and the environmental stimuli that allow for such acquisition; while monolingual development has been well-researched by psychologists and linguists over past decades, the effects of environmental stimuli on bilingualism display scant research as to the importance of interpersonal relationships on the acquisition of multiple languages. This research examines the psychological studies exploring the effects of interpersonal relationships of the child to their parents, siblings, and other stimuli, such as communities and technology, to the child's linguistic development. The referenced works focus on the relationships between the child and their interpersonal environment and each relationships' effects on the native-level acquisition of multiple languages, specifically the family's primary language and a secondary language of cultural importance. The environmental component of language composition is crucial to bilingual development, as children often rely on such linguistic relationships to develop native-level abilities in their primary and secondary languages. There was a positive relationship found between a child's bilingual attainment and parental responsiveness to the acquisition of a secondary language, as well as a positive relationship between a child's linguistic ability in the presence of a sibling, under which they are able to better develop their receptive and expressive vocabulary in a second language. The review does not account for differences in a child's upbringing, such as single-parent households, multigenerational households, or external familial and peer relationships, which explain differences in a child's attainment of secondary languages. A focus on more complex interpersonal relationships between the child and their interactions may explain differences in bilingual acquisition.

Libelula Baldriche

TN - Middle Tennessee State University

Discipline: Engineering

Authors:

#1 Lula Baldriche

#2 Anwar Elhadad

#3 Seokheun Choi

#4 Yang "Lexi" Gao

Abstract Name: Green Power: Paper-Based Bacterial Batteries

Papertronics, or paper electronics, is revolutionizing next-gen healthcare, environmental monitoring, displays, flexible electronics, and energy storage with a low-cost, green, sustainable approach. The key challenge is ensuring an independent, self-sustaining power supply for use in resource-limited environments. The objective of our project was to develop a bacterial-powered battery for flexible paper electronics and enhance the lifespan and power performance. Bacterial batteries, or Microbial Fuel Cells, typically consist of anodic and cathodic chambers separated by a proton exchange membrane (PEM), allowing only H⁺ ions or other cations to pass from anode to cathode. A conductive load connects the two electrodes, completing the external circuit. In the anodic chamber, microorganisms oxidize organic matter and transfer electrons to the anode, completing the respiration process. The battery component fabrication consisted of PEDOT:PSS + DMSO on paper for the anode, PEDOT:PSS + DMSO + Ag₂O on paper for the cathode, and a PEM constructed from wax printed on paper. Thus, an entirely paper-based battery platform is developed, decreasing the production cost and simplifying the fabrication process. Over a 7-week time-span, the paper-based biobattery array increased power generation to ~45 $\mu\text{W}/\text{cm}^2$. Our 3D conductive paper fiber environment improved power performance and lifespan, revolutionizing microbial energy for on-chip paper power supplies.

Colby Baldwin

GA - Kennesaw State University

Discipline: Health and Human Development

Authors:

#1 Teja Venkata Sai Naveen Vuddagiri

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#4 Sandip Das

Abstract Name: Novel Low-cost Device for Real-time Measurement and Health Monitoring of Field-Deployed Solar Panels

Solar power has emerged as a potential renewable and sustainable energy source. Measurement, testing, and evaluation of solar panels are important for industrial quality control, education, and research and development. Commercial instrumentation exists to perform such measurements in a production factory or research labs. However, such instruments are very expensive and bulky. In addition, they are not suitable to deploy in a solar power field. Such limitations pose a barrier to continuous monitoring of solar panels' health after production when they are commissioned outdoor in a solar power plant. In this project, we have developed an innovative solution to address these challenges. We have designed and fabricated a portable low-cost device for remote real-time monitoring of solar panels. Our device costs less than \$100 and it can measure solar panel's electrical parameters and compute its power output within 2% accuracy compared to commercial lab-grade instruments that costs >\$3,000. Our low-cost device integrates an ESP32

microcontroller, a capacitive load, an analog front-end comprising of operational amplifier, an energy harvesting circuit, solid-state switches, temperature sensing circuit, and an analog-to digital converter circuit. The device is capable of measuring a solar panel's voltage, current, and tracing the current-voltage characteristic curves under different ambient conditions. The integrated direct Wi-Fi on the microcontroller allows the device to remotely monitor the panel's health. In addition to the hardware, we have also created an open-source python program that can autonomously analyze the performance of a solar panel by collecting and analyzing I-V curves in real-time to assess a solar panel's power output and its health and alert the maintenance personnel in case of any faults or malfunctioning. In addition, our system enables novel strategies to achieve higher efficiency of a solar plant, thus producing more renewable energy for a sustainable world.

Stephanie Ballen

MN - St. Olaf College

Discipline: Environmental Science and Sustainability

Authors:

#1 Jake Grossman

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Nick Starceovich

Matthew Blake

Abstract Name: Temporal Patterns in Boxelder and Basswood Ecophysiology

Plant physiologists know that most traits result from both environmental and genetic factors, but often struggle to quantify the relative importance of each for any given trait. Research by Dr. Jake J. Grossman and his students applies this framework to the water usage of two tree species, boxelder (*Acer negundo*), and American basswood (*Tilia americana*) in temperate continental woodlands of Northfield, Minnesota. Grossman's lab has measured TLP (turgor loss point, an index of drought tolerance) and other metrics that characterize water use physiology over the growing season. He has hypothesized that there is ecologically consequential seasonal change in TLP throughout the calendar year, even when accounting for species of tree, year-specific environmental factors, and location. To explore this hypothesis, we applied hierarchical clustering to a TLP time series and found that observations from trees of the same species cluster together. We then fit a segmented line model to predict TLP and found that it varies across species and time, suggesting that different tree species adapt to various environmental factors throughout the season differently. We found a characteristic seasonal pattern in TLP: it drops in the beginning and end of the growing season, but is constant in the middle. We found that 34.8% of the variance in TLP can be explained by species, time of year, and year. This variance demonstrates the effect of individual differences and species-level adaptations upon trends of drought tolerance over time.

Anthony Bamford

NC - Elon University

Discipline: Communications

Authors:

#1 Anthony Bamford

Abstract Name: A Quantitative Analysis of Atlantic Coast Conference (ACC) Football Game Duration

This study aims to identify the variables that influence Atlantic Coast Conference (ACC) football games. This study examined 442 ACC conference and non-conference football games from 2019-2023. Six variables were used: total number of plays, total number of scoring plays, total number of fouls, replay stoppages, replay stoppage time, and commercial format. Data was collected from the ACC and then cleaned and organized in Microsoft Excel. A simple regression model was created in Excel. Additional regression analysis with dummy variables was generated using R. Total number of plays was the most influential variable while total number of scoring plays was the least influential variable on game duration. The regression analysis showed the statistical significance of the six variables and predicted game durations within 10 minutes for 78% of the games studied. Ultimately, the results of this study are useful for both conference and league administrators interested in learning more about the factors that influence college football game duration. The project also highlights the difficulty of predicting game length due to the extreme variability of college football games.

Rhea Bandyopadhyay

PA - Lafayette College

Discipline: Economics

Authors:

Abstract Name: How Ideology and Cognitive Skills Influence Motivated Reasoning About Electoral Poll Information

The political landscape in the United States has become increasingly polarized in recent years, with political discourse often becoming heated and people relying mainly on information congenial to their ideology. This paper examines the propensity of individuals (college students and faculty in our sample) to engage in motivated reasoning — the tendency to engage in self-serving beliefs — when evaluating the accuracy of electoral polls for the 2024 Presidential Election. Using a between subjects randomized experiment, I assess the levels of motivated reasoning when participants are presented with polling information which either favors their preferred candidate (good news) or the opponent (bad news). I hypothesize that participants are more likely to incorporate good news than bad news in their beliefs (motivated reasoning). I also expect that the degree of motivated reasoning is positively correlated with both cognitive reasoning skills and the strength of political ideology, as supported by previous research. Specifically, to measure cognitive reasoning skills, participants complete a Cognitive Reflection Test (CRT). Strength of political beliefs will be assessed through questions on political affiliation and ideology. Motivated reasoning is measured by the degree of belief updating. Specifically, participants first estimate their preferred candidate's 'true' popularity after viewing an electoral poll showing a tie. Then, they are presented with a second poll — randomly assigned to show either good or bad news — and asked to revise their estimate. Lower levels of belief updating in response to bad news, compared to good news, would indicate a reluctance to accept unfavorable information, thus showing evidence of motivated reasoning. Therefore, my methodology allows for a nuanced analysis of the relationship between motivated reasoning, cognitive reasoning skills, and the strength of political ideology.

Braiden Bangalan

KS - University of Kansas

Discipline: Political Science

Authors:

Abstract Name: Strategic decoupling and China's global economic transformation

Previous researchers have investigated the impacts of the U.S.-China Trade War (UCTW) through the changes in the global value chains of prominent multinational corporations (MNCs). The UCTW led to the “strategic decoupling” of global supply chains, whereby MNCs shifted foreign direct investment strategies and offshored previously held industrial investments abroad for new trade routes favorable to rising tariffs on either side. Escalations of trade tensions have threatened the supply chains for many MNCs, and due to the export-oriented nature of these firms, tariff hikes from the trade war have forced the shifts of many firms’ supply chains and foreign direct investments (FDIs) (Blanchard et al., 2021). Furthermore, Chinese MNCs have sought new regions for growth, such as Central Latin America and Central and Eastern Europe, to begin “greenfield” investments that were close to main trading hubs before the trade war, e.g. Mexico and Eastern Europe (Ortiz Velásquez & Prudencio Vazquez, 2022; Ramasamy & Young, 2022). Analysis of the changes in FDI flows has been ambiguous regarding the effects on the global value chains (GVCs) of firms whose MNCs invest in sub-Saharan African states. This research will investigate the changes in inward FDI flows by Chinese MNCs into Sub-Saharan African states and further contribute to analyzing the reality of the post-trade war international trade order.

Lauren Barajas

TX - The University of Texas at El Paso

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Nicolas Macias-Esplana

#2 Lucero Astrid Acosta

#3 Erik Lopez

#4 Kosaku Aoyagi

Sergio Andy Lares

Abstract Name: The Association of Social Support with Response to Leg Cycling Ergometer Exercise in Knee Osteoarthritis Pain in a Hispanic Dominant Community

Osteoarthritis (OA) affects ~600 million people worldwide, most commonly affecting the knee joint. A leg cycling ergometer is a commonly recommended exercise to ameliorate knee OA pain, but responses vary, suggesting that patient characteristics may be associated with the treatment response. Social support has been increasingly recognized as a factor associated with knee pain, yet its association with the effects of exercise on knee pain remains unknown. Thus, we sought to examine the associations of social support to changes in knee pain following the leg cycling ergometer in people with knee OA. We hypothesize that higher levels of social support would be associated with greater changes in knee pain. This secondary analysis of a clinical trial involved participants with knee OA completing a 25-minute leg ergometer exercise. Social support was assessed using PROMIS measures (instrumental and emotional support). Outcomes included changes in knee pain on a numeric rating scale and pain sensitivity at the knee as assessed with pressure pain threshold (PPT). Linear regression models, adjusted for age, sex, and BMI, were used for analysis. Seventeen participants were included (mean age: 54 years, 53% female, mean BMI: 32, 59% Hispanic). Instrumental support was significantly associated with changes in knee pain ($\beta = 0.162, 0.003, 0.322, p = 0.046$). No significant associations were found for emotional support and knee pain changes or for either type of support with knee PPT changes. Contrary to our hypothesis, higher instrumental support was associated with increased knee pain following exercise, though with a small effect estimate, while both instrumental and emotional support were not associated with changes in PPT. Our results suggest the level of social support may not be a predictor for exercise response to knee OA pain, and there may be other factors contributing to the variability in the exercise response.

Marcus Barbu

NC - Wingate University

Discipline: Biochemistry

Authors:

#1 Brett Schofield

Jared Deras

Abstract Name: Satb1 and Satb2 can homodimerize independently of DNA

Gene regulation is essential for virtually all biological processes. Eukaryotic cells use the compaction of individual chromatin fibers as one method of silencing or activating genes. Tightly compact regions of heterochromatin typically contain inactive genes, while loosely organized regions of euchromatin usually contain active genes. The organization of chromatin into these structures is accomplished by chromatin architectural proteins such as Satb1 and Satb2. Although Satb1 is known to interact with DNA as a homodimer, it is currently unclear whether Satb2 binds in a similar manner. However, the significant homology between Satb1 and Satb2 suggests that both proteins might bind DNA in the same way. Furthermore, it is unknown whether Satb1 homodimerization is dependent on DNA. Here, we demonstrate that Satb1 and Satb2 both form homodimers independently of DNA. This was determined using two fluorescently tagged versions of Satb1 or Satb2. The first contains a mutated Nuclear Localization Sequence (NLS) that confines the protein to the cytoplasm, while the second has a functional NLS. When these proteins are co-expressed in HeLa cells, the wildtype protein is able to relocate the nuclear import-deficient protein into the nucleus, demonstrating DNA-independent dimerization.

Famatta Barjobo

GA - University of West Georgia

Discipline: Political Science

Authors:

#1 J. Salvador Peralta

Abstract Name: Democratic Erosion In Haiti

Democratic erosion or autocratic consolidation is a process that occurs over long periods with concrete actions taken to alter a regime from democratic to non-democratic. This analysis aimed to demonstrate the precursors to erosion, symptoms of erosion, and resistance to erosion or the aftermath of the decline present in Haiti from 2019 to 2020 under the presidency of Jovenel Moïse. Erosion was measured using the V-Dem democracy index and demonstrated more than a 2% decline in the chosen period. The recency of the selected period demonstrated Haiti's worsening state of affairs. This analysis also delved into Haiti's history and features in its institutions that aided in further autocratic consolidation and reduction in horizontal and vertical accountability. Additionally, severe lack of accountability, widespread violence, and barely functioning executive and legislative branches are also analyzed and explored while efforts to combat oppression and restore democracy are considered. This analysis seeks to validate the severity of events while providing detailed accounts of how they aided in the autocratic consolidation of Haiti. Conventional (economic inequality, media repression, reduction in freedom and fairness, etc.) and unconventional (co-opting democratic rhetoric, taking advantage of dysfunctional opposition parties, manufacturing discontent, etc.) paths to democratic backsliding are dissected. Indicators of backsliding and authoritarian behavior the Haitian state possessed before the Moïse regime are also synthesized throughout this analysis. Keywords: democratic erosion, backsliding, authoritarianism, autocratization

Bryana Barlog

IN - Indiana University East

Discipline: Biology

Authors:

#1 Jill Schweitzer

Ashleigh Spaeth

Abstract Name: Potential Function of YDL167C in *Saccharomyces cerevisiae*

YDL167C is a gene with an unknown function within the single celled eukaryotic organism, *Saccharomyces cerevisiae*. Research was conducted to learn more about the unknown function of this gene. This research consisted of bioinformatics searches and wet lab experiments. The four methods used during our research included bioinformatics research, YDL167C deletion, spot assay testing growth under four different stress conditions, and morphological analysis. Bioinformatics allowed the discovery of protein domains, the ability to find genes with similar functions, and the predicted protein localization. The potential location of the Ydl167p was suggested to be in the cytoplasm. The results of bioinformatics research showed that YDL167C may be associated with the binding of DNA and RNA. Deletion of YDL167C in yeast was completed by using a PCR-based strategy. A PCR product was created to replace YDL167C with URA3 and then used to transform yeast. Next, a confirmation PCR reaction was performed to confirm that URA3 was properly inserted into the YDL167C chromosomal location. Spot assays were then performed to compare the growth of ydl167c to the wild-type strain under different stress conditions. The stress conditions chosen were temperature gradient of 30°C, 37°C, and 42°C, 10 mM caffeine, 100mM hydroxyurea, and 300 mM MgCl₂. Our spot assay results suggest that the ydl167c strain has an increased fitness at 42°C compared to the wild-type strain. In the morphological analysis, 100 log-phase cells of wild type and ydl167c strains were measured to determine their budding stage. The morphological analysis results showed that the ydl167c strain displayed an increase in unbudded cells, suggesting that entry into the cell cycle is impacted deletion of YDL167C.

Jaylesiyah Barner-Moon

OH - University of Findlay

Discipline: Criminology/Criminal Justice

Authors:

#1 Jaylesiyah Barner-Moon

Abstract Name: Variables of Justice: Examining Disparities in Felony Sentencing

Significant disparities exist in incarceration rates, with minority groups being overrepresented in the prison population. This issue is deeply rooted in the historical context of the criminal justice system, where systemic inequalities have persisted over time. The literature on this topic focuses on a criminal's race and where they live when trying to find sentencing patterns. However, identifying the factors that contribute to the disparities in felony sentencing within the criminal justice system, beyond the variable of race, is crucial for understanding and addressing systemic inequalities. This project analyzes data from the Monitoring of Federal Criminal Sentences 2020-2021 from the United States Sentencing Commission to explore whether disparities in sentencing have lessened over time and what factors contribute to these disparities besides race. Within the existing dataset, dependent and independent variables were selected to demonstrate the relationship between sentencing and the factors influencing incarceration sentences. Data recording was completed to facilitate the use of ANOVA. After selecting, the dependent and independent variables, an ANOVA plot was generated in SPSS to show the comparative relationships. The resulting data (means,

statistical significance, and percentages) was input into Excel to create bar graphs. These graphs illustrate the relationship between the independent (age, race, gender, criminal history, education, and citizenship) and dependent (total months in prison) variables and allow for filtering of felony crimes by any variable. The comprehensive approach used in this study, combining ANOVA and graphical representation, provides a clear illustration of the disparities and their contributing factors. The analysis highlights the significant impact of race as well as education level, gender, generational differences, criminal history, and citizenship status on sentencing outcomes. These findings underscore the persistent and multifaceted nature of disparities in incarceration sentences.

Caylee Barnes

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Caylee Barnes

#2 Dalton Patterson

#3 HaoSheng Sun

Abstract Name: Role of Splicing Factor EXC-7 and UNC-75 in Neuronal Maturation in *C. elegans*

Neurons are formed and integrated into neuronal circuits during embryonic development. After birth, they undergo functional and anatomical changes driven by tightly regulated genetic programs. The underlying mechanisms contributing to neuronal maturation and how these neurons mature post-birth are poorly understood. Alternative splicing (AS) is a post/co-transcriptional mechanism in which splicing factors (SFs) are recruited and act upon premature mRNA strands to produce multiple mRNA isoforms from one gene. The expression of these isoforms can change depending on the stage of development, causing differences in how an individual gene is expressed. This isoform-switching process allows for greater functional diversity within a specific gene. This study aims to test the hypothesis that AS regulation alters neuronal isoform expression, contributing to neuronal maturation. I will use the model *Caenorhabditis elegans* due to its well-characterized cell lineage, rapid development cycle, and ease of genetic amenability. I will focus on the *exc-7* and *unc-75* SFs (mammalian orthologs are ELAVL and CLEF families). Both contribute heavily to neurological processes and maturation, such as aiding in the regulation of neuron differentiation and synaptic transmission. Computational methods allow for the analysis of bulk and single-nuclei RNA-sequencing data generated in the lab and published for public access across developmental stages in *C. elegans*. Utilizing developmental bulk RNA-sequencing data across the entire nervous system (NS) of *C. elegans*, I can evaluate NS-wide SF expression changes across different larval stages. With this, I will be able to identify isoform switching that contributes to expression changes found in the differential expression analysis. Knowing that the NS comprises multiple neuronal cell types, I will be using single-cell methodologies to evaluate SF expression changes in specific cell types. Completing this, I expect to evaluate *exc-7* and *unc-75* SF expression changes across whole NS development and specific neuronal cell-types.

Trinity Barnett

NC - Elon University

Discipline: Sociology

Authors:

#1 Alexis Franzese

Abstract Name: Let's Go! Exploring Trip Planning Behaviors

For many, traveling on a vacation is a time of relaxation to escape the struggles of the real world, but that is not always the case. Scholars have studied the effects of planning a vacation itself, with a focus on how women and men engage in trip planning behaviors differently. The current study examines individuals' experiences while planning a trip to Walt Disney World (WDW) with an emphasis on understanding the influence of parental status on planning and the timing of planning activities. The data was collected via a survey posted on various WDW social media trip planning sites and consists of a subsample of 213 out of the 262 individuals that completed relevant items about previous trip planning experience. While our study was open to individuals regardless of gender, or trip planning experience, our sample consisted of 85% female-identifying individuals and 15% male-identifying individuals who had planned and completed one trip to WDW. 209 respondents provided information about who they visited the parks with, with respondents equally split between parents traveling with children (n=103) and individuals traveling without children (n=106). Results from the 213 subset found that a majority were planning for at least one other individual (74.88%) and began planning more than six months in advance of their trip (64.79%). Some of the most stressful aspects of trip planning to WDW were attraction and dining reservations whereas the least stressful aspects were transportation to and from WDW. Additionally, another subset of 112 respondents who were actively planning a trip and had previous trip planning experience, reported that an overwhelming majority felt that their previous experience helped with their current trip (99.12%). This research is important because it expands our understanding of trip planning behavior and has implications for studies of travel studies.

Levi Barnett

UT - Utah State University

Discipline: English and Literature

Authors:

Abstract Name: The Cyclops's Terror: The Sublime That Disempowers in Góngora's Polifemo y Galatea

The short epic poem *Fábula de Polifemo y Galatea* by Luis de Góngora (1561–1627), arguably the most consequential early modern poet in Spanish, recounts the myth of the formidable and fearsome cyclops, his unrequited love for beautiful Galatea, her preference for young and handsome Acis, and Polyphemus's murderous rage at discovering the two lovers. While existing scholarship has thoroughly explored themes such as the satirical nature of Polyphemus's courtship and the contrasts between the two male rivals, less attention has been given to the effects of the terror the cyclops evokes and how it suppresses the two lovers. This study adopts an interdisciplinary approach to uncover the effects of terror within the poem. Theories of horror and terror highlight the stark contrast between the hypermasculine, aggressive, and loud cyclops and the soft-spoken, handsome, and relatively effeminate Acis. Furthermore, the concept of the sublime, a term originating with Greek philosopher Longinus (1 A.D.) and later expanded by XVII and XVIII European thinkers, reveals the underlying gender and power dynamics. This analysis demonstrates how the cyclops's violence enforces a form of gendered terror that dominates not only the lovers, but also the reader. As the poem unfolds, the horror experienced by Galatea and Acis mirrors the reader's own captivity to Polyphemus's sublime presence, underscoring the inescapable force of his destructive power. By deepening our understanding of the *Polifemo*, we can uncover how early modern literature engages with themes of gender, power, and the sublime, opening the text to modern interpretations of terror.

Kennedy Barnhouse

TX - Stephen F. Austin State University

Discipline: Education

Authors:

#1 Kennedy Barnhouse

#2 Sarah Straub

Abstract Name: Building Compassion and Connection: A Case Study of Humane Education Through Middle Level Book Club Experiences

Introduction Humane education aims to foster empathy, respect, and responsibility by teaching about animal welfare, environmental stewardship, and social justice. This study examines middle school students' experiences in a humane education-focused book club intended to promote compassion and critical thinking. The goal is to explore how participation influences students' understanding of humane education and their approach to societal issues. **Literature Review** Research suggests that humane education can significantly impact empathy and prosocial behavior (Weil, 2024), with students developing a deeper compassion for others through ethical awareness activities (Bruneau et al., 2023). Book clubs, specifically, have been shown to enhance critical thinking and collaboration skills, providing a supportive space to explore complex themes (Smagorinsky & Johnson, 2021). This study extends this research by examining whether a book club on humane education can deepen students' ethical and solutionary skills. **Methods** This case study was conducted in a middle school book club with three participants over one semester (September–December 2024). Parental consent and child assent were secured, and the SFA student researcher completed CITI training on human ethics. The study utilized pre- and post-surveys to assess students' understanding of humane education, problem-solving enjoyment, and perceptions of group discussions. Both quantitative (Likert scale) and qualitative (open-ended questions) data were collected. **Data** Survey analysis showed increased understanding of humane education; initially, only 40% “strongly agreed” they knew what humane education meant, which rose to 70% in the post-survey. Confidence in making a difference also rose from 50% to 80%. Open-ended responses highlighted students' excitement about learning how small actions contribute to societal benefits, enhancing their sense of social responsibility. **Conclusion** This study highlights the effectiveness of book clubs as humane education platforms, fostering compassion, ethical thinking, and a solutionary mindset. Future research could investigate the long-term impact of humane education on students' attitudes and behaviors.

Adriana Barni

FL - The University of Tampa

Discipline: Chemistry

Authors:

#1 Adriana Barni

#2 Megan George

#3 Jacob Pangborn

#4 Brett Hemric

Abstract Name: Azidation of 1,3-Dienes Using Zhdankin's Reagent

Azides (N₃) represent an important compound in the chemical industry that can be utilized for biorthogonal chemical reactions that are important in fluorescent applications and can be utilized as precursors for many pharmaceutical scaffolds. Typically, azides function as an intermediate that can be converted into other nitrogen-containing compounds upon derivatization. The incorporation of azides onto alkenes has been thoroughly studied, but their addition to 1,3-dienes has seen few deliberate studies. This work reports three divergent protocols for the copper-catalyzed addition of azides to 1,3-dienes in a chemo-, regio-, and site-selective manner using Zhdankin's reagent. Representative product derivatization and mechanistic insights are also demonstrated.

Noel Barr

OK - University of Central Oklahoma

Discipline: Art History

Authors:

Abstract Name: Chesley Bonestell: Designing the Future

This paper looks at the work of Chesley Bonestell, an astronomical illustrator whose paintings of space fueled public interest, and motivation for space exploration before manned space travel. Born in 1888, Bonestell discovered his love for painting early on, as well as his fascination with astronomical paintings in 1905, after viewing Saturn at Lick Observatory in San Jose, California. Bonestell would transition to work as an architect, working on designs for the Golden Gate Bridge, followed by a career in painting backgrounds for science fiction media. Chesley Bonestell combined architectural and cinematography skills to create his own imaginative depictions of planets. His iconic painting, Saturn as seen from Titan (1944), along with his artistic contribution to The Conquest of Space (1949), inspired countless enthusiasts and scientists to reach for the stars. Working closely with notable figures like rocket scientist Wernher Von Braun, bridged the gap between idealization, and a technical reality. Bonestell's impact on space exploration and society is underscored by his lasting recognition for space enthusiasts, including having a crater on Mars and an asteroid named in his honor. This paper reflects Bonestell's legacy as the "father of space art," whose work remains a continuous glimpse into the pursuit of space exploration.

Emma Barrett

GA - Georgia State University

Discipline: English and Literature

Authors:

#1 Emma Barrett

Abstract Name: Caging The Bird: Analyzing the Proto Neurodivergent Horror in Shirley Jackson's The Bird's Nest

Jackson's propensity for themes of control and isolation makes many of her novels something of a beacon for feminist analysis. Considering the recent resurgence in popularity of *The Haunting of Hill House* and *We Have Always Lived in the Castle*, queer and feminist scholars are quickly claiming Jackson as one of their own. However, critics ignore one crucial lens in their analyses: Critical Disability Studies. While many of Jackson's works echo disabled and neurodivergent politics, these overlooked politics are perhaps best encapsulated by one of Jackson's most overlooked novels. *The Bird's Nest*, published in 1954, is a novel explicitly about a woman named Elizabeth who is the host of a Dissociative Identity Disorder system. More importantly, it is a novel about disability that positions doctors as a source of horror. While current scholarship certainly engages with Jackson's portrayal of Elizabeth from a broadly feminist perspective, the novel's relative obscurity has translated to a gap in scholarship from the novel from a strictly Disabled perspective. By employing the lens of Mad Studies, one of Critical Disability Studies' many offshoots, to the novel, this analysis hopes to show how Jackson's use of sarcasm and narration presents a wildly ahead of its time critique of how the partnership of misogyny and ableism is inherently horrific. Additionally, while this analysis cannot comment on how well *The Bird's Nest* has aged as a piece of representation, a Mad Studies reading of Jackson's novel hopes to highlight how this horror novel engages with neurodivergence almost 40

years before the passing of the ADA. To write horror that centers Disabled experiences, one must analyze the overlooked classics of yesterday.

Nathan Barretto

PA - Carnegie Mellon University

Discipline: Economics

Authors:

#1 Nick Pretnar

Abstract Name: Assessing the Impact of Business Cycles on the Equity Premium in the United States

The equity premium puzzle is an unresolved issue in economics concerning the larger than expected difference between the average return on traditional equity versus risk-free debt. Significant research has been conducted on factors contributing to the premium's existence, such as investor risk aversion and measurement of the premium itself, but less work has been done on the impact that business cycle fluctuations may also have on this phenomenon. Utilizing data on GDP estimate measures, recessions in the United States, and national yield curves, we assess the way economic booms and busts may influence the equity premium. Primarily, we first examine relationships between GDP estimate measures, such as personal consumption expenditures; risk aversion measures, such as the price of volatile stocks; and equity premium measures, such as an upper bound on the premium. These relationships are identified through linear regression tests, as well as lead and lag correlations to assess future predictions. Next, we correlate the various equity premium and risk aversion measures with the growth rates of GDP estimate measures, testing the influence of fluctuations in components of the national economy. Next, we further this understanding by categorizing quarters by their recession status and analyzing equity premium levels under these conditions. This is mainly carried out via equal variance tests between recession and non recession groups for the equity premium and risk aversion measures. Finally, we investigate the risk-free debt component of the equity premium through more lead and lag correlations, this time with quarterly US bond returns. Our results lead us to conclude that business cycle fluctuations have a notable relationship with equity premium levels, although that connection may be more striking with smaller individual indicators, such as the dividend price ratio and gross initial public offering, than necessarily the macroeconomy as a whole.

Thomas Barros

TN - Trevecca Nazarene University

Discipline: Biology

Authors:

#1 Thomas Barros

#2 Claudia Miller

#3 Kaylee Breeding

Claudia Miller

Kaylee Breeding

Abstract Name: The Effect of Arachidonic Acid on Colorectal cancer cells

Colorectal cancer is one of the most prevalent cancers in the U.S. today, most typically caused by chronic inflammation of the bowels. The mechanism of inflammation is controlled by cyclooxygenase-2 through the synthesis of prostaglandins from arachidonic acid. Arachidonic acid is an unsaturated, omega-6 eicosanoid fatty acid that is found in many meats and is the precursor for prostaglandins and many other fatty acid derivatives. Arachidonic acid in certain quantities was found to decrease the proliferation of cancer, but contrastingly also found to increase the growth rate of cancer in higher quantities. In the absence of COX-2, arachidonic acid can induce apoptosis in high enough amounts. In amounts higher than ~100 μ M, apoptosis

occurs. In the presence of cyclooxygenase, this amount is not clear. Arachidonic acid is theorized to cause apoptosis of cells by causing excessive oxidative stress or through disrupting membrane fluidity. The goal of this study is to find the threshold of the anti-tumorigenic abilities of arachidonic acid. This was done through establishing baseline growth curves through a positive and negative control. The positive control was growth in normal media with fetal bovine serum (FBS) and the negative was growth of cancer in media with FBS absent. These curves will serve as basis of comparison when adding arachidonic acid to the HT-29 colorectal cancer cells.

Izzi Barry

OK - University of Central Oklahoma

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Collegiate Engagement as a Catalyst for Inclusive Leadership and Sexual Health Advancement

This project examines the relationship between collegiate campus involvement and the promotion of sexual health and wellness among students. The central research question investigates how engagement in inclusive leadership and campus organizations influences students' understanding and practices regarding sexual health. Drawing from a foundation of existing studies on health communication and peer-led interventions, this research aims to contribute to the discourse by highlighting the intersection between leadership roles and health advocacy in higher education. The methodology involves a quantitative survey to measure sexual health knowledge, attitudes, and behaviors among students with varying levels of campus involvement. This approach provides a comprehensive understanding of statistical trends and patterns, shedding light on the complexities of collegiate sexual wellness. Preliminary findings suggest that students engaged in inclusive leadership roles demonstrate higher sexual health literacy and are more likely to access campus wellness resources. Expected results will explore how peer influence within organizations fosters a culture of openness and reduces stigma around topics such as consent, sexually transmitted infections, and contraception. These findings will be contextualized within broader discussions on the role of higher education institutions in promoting public health and leadership development. By addressing the intersection of involvement and health, this research seeks to empower colleges to adopt strategies that integrate sexual wellness into leadership development programs. The discussion will emphasize actionable recommendations for creating inclusive, health-promoting environments on campuses, ultimately contributing to a generation of informed and proactive leaders.

Marina Barsoum

NY - Siena College

Discipline: Sociology

Authors:

#1 Marina Barsoum

Abstract Name: Storytelling as a Window into Social Engagement and Health

Storytelling is a very old practice that fosters connection, understanding, and the transfer of wisdom across generations. Defined as the act of sharing narratives through verbal and non-verbal means. Storytelling serves as a crucial bridge in building social connections. However, in the post-pandemic era, older adults face

increasing isolation and loneliness, with significant implications for their mental and physical health. Loneliness defined as the dissatisfaction with unfulfilled social need, and social isolation, rooted in the absence of meaningful connections, are linked to the higher risks of mental health conditions like anxiety, and depression. This can lead to illness such as Dementia. This research investigates the potential of storytelling to mitigate these challenges by promoting community engagement among older adults, with the specific focus on residents of Watervliet, NY. Particularly in the Watervliet Housing Authorities Quinn Apartments. By exploring how storytelling fosters a sense of belonging, preserves personal histories, and builds intergenerational connections, the study seeks to answer the following questions: How does storytelling impact the well-being of older adults? Can story telling reduce the perception of older adults as the "forgotten generation"? How can community-based storytelling initiatives enhance social engagement and create meaningful connections? The study aims to address gaps in research on the health benefits of storytelling for community-dwelling older adults. By integrating evidence from successful community story telling programs and assessing their applicability, we propose tailored interventions to combat isolation such as senior fairs, monthly meet ups, and community games. Storytelling not only offers a medium for shared experiences but also reinforces the critical role older adults play in Watervliet's community history, and identity. Ultimately, this research seeks to establish storytelling as a tool for enhancing well-being, fostering resilience, and creating inclusive, connected communities.

Brian Bartley

PA - University of Pittsburgh

Discipline: Engineering

Authors:

#1 Alessandro Fascetti

#2 Galen Holland

#3 William Smith

#4 Rakie Cham

Abstract Name: A Novel Virtual Reality-Based Platform for Kinetic Visual Field Testing

Visual field testing has long been a standard for diagnosis of degenerative eye diseases. However, traditional methods have been associated with mechanical complication and unfavorable conditions for patients, especially those with physical or cognitive impairments. This paper presents a novel virtual reality (VR)-based solution to address the issues of traditional kinetic visual field testing, which has been plagued by patient discomfort, inflexibility of machine maintenance and maneuverability due to underlying mechanical complications, and operator dependency. By replacing the physical equipment with digital, software-based solutions, the virtual environment brings the potential to eliminate many of these logistical and mechanical challenges. The developed VR application uses Unity as its platform and the Varjo XR-4 Aero as its head-mounted display to replicate the Goldmann visual field test, allowing for the incorporation of advanced features such as gaze tracking to monitor patient compliance. Other benefits include reducing test time through automation, increasing accessibility for patients with mobility impairments, and enabling testing from more comfortable environments such as the patient's home. Additionally, the system's integration of gaze tracking allows for real-time detection of irregularities, which could ensure accurate results and reduce the likelihood of false positives or negatives. Preliminary testing demonstrates feasibility and sensitivity of the system, by comparison of results from a healthy and visually impaired patient. Despite the promising advantages of the virtual model, some limitations remain, including field-of-view constraints and the need for device-specific adaptations for gaze tracking. Nonetheless, the application demonstrates the potential of VR to streamline the testing procedure, enhance patient comfort, and improve the overall efficiency of visual field assessments. Future work will focus on expanding compatibility across different devices, pursuing larger scale testing, and addressing current limitations to enhance the system's effectiveness.

Vyaas Baskar

CA - Lynbrook High School

Discipline: Engineering

Authors:

#1 Manuel Espindola

Akhil Bandla

Abstract Name: Controlling a Triple-Jointed Robotic Arm to Detect and Trace 3D Surfaces for Medical Applications

The use of robots in surgical processes and hospitals has become more common throughout the last decade. These robots can perform complex operations with a generally low risk to patients. This study describes the control system for a robotic arm and vision system that detects the curved surface of a wound in 3D and traces the curved surface, applying plasma to accelerate the wound healing process. The machine developed utilizes a triple-jointed arm, driven by stepper motors and a servo. A stationary stereo camera feeds frames and a depth map to a Raspberry Pi 5, where a YOLOv8 segmentation model runs inference to detect the location and shape of the wound. Using the depth map, a 3D curve is approximated. The curve is then converted to machine coordinates. Next, inverse kinematic calculations are performed to determine the target angles of each arm joint such that the end effector is at a specific point on the curve. The target angles are sent to an Arduino Mega 2560 controller, via USB serial. On the Arduino, PID controllers are used to position each of the joints to the target angles. To comply with ISO standards, the machine includes safety features such as an emergency stop button, manual overrides, and status lights. The machine also includes a temperature sensor (an IR sensor), used to maintain a safe temperature at the wound surface and prevent cell damage. Our presentation will cover the instrumentation and control methods applied, using the camera for wound detection, and toolpath generation. In addition, it will cover the methodology, safety features, machine specifications, electrical components, and mechanical design.

Nicholas Bastia

TX - The University of Texas at Austin

Discipline: Chemistry

Authors:

Abstract Name: Chemical Characterization of Lenoir and Parental Wines Utilizing Untargeted LC-MS-Based Metabolomics

Amid rapidly changing environmental conditions, grape varieties with drought-tolerance and resistance to pests that produce high-quality wine have become highly sought after by winemakers and enologists. The Lenoir varietal (a.k.a. Black Spanish, Jacquez), one of the oldest American hybrid grapes, displays natural resistance to Pierce's disease and Phylloxera. The rootstock is particularly valuable for winegrowers in the warm winter regions of the southeastern United States, such as California and Texas. There has been no precedent for the chemical characterization of Lenoir and how it may correlate to its potential parental wines according to its metabolite composition. Herein, we aim to elucidate the metabolomic profile of Lenoir and investigate correlations between the varietal, its possible parental wines, and selected control wines. This study utilizes a mass spectrometry-based metabolomic workflow to characterize the relationship between Lenoir and its four hypothesized parentals—Cabernet Sauvignon, Black Muscat, Cabernet Franc, and Norton. The phenolic and metabolomic profiles of ten mono-varietals were obtained utilizing liquid chromatography-mass spectrometry (LC-MS). Chemometric tools such as Principal Component Analysis (PCA) and Partial Least Squares Discriminant Analysis (PLS-DA) were utilized to analyze the multivariate data and identify

groupings while elucidating prominent relationships between the varietals. The metabolomic analysis identified 150 unique flavonoids across the wine samples, with several important flavonoids shared between Lenoir and its potential parental varieties.

Katherine Bates

KY - University of Kentucky

Discipline: Biology

Authors:

#1 Luke Bradley

Abstract Name: The Symphony of the Cell: Using Data Sonification to Engage Students in Molecular and Cellular Biology

As technology continues to evolve and influence our lives, the demand for careers in science, technology, engineering, and mathematics (STEM) has only grown. However, challenging content and lack of valuable experience often prevents students from finding a sense of belonging in these fields, discouraging many from considering futures in STEM. Thus, alternative learning techniques that both introduce foundational concepts and engage students are essential to addressing this need. A common difficulty for many students is understanding how protein sequence and structure contribute to protein function, and how errors in proteins impact the overall function of a cell. To present these foundational concepts to introductory students, our team has developed a virtual authentic-learning tool that utilizes data sonification in which each amino acid in a primary protein sequence is assigned a musical note and rhythmic value based on its hydropathy. This software allows harmonious music segments to be composed from primary sequences of functional proteins. Moreover, this software may also be used to model disease-associated point mutations by creating dissonance in music segments, allowing the user to audibly identify mutations and understand how errors impact cellular symphony. Our hypothesis is that this data sonification learning module will both increase student understanding of the molecular basis of disease and improve student attitudes toward STEM. Our preliminary results show this activity changes student attitudes following presentations to middle school and high school student groups supporting this hypothesis and future expansion of the models.

Veronica Batista

NM - University of New Mexico - Valencia Campus

Discipline: Chemistry

Authors:

#1 Jerry Godbout

#2 Carlos Bustillos

Abstract Name: Quantifying Colorant Concentrations in Crystalline Glazes

Zinc silicate-based glazes are used to create large, visually stunning, macrocrystals reaching up to several centimeters in diameter. Since the zinc silicate is colorless, copper, nickel, cobalt, and iron compounds are added at single percent-by-mass levels to produce colored crystals. When more than one colorant is used, isolated regions of macrocrystal formation and coloration can form, despite a uniform glaze application prior to kiln firing. The mechanism of this localization is not well understood. X-Ray Fluorescence (XRF) spectrophotometry is a technique well-suited to analyze the glaze composition, but suffers from the limitation of being a bulk technique. Scaling the XRF signals from the colorant element(s) to zinc is found to be an

effective way of correcting for the highly variable glaze depth, allowing quantitative determination of the colorant concentration.

Gerelmaa Batjargal

MI - Albion College

Discipline: Economics

Authors:

Abstract Name: Landlocked Developing Countries Trade Policy Analysis

Landlocked developing countries (LDCs) face significant challenges, such as high transport costs and limited market access, due to their limited access to oceans. This study focuses on Mongolia as a case study to explore these challenges and identify strategies that could benefit other LDCs. Using economic data from 1990 to 2023, key indicators such as inflation, import and export volumes, GDP, foreign trade volume, share of world trade, and tariffs were analyzed across 32 LDCs. The gravity model method and case analysis were employed to examine trade dynamics, particularly with economic size and geographic distance. Additionally, the export diversification index was used to assess the variety and distribution of products exported by these countries. The findings aim to inform policy decisions that support sustainable economic growth for landlocked nations, helping them overcome geographical disadvantages.

A. Battaglia

PA - Saint Vincent College

Discipline: Physics and Astronomy

Authors:

#1 Matthew Vanden Berk

#2 Coty Walters

#3 Daniel Vanden Berk

#4 Michael Antonacci

#5 David Grumbine

Abstract Name: Monitoring Space Weather with CosmicWatch Muon Detectors

The Earth is bombarded continuously by charged particles from outer space; these particles—mostly protons—interact with the Earth's atmosphere, creating a shower of particles, including muons that reach the Earth's surface. The rate of cosmic rays impacting the Earth has a significant dependence on solar activity. We have been monitoring the muon rate at Earth's surface using student-built CosmicWatch detectors. Over several months in 2024, we have measured variations in the muon rate corresponding to solar activity, including a number of intense solar storms. We compare our results to those of cosmic ray monitoring stations around the world. Our results show that space weather can be monitored by inexpensive, easily deployable CosmicWatch detectors.

Matthew Baube

MI - Wayne State University

Discipline: History

Authors:

Abstract Name: Crossroads: Labor, Masculinity, and Blackness in the Origins of Blues

This project explores the multifaceted factors that contributed to the emergence of blues and jazz music in the United States. It recognizes that a complex interplay of influences, including labor, anti-Black racism, and gender roles, shaped this music's compositions, culture, and reception. Additionally, this project seeks to shed light on the ongoing struggle to preserve blues and jazz as essential African American and American art forms, particularly in the face of attempts to erase the central role of Black musicians. By examining the intersections of Blackness, gender, geography, and labor, this project hopes to inform the academic community and the broader public about the historical origins and significance of blues and jazz. Ultimately, this project aims to bridge the gap between fans and listeners and the scholarly study of this music, providing a modern perspective on its rural African American roots. This project aims to analyze blues and jazz music using various intersectional lenses and to argue the intrinsic African American identity in the music by examining how it's been shaped by labor, gender, geography, and Blackness. My research questions are as follows: Was blues created in response to laboring conditions in the nineteenth century? At what point in the twentieth century did blues become labor in itself? Did these labor roles positively or negatively impact masculinity, and how was that expressed in blues as the music progressed? What role did blues play in the reclamation of African American identities in the post-emancipation United States? Lastly, how can we preserve the history of blues and jazz music as a quintessential African American art form in the twenty-first century while exploring new understandings of the music's origins?

Nikolai Bauman

VA - Virginia Commonwealth University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Dressing for the Glass Ceiling: Suffragette and Dress Reform Fashion and Perceptions of 2024 Female Presidential Candidates

While many scholars have discussed the influence of the glass ceiling in holding women back from entering politics, little research has been done on the influence of fashion as a barrier. Women's fashion became explicitly politicized in the 1850s with the growth of the dress reform movement. Later, in the early 1900s, women began harnessing fashion as a tool to gain respectability in their fight for suffrage. The goal of this research paper is to examine how fashion has influenced the perception of American women in politics over time and how fashion may be an invisible component of the glass ceiling that has made it more difficult for women to become involved in politics. This study analyzes photos of the American suffragists' fashion during the 1900s and 1910s and images of female presidential candidates in the United States. This analysis of peer-reviewed studies identifies the links between fashion and the opinion of politicians, as well as how counterstereotypic presentation may help women present themselves as leaders rather than women when running for political office. This comprehensive literature review also evaluates media coverage of politicians' fashion through articles in the popular American newspapers The New York Times and The Washington Post. The findings of this study demonstrate a continued tradition of political women employing fashion as a tool to fight negative stereotypes due to their gender. While fashion can be beneficial for female politicians, it has also become a necessary aspect of campaigning that male politicians do not have to contend with to the same degree when entering the political sphere.

Claire Baumann

KY - University of Kentucky

Discipline: Education

Authors:

Abstract Name: Who Has the Power on Campus?: University Professors and Academic Freedom

The 2024 election has many university educators worried about how academic freedom will be impacted during the Trump presidency. In order to picture the possible future of collegiate academic freedom, it is important to understand how it has shifted into the form it takes today. Academic freedom, as defined by the American Association of University Professors, protects and allows professors “to speak freely when participating in institutional governance, as well as to speak freely as a citizen.” Using archival material from the Abby Marlatt papers, 1945-2007, at the University of Kentucky (UK) Special Collections Research Center, this research will explore the 1962 case in which Dr. Marlatt and Professor Morin were penalized for their political activity. Known as the “handbill incident,” this activity occurred in downtown Lexington outside of school hours with no university affiliation. Their case fell under academic freedom as it related to their ability to speak freely as a citizen; however, they still encountered serious consequences. More recently, UK experienced significant power shifts during the summer of 2024. The University Senate was dissolved, giving power to the president and administrators and effectively relegating the new Faculty Senate to an advisory role. This research will discuss the impact of the dissolution on academic freedom and the protection of professors’ free speech “when participating in institutional governance,” if this “institutional governance” has been revoked. Comparing these two tests of faculty academic freedom that happened 60 years apart will provide a greater understanding of university power dynamics and how they impact the faculty’s academic freedom.

Erkhemtugs Bayar-Ochir

WI - University of Wisconsin-Superior

Discipline: Computer Science

Authors:

#1 Sergei Bezroukov

Abstract Name: Wireless Personal Pulse Oximeter with Bluetooth

This project aimed to develop a portable, real-time heart rate and oxygen level (SpO2) monitoring device using the MAX30102 sensor with the BGM220P microcontroller module. The device is designed to be provide critical health metrics that can be displayed on an OLED screen as well as transmitted via Bluetooth communication. The MAX30102 is a sensor for pulse oximetry and heart-rate monitor module. It operates on the principle of emitting red and infrared lights and calculating the vital components using light absorption characteristics of oxygenated and deoxygenated blood cells (Hgb) in the blood. An OLED display was chosen for its portable feature and clear visual output, and the display is driven by the SSD1306 controller, which communicates with the microcontroller over an I2C interface. The BGM220P is a microcontroller module with Bluetooth interface, chosen for its processing power which is at 32 bits. The microcontroller was to manage sensor data acquisition, processing, and display output. The software for the project was developed entirely in C language with Simplicity Studio IDE. The web application at <https://heartratesurf.netlify.app/> was developed with javascript to allow users to monitor their heart rate and blood oxygen level with their smart devices such as phone, tablet, or laptop. The website can be reached by any smart device that has Bluetooth, and the device works by placing the finger on the MAX30102 sensor. The sensor is programmed into SpO2 and Heart rate mode where it emits red light that is visible to the eyes. Upon finger placement the

device immediately starts sampling and display the calculated oxygen level and heart rate. These results are filtered by a buffer in order to remove noise and inconsistencies.

Sharmila BC

CO - Regis University

Discipline: Biology

Authors:

#1 Gena Nichols

Ariadna Juarez-Avalos

John Nguyen

Abstract Name: Synthesis of cDNA Libraries to Observe Interactions with Dengue Virus NS4B Proteins

Dengue virus (DENV) is transmitted from Aedes mosquitos to humans in mostly tropical regions, and there is no effective treatment or vaccine. Upon entering a host cell, DENV viral proteins create a viral replication complex within the endoplasmic reticulum. The viral nonstructural protein 4B (NS4B) is crucial for anchoring and initiating this complex and can be observed through protein-protein interactions. In addition to viral proteins, NS4B has also been determined to interact with cellular proteins. To identify additional cellular binding partners of NS4B, a mammalian-2-hybrid platform was created. NS4B was subcloned into a pVP16 cloning vector and ligation was confirmed by restriction digest. A cDNA library was constructed from total Vero DNA followed by ligation of resulting cDNAs into a pM-Gal4 cloning vector. Preliminary tests indicate that a large size range of cDNAs have been successfully cloned. This work is a preliminary step toward identifying cellular proteins that interact with NS4B and determining potential roles of this viral protein in both viral replication and disturbance of cellular functions.

Sharmila BC

CO - Regis University

Discipline: Biology

Authors:

#1 Gena Nichols

Ariadna Juarez-Avalos

John Nguyen

Abstract Name: Comparing the Transfection Efficiency of Vero Cells Using Calcium Phosphate, Verofect, and Lipofectamine 3000

Transfection is the process of introducing foreign genetic material to eukaryotic cells. This process requires certain chemical reagents or physical processes to deliver nucleic acids and plasmids to the cell. Fluorescent genes such as GFP or RFP are often inserted into plasmids to best visualize the effectiveness of the transfection. A high transfection efficiency is vital when studying the roles of exogenous cellular or viral proteins in cellular pathways. Vero cells are a common cell line used for studying viral infection, however they are notoriously difficult to transfect. This study compares the transfection efficiency of 3 different reagents: Calcium phosphate, Verofect (Oz Biosciences), and Lipofectamine 3000 (ThermoFisher). Variations of transfection protocols and reagents were used to determine the best method of Vero transfection. Cells were transfected using vectors that express fluorescent proteins fused to cellular proteins (GFP-Rab-8, and GFP-Rab-11) or Dengue Virus NS4B protein (RFP-NS4B). Our results indicate that Verofect is the most

effective, as it had the highest estimated transfection efficiency at 90%, followed by Lipofectamine 3000 at 60-70%, and finally calcium phosphate at 10-20%. Comparing the vectors used, RFP fluorescence was more difficult to determine by fluorescent microscopy, which could result in artificially low transfection efficiency by our calculations. Overall, Verofect, a reagent designed specifically for transfection of Vero cells, did outperform both Lipofectamine 3000 and calcium phosphate.

Ellen Beall

VA - George Mason University

Discipline: Environmental Science and Sustainability

Authors:

#1 Ellen Beall

#2 Rosalina S. Christova

Abstract Name: Population changes of ciliate *Nassula variabilis* exposed to cyanobacterial strains of *Microcoleus* as food source

Nassula spp. is a ciliate grazer that specializes in feeding on cyanobacteria. Various studies have observed the responses *Nassula* has to feeding on toxic and non-toxic cyanobacteria, with results ranging from population growth to increased mortality. *Microcoleus* is a mat forming cyanobacteria that can produce anatoxin-a, which can be harmful to aquatic life and animals. In this experiment, we used laboratory cultures of *Nassula variabilis* isolated from Ellicott City, Maryland, non-toxic and toxic strains of *Microcoleus* from Eel River, California, and the Shenandoah River, Virginia, and toxic strains isolated from a tributary to the Virgin River in the Zion National Park, Utah grown in BG11 culture medium. We transferred 20 ciliates in 2 mL well with BG11 and 1 mL medium with *Microcoleus* filaments. The experiment was done in 24-well plate, in triplicates for each *Microcoleus* strain, and control treatment with non-toxic *Oscillatoria* species. The number, color, relative position and mortality within the well of each ciliate was recorded daily, for period of 30 days. Trends showed rapid decline of all *N. variabilis* cells within the first week, likely due to the stress of new environment. *N. variabilis* exposed to *Oscillatoria* showed declined population health, but soon recovered. Of those remaining, ciliates grazing on *Oscillatoria* increased in population, those grazing on non-toxic *Microcoleus* from the Shenandoah River maintained a steady population for several weeks before decline, and those grazed on the toxic *Microcoleus* strain from the Shenandoah River experienced a small increase in population before declining after several weeks. Ciliates exposed to *Microcoleus* from California died after 3 days, regardless of toxicity, while ciliates exposed to *Microcoleus* from Utah died after 7 days. Further study is needed to understand the influence of anatoxin-a variants on ciliate survival and potential transfer of toxins within the food web.

Rachael Beardsley

OH - Defiance College

Discipline: Interdisciplinary

Authors:

Matthew Craig

Abstract Name: Digitizing the Past: The The Schauffler College Archive at Defiance College

The Schauffler College of Religious and Social Work was founded by Henry A. Schauffler (1837-1905) on Jan 23, 1886. Located at present day Fowler Drive in Cleveland, Ohio, the Schauffler College merged with

Clara Schauffler née Hobart's Slavic Bible Readers' Home in 1890, and sought to train young women to serve as missionaries to the Slavic immigrant population of Cleveland. Over the course of the summer of 2024, we were given the opportunity to work with the Schauffler Archive and Defiance College to develop and implement a process for digitizing the thousands of files and artifacts within the Schauffler College Archive. In this time, we uncovered the nearly forgotten stories of a number of Schauffler students, including Mrs. Asayne Sato who attended the college from 1908-1909 before returning to Japan to work in diplomatic relations, Ms. Annette Goltscher who graduated in 1925, spoke eight languages, and became one of the first policewomen in Cleveland, and Ms. Sibusisiwe Violet Makanya, of Umbumbulu, Natal, South Africa, the first Black South African social worker and a powerful proponent of Black girls' education in apartheid South Africa. Using modern technology, we are working to archive the Schauffler College collection with Ohio Memory-and thereby making it readily available to interested parties-while preserving and amplifying the voices of these women for current and future generations. Through digitizing the Schauffler College collection, it will not only be preserved from the inevitable degradation of paper ephemera as well as allowing access for the use of up-and-coming technologies such as AI translations, but also setting an example of the nature of historic preservation of material culture, particularly in the case of immigrant, minority, and otherwise marginalized populations.

Dhanush Beareilly

VA - Virginia Commonwealth University

Discipline: Nursing and Public Health

Authors:

#1 Dhanush Beareilly

Abstract Name: Bridging the Divide: Addressing Healthcare Inequities Between Rural and Urban Communities

The healthcare disparities between rural and urban communities in the United States are a pressing issue, reflecting systemic inequalities rooted in geographic isolation, resource scarcity, and economic insecurity. Residents of rural areas face significant challenges in accessing timely and adequate care, leading to poorer health outcomes and delayed treatments for chronic and acute conditions. This paper delves into the discussion of two contrasting healthcare delivery models-centralized hospital systems and decentralized rural clinics-and evaluates their relative efficiencies in meeting the unique needs of rural communities. Decentralized clinics provide accessible, culturally appropriate care by placing healthcare providers within rural communities. Decentralized clinics do well in providing routine, preventive, and chronic disease management care services. This approach fosters better patient-provider relationships. When supplemented with telehealth innovations, they can also transcend geographical and financial barriers, connecting rural residents with much-needed access to specialized expertise without expensive and timely travel. In turn, centralized systems are vital in providing specialized care that is unavailable at smaller facilities; however, their distance from rural populations makes them inaccessible and negatively affects delayed care and deteriorating health status. The hybrid model capitalizes on the complementary strengths of dispersed community clinics and central full-service hospitals through advanced telehealth networks. It minimizes the logistical barriers and enhances local access to care, making the specialist care, when required, significantly improve rural health outcomes. Given the integration of these two models, an expansive policy intervention encompassing the expansion of Medicaid, investment in broadband infrastructure, and workforce development is essential for its overall success. These are essential to making healthcare delivery sustainable in rural areas, where particular challenges include provider shortages and unreliable digital infrastructure. From this perspective, the hybrid model offers a promising path for reducing health disparities and improving outcomes through a comprehensive healthcare system with equal care for rural populations.

Lauren Beck

PA - Duquesne University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Kasey Stepansky

#2 Michelle Criss

#3 Morgan Anderson

Kasey Stepansky

Abstract Name: Stories of an Intergenerational Neighborhood: Living and Learning with Older Adults as Health Science Students at a Personal Care Home

An intergenerational community places emphasis on socialization and cooperation across generations. Intergenerational interaction between older adults (OAs) and youth increases self-esteem, decreases social isolation, and promotes quality of life. This project presents a novel intergenerational community in a personal care home that situates graduate health science students as neighbors to older adult residents, requiring at least four hours of intergenerational interaction a week. The purpose of this study is to assess the impact on quality of life and ageism in this intergenerational living from the student and OA resident perspective. A mixed methods study design was utilized to assess ageism of health science students and illustrate the lived experiences of students and OAs living together. Students and OAs from a single personal care home were recruited. Students were assessed pre/post at least five months of interaction, while OAs were assessed post. Quantitative student outcomes on ageism included pre/post assessment using the Relating to Older People Evaluation (ROPE) and the Geriatric Attitudes Scale (GAS). Upon preliminary analysis, minimal changes were noted in student ageist perceptions quantitatively pre/post interactions. Qualitative reporting included 30-minute semi-structured interviews with student residents pre/post and OAs post. Individual content analysis was followed by consensus coding to validate thematic results. Qualitatively, intergenerational living was valued by students and OAs. The students and OAs identified the experiences as influencing future healthcare knowledge, breaking stigmas, learning from wisdom, and impacting mental health through authentic relationships. Creating intergenerational communities is a concept in its infancy. This arrangement may improve quality of life of both students and OAs. Considering the mental impacts of higher education and isolation in older adult communities, HCPs should advocate and consult on the creation of intergenerational living communities.

Kailey Beckford

PA - University of Pittsburgh School of Nursing

Discipline: Health and Human Development

Authors:

#1 Betty Braxter

Abstract Name: Exploring the Perceptions of Black Pre-Professional Birthing People on Maternal Health in the United States

According to the CDC, Black birthing people in the US are three times more likely to die due to pregnancy related causes than White birthing people. There are multiple factors that contribute to these disparities, including socioeconomic status, systemic racism, and discrepancies in health care provision. Although education should be a protective factor, it has no effect on the disparate health outcomes in Black birthing people. The purpose of this study was to explore perceptions of pre-professional Black birthing people on maternal health and describe areas for improvement. Using a descriptive design, a convenience sample of 28 Black participants completed a demographic questionnaire and answered 4 open-ended survey questions

about views on maternal health, such as “Choose 5 different words/phrases that describe your views on maternal health in the US?”. Responses were then examined using comparative thematic analysis. 3 themes emerged: Quality not reflecting expense, Concern towards birthing associated with high mortality, and Feeling overlooked despite importance. Based on the findings, it is recommended that quality care be made more affordable and accessible regardless of race/ethnicity, providers receive more education about culturally competent care, and patients receive education to advocate for themselves during the perinatal period.

Liliahna Bedolla

NC - University of North Carolina at Charlotte

Discipline: Health and Human Development

Authors:

#1 Heather Smith

Abstract Name: The Burden of Fetal Alcohol Syndrome in South Africa: Prevalence, Impact, and Implications

Fetal Alcohol Syndrome (FAS) is a preventable condition caused by alcohol exposure during pregnancy, leading to cognitive, physical, and behavioral impairments in newborns. It is one of the leading preventable causes of developmental disabilities worldwide, with profound and lifelong effects on individuals and families. FAS affects less than 1% of the general population globally, but South Africa is disproportionately impacted, with over 6% of the population diagnosed with the disorder. Despite this, the South African government and the Department of Health have made limited efforts to address the issue. This study aimed to explore the causes and consequences of FAS in South Africa using interviews and secondary data. Our findings highlight the pervasive and long-lasting effects of alcohol consumption during pregnancy, particularly cognitive impairments and physical developmental delays in affected children. In regions with high alcohol consumption, we found a direct correlation between higher rates of FAS and a lack of public awareness about the risks of drinking during pregnancy. Interviews with healthcare providers revealed significant barriers to prenatal care, with many expectant mothers in rural and economically disadvantaged areas unable to access timely guidance or screenings. These findings underscore the urgent need for action to address FAS in South Africa. The high prevalence of the disorder calls for substantial investment in awareness campaigns, particularly in rural communities, and improvements in healthcare infrastructure to ensure all pregnant women have access to education and prenatal care. Strengthening these areas is essential to reducing the long-term societal and economic costs of FAS and improving the well-being of affected individuals and families.

Annmarie Bedsaul

NC - North Carolina State University

Discipline: Engineering

Authors:

#1 Ramair Colmon

#2 Donald Freytes

Abstract Name: Characterization of Inhalable Vocal Fold ECM in Treating Vocal Fold Injury

Endoscopic surgery, often resulting in irreparable vocal fold (VF) scarring, is a common intervention for laryngologists seeking to treat voice disorders caused by vocal fold (VF) injury. One tissue-engineering

approach to treating VF injury leverages tissue-specific porcine-derived extracellular matrix (ECM) hydrogels, given their low immunogenicity, inherent bioactivity, and morphological versatility. Recently, our laboratory has developed a porcine-derived vocal fold lamina propria ECM hydrogel (VFLP-ECMh) that preserves native proteins and exhibits anti-fibrotic properties through modulating TGF- β 1-mediated fibroblast activation in vitro. However, surgical intervention is required to administer this biomaterial. To mitigate challenges associated with endoscopic surgery, we developed a non-invasive delivery strategy; capitalizing on human respiration to deliver an aqueous VFLP-ECM extract directly to the VFs via nebulization (nebVFLPx). This study investigates the therapeutic potential of nebVFLPx for VF regeneration. We assessed biocompatibility of nebVFLPx by evaluating both its cytotoxicity and its anti-fibrotic activity in vitro. We've demonstrated that nebVFLPx is minimally cytotoxic when cultured with human dermal fibroblasts (HDF) for 24h as shown by Picogreen and MTT assays. RT-qPCR determined nebVFLPx reduced ACTA2 gene expression in HDF differentiated with TGF- β 1 24h prior to treatment. Additionally, to determine the required nebulization dose for future in vivo studies, we quantified the concentration of solubilized VFLP-ECM before and after nebulization using UV-visible spectrometry. Future studies will assess the correlation between nebVFLPx concentration and ACTA2 gene expression in HDF. To obtain deposition in the larynx during delivery in vivo, nebulized droplets should be between 4–7 μ m. We investigated ECM particle size via dynamic light scattering (DLS) and nebulized droplet size distribution using brightfield microscopy. DLS determined VFLP-ECM particles were 1- μ m in diameter after nebulization, droplets were between 5-6 μ m. This comprehensive characterization is crucial for advancing nebVFLPx toward preclinical studies for VF regeneration, offering valuable insights into its physical, chemical, and biological properties.

Andrew Behrend

GA - Kennesaw State University

Discipline: Physics and Astronomy

Authors:

#1 Matt Bonvisutto

#2 David Joffe

Abstract Name: Use of duration-of-transit measurements in determining the orbital inclinations and sizes of exoplanets

This project is a test of a new methodology for the measurement of the properties of exoplanet orbits that utilizes the data from the Transiting Exoplanet Survey Satellite (TESS). In this project I investigated variations in the light curve observed from stars over one-month periods and used that information to detect possible planets orbiting the star, as well as their size, orbital radii, and the angle that they pass across the disk of the star. This last property is a new measurement which has not been done before. I then looked for changes in the orbital angle over the course of multiple transits to determine whether this method could be used to detect not only exoplanet orbits, but also changes in the orbit over time. Being able to detect these orbital changes would represent a significant advance in exoplanet detection as they might be indications of additional planets which might not otherwise be directly seen in transit studies.

Daniel Bekele

PA - Allegheny College

Discipline: Computer Science

Authors:

#1 Daniel Bekele

#2 Audrey Blarr

#3 Alish Chhetri
#4 Anton Hedlund
#5 Charlie Schwartz
#6 Aria Zong
#7 Stephen Palmer
Alish Chhetri
Anton Hedlund

Abstract Name: Evaluating Text, Code, and Image Generation in Language Models

Large Language Models (LLMs) are learning models that are trained to be able to understand and generate text, code, and images given prompts. The process of creating prompts for these models is known as prompt engineering. This project presents an experimental study, where we take a closer look at how LLMs perform across different tasks, including writing stories, explaining and debugging code, and creating images. We also evaluate different techniques used for prompt engineering and the ability of LLMs to self-evaluate and improve its generated output. We use metrics such as correctness, relevance, creativity, clarity in our evaluations. Our experiments contribute valuable insights into understanding prompt engineering and boundaries in LLM generation. For example, our results show that text-based tasks such as code refactoring and test case generation have the highest scores for correctness and clarity, while explanations showed slightly lower clarity. For image generation, styles like "Painting" and "Photo" scored highest in quality, coherence, and relevance, while "Infographic" prompts had lower ratings and greater variability. These results suggest differences in how models handle logical representation across visual and textual outputs. When comparing different models, we found that, for example, GPT-4 and Claude-Sonnet are consistently strong across metrics, including quality, relevance, and creativity. On the other hand, models like GPT-4 Turbo and O1-Preview demonstrated occasional variability, particularly in relevance and quality. Qualitative feedback from evaluators highlights strengths in logical consistency and contextual understanding in LLMs but identifies challenges in generating highly creative or adaptive responses. Overall, our results showcase both the strengths and areas for improvement in the area of prompt engineering and identify cases where specific models or prompting techniques are better suited than others.

Alexandra Bell

PA - Point Park University

Discipline: English and Literature

Authors:

Abstract Name: The Seizure and The Shattering: Unnatural Feminist Narratology in Nonfiction Texts by Lauren Slater and Maggie Nelson

Brian Richardson's definition of "unnatural narrative theory" in "Unnatural Narrative Theory" set a precedent for narratologists and readers of unnatural narratives alike, describing it as the theory "of fictional narratives that defy the conventions of nonfictional narratives and of fiction that closely resembles nonfiction." What is missing from this definition, and the work of many papers on this branch of narratology, is the consideration of nonfiction works that employ the unnatural. This presentation will first explicate two examples of unnatural narratology within the nonfiction genre: *Lying: A Metaphorical Memoir* by Lauren Slater and *The Argonauts* by Maggie Nelson. Both defy genre conventions and the "natural" structure of memoir through nonmimetic and antimimetic elements, including unnatural temporal order, intertextuality, and genre hybridity. Slater and Nelson accomplish the transgression of traditional narratology through two different approaches: where Slater blurs the demarcation between truth and fiction under the guise of a memoir, purposely writing into the form as a way to break it apart from the inside, Nelson employs the unnatural by writing away from the memoir and into a work of "autotheory" which breaks the binaries of gender and genre alike. This presentation will then examine how the latter – gender and genre – are inextricably bound in these

works, therefore qualifying both as unnatural feminist narratologies. What is accomplished in these texts is not only the successful subversion of a genre largely ruled by an allegiance to the “natural” modes of writing and patriarchal order, but also the inception of feminist theory and hybridity within the memoir – an apparatus of unnatural narratology serving as an emblem for the future of feminist creative nonfiction. Ultimately, this presentation will argue that Slater’s and Nelson’s works are important seminal texts for deconstructing genre boundaries in nonfiction because they successfully implement unnatural feminist narratology.

Michael Bell

PA - Lafayette College

Discipline: Economics

Authors:

#1 Hongxing Liu

Abstract Name: The Economic Feasibility of Nuclear Small Modular Reactor (SMR) Technology in the United States

In the face of global climate change and increasing energy demands, the debate over nuclear power's role in the energy mix remains highly relevant. As the United States seeks to reduce its carbon footprint while ensuring a sustainable and cost-effective energy supply, nuclear Small Modular Reactor (SMR) technology presents a potential option alongside other sources. SMRs are characterized by inherently safe engineering and lower upfront and long-term costs, offering a possible zero-carbon energy source capable of meeting substantial baseload electricity needs. This thesis will conduct a cost-benefit analysis to assess the overall feasibility of SMR technology in the U.S. energy mix, including both the financial and societal impacts. To do this, I will first evaluate whether SMRs provide a safe, stable, and cost-efficient energy alternative to traditional nuclear technology by comparing their fixed, variable, operating, and maintenance costs and dissecting respective safety and waste production aspects. After this, I will compare the projected Levelized Cost of Energy (LCOE) and return on investment metrics of SMR technology with both solar and wind energy to determine financial viability. Additionally, a major component of the macroeconomic implementation of new technologies is public perception, something particularly important when discussing nuclear power. This thesis will gauge the public perception of SMR technology by conducting a nationally-representative survey of 1,500 participants ran using Prolific, a respected online survey platform widely used in economic studies. These surveys will offer insights into the societal impact of SMRs, helping to quantitatively assess whether public willingness to accept aligns with the potential of Small Modular Reactors. Through this gained understanding of the technical, financial, and societal factors of SMR technology, I will provide a comprehensive assessment of SMR technology's economic feasibility and potential role in the U.S. energy mix.

Amelia Bellah

CA - California State Polytechnic University - Pomona

Discipline: Anthropology and Archaeology

Authors:

#1 Iftekhar Alam

Jesse Richert

Abstract Name: Understanding the human burial signatures using ground penetrating radar and magnetic gradiometer: A case study on Agua Mansa Pioneer Cemetery

Surface geophysical surveys using ground penetrating radar (GPR) and magnetic gradiometer will be used to understand the burial signatures at the Agua Mansa Pioneer cemetery. Agua Mansa was a 6.3-acre pioneer cemetery in Colton, California that was actively burying from 1854 to 1963. Currently, the cemetery site consists of the ruins of an old church, a replica church, and many unmarked graves. According to burial records, there are approximately 2,000 human burials known at this site with only a few hundred headstones still standing. The settlement was established in the 1830s by settlers from Abiquiu, New Mexico. Up until 1862, Agua Mansa was a prevalent farming settlement when a flood destroyed most of the settlement which never fully recovered. The cemetery was not affected due to its location on a hilltop, most of its destruction came in the early 1900s when it was vandalized. GPR is a non-invasive geophysical technique that utilizes electromagnetic waves to map the subsurface. The magnetic gradiometry is a second non-invasive geophysical technique that identifies any anomaly with an anomalous magnetic body. Together the two methods will provide more in-depth data to indicate locations of unmarked burials while the signal characteristics will correlate from marked burial signatures. Additionally, through surface survey and historical background research, the types of burials at Agua Mansa will be identified. Expected results of this project include identified locations of unmarked graves characterized by high amplitude reflectivity in 3D surface maps and magnetic low. However, the presence of any metallic object with the burial may also result in magnetic highs.

Mari Belle

OK - University of Central Oklahoma

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Mari Belle

Abstract Name: This study examines LGBTQ+ self-discovery after 40, exploring psychological, social, and cultural influences, including mental health, life experiences, and societal barriers, aiming to promote inclusive policies and broaden identity understanding.

This study explores the process of LGBTQ+ self-discovery and coming out for individuals aged 40 and beyond, a demographic that challenges ageist assumptions and broadens the understanding of identity formation. With an increasing number of LGBTQ+ individuals embracing their authentic selves later in life, this research aims to address the unique psychological, social, and cultural factors influencing their journeys. Through a mixed-methods approach, this study examines the mental health implications, social support systems, intersectional identities, and the impact of life experiences such as previous marriages, parenthood, and careers. The research also investigates the barriers and opportunities faced by these individuals in the realms of health care, legal issues, and workplace dynamics, as well as the role of media in shaping late-in-life self-discovery. By focusing on the lived experiences of LGBTQ+ individuals over 40, this study seeks to inform more inclusive policies, support systems, and societal attitudes, promoting mental health and well-being across all stages of life. Ultimately, this work contributes to the growing body of literature that validates diverse life paths and timelines for LGBTQ+ identity formation.

Alexis Bellotti

WI - University of Wisconsin-Stout

Discipline: Film/Photography Studies

Authors:

#1 Alexis Bellotti
#2 Casey Blackwood
#3 Megan McDowell
#4 Emery Christian
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Casey Blackwood

Abstract Name: Exploring Mixed Media Pipelines for Animated Short Films

This project is researching the many ways mixed media can be achieved in UW Stout's Senior Animation Capstone course. We aim to figure out how accessible it is to create a mixed media short throughout the course of one year. Looking at past senior thesis films, many students have veered towards using solely 2D animation for their capstone course- even though the program sequence for the animation BFA heavily pushes for use of 3D methods. We hope that experimenting with mixed media will allow for students to utilize every skill they have learned from courses required for the animation degree. We will create an animation that combines 2D animation with 3D environments and characters, using resources from the school and beyond. Mixed media includes different types of animation, texture, and even music. We want to explore collaborations between students and composers to enhance future UW Stout animation student's thesis films with narrative scores. We hope to find that the pipeline is manageable for students to do, allows for pointed portfolio pieces, creates a better workflow for capstone, matches industry standards, and bridges the gap between music production and narrative shorts.

Hailey Belverio

PA - Moravian University

Discipline: Biochemistry

Authors:

#1 Rachel Riley
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#4 Anastasia Thévenin

Abstract Name: Mutually-Exclusive Interaction of Connexin 43 with Src and ZO-1 is Regulated through a Single Phosphorylation Event

Connexin 43 (Cx43) is a transmembrane protein that forms gap junctions (GJs) - cellular channel structures necessary for direct cell-cell communication. Cx43 GJ function is regulated through phosphorylation on the serine and tyrosine amino acids along Cx43 C-terminus (CT). Functional, open GJ channels interact with a scaffolding protein, zona occludens 1 (ZO-1). However, the interaction of Cx43 GJs with a non-receptor tyrosine kinase Src closes GJ channels, thus decreasing cell-cell communication. In turn, the binding of Src to Cx43 also helps regulate Src's oncogenic activity. While it is well-established that Cx43 is unable to interact with both Src and ZO-1 simultaneously, the molecular mechanism that regulates these mutually exclusive interactions remains unknown. Our laboratory screened mutants of Cx43 and observed that mimicking serine 373 phosphorylation on Cx43 recruits Src, while ZO-1 is unable to interact with Cx43 when this site is phosphorylated. On the other hand, Src interaction with the phospho-dead (alanine) mutant of Cx43 was decreased. We hypothesized that S373 phosphorylation serves as a regulatory switch that dictates whether Cx43 will interact with Src (when phosphorylated) or with ZO-1 (when not phosphorylated). We conducted pull down assays between purified, GST-tagged CX43CT S373 mutants and Src in healthy cells and cancer cells. In addition, we utilized a truncated mutant of Cx43CT lacking the last four C-terminal amino acids, thus preventing its interaction with ZO-1. Our results demonstrate that the S373E mutant, as well as the truncation mutant, were able to recruit Src more effectively when compared to the S373A and WT Cx43. Importantly, expression of the Cx43 S373E mutant decreased levels of Src-driven cell proliferation in prostate

cancer cells when compared to the expression of the S373A mutant. This work provides evidence that Cx43 phosphorylation dictates Src and ZO-1 recruitment to Cx43CT in both healthy epithelial cells and cancer cells.

Alexandria Bender

PA - Westminster College

Discipline: Biology

Authors:

#1 Helen Boylan Funari

Abstract Name: The Effects of Nature Therapy on Stress

Stress is extremely prevalent within our modern-day society. The need to earn an education, maintain a steady income, support family members, and spend time with friends can cause intense pressure. Recently, research teams have been looking for new and effective ways to decrease stress levels. Our project focused on the effects of nature therapy on stress. Nature therapy involves an individual connecting mindfully with nature, a process which has been demonstrated to improve one's physical and mental health. Because stress is not an easy subject to measure, our study involved objective measures (ex: heart rate, blood pressure, heart rate variability, sleep score, stress score, and salivary cortisol and alpha-amylase levels) and subjective measures (ex: surveys). For the first half of the four-week study, individuals continued their daily routines for baseline stress measurements. During the second half, participants completed nature therapy activities to determine if the nature therapy reduced the stress measurements. The goals of our study included assessing the impact of nature therapy on the objective and subjective measurements of stress in this small pilot study (N=10) and determining which stress measurements are best for larger, future nature therapy studies. This study, involving human subjects, was approved by Westminster's Institutional Review Board, and confidentiality was maintained on all participant data. The results of our data show a statistically significance decrease in perceived stress following the two weeks of a nature therapy intervention. There were also several individuals who were found to have significant findings for certain stress-related metrics. These results bring up the question of whether specific people are more susceptible to the benefits of nature therapy. Correlation analysis indicates a number of our stress metrics are positively correlated. This small, pilot study indicates that nature therapy does reduce perceived stress. It also provides the groundwork for larger stress-related studies.

Nancy Benedict

MN - Hamline University

Discipline: Exercise Science and Nutrition

Authors:

#1 Lisa Ferguson-Stegall

Abstract Name: Nutritional Knowledge, Dietary Habits, and Protein-Iron Intake: A Comparative Study of Omnivorous and Plant-Based Diets in College Athletes

Individuals generally adhere to one of three dietary patterns: vegan, which excludes all animal products, vegetarian, which is primarily plant-based but may include select animal-derived products, and omnivorous which incorporates both plant-based and animal-based sources. As plant-based diets become increasingly popular in the general population, their adoption is likely to rise among collegiate athletes. However,

concerns persist regarding the adequacy of protein intake in plant-based diets and its impact on athletic performance. While research supports that well-balanced plant-based diets can fulfill nutritional requirements, the specific dietary adequacy and nutritional knowledge among collegiate athletes remains insufficiently studied. This study investigates athletes' perceptions of sports nutrition and evaluates the sufficiency of their dietary intake in meeting performance-related nutritional requirements. We further assess the alignment of reported caloric and protein intake with established recommendations. Using an original survey of collegiate athletes (n=59), we found that while 98.3% of athletes are aware of their protein requirements, 50.9% perceive a deficiency in their intake, underscoring a gap between knowledge and practice. Moreover, while 59.3% of athletes often believed their caloric intake to be adequate, preliminary analysis of a 3-day dietary log suggests actual intake may fall short of perceived needs with athletes reporting an average intake of 1,105 calories below recommendations. This study provides critical insights into the dietary practices of collegiate athletes, highlighting the need for improved nutritional guidance tailored to athletes. This research also addresses a significant gap in the literature regarding the interplay between dietary choices and nutrient sufficiency in athletic populations.

Carmen Benitez

FL - Florida Atlantic University

Discipline: Economics

Authors:

Abstract Name: Battle of the Sexes: The Impact of Gender on Household Spending and Saving

What factors influence the spending behavior of Americans? Arguably, one of the most significant and relevant indicators of the U.S. economy is the spending and budgeting patterns of households. The Federal Bureau of Labor Statistics tracks these patterns, along with other key economic indicators, to assess the overall health of the national economy. I hypothesized that gender did not have an impact on saving, spending, and budgeting patterns in American household. I conducted research by creating a questionnaire and collecting 142 completed surveys through Amazon Mechanical Turk. The data was analyzed using IBM's SPSS software. My results showed me that gender was a defining factor among respondents. I found a significant difference in the responses from different genders. While 86.1% of females agreed or strongly agreed that they noticed increased prices, only 61.8% of males replied similarly. This was statistically significant at less than 1%. I also saw 52.7% of females admitted they save between \$3001 to \$5000, as opposed to 17.3% of males who said they save an amount within the same range. This finding was found statistically significant at the <1% level. These findings contradicted my hypothesis. From this I can conclude that more females are likely to confidently claim that there have been price increases in necessary goods and services. Females are also more likely to save more monthly for future goals. I believe that the public could take advantage of this knowledge to recognize the differences between genders in the economic and financial sphere.

Lilly Bennett

VA - James Madison University

Discipline: Nursing and Public Health

Authors:

#1 Lilly Bennett

Abstract Name: Relationships Between Perceptions of Older Adults and Willingness to Work Among

Undergraduate Healthcare Students

This study aims to identify the perceptions that undergraduate students with a healthcare-focused major and/or minor at James Madison University have towards older adults, as well as identify these students' willingness to work with older adults as their intended patient population. The primary objective of this research is to see what relationships exist within these two variables, followed by looking at the differences across demographic groups and fields of study. The analyses may expand knowledge and advance understanding about ageist perspectives and how it will influence the future of healthcare. Currently, there is a lack of research on the identified variables; literature exists about specific careers in healthcare, such as nursing, but not analyzing several health professions together. Much of the research that has been done on willingness to work with older adults is also exclusive to Asian participants, so there is a need for expanded research in the United States. With the present lack of future healthcare professionals willing to work with this population, there will be gaps in care for older adults, which will create problems within the healthcare system, such as increasing rates of age-related disabilities and deficiencies in quality of long-term care. From December 2024 through January 2025, data will be collected using an instrument derived from two existing surveys: the Fraboni Scale of Ageism and the Willingness to Work with Elderly People Scale. Pearson correlations will be conducted analyzing the independent variables of perceptions of older adults among the sample and sub-samples and dependent variable of willingness to work with older adults aiming to identify and the possible impact perceptions may have on willingness to work with this population. The insight from the study may assist in improving healthcare education and training, strengthening the desire and willingness to work with older populations.

Amber Bennett

VA - James Madison University

Discipline: Psychology

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Braden Berger

Abstract Name: The Influence of Experimenter Gender on Hormones, Behavior, Physiology, and Voice

Subtle contextual factors can shape behavioral outcomes, making scientific reproducibility difficult. Experimenter gender may be a factor contributing to between-study variance, yet it frequently goes unreported. This lack of reporting could be an important variable to the ongoing reproducibility crisis (Klein et. al., 2018). Research across multiple disciplines shows that experimenter gender can affect participants' pain perception, hormones, and decision-making processes (for review see Chapman et al., 2018), however no single study examines the impact of experimenter gender on hormones and hormonally-dependent behavior and physiology simultaneously. Our study systematically explores how experimenter gender affects participants' estrogen and testosterone levels, risk-taking behavior, grip strength, anxiety, and voice. We examined these effects in both male and female participants. All measures were collected from participants on three consecutive days. On each day, the participants interacted with either a male experimenter, female experimenter, or no experimenter, in a randomized order. Preliminary results suggest that experimenter gender influences risk-taking behavior, with females taking more risks around female experimenters compared to male experimenters, while males took more risks around female experimenters. Our findings also indicated that experimenter gender affects vocal stability, with male participants showing the highest amplitude instability in the presence of a female experimenter and the lowest in the no-experimenter condition. We are currently conducting an additional study to determine whether these vocal changes impact listener perception of the speaker across multiple attributes (e.g. attractiveness, confidence, trustworthiness, etc.). Enzyme-linked immunoassays will be used to determine whether salivary hormones can predict the

behavioral and physiological changes. These findings highlight the importance of reporting the experimenter's gender in research, as it may influence participants' physiology, behavior and vocal acoustics. By analyzing this overlooked variable, our study contributes to a deeper understanding of factors that may impact replicability issues in scientific research.

Natalie Bennings

OH - University of Cincinnati Main Campus

Discipline: Psychology

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#3 Eli Salem

#4 Nathan Anderson

#5 Rose Marie Ward

Abstract Name: Vignette Analysis of Bystander Intervention Strategies: Contexts of Negative Alcohol Consequences

There is a culture on college campuses that promotes excessive drinking and thus can lead to a number of dangerous situations including sexual assault, alcohol overdose, and other related injuries. One method of combating this issue includes university training modules that aim to shape students into what is referred to as an “engaged bystander” to promote safer drinking environments. A plethora of research has been conducted on bystanders' personal barriers and motivations with respect to sexual assault interventions. However, there is a relative paucity of literature examining bystanders to alcohol consequences. Therefore, the current project will 1) develop a measure of alcohol-related bystander perceptions; 2) assess the relationship between drinking location and endorsement of the bystander strategy; and 3) explore the likelihood of intervention depending on the state of (e.g., intoxicated or not) and the gender of the drinker in the story. Participants will be from one university and will complete the survey online. The survey will have eight vignettes counterbalanced between male and female presentations. These vignettes are composed of both open-response and multiple-choice questions that propose a specific situation and ask participants to describe their thoughts and intentions when a friend is experiencing negative consequences due to alcohol consumption. Data collection is ongoing. Potential results from this study have several implications. For example, if students report a lower likelihood of intervening based on location, intoxication state, or gender, different bystander training interventions can be developed. In addition, these differences may provide initial evidence of biases that the participants might have.

Samuel Bensemann

WI - University of Wisconsin-Milwaukee

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Gavyn Wilson

Abstract Name: Practice Domestic Architectures: a survey and speculation on subversive spaces

This research aims to investigate a curious architectural type nearly lost to history and susceptible to being forgotten by posterity: the practice cottage. There exists little documentation considering its ubiquity in the

early-mid 20th century. How can this type, originating from the home economics (HE) movement, be documented, celebrated, preserved, and recontextualized using architectural analysis? By challenging preconceived notions of HE as sexist, regressionist, and disabling, this analysis attempts to reposition HE and the practice cottage as sites of both gender and racial subversion. In 1919, the term “practice cottage” was first used in the annual report of the Federal Bureau for Vocational Education (FBVE), funded by the Smith-Hughes Act of 1917. After the passage of this act, dozens of single family homes were constructed on college campuses for HE departments. They were described as “fitted up as an average home... in which the vocational students carry on all of their work.” (see link) Cohorts of young women, led by female faculty, would live and work at the house, a 1:1 laboratory for care work skills. These buildings subverted the typical understanding of a heteronormative, single family home, becoming a space for and by women, without male oversight. Under the guise of preparation for the ultimate, stereotypical female role—homemaker—these buildings supported unconventional relationships, communal living, and higher education for women, a type of quiet liberation. This research proposes a cohesive survey of the practice cottage, utilizing archival architectural documentation along with relevant government reports. The project will produce a congruent drawing collection, 3-d digital models, and written analysis, uncovering latent social and spatial relationships. This research suggests that looking towards a radical past might provide insights on potential futures. In our increasingly complex contemporary context how might the field reconsider “practice” domestic architectures as sites of subversion and liberation?

Jasmine Benson

CA - University of California - Merced

Discipline: Nursing and Public Health

Authors:

#1 Jasmine Benson

#2 Alexandra Rivera-González

Abstract Name: Sociodemographic disparities in uninsurance rates for Medicaid expansion versus non-expansion states

OBJECTIVE: To compare uninsurance rates by sociodemographic characteristics in Medicaid expansion states (California, New York) versus non-expansion states (Texas, Florida). **BACKGROUND:** Health insurance is a key determinant for health care access. In 2014, the Affordable Care Act introduced an optional Medicaid expansion for states to extend health insurance eligibility to low-income adults. While some states adopted the expansion, others opted out. **METHODS:** Using publicly available data from the US Census Bureau (data.census.gov), we extracted 2023 uninsurance estimates and percentages by select sociodemographic characteristics (sex, age, race/ethnicity, and citizenship status) for California, New York, Texas, and Florida. These states were selected as proxies for expansion and non-expansion states given their similar demographic populations (e.g., large proportion of Latinos and noncitizens) and differing political climates. **RESULTS:** Texas and Florida had overall higher uninsurance rates (16.4% and 10.7%, respectively) compared to California and New York (6.4% and 4.8%, respectively). For non-expansion states, the groups with the highest uninsurance rates were males (TX: 17.4%, FL: 12.1%), 19-64 year-olds (TX: 21.7%, FL: 15.5%), Latinos (TX: 25.6%, FL: 15.6%) and American Indian/Alaska Natives (TX: 21.8%, FL: 33.8%), and non-citizens (TX: 46.8%, FL: 29.7%). Meanwhile, those same groups had lower uninsurance rates in expansion states: males (CA: 7.5%, NY: 5.8%), 19-64 year-olds (CA: 9.0%, NY: 6.8%), Latinos (CA: 10.4%, NY: 9.7%) and American Indian/Alaska Natives (CA: 11.5%, NY: 14.0%), and non-citizens (CA: 20.5%, NY: 17.4%). **DISCUSSION:** Overall, the selected non-expansion states had worse uninsurance rates compared to expansion states. These results persisted across sociodemographic characteristics. These findings evidence how state policy climates can impact an individual’s access to care and exacerbate disparities for different subgroups.

Hannah Benton

FL - University of Central Florida

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Fanfiction as a Reflection of Available Representation: A Critique on Mass Media

With the lack of reputable disability representation in popular superhero media, fans turn to fanfiction to write the representation they long for. This absence of proper representation in media can feel like the erasure of disability, and in compensation, fanfiction paves the way for authentic representation in media. Fanfiction authors do this by reacting to specific choices made by the mass media outlets through their creations. Fan studies scholars have examined fan reactions for decades, categorizing them into two groups: affirmative (agreeing with the source material) and transformative (disagreeing with the source material). Affirmational fans interpret the canon text without challenging its ideologies, expanding upon it in ways that remain consistent with the original narrative. Transformational fans challenge and shift the canon text into something different. Fanfiction is considered a transformative reaction. Informed by disability studies and fan studies, this research aims to study fan reactions around disability to understand what it is they affirm/transform from the source material. When a disabled identity is explored in the canon, do the fanfictions respect it? Or do they choose to alter it? What about an able-bodied identity? What facets of identity are the ones that receive alteration as opposed to approval? By analyzing 2,000 fanfictions within the MCU and DCU, this rhetorical critique will encourage future rhetoricians to think critically about the realities they affirm/transform from media representations. This methodology, as a part of a broader project, will lay the foundation for a more comprehensive rhetorical critique of the representational choices made by mass media outlets. This analysis will reference models of disability, such as the medical, social, and identity model, to deepen our understanding of these representational dynamics. In doing so, this research will contribute to the ongoing conversation regarding the responsibility of artist and audience.

Aizada Berdalinova

FL - Florida International University

Discipline: Interdisciplinary

Authors:

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Abstract Name: Enhancing the Efficacy of Adoptive T Cell Therapy for Patients with Diffuse Large B-Cell Lymphoma by Ablating Galectin-3–Ligand Interactions

Diffuse large B-cell lymphoma (DLBCL) is a major form of non-Hodgkin lymphoma that impacts over 10,000 individuals annually. This malignancy often relapses and is refractory to initial standard therapeutic approaches, underscoring the need to develop innovative therapies. Chimeric Antigen Receptor (CAR)-T cell therapy is a promising immunotherapy approach using patient T cells engineered to express CARs targeting cancer cell surface markers that are adoptively-transferred back into patients to elicit anti-tumor T cell activity. While therapeutic responses are promising, there is a need to develop a more effective CAR-T cell

formulation with enhanced anti-tumor efficacy and in vivo persistence. Early data from our laboratory suggest that DLBCL patients exhibit heightened serum levels of galectin (Gal)-3 that could bind Gal-3 ligands on CAR-T cells and dampen functional activity and even induce cell death. We hypothesize that interference of Gal-3 binding to CAR-T cells could protect CAR-T cells from the immunodampening effects of Gal-3 to thereby enhance CAR-T cell therapy against DLBCL and improve patient outcomes. In this project, we will evaluate the effects of a novel orally-active Gal-3 inhibitor, GB1107, designed to block Gal-3 binding to its ligands on cell surfaces. We will conduct flow cytometry-based binding and cell death assays using GB1107, recombinant human Gal-3 (rhGal-3), annexin-V/propidium iodide probes, and in-house prepared CAR-T cells to assess whether GB1107 can block Gal-3 binding to CAR-T cells and protect them from Gal-3-mediated cell death. In addition to examining dose-dependent inhibitory activity against Gal-3 binding to T cells, we will also assess selectivity of GB1107 against blocking Gal-3 by comparing potential blocking activity to other common galectins, Gal-1 and Gal-9. Resultant data will offer new insights into how Gal-3 modulates immune responses in DLBCL and show whether a Gal-3 inhibitor can potentially enhance CAR-T cell function in patients undergoing CAR-T cell therapy.

Saron Bereket

VA - Virginia Commonwealth University

Discipline: Biology

Authors:

#1 Carlos Escalante

#2 Karen Hernandez

Abstract Name: Dissecting the role of Rep68 structural motifs on Adeno-Associated virus replication.

Adeno-associated virus (AAV), specifically serotype 2, is a human parvovirus in the Parvoviridae family, known for its low immunogenicity and ability to infect a wide variety of cell types. This makes AAV a valuable tool in gene therapy, where the AAV genome can be modified to replace viral genes with therapeutic genes of interest. Thus it has promise in gene therapy and treating genetic disorders such as muscular dystrophy, hemophilia, and certain forms of blindness. It also has implications in cancer research and for studying gene function. AAVs consist of a single-stranded DNA genome that is non-enveloped and dependent on helper viruses, such as adenoviruses or herpesviruses. The protein Rep68 is focused on because its critical DNA binding and helicase-ATPase domain activities are important for AAV replication. Specifically, this study used the AAV Helper-Free System to produce AAV2 particles without requiring the use of a helper virus, simplifying the process and prioritizing the production of essential plasmids for AAV replication. Using plasmids pRC2 (expressing Rep and Cap genes), pHelper (expressing adenoviral helper functions), and pAAV which codes for Green Fluorescent Protein (GFP), we aim to test the effects of the Rep68 mutants F364A, C405H, H456A, and H582A on replication efficiency and the mechanisms by which Rep68 facilitates viral DNA replication. Microscopy images of Pro 293-T cells after plating and 24 hours before transfection showed ideal cell culture confluency with no contamination. However, the western blot and fluorescence microscopy results did not show sufficient GFP expression thus we were unable to test the mutants yet. In future research, PEI can be used in place of the phosphate calcium protocol for transfection to be able to test the mutants. Ultimately by learning more about how Rep68 facilitates viral DNA replication, AAVs can become better vectors for gene delivery.

Dina Berenshteyn

VA - George Mason University

Discipline: Psychology

Authors:
#1 Cher Weixia Chen

Abstract Name: How College Students Perceive Domestic Violence in The United States: An Interview Study

As domestic violence has increased in the US since the 2020 Covid Pandemic, its impact has devastated many American lives. Perception of this violence plays a key role in its continuation as society's beliefs on this topic can greatly influence how it is addressed culturally and legally. This interview study examined how college students in the United States, one of the most vulnerable populations to intimate partner violence, perceive domestic violence. 18 college students from a large public university located in Virginia were recruited using formal and informal networks of college students through the process of snowball sampling. Semi-structured qualitative interviews that entailed open-ended and conversation-based questions were securely administered through Zoom. The questions approached topics such as base-line definitions, legality, victims, personal connections, and mental schemas. Qualitative data analysis through the means of analytical memos and closed coding were then conducted on the transcripts. Preliminary findings show that emerging themes include cycles of abuse, societal and legal shortcomings of justice, and the patterns of stereotypes. The perception of abuse being circular signified that violence can be viewed as inherently perpetual and even generational. Participants believed the justice system does not bring justice to survivors and they faulted the ease of believing abusers and victim blaming. However, they acknowledged the nuances of proving someone as guilty. Participants were able to identify demographics that they thought to have more abusers vs survivors. This displayed clear prejudice which opened the door to question how this can affect outcomes for both survivors and abusers.

Regan Bergan

TN - University of Tennessee at Knoxville

Discipline: Nursing and Public Health

Authors:
#1 Noel Arring
#2 Casey Norris

Abstract Name: Understanding the Experiences of Caregivers of Pediatric Patients with Neuromuscular Disorders Using Noninvasive Ventilation

The overall objective of this research is to understand the experience of caregivers of pediatric patients who use noninvasive ventilation (NIV) for respiratory support as a result of a neuromuscular disorder (NMD). A brief questionnaire will initially be administered to gather demographic information. A descriptive qualitative approach will be used. Data will be gathered using semi-structured interviews. Audio and/or video recordings of each interview will be transcribed using Zoom and destroyed after confirming accuracy of transcription. Deductive thematic analysis will be performed with the transcribed interviews to gain a better understanding of the experiences of caregivers of pediatric patients with NMDs who use NIV.

Lillian Berger

ND - University of North Dakota

Discipline: Engineering

Authors:

#1 Chelsea Fuller
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Chelsea Fuller
Jacqueline Kim Correa

Abstract Name: Dynamic Blade Design: Bridging the Gap Between Walking and Running

Amputation of the lower limb impacts mobility and quality of life for over 1 million people worldwide annually, and post-operative recovery is prolonged and imperfect. Research shows that existing prosthetics only mimic natural biomechanics 30% of the time, and in cases of failure, 60% of the time are due to stresses of walking, running, etc. We originally designed a blade that mimicked the walking and running blades currently on the market by sharpening the bends of a running blade and flattening the bottom. But soon realized that this design was only the first step of closing these gaps, we decided to transition to a bio mimic approach where we effectively took lessons from kangaroos, dogs, and humans to inform a more resilient and functional prosthetic blade that could better approach the functionality of the missing limb. Kangaroo legs have a similar structure to the original blade design, but their muscles add more support and make their legs more resistant to the ground force reactions produced when they jump. The dog's hind leg anatomy is like the kangaroo's but on a smaller scale which gives us better proportions for the blade while maintaining the power output. For the human feet, the design process was broken into three sections: the heel, the arch, and toes. The bone structure found in the human foot gives it the strength to withstand the impact of heel strike and toe push, and the muscles add the elasticity needed for the foot to flex upon impact and return to its initial shape. The heel required a sturdier material while the arch and upper foot would be made with a more flexible material, and then the toes would be made with a material with a higher elastic value so that they could provide additional spring during dismount.

Samantha Bergstedt

MN - St. Catherine University

Discipline: Exercise Science and Nutrition

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Abstract Name: The Relationship between Sleep and Food Choice in a College-Age Population

Introduction: College students are at greater risk for sleep deprivation and poor-quality nutrition compared to other populations. Interventions that target sleep hygiene may improve overall health, decreasing the chronic disease risk and its detrimental impact on quality of life and healthcare spending. Sleep deprivation is linked to increased food motivation, decreased self-control around food, and increased consumption of calorie-dense, nutritionally depleted foods (Rihm et al., 2019; Benjamins et al., 2020). Purpose: This study examines how sleep hygiene affects food choices in a college-aged population. Methods: Participants were interviewed about sleep patterns and food choices using the Sleep Quality Survey (SQS) and the National Institute of Health's Fruit/Vegetable Quick Food Scan. Data on food intake were also collected. Open-ended questions were used to gather qualitative data on sleep and its impact on food choice. Descriptive statistics and Pearson's correlational analyses were conducted to examine the relationship between sleep patterns and food choices. Results: Twelve female subjects and one male subject, with a mean age of 25.9 years (SD = 4.6), completed the study. The average hours of sleep per night was 7.2 hours (SD = 1.0), which meets the American Sleep Association's recommendation of 7 hours. Moderate inverse correlations between sleep duration and sugar intake and between sleep quality and BMI were identified ($r = -0.46$, $r = -0.42$).

respectively); however, these were not significant ($p > 0.05$, both). No other statistically significant relationships were found between sleep and BMI, mean energy intake, added sugar intake, fiber intake, or sodium intake for this population. Conclusion: In this study, sleep patterns were not significantly associated with food choices. Further investigation with a larger sample size, focusing on participants with inadequate sleep, will help to clarify the relationship between poor sleep and food choices.

Bezawit Berhanu

MN - Minnesota State University - Mankato

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Breaking Barriers: Women's Representation and Challenges in STEM Careers

The underrepresentation of women in STEM careers persists as a significant challenge despite decades of progress in gender equality. This research explores the multifaceted barriers faced by women in STEM, including cultural biases, systemic obstacles, and the lack of role models, while highlighting actionable strategies for fostering a more inclusive environment. Drawing from a combination of qualitative interviews and quantitative data analysis, this study investigates how workplace dynamics, educational pipelines, and mentorship programs influence women's participation and retention in STEM fields. The findings reveal persistent stereotypes that discourage young women from pursuing STEM careers, unequal access to opportunities for professional development, and the challenges of navigating male-dominated environments. Additionally, the research underscores the importance of early interventions, such as hands-on STEM experiences for girls, and institutional reforms aimed at dismantling discriminatory practices. A critical analysis of successful case studies demonstrates how targeted initiatives, including diversity-focused recruitment and retention strategies, can effectively bridge the gender gap in STEM. This study also proposes a framework for creating supportive ecosystems that empower women in STEM through mentorship, sponsorship, and community-building efforts. By addressing structural inequities and amplifying the voices of women in STEM, this research aims to contribute to the broader goal of achieving gender equity in innovation-driven industries. Ultimately, this work seeks to spark dialogue among educators, policymakers, and industry leaders about the urgent need to break barriers and create opportunities for women in STEM, fostering a future where diverse perspectives drive scientific discovery and technological advancement.

Maggie Berkebile

PA - Westmoreland County Community College

Discipline: Health and Human Development

Authors:

Hamda Hamad

Abstract Name: Nano-Hydroxyapatite vs. Fluoride: The Fight for Remineralization

Nano-hydroxyapatite is becoming an increasingly popular ingredient in fluoride-free oral hygiene products. The intent of this research is to settle the debate: Which product yields more effective results in the overall fight for remineralization? Our research uses quantitative studies found in scholarly, peer-reviewed articles. A trendy subject for those interested in a more holistic lifestyle, nano-hydroxyapatite is a biocompatible, biomimetic agent. It is a nanoscopic synthetic derivative from hydroxyapatite, which is a naturally occurring mineral found in bones and teeth. Since nano-hydroxyapatite is still relatively new to the dental market, the

overall efficacy is currently under discussion. Fluoride is the current gold standard for remineralization that has been researched and supported by dental professionals for decades. When comparing the two, nano-hydroxyapatite has not yet been seen as an equal. The articles we reviewed used in vitro, single-blind, and double-blind methods to accumulate effective research. Each study used a controlled amount of demineralized enamel as the subject, and separately applied nano-hydroxyapatite and fluoride products directly onto the enamel. These studies then compared the extent of remineralization after a prolonged time, ranging from immediate results to 6 months. Three studies demonstrated that fluoride had a significantly greater outcome in its effectiveness than nano-hydroxyapatite. In contrast, the results of three different studies that compared similar products showed that nano-hydroxyapatite was the superior out of the two. A final study was reviewed showing that there was no significant contrast in comparison of the two seemingly equal products, reinforcing the tie. With this insightful information, we have concluded that nano-hydroxyapatite and fluoride are equally as effective in the process of remineralization. With a promising future, nano-hydroxyapatite proves itself as a strong contender within the scope of dentistry.

Amparo Bernabe

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: Cultural Center for Fostering Inclusivity and Diversity: Focus on Learning About Latin American and Hispanic Culture

The project explores the creation of a cultural learning center designed to preserve and celebrate Hispanic and Latin American heritage while fostering cross-cultural understanding. The primary research question centers on how such a facility can empower individuals to embrace their cultural identity, facilitate the intergenerational transmission of traditions, and create a sense of belonging within diverse communities. The center's purpose is to address the challenges faced by Hispanic and Latin American populations in maintaining their cultural heritage amidst the pressures of assimilation and cross-cultural interactions. The growing disconnect between Hispanic and Latin American communities and their linguistic and cultural roots highlights the importance of this research. Studies indicate that third-generation Hispanic individuals in the United States often lose fluency in Spanish and face judgment from their community for it. Simultaneously, there is a widespread desire among Hispanics for future generations to retain their language and cultural heritage. This project aims to provide a unique contribution by addressing this gap through design solutions that emphasize inclusivity, accessibility, and cultural engagement. The research includes literature reviews of existing cultural centers, case studies of successful inclusive design projects, surveys and interviews with Hispanic and Latin American individuals, and analysis of demographic and cultural trends. The center also features an auditorium, café, children's center, library, workshops, classrooms, meeting areas, and a gift shop, creating an inclusive space for cultural learning, community-building, and celebrating Hispanic and Latin American heritage. The project is expected to result in a design that fosters cultural pride, intergenerational dialogue, and cross-cultural understanding. The center's impact will extend beyond its physical structure, enriching family life and community cohesion. By addressing language preservation, cultural education, and social inclusivity, this project will offer a framework for building environments that celebrate diversity and unity in a globalized world.

Daphne Bernal

VA - George Mason University

Discipline: Nursing and Public Health

Authors:

#1 Iulia Fratila

#2 Liza Berdychevsky

Deema Osman

Abstract Name: Reddit Netnography Exploring (Ex)Cannabis Users' Hedonic and Eudaimonic Well-Being Outcomes and Understanding the Role of Online Forums for Informal Health Communication

Cannabis use can have profound impacts on health and well-being outcomes. These outcomes can be analyzed from the hedonic-eudaimonic well-being theory. Hedonic well-being refers to momentary pleasures, discomforts, and sensations, while eudaimonic well-being refers to fulfillment, actualization of goals, and developing meaningful relationships with oneself and others. Due to the widespread legalization and liberalization of cannabis in the U.S., it is important to explore how (ex)cannabis users perceive and experience these well-being factors. Furthermore, it is timely to learn how cannabis health outcomes are communicated among (ex)cannabis users. Studies have found that social media platforms can offer meaningful spaces for health communication and successfully encourage health improvement. Thus, this research is two-fold: (1) seeking to explore how (ex)cannabis use impacts hedonic and eudaimonic well-being and (2) to understand the online platform, Reddit, as an informal health communication channel. The data were collected from four cannabis-focused Reddit communities. The study follows netnographic methodology using constructivist grounded theory for data analysis (i.e., adhering to the initial, focused, and theoretical coding). In total, 2532 posts were collected from the various online communities. The current preliminary data analysis includes 435 coded posts. The preliminary findings indicate that cannabis use can have both positive and negative effects on hedonic and eudaimonic well-being. For instance, the data suggests cannabis can contribute positively toward enhancing social connections while negatively impacting one's purpose in life, which represent eudaimonic well-being meanings. Regarding hedonic well-being, cannabis' positive impacts are related to pleasure, while negative outcomes are related to emotional outcomes. Additionally, the data shows that Reddit offers a supportive channel for discussion of sensitive topics related to one's overall health. Previous studies have also found Reddit to be an effective platform for discussing cannabis experiences. These findings can inform cannabis education and shed light on digital health communication.

Maya Berrebbi

PA - University of Pittsburgh School of Nursing

Discipline: Nursing and Public Health

Authors:

#1 Yuchen Zhang

#2 Jennifer Seaman

Sophia Loreski

Abstract Name: Pain and Palliative Care Among Hospitalized People Living with Dementia Who Are Hospitalized

Dementia is an umbrella term for a group of neurodegenerative diseases that may affect many aspects of bodily function and interfere with numerous daily activities. Along with disease progression, people living

with dementia experience progressive declines in cognitive, functional, and communicative capacities. This increases the risks of PlwD experiencing inadequate health-related management while unable to advocate for their own needs or preferences in care. One of the most important and recognizable beings, people living with dementia (PlwD) are likely to experience unrecognized or under-managed pain due to the presence of dementia. Palliative care is a philosophy of care that aims to provide structured, continuous care with consideration of a person's overall well-being. PlwD, especially those in more advanced stages, have trouble communicating their pain or discomfort, and palliative care is useful because it focuses on managing those symptoms using comfort-based pharmacological and nonpharmacological strategies. Pain is particularly a problem in treating PlwD because it can lead to increased agitation and behavioral disturbances, decreased participation in rehabilitation, an impaired immune response, overuse of psychotropic medications, and overall worsening cognitive health. We aim to examine the changes in pain-related symptoms of PlwD in the hospital setting before and after palliative care subspecialty consultations. We will conduct a secondary analysis using a subset of the sample from an ongoing retrospective cohort analysis, which employs electronic health records from the hospitals within the University of Pittsburgh Medical Center network. We will utilize descriptive analysis to characterize our included sample, and the Wilcoxon Signed Rank test to investigate the potential changes in pain. We hypothesize that with the implementation of palliative care service, PlwD will reduce pain severity with fewer adverse events. Overall, our analysis anticipates providing a preliminary understanding of the relationship between pain and palliative care in hospitalized PlwD.

Kaitlyn Berry

AL - Auburn University

Discipline: Health and Human Development

Authors:

#1 Diana Samek

Abstract Name: Preventing Sexual Assault on College Campuses: A Review of the Literature Review

In our Literature Review, we researched preventative measures for sexual assault on college campuses. This topic is of great importance as sexual assault remains steadily prevalent. For example, 26.46 of undergraduate women experience nonconsensual sexual contact by physical force or inability to consent (Association of American Universities Climate Survey, 2019). We learned that there are a multitude of ways for universities and students to work together to prevent sexual assault on college campuses. The most well-supported approaches included increasing bystander training and intervention (Ahren et al., 2011; Wantland, 2008), active campus commitment, and correcting misconceptions surrounding sexual assault and men's understanding of consent (Zapp et al., 2021). Within our review, bystander intervention can be described as interjecting in degrading conversations to correct misconceptions, refusal to participate in risky behaviors, and speaking up for victims. Campus intervention was looked at primarily as environmental factors such as emergency call buttons, well-lit areas with minimal dark spots, and the distance between buildings, as well as security surrounding campus buildings. The idea of correcting misconceptions and men's understanding of consent was analyzed less compared to the first two strategies in our review. This topic consisted of ensuring men, particularly Fraternity members could have a greater understanding of the topic of consent as well as what sexual assault consists of. It is our opinion that a great deal more emphasis should be placed on teaching undergraduate students, especially men, what is and is not consent. This could be promoted through orientation seminars to the university or mandatory 1-credit courses in the first semester, including review and attention to sexual scripts, how pornography often does not depict consent, and what exactly consent is and isn't.

Amanda Betancourt

TX - The University of Texas at San Antonio

Discipline: Architecture, Construction Management, and Interior Design

Authors:

#1 Ibukun Awolusi

Abstract Name: Evaluating Data Privacy, Security, and Trust in the Adoption of Wearable Sensing Devices for Construction Safety and Health Management

The adoption and implementation of wearable sensing devices (WSDs) in the construction industry has been slower than that of other industries such as healthcare, likely due to privacy, security, and trust concerns of industry professionals. Understanding the factors associated with these concerns will enable stakeholders to gain better insights into their relationships and how they influence the future of WSDs in the construction industry. This study aims to examine the impact of data privacy, security, and trust on the adoption and implementation of WSDs for safety and health management in construction. First, the constructs and factors associated with privacy, security, and trust are identified, defined, and characterized. Second, applicable theories and models for adoption and implementation with respect to privacy security, and trust in WSDs will be reviewed. This would be followed by the development of a conceptual framework that will be used to evaluate key stakeholders' perceptions of the impact of data privacy, security, and trust in the adoption of WSDs. A survey of key stakeholders will be conducted to evaluate their perception of the potential impact of these factors on the adoption and implementation of WSDs in the construction industry. The findings of this study are expected to help foster the effective adoption and implementation of WSDs among construction stakeholders for the prediction and prevention of injuries, illnesses, and fatalities in the construction industry.

Caleb Bettcher

CO - University of Colorado at Boulder

Discipline: Physics and Astronomy

Authors:

#1 Julia Claxton

Abstract Name: Classification of High-Energy Particle Precipitation Events Using Computer Vision

Earth's radiation belts host high-energy particles in a delicate balance which can be disrupted by certain events, such as Electromagnetic Ion Cyclotron (EMIC) waves, resulting in particles falling towards the Earth's atmosphere. This Energetic Particle Precipitation (EPP) can deplete atmospheric ozone, interrupt telecommunications, and destroy sensitive electronic components. For our efforts, we have chosen to direct our focus towards EMIC waves as they have the greatest impact on the aforementioned effects of EPP due to their tendency to precipitate the highest energy electrons and to provide a strong foundation for the future application of our methods to include multiple sources of EPP. Data collected by the twin ELFIN satellites aims to provide researchers with a deeper understanding of this region of space and the varying sources of EPP. We aim to further this field of research by applying the YOLO Computer Vision framework to the ELFIN dataset in order to identify EMIC-induced EPP events. This identification is made possible by the unique data signature of EMIC-induced EPP: an elevated rate of electron precipitation at relativistic ($\gtrsim 500$ keV) energy levels which tapers down as energy levels decrease. To train a YOLOv8 model, we constructed a labeled training set by isolating EMIC wave events, plotting them against a graph of standardized dimensions displaying the J_{prec}/J_{trap} ratio (the number of electrons which fall into the atmosphere over the number of electrons which are trapped in orbit), and introducing seeded randomness to improve model performance. We present our results of the trained YOLO models and their application towards determining the distribution of EMIC detections in the magnetosphere from ELFIN data. These results are compared with currently published research on EMIC-induced EPP. With our models and findings, future researchers will develop a better understanding of how to predict EPP-causing events and protect against them.

Lauren Beuerle

NC - Elon University

Discipline: Mathematics

Authors:

#1 Karen Yokley

Abstract Name: Mathematical Modeling of COVID-19 With a Focus on Asymptomatic Transmission

In 2020, the global COVID-19 pandemic erupted. Without knowledge to combat the disease, hospitals around the globe were overrun. Scientists and mathematicians, using past information on extremely infectious viruses, began investigating the effectiveness of social distancing, facial coverings, and eventually, vaccinations. Mathematical models can be used to explore the quantitative effectiveness of vaccinations, facial coverings, and create predictive models to aid the creation of policies in order to prevent future surges in cases. This project will utilize the ordinary differential equation SIR model to explore susceptible (S), infectious (I), recovered (R) populations to explore impact of asymptomatic individuals. The products of this model can be used as a reference for preventative measures for future epidemics that follow a similar pattern to COVID-19.

Alexandra Bevins

OH - Defiance College

Discipline: History

Authors:

#1 Alexandra Bevins

Abstract Name: The American Battle Monuments Commission: Death, Commemoration, and the Nation-State

This presentation explores the role of the American Battle Monuments Commission (ABMC) in constructing a post-WWI commemorative language of honor, sacrifice, and duty. It takes up questions such as “What audience were ABMC spaces created for?”, “How did architects, such as Paul Philippe Cret and Thomas Harlan Ellett, interpret and make evident the United States's claim to political, social, and cultural authority through their works?”, and “How were stylistic choices linked to America's self-perception in the postwar era?”. It pursues answers to these questions through the lens of architecture and asserts that the ABMC's spaces were intentionally designed to project a dominant image to the country's wartime allies. This presentation builds on the theoretical proposals of Hutchinson in *Nationalism and War* and Von Stackelberg and Macaulay-Lewis in *Housing the New Romans: Architectural Reception and Classical Style in the Modern World* to assert that the ABMC produced works of ethnosymbolism that were intentionally designed in architectural styles reminiscent of antiquity. It uses two sites of memory and mourning- the Chateau-Thierry Monument and St. Mihiel American Cemetery- as case studies to analyze and draw conclusions about the ABMC. Critical to this project is moving beyond a simple examination of architecture as space devoid of meaning and understanding it as the intersection of a rich social, political, and cultural debate surrounding death and the nation-state. It concludes by suggesting that these spaces were intentionally designed to signify nationalistic prestige and commitment to America's allies, were constructed for a European audience, and were the manifestation of an innovative, and unique style.

Blake Beyer

WI - University of Wisconsin-Parkside

Discipline: Psychology

Authors:

#1 Blake Beyer

Abstract Name: Parent Factors and their Effects on Emerging Adult Internalizing Behaviors

This study examined how parental anxiety and depression influences emerging adult (EA) anxiety and depression, and whether this influence is carried through deleterious parenting behaviors such as overparenting, distress intolerance, and hostility. Research has indicated that parental mental health issues can disrupt emotional regulation, leading to distress intolerance and as a result, parenting behaviors such as hostility and overparenting (a parenting style that restricts a child's autonomy and is developmentally inappropriate). These parenting behaviors have been linked to increased depression and anxiety within emerging adults. The current study included 290 EAs and their closest parents; each completed surveys that measured mental health, parenting styles, and self-perceptions. Self-reported anxiety and depression were measured using the Depression Anxiety Stress Scales. Distress intolerance was measured using the Coping with Children's Negative Emotions Scale. The Multidimensional Overprotective Parenting Scale was used to measure overparenting, and the Warmth and Hostility Scale measured hostility. Key findings suggest that parental depression was associated with EA depression both directly and indirectly (through distress intolerance and hostility). Parental depression was also related to overparenting; however, overparenting did not predict EA depression. For anxiety, no direct link between parental and EA anxiety was found. Parental anxiety was associated with distress intolerance, overparenting, and hostility. However, the only significant mediation found for EA anxiety was the path among parental anxiety, overparenting, and EA anxiety. These results indicate that parental mental health is key in predicting EA mental health, especially when considering the role of parenting behaviors. Namely, parental mental health may spillover and adversely impact parental decisions, leading to behaviors such as overparenting, distress intolerance, and hostility. Future interventions aimed at reducing parental distress intolerance and hostility, as well as educating parents about the impact of overparenting, may help reduce harmful parenting behaviors and in turn, EA depression and anxiety.

Surya Bhamidi

IL - University of Illinois Urbana-Champaign

Discipline: Engineering

Authors:

#1 Shaloo Rakheja

Abstract Name: Modeling Resistivity in Nanoscale Copper Interconnects

In this work, physical models of resistivity-size scaling and temperature effects in nanoscale copper interconnects are explored. Interconnects are a vital component of microprocessors, connecting elements within them. As microprocessors scale down in size, interconnects must also shrink. With decreasing size, the resistivity of interconnects becomes prohibitive to latency. As a result, analyzing an interconnect's resistivity at advanced technology nodes is important. Electron scatterings from phonons, grain boundaries and sidewalls are used in a model of resistivity versus interconnect size. Grain boundary scatterings are modeled using a reflectivity parameter R ranging from ideal case $R=0$ of no electron reflection at a grain boundary to

the worst case, $R=1$ where all electrons are reflected. Sidewall scattering contributions include sidewall roughness approximated to a sinusoidal form and use a different specular parameter p , which is dependent on the liner material used. Tantalum, modeled as non-conducting, and graphene, which is conducting, are considered as liner materials. To model temperature effects on resistivity, the Bloch-Grüneisen formula is used to model electron-phonon scattering. Our work shows that for a smooth interconnect of cross-sectional area 800 nm^2 and aspect ratio 2, as R increases from 0.25 to 0.75, resistance per unit length increases from $5.07\text{E-}2$ to $2.77\text{E-}1 \text{ Ohm/nm}$. As p increases from 0.25 to 0.75, resistance per unit length decreases from $3.21\text{E-}2 \text{ Ohm/nm}$ to $1.07\text{E-}2 \text{ Ohm/nm}$ for the same size. At the same dimensions, when surface roughness of 2 nm is added it accounts for 1.10% of the total resistivity. Roughness accounts for 15% of total resistivity when it is at 35% of total linewidth. We also discuss the role of topological metals in replacing copper as interconnects. Our work sheds light on the physics behind resistivity-size scaling in interconnects and can be used for interconnect design, optimization, and benchmarking at advanced technology nodes.

Krishna Bharadwaj

IA - University of Iowa

Discipline: Biology

Authors:

#1 Andrew Kitchen

#2 Michael Schneider

Abstract Name: Selection analysis of TBR1 gene in primates

The TBR1 gene encodes a transcription factor essential for the development of the brain, influencing cortical layer formation, cognitive development, and social behaviors. Although many primate species share the same TBR1 gene sequence, they exhibit distinct cognitive and behavioral patterns, suggesting that variations in TBR1 expression, rather than nucleotide sequence differences, may contribute to these disparities. This study aims to investigate whether changes in TBR1 gene expression in primates are linked to evolutionary fitness. In this first phase of our research, we analyze the TBR1 gene sequence across several primate species to identify signatures of positive or purifying selection. To assess this, we employ the PAML (Phylogenetic Analysis by Maximum Likelihood) software, which allows for the detection of selective pressures on the gene. Our findings will contribute to understanding how evolutionary changes in TBR1 expression may influence brain development and behavior in primates

Satyaj Bhargava

PA - University of Pittsburgh

Discipline: Engineering

Authors:

#1 Ben Cohen

#2 Minjie Wu

#3 Howard Aizenstein

#4 Tamer Ibrahim

#5 George Stetten

John Lorence

Abstract Name: A Novel Approach to Brain Vessel Segmentation Using MRI for Alzheimer's Disease Research

Alzheimer's disease is increasingly recognized as having a vascular component, with studies suggesting that impaired blood flow and vessel abnormalities contribute to cognitive decline. Consequently, methods to study the morphology of brain vessels are warranted. Current techniques allow for viewing 3D MRI brain scans to examine a patient's vessels, but automated methods to segment these vessels and obtain quantifiable metrics lack reliability and accuracy. We present a novel image analysis algorithm designed to accurately segment brain vessels from 3D MRI images, enabling more detailed analysis. Our algorithm begins by preprocessing the image into 'variance wells' (vWells), a type of 'superpixel' derived from the variance in the image's intensity. vWells are small, irregular, and relatively homogeneous clusters of adjacent pixels, which can be connected to segment objects in an image while preserving sharp boundaries. The computed vWells are arranged into a graph structure where vWells serve as nodes, and edges connect adjacent vWells. The algorithm takes two manually placed points along a vessel, then uses the graph structure to connect and complete the corresponding section of a vessel by leveraging the statistical relationships between adjacent vWells. Detailed visualization tools allow users to superimpose the segmentation as a semitransparent surface over the original MRI data, facilitating visual confirmation of segmentation accuracy. By combining these automated techniques with human supervision based on detailed visualization, our approach provides a robust and reliable method for brain vessel segmentation. Preliminary application of our method to segment the Circle of Willis arteries, a vital network for maintaining cerebral blood flow, in 27 time-of-flight MRI scans demonstrates its ability to consistently provide precise, quantifiable metrics (such as diameter, length, and curvature of vessel structures) across diverse 3D MRI datasets. This capability supports large-scale studies of vascular abnormalities linked to cognitive decline and advances Alzheimer's disease research.

Gauri Bhatia

PA - University of Pittsburgh

Discipline: Nursing and Public Health

Authors:

#1 Teresa Thomas

Abstract Name: Self-Advocacy Experiences of Individuals with Cancer Living in Rural and Low Socioeconomic Areas

Background/purpose: Patient-centered care depends on patients' ability to communicate values, needs, and priorities with their healthcare team ("self-advocacy"). Self-advocacy research has not addressed experiences of rural and/or low socio-economic status (SES) patient populations, limiting the ability to tailor interventions for these individuals. This study aims to describe self-advocacy experiences among underserved patients with cancer. **Methods:** We recruited adults with a history of cancer through an online research registry and an ongoing cancer clinical trial whose home addresses were considered (a) rural and/or (b) low SES determined by Rural-Urban Continuum Codes (RUCC) ≥ 4 and Area Deprivation Index ≥ 60 , respectively. Participants completed a one-on-one semi-structured phone interview regarding their cancer-related self-advocacy experiences. Qualitative data was organized and analyzed according to the RADaR qualitative approach to summarize participant-reported behaviors, barriers, and facilitators of self-advocacy. **Results:** Participants (N=30) reported a mean age of 62 years; 76.7% were female, and 70% had an advanced cancer diagnosis within the past 24 months. 23% live in a rural area and 100% live in an underserved area. Five major themes emerged from participants' self-advocacy experiences: the healthcare team, treatment process, barriers to care, connectedness, and advocacy. Various sub-themes were identified within each topic. Connectedness and barriers to care directly related to living areas were mentioned in half of the interviews analyzed. Participants either had implicit trust in their healthcare team or reported receiving inadequate, impersonal care. Many participants reported that their self-advocacy was either unproductive or not initiated. **Conclusions/Implications:** The results demonstrate that rural and low SES patients with cancer face barriers to accessing person-centered care. Future work should explore how to directly address these barriers. Our team is currently using these results to guide the development of a peer navigator intervention for high-need underserved cancer patients.

Samikshya Bhatta

WI - University of Wisconsin-Madison

Discipline: Biology

Authors:

#1 Dr. Vladislav Leonov

#2 Jay Jang

#3 Dr. Alexey V. Glukhov

#4 Dr. Timothy J. Kamp

Abstract Name: Dynamic Changes of Ca²⁺ Cycling During Neonatal Mouse Heart Regeneration

Myocardial infarction (MI) is a leading cause of heart failure, with high mortality rates due to the adult human heart's limited regenerative capacity, resulting in scar formation rather than myocardial regeneration. In contrast, some neonatal mammals, including mice, can regenerate damaged myocardium by reactivating cardiomyocyte proliferation. Intracellular Ca²⁺, a key second messenger in numerous signaling pathways, has only recently been implicated in cardiac regeneration. It was also found that the cardiac-specific protein LRRC10, that is crucial for cardiac regeneration, regulates transients (CaT) and CaT recovery was compromised in *lrrc10*^{-/-} zebrafish hearts, leading to impaired regeneration. However, the regulation of CaT required for cardiac regeneration remains poorly understood. The preliminary data for this study aims to elucidate the role of intracellular Ca²⁺ cycling in mammalian cardiac regeneration and its regulation. We hypothesize that the CaT properties change dynamically during neonatal heart regeneration in an LRRC10-dependent manner, and cholinergic and beta-adrenergic stimulation exhibit blunted regulation of CaT during neonatal mouse heart regeneration. To demonstrate the feasibility of our experimental approach, we conducted a pilot study using high-resolution optical mapping (3,333 frames/s, 60 microns per pixel) to measure CaT in neonatal mouse hearts. Control hearts (postnatal day 8, n=4) were compared to post-MI hearts (postnatal day 8, n=6) following surgical induction of MI on postnatal day 1. The hearts were Langendorff-perfused at 37°C and loaded with the Ca²⁺-sensitive fluorescent dye Rhod-2AM. Pacing was performed at a physiological rate of 10 Hz. We observed altered CaTs in post-MI hearts compared to age-matched controls, specifically a widespread reduction in CaT upstroke velocity and a trend towards shortened CaT duration. We anticipate that in wild-type (WT) hearts, these CaT alterations should be restored by P28 as the myocardium recovers, but not in *lrrc10*^{-/-} hearts.

Anvita Bhattad

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Mark Corkins

#2 Lance Davidson

Abstract Name: Deep Sea Adaptation to Hydrostatic Pressure

The planet is covered in extreme environments that are constantly changing. The organisms that live in these environments must adapt to the unique problems these environments impose. This research focuses on discovering how organisms adapt to living at the bottom of the ocean. One of the main problems this incurs is problems that arise from high hydrostatic pressure. High hydrostatic pressure is predicted to denature

proteins, increase the viscosity of fluids, and disrupt membrane dynamics. We aim to identify genes and pathways that are changed in response to changing pressures deep in the ocean. Other research groups have looked at the effects of pressure on individual organisms such as *Apostichopus japonicus* (sea cucumber) and *Bathycyma lactea* (sea limpet). In their research, they performed deep-seq experiments that looked at the transcriptional response of pressure. Our goal is to take these datasets and identify universal adaptations to increased hydrostatic pressure. To accomplish this, we are annotating these genomes in order to find homologous genes between these species. Then we plan on identifying genes that have a similar change in expression in response to changes in pressure. The genes identified from this analysis will be tested in a model organism to see if they confer resistance to pressure. Our research will help people adapt to working at extreme depths.

Anurag Bhattarai

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Samantha Golf

#2 Jenna Donohue

#3 Stefanie Robel

Abstract Name: Applying Novel Methods for Assessing the Blood Brain Barrier after Traumatic Brain Injury

Traumatic brain injury (TBI) affects over 10 million people annually and is induced by a mechanical force to the head. The subsequent injury is focal, diffuse, or a combination of both. Following a focal TBI, astrocytes become reactive and form a border that is thought to prevent blood leakage from broken vessels reaching the healthy surrounding brain. However, it remains unknown whether the blood brain barrier (BBB) is repaired on vessels damaged in the injury. In contrast, blood vessel breakage is rare in diffuse mild TBI (mTBI), but BBB impairment is abundant. Our lab previously demonstrated that, in the case of diffuse mTBI, astrocytes fail to assemble a protective border or to repair the BBB, leading to continual leakage of blood-borne factors into surrounding tissue even months after the injury. BBB disruption is linked to numerous neurodegenerative disorders; thus, it is of interest to have tools to assess BBB damage in the context of TBI to determine potential therapeutic targets. In the present study, we test the applicability of tools from other fields in a novel context: BBB and TBI. We show that mice expressing a green fluorescent protein (GFP) tag on the tight junction protein zona occludens 1 (ZO-1) can be employed to assess BBB changes after injury. We further demonstrate that, while protein cross-linking with paraformaldehyde (PFA) fixation frequently renders BBB protein antigens unrecognizable by antibodies, a 3% glyoxal fixation protocol allows for effective visualization and quantification of BBB and vasculature proteins after TBI using immunohistochemistry. Finally, we show that peripheral injection of the small, fluorescently-tagged molecule cadaverine can be used to reveal BBB damage several weeks after focal stabwound injury, which has not been previously reported.

Sarah Bhayani

AL - University of Alabama at Birmingham

Discipline: Psychology

Authors:

#1 Emily Johnston

#2 Isaac Martinez

#3 Raba Tefera

Abstract Name: End-of-Life Care and Bereavement: Impact on Siblings of Patients with Chronic Illnesses

Introduction: Cancer and advanced heart disease are the two leading causes of disease-related deaths among US children (1,2,3). With the time and emotional demands of caring for a critically ill child, the needs of siblings can be overlooked; the impact of end-of-life treatment on siblings is understudied (4,5). Thus, we conducted a secondary analysis of bereaved parent interviews to explore the impact of death on bereaved siblings. **Methods:** We performed a secondary analysis of semi-structured interviews of bereaved parents about their perspectives on high-quality EOL care. Interviews were conducted with bereaved parents in Alabama whose child (0-21 years at the time of death) died of cancer or advanced heart disease ≥ 6 mo before the interview. Although not directly asked about, quotes related to siblings were identified and inductively and iteratively grouped into themes by a coding team. **Results:** Sixty parents, representing fifty-one children, were interviewed. Forty-seven were mothers (78%), twenty-four (51%) were Black, and twenty-two (49%) were White. Twenty-seven (53%) children died of AHD and twenty-four (47%) of cancer. Children died at a mean age of 7.9y and a median of 3.4y before the interview. Many parents (36; 60%) discussed themes regarding the impact of end-of-life treatment on siblings. Parents identified changes in siblings during end-of-life care and bereavement, including difficulty expressing feelings, personality changes, and risky behaviors. Parents also discussed the importance of bereavement support for siblings, which they did not always have access to. To mitigate these effects, parents tried to make life as normal as possible for siblings. They looked for tangible support including childcare and monetary support from the community and medical team and guidance explaining end-of-life processes to siblings. **Conclusions:** While not specifically asked, many parents discussed the psychosocial health of bereaved siblings. This emphasizes the importance of addressing sibling well-being at end-of-life and in bereavement.

Simran Bhikot

GA - Augusta University

Discipline: Biology

Authors:

#1 Paul Langridge

Abstract Name: Producing and analyzing synthetic signals: sending and receiving cell populations in the *Drosophila* wing imaginal disc

Notch receptors, found across multicellular organisms, play critical roles in development and are implicated in diseases, notably cancer, due to system mutations. Operating via mechanosensitive activation, adjacent cell-derived ligand Delta binds to Notch, undergoing endocytosis and inducing mechanical stress on the ligand-receptor complex. This stress prompts structural changes in Notch's extracellular Negative Regulatory Region (NRR), leading to cleavage by ADAM protease and subsequent γ -secretase cleavage, releasing an intracellular domain that acts as a transcription factor, modulating Notch target genes. Recent advances have facilitated the development of synthetic Notch (synNotch), which can convey tailored signals from neighboring cells and holds promise for therapeutic interventions. SynNotch utilizes distinct ligand-receptor binding domains and incorporates foreign transcription factors to induce specific responses, such as producing GFP or eliciting therapeutic behaviors. However, understanding synNotch's functionality within tissue contexts still needs to be improved, requiring consideration of factors like tissue growth, cell arrangement, and response strength for effective therapeutic application. To investigate Notch receptor signaling, techniques involve generating cell populations with exclusive traits through recombinase-mediated ligand and receptor gene expression switching. Subsequent fluorescent immunohistochemistry of dissected wing imaginal discs allows visualization of ligand cells and signaling patterns under a fluorescent microscope. These experiments aim to characterize mechanosensitive receptors in *Drosophila*, design novel receptor combinations, and assess their impacts on fly wing and nervous system development, offering insights into mechanosensation and potential therapeutic avenues in developmental biology and neuroscience.

Ria Bhutani

CA - University of the Pacific

Discipline: Biochemistry

Authors:

#1 Skylar Carlson

Abstract Name: Mitigating Caffeine Toxicity in Planaria: Identifying Protective Agents in Evodia Extract

In Seattle, caffeine equivalent to the amount in 30,000 8-oz. cups of coffee is pumped out into waterways daily! The purpose of this project is to identify compounds in the fruit of the honey tree (*Evodia rutaecarpa*) that is native to Eastern China that block caffeine's detrimental effects on regenerating planaria. Caffeine has been called an "emerging chemical of concern" in local waterways because of its increasing concentration in drinking water supplies while causing conditions such as oxidative stress, reproductive issues, and even fatality in aquatic life (Vieira et. al., 2021). The available treatments for caffeine-polluted water all have drawbacks: high energy consumption, excessive chemical usage, high cost, and toxic by-products, to name a few; thereby making large scale implementation futile and this necessitates preventative measures (Raj et al., 2021). A compound in *Evodia* that has been shown, in part, to reduce caffeine-induced sleep disturbances in mice is evodiamine (Ko et al., 2018). The purpose of this study is to identify other compounds in *Evodia* that also reduce the negative action of caffeine. *Girardia dorotocephala* (planaria), a species of flatworms, was used as the model species because of its high regenerative capacity and the known detrimental impacts of caffeine on its growth. Preliminary data shows that planaria that were subjected to a treatment containing an extract of *Evodia* and caffeine showed lower levels of abnormal growth and death than those that were subjected to caffeine alone. The *Evodia rutaecarpa* extract will be fractionated and the resulting fractions will be tested for their ability to inhibit the deleterious effects of caffeine. The expected result of this study is that 1-2 fractions will have the desired activity and allow us to isolate the compound(s) that inhibit(s) caffeine degradation in regenerating planaria.

Adrianna Biddle

TX - The University of Texas at San Antonio

Discipline: Biology

Authors:

#1 Kamari Weaver

#2 Eden Francoeur

#3 Parithi Balachandran

#4 Ardian Ferraj

#5 Christine Beck

Abstract Name: Investigating the expression and regulatory differences of transposable elements between inbred laboratory mice.

Transposable elements (TEs) are repetitive DNA sequences capable of replicating and repositioning within the host genome. These elements make up over 40% of human and mouse genomes, with long interspersed nuclear elements (L1s) alone accounting for more than 20%. L1s have evolutionary significance, as their cis-regulatory motifs can be exapted for host benefit. Understanding TE expression and regulation across individuals within a population is imperative to inform future studies on mechanisms of variation and

evolution. This study evaluated TElocal, a tool designed to quantify TE locus expression in mouse genomes. We found that monomeric repeat variation (MRV) of L1MdTf promoters may alter expression of L1 elements, leading us to hypothesize that TE insertions will have variable expression between mouse strains, and that MRV may cause this variability. Using previously generated mESC RNAseq data from 10 inbred mouse strains, we obtained gene and transposon locus read counts from TElocal (v1.1.1). Outputs were normalized using DESeq2 R package [v1.44.0]. Normalized read counts were correlated with MRV data, and the identified intergenic L1 loci expression levels were compared between each strain. We observed differential expression of L1 loci between strains and found that promoter length influenced variable TE expression. To validate TElocal's performance, we compared the expression of intronic L1 loci with their associated genes. For instance, within the highly expressed gene Phf14, the intronic L1 showed significantly lower expression across all strains, with minimal correlation between gene and L1 expression variability. These findings demonstrate that MRV can alter TE expression and that genic TE insertions have a different regulatory landscape than intergenic insertions. TElocal proved effective for investigating allelic heterogeneity and regulatory effects of TEs. Future studies will use this tool to explore cis-regulatory elements binding TEs and assess TE influence on gene expression across tissues and evolutionary timelines.

Atche Bilyal

GA - Brenau University

Discipline: Business

Authors:

Abstract Name: How Governance Practices and Strategic Decision-Making Influence Financial Performance in Family-Owned Businesses in North Georgia, USA

This research examines how governance practices and strategic decision-making influence the financial performance of family-owned businesses in North Georgia, USA, addressing a gap in existing literature by clarifying links between governance structures, strategic choices, and measurable outcomes. These enterprises face unique challenges due to intergenerational ties, overlapping roles, and distinctive frameworks. Focusing on leadership roles, decision-making procedures, and succession planning, it measures their combined effects on Return on Assets (ROA), revenue growth, and profit margins. Adopting a mixed-methods design, this study combines structured surveys and in-depth interviews with business owners and executives, conducted in cooperation with the local Chamber of Commerce. This approach ensures findings remain grounded in real business conditions, offering insights valuable to local and similar contexts. Additionally, the secondary data broadens the analysis, revealing how industry-specific and macroeconomic factors shape results. Guided by stewardship theory, which highlights leaders' intrinsic motivation to serve their enterprises' long-term interests, this investigation shows how thoughtful governance and informed strategic decisions can address complexities in family business structures. Although centered on North Georgia, this study's frameworks can guide governance improvements and strategic refinements nationally and internationally. By integrating quantitative and qualitative methods, this research enriches scholarly dialogue on family business management and bridges the gap between academic research and practice. In demonstrating how prudent governance and informed strategies bolster financial performance across varied environments, this study underscores its significance for diverse economic landscapes and offers adaptable, evidence-based guidance well beyond the region examined.

Audrey Birdwell

TN - Lipscomb University

Discipline: Biology

Authors:
#1 Joshua Owens

Abstract Name: Exploring Carnitine-Dependent Mechanisms of Valerobetaine in Breast Cancer Migration Inhibition

Breast cancer results in roughly 297,500 cases each year in the United States with over 43,000 deaths. These deaths result from the ability of cancer to break the cell life cycle and uncontrollably proliferate and metastasize throughout the body. Notably, more than 75% of breast cancer related deaths are due to metastases. The hallmark of reprogramming cellular metabolism enables cancer cells to augment fat metabolism in addition to glycolysis, driving increased tumor aggressiveness and heightened metastatic rates. Currently, there are no FDA-approved drugs that specifically target metastases or inhibition of migrating cancer cells. Therefore, potentially inhibiting fat metabolism could cause a reduction in metastases and migration of cancer cells; however, current inhibitors of fat metabolism are extremely toxic and have not been translated to the clinic. Previously, we discovered Valerobetaine (VB), a microbe-derived, non-toxic molecule capable of inhibiting fat metabolism, as a potential therapeutic. Initial experiments focused on demonstrating that VB could reduce the migration of MCF-7 breast cancer cells under fatty acid supplementation using scratch assays. These studies confirmed that VB mitigates the pro-migratory effects of increased fat metabolism. Subsequent research explored VB's mechanism of action, hypothesizing that it functions through carnitine-dependent pathways. Through treatment groups including carnitine supplementation and utilizing scratch assays, we observed that VB's inhibitory effect on migration was reversed, implicating the carnitine shuttle in its mechanism. These findings suggest VB as a promising co-therapeutic for reducing metastatic behavior in breast cancer, supporting its potential translation into clinical use.

Sonia Birla

NC - University of North Carolina at Charlotte

Discipline: Geography/Geology

Authors:
Flavia Moore

Abstract Name: The Lasting Consequences of Climate Change on Crop Cultivation in Eastern Thailand

This research sought to determine the lasting consequences of climate change on tropical crop cultivation in Eastern Thailand, mainly the Chanthaburi province. This region grows many crops, but durian, a cash crop, has significant market demand domestically and internationally. During June-July 2024, the research team conducted structured interviews with fifty-two farmers in Eastern Thailand. Furthermore, they conducted ten semi-structured interviews with key stakeholders in government offices related to agriculture, experts from crop-specific trade associations, and researchers focused on agricultural economics. Through these methods, they found that climate change fundamentally altered agricultural practices in Eastern Thailand. Findings reveal that climate change has fundamentally altered agricultural practices in the region, with water-related challenges—such as drought, flooding, and rain variability—emerging as the most significant drivers of impact. Farmers consistently cited water shortages, access limitations, and management difficulties as major concerns. Additional climate factors, such as temperature fluctuations, heat, wind, and seasonality further threaten crops. These weather patterns have led to increased crop stress, diminished yields, and lowered produce quality, particularly for water-intensive crops like durian. Shifting seasonality and shortened growth cycles further disrupt agricultural operations, leading to unpredictable harvest times and increased input costs. Despite limited government support, farmers have demonstrated resilience by adopting adaptive strategies such as intercropping, improving water management infrastructure, and diversifying crop types. However, these measures often require significant financial investment, limiting access for smaller farms and exacerbating economic inequalities. Farmers also expressed concerns about the sustainability of certain

adaptation practices, which may inadvertently contribute to long-term environmental degradation. Yet, despite these crises and difficulties adapting in the long run, market demand for durian continues to drive decision-making.

Shriya Biswas

NY - Union College

Discipline: Health and Human Development

Authors:

Abstract Name: Exploring Disparities in Metastatic Breast Cancer Treatment Timeliness

Healthcare inequity is a global challenge, with individuals in low- and middle-income households disproportionately affected by conditions such as metastatic breast cancer, which require timely detection and treatment. This study aims to develop predictive models that promote health equity by using diverse, representative data to identify and address health disparities in cancer care. Specifically, we examine how factors such as socioeconomic status, geographic location, race, gender, and access to healthcare resources influence treatment accessibility and diagnostic timelines. We analyzed a dataset containing 13,173 metastatic breast cancer patient records, including demographics, diagnoses, treatment options, and insurance data. Through exploratory data analysis, ANOVA, and correlation analysis, we investigated how these factors relate to the waiting period to treatment. Our findings revealed that payer type and race significantly influenced the time to treatment, suggesting potential disparities in access to or quality of care. Correlation analysis indicated weak or negligible relationships between metastatic diagnosis periods and individual factors such as age, household median income, and BMI. Addressing these disparities could help improve the equity and quality of cancer care, ultimately reducing differences in treatment timelines and patient outcomes.

Alexandra Biternas

CA - California State University - Bakersfield

Discipline: Biology

Authors:

#1 Jennifer Manilay

Hannah-Betty De Moica

Abstract Name: The Impact of Von Hippel-Lindau (VHL) Gene Knockout in Osteocytes on Bone Marrow Microenvironments and B Lymphocyte Development

Little is known about the effects of environmental factors, particularly oxygen levels, on B cell development and immune function; specifically focusing on the role of the Von Hippel-Lindau (VHL) gene. B lymphocyte development is influenced by microenvironments during periods of altered homeostasis, but the exact impact of hypoxic conditions and VHL deficiency in early osteoblasts on bone marrow is not well understood. We hypothesized that an inducible VHL gene knockout reporter in early stage osteoblasts would alter bone marrow function and subsequently affect B cell development. Using techniques such as tissue digestion, hemocytometer cell counting, and flow cytometry (FACS), we examined green fluorescence protein (GFP) expression in VHL homogenous knockout mice (Tagln-ERT2-Cre;Ai213;Vhlfl/fl) treated with tamoxifen. GFP detection in single-cell suspensions from duodenal tissue resulted in 0.14% detection compared to non-induced controls. Further work will focus on confirming the VHL knockout via DNA extraction from heterogeneous Vhlfl/+ mice and more thoroughly analyzing any impacts on bone marrow deficiency and B

cell development. Analyzing these changes results longitudinally may be helpful in determining how microenvironmental changes may result in delayed progression of B cell development.

Alexandra Biternas

CA - California State University - Bakersfield

Discipline: Biology

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#1 Jennifer Manilay

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Madison Blackerby

GA - University of West Georgia

Discipline: Political Science

Authors:

#1 Madison Blackerby

Abstract Name: Priced out of Life: Alabama's Insulin Crisis

Alabama's high insulin costs are bankrupting people and dragging down the state's economy. The rising cost of insulin is such an essential topic to many people because in Alabama, almost everyone knows and loves someone who is affected by diabetes, whether it be type one or type two. Diabetes affects children, teens, and adults, and people with type 1 diabetes depend on insulin every day. The unequal distribution of diabetes is caused by several factors, including age, race, socioeconomic level, genetic susceptibility, lifestyle, and underlying medical disorders. This problem is more prevalent in rural areas and low-income communities across Alabama. It is essential to comprehend how diabetes impacts different populations to create effective preventative and treatment plans. We also must consider the accessibility to these treatment plans and see if insulin at its varying prices is affordable for families and individuals afflicted with this disease. Our research shows that the high insulin cost is primarily due to market and government failures. The market failure in the insulin industry can be attributed to the lack of competition. The government's failure is due to Alabama's

unwillingness to expand Medicaid despite the fact that many low-income individuals lack insurance that may reduce the cost of insulin. Through a case study of Alabama's insulin crisis, I expect to find evidence to demonstrate how high cost of insulin affects vulnerable populations by showing the existing insurance and coverage gaps and how these require governmental action at the state level.

Jack Blackmar

PA - Lafayette College

Discipline: Engineering

Authors:

#1 Jack Blackmar

#2 Ryan Rosario

Abstract Name: Investigating the Role of Interfascicular Matrix During Ligament Failure

Ligaments and tendons have spatially heterogeneous mechanical properties that are poorly understood. At the mm-length scale, ligaments and tendons are composed of fascicles, which are collagen-dense stiff and aligned fibers, and a compliant interfascicular matrix (IFM) that connects the fascicles. Despite the differences in these components, previous studies have treated ligaments and tendons as homogeneous materials. Making this assumption is useful when testing materials because it allows for the identification of material properties and simplifies the mathematics needed to calculate strain data. This method relies on the hypothesis that the pre-failure portion of the stress/strain relationship in ligaments is entirely dependent on the behavior of fascicles. As a result, past research has primarily focused on fascicle-direction loading. However, more recent research has sparked debate about where failure in ligaments begins, as fatigue failure could be a result of microtears in the IFM, fascicles, or both. Given that the IFM is a material that is not well understood, and therefore an individual model for the IFM is needed before we can fully understand how ligaments and tendons behave. This study aims to isolate and begin characterizing the mostly unknown mechanical properties of the IFM. To do this, we will perform ligament tensile tests in a novel orientation. Previous studies have sliced in between fascicles in order to easily get thin sections of tissue. However, we have developed a unique tool that allows us to consistently create thin sections while slicing through the stiff fascicles. Additionally, we developed an original staining protocol that aids in fascicle/IFM identification without altering the mechanical properties of the material. Combining our data with existing data will help create a more robust model for IFM behavior, and gaining this knowledge will help create models that can accurately predict failure in ligaments and tendons.

William Blair

PA - Lafayette College

Discipline: Engineering

Authors:

Abstract Name: Assessing the Impacts of Beaver Dam Analogues on Stream Morphology

Beaver Dam Analogues (BDAs) are temporary, semi-permeable structures built by humans to replicate the environmental impacts of natural beaver dams on streams. Made out of wooden posts and willow branches, BDAs are a low-tech, low-cost solution that can be implemented in streams as a restoration method, specifically in streams that experience more erosion from fast water flowing through narrow parts of the channel. BDAs are intended to reduce erosion and increase deposition in the channel. It is hypothesized that

BDAs cause the stream width to increase. However, the specific impacts of BDAs on stream geomorphology are still unknown. Here we show how stream width varies in proximity to BDAs compared to how stream width fluctuates under non-BDA conditions for a restoration site along Red Canyon Creek near Lander, Wyoming, USA. We specifically examined stream widths directly at the BDA and 0.5 meters upstream of the channel for BDAs 12 through 29 using daily data for the years 2017, 2019, 2021, 2022, and 2023. We compared how the stream width for each BDA changed from 2017 to 2023. From our collected data, we found that from 2021 to 2023 100% of the stream widths measured at BDAs became wider and 94% of the stream widths measured 0.5 meters upstream of the BDA became wider. Wider stream widths likely occur as BDAs alter flow patterns, directing the stream into the side of the channel. Our results show that the installation of BDAs in streams has potential to cause the stream width to increase and to overall aid in stream restoration. Altogether, our results provide useful information regarding the impacts of beaver dam analogues as an affordable solution when considering how to improve the ecological health of streams.

Chesley Blake

SC - University of South Carolina - Columbia

Discipline: Biology

Authors:

#1 Chesley Blake

#2 Douglas Pittman

#3 Angelica Balcarcel

Abstract Name: Discovering Drug-Like Compounds by Targeting Protein Interactions Using a Yeast-3-Hybrid System

Traditional drug therapies often target a limited number of conserved sites, such as ATP-binding regions. However, the use of these sites often leads to off-target toxicity in both malignant and normal cells, limiting therapeutic specificity. Current research on non-ATP inhibitors can identify more effective drug targets that promote selective apoptosis, specifically in cancer cells. This study is using yeast (*Saccharomyces cerevisiae*) as a model system to investigate protein interactions and design specific peptides with the intention to disrupt interactions specific to cancer cells. The objective of this project is to detect interactions between retinoblastoma (RB1) and human Cyclin A (CCNA2) in Yeast-2-Hybrid (Y2H) and Yeast-3-Hybrid (Y3H) systems. CCNA2 and RB1 were cloned into two different expression vectors, pGBK and pGAD. Once the CCNA2-RB1 interaction is detected using the activation of reporter genes in a Y2H system, a third plasmid that encodes for the amino acid sequence HAKRRLIF will be introduced. This peptide sequence was previously demonstrated to disrupt the CCNA2-RB1 interaction in vitro, so the expectation is that it will disrupt the protein-protein interaction in the Y3H system as well. Following this proof of principle, an oligo/peptide library will be generated to develop a high-throughput screen for disruption of any combination of protein interactions. Promising candidates will be converted into peptide-mimetic compounds. Then, the inhibitory drug-like compounds will be optimized into pharmaceutically relevant compounds using REPLACE (Replacement with Partial Ligand Alternatives through Computational Enrichment) technology. Using the Y3H system, drug-like compounds can be developed with the ability to disrupt protein interactions specific to cancer cells.

John Blazakis

PA - Lafayette College

Discipline: Economics

Authors:

Abstract Name: Assessing the Impact of State-Contingent Debt Instrument Issuances on Industrial Development in Emerging Markets

Nations are increasingly relying on capital markets to stabilize their economies, posing significant challenges and opportunities that could lead to either a debt crisis or financial prosperity. Innovative sovereign debt restructurings have been more common because of this growing financialization, leading to the increased use of state-contingent debt instruments (SCDIs). SCDIs are floating rate bonds that are typically linked or indexed to variables or events such as a country's GDP to improve a debtor country's capacity to service their debt. The impact of SCDIs on spurring industrial growth is not clear. The proliferation of industrial projects such as public transportation highlights the importance of recognizing the role of how national debt can affect infrastructure. Using aggregated SCDI issuance data from 25 countries from South America, Africa, and Europe over 1989 to 2020, this paper tests the effect of these issuances on infrastructure development. I examine both public and private sector projects using a method of an instrumental variable regression. I also explore the effectiveness of SCDIs on domestic growth in crisis versus non-crisis situations through case studies of Greece, Portugal, and Ukraine. I hypothesize that SCDI issuances have proven to be effective in sovereign debt management; thus, I expect there to be a positive effect on infrastructure development and the effect to be larger on public sector projects than in the private sector.

Ella Bleak

UT - University of Utah

Discipline: Biology

Authors:

#1 Talia Backman

#2 Talia Karasov

Abstract Name: Understanding Weapons of Bacterial Warfare

Phage-tail-like bacteriocins, also known as tailocins, are virus-like toxins used by bacteria to compete with other bacteria for resources. Tailocins have highly specific killing abilities; they can kill genetically closely related bacteria, but not the producing strain or more distant bacterial relatives, and because of this specificity they are promising alternatives to antibiotics. In 2019, the CDC estimated more than 2.8 million antibiotic-resistant infections occur in the U.S. annually, with more than 35,000 deaths. As antibiotic resistance is becoming more prevalent, alternative therapies are becoming increasingly necessary. To ultimately develop tailocins for clinical treatment, more research is needed to understand the underlying mechanisms of tailocin specificity. The Karasov Lab studies tailocins produced by wild populations of the pathogenic bacterium *Pseudomonas syringae*, an abundant pathogen that infects the model plant, *Arabidopsis thaliana*. We found that tailocins are highly conserved in wild populations of *P. syringae* and frequently used in bacterial competition amongst pathogenic strains. We identified 70 genes in the *P. syringae* genome which were involved in a bacterial sensitivity to a tailocin. 6 were involved in the biosynthesis of the O-Antigen Polysaccharide (O-PS): an important part of the lipopolysaccharide (LPS) found on gram-negative bacterial membranes which contain long sugar chains. Tailocins bind target cells with high specificity by using their tail fibers to interact with target cell O-PS akin to a lock and key interaction. My current research aims to broadly characterize the LPS of strains of wild *P. syringae* to identify relationships between LPS composition and sensitivity to tailocin. Additionally, I aim to identify specific sugar monosaccharides that make up the O-PS which the tail fibers bind to. This research will greatly contribute to the understanding of tailocin-LPS interactions to better understand how tailocins identify and kill their targets, and how bacteria evolve resistance to tailocins.

Alexander Blevins

KY - University of Kentucky

Discipline: Engineering

Authors:

#1 Alexander Blevins

#2 Jesse Cox

#3 Philip Lee

Jesse Cox

Abstract Name: Sustainable Green Hydrogen Stations for Hydrogen Vehicles in Kentucky

Our previous research was working on sustainable photovoltaic (PV) uses and a hybrid between hydrogen generation and PV energy. With the decline in natural resources and limited recycling options for electric vehicle batteries, we have expanded our research to utilize green hydrogen for hydrogen vehicle stations using excess PV energy. Hydrogen is a reliable source of energy for the future of vehicles, as it is clean, reliable, and can be generated through hydrolysis with minimal risks. Hydrogen production through hydrolysis, using Polymer Electrolyte Membrane (PEM) electrolyzer, results in electricity, water vapor, and heat as byproducts. The ways that hydrogen can be produced vary on a large spectrum. Hydrolysis splits water into hydrogen and oxygen, in which we can store the hydrogen in hydrogen fuel cells. Any type of energy source such as geothermal, biomass, solar, and wind can produce hydrogen for vehicles or other applications. This is due to the hydrogen being split by electricity during hydrolysis. In this study, we focus on the feasibility of on-grid PV-based hydrogen charging stations, leveraging existing PV data and excess electricity from current load profiles for hydrogen conversion across Kentucky. Considering energy sources, some are more hazardous and expensive. Hydrogen poses minimal risk and produces only a small amount of heat. Although it is combustible, just like gasoline, hydrogen can be stored safely. Using our modeling and simulations, we projected hydrogen production and utilization for light and heavy-duty hydrogen vehicles. Introducing hydrogen stations offers a practical alternative to gas stations, addressing energy sustainability while mitigating recycling challenges.

Annie Blevins

AR - Lyon College

Discipline: English and Literature

Authors:

#1 Terrell Tebbetts

#2 Melissa Merte

Abstract Name: Morgan Le Fay: Chivalry's Hidden Threat

Once portrayed as a wise healer, the mythological character Morgan Le Fay changed in literature after her disagreements with King Arthur, quickly becoming a deceiving temptress. She fits this evil characterization in Sir Gawain and the Green Knight, creating a game to trick Arthur's knight, Gawain, and reveal the flaws of knighthood in general. Her significance as a character is highlighted in this story, as she is the one responsible for the entirety of Gawain's adventures. However, she is not revealed as the puppet master until the end of the story, in which she is briefly introduced by the Green Knight, receiving all of the blame for the suffering of Arthur's knightly court. Many scholars have argued that this delayed revelation strategically overshadows Morgan's power and control over the narrative, attempting to obscure the fact that a female figure is responsible for defaming knighthood. I add to this argument that this obscurity is necessary to hide the reality of the weakness of knighthood and patriarchal dominance, both relying on women to be able to perform their

duties. Morgan playing the role of the puppet master of this threat to knighthood and chivalry symbolizes the real threat to King Arthur's court, knighthood, chivalry, and male power: women. Through hidden control and manipulation of Gawain's decisions, Morgan leaves a lasting effect on not only Gawain, but knighthood and chivalry together, symbolized through the green girdle, the beheading game, and the reversal of typical gender roles of herself and Lady Bertilak. Hidden, dominant, feminine, and successful, Morgan is concealed from the plot of the story to warn of what can really happen if women are granted control.

Bailey Blewitt

DE - University of Delaware

Discipline: Criminology/Criminal Justice

Authors:

#1 Bailey Blewitt

Abstract Name: Lower Your Expectations: A Quantitative Analysis of Individual-Level Factors Influencing Black and Latino IPV Survivors' Experiences of Institutional Betrayal by the Criminal Legal System

This study investigates the impact of individual-level factors on institutional betrayal (IB) among Black and Hispanic victims of intimate partner violence (IPV) who interacted with the criminal legal system (CLS). A total of 199 participants who are 18 years or older, identify as a woman, transgender, or nonbinary, have experienced IPV, and identify as Black and/or Hispanic completed a Qualtrics survey assessing their experiences with IB. The Institutional Betrayal Questionnaire (IBQ-2), adapted for the criminal legal context, was used to assess participants' experiences. ANOVA analyses were conducted to examine the relationships between IB scores and various individual characteristics: age, presence and number of children, education, employment status, and sexuality. Results revealed significant differences were observed in IB scores by age, with younger participants (18-29) reporting higher levels of betrayal compared to older participants (40+). The presence of children was associated with lower IB scores, and individuals with more children reported lower levels of institutional betrayal than those with fewer children. Higher education levels were linked to greater perceptions of IB, and full-time employed individuals reported higher IB scores compared to part-time or unemployed participants. Finally, LGBTQ+ individuals experienced higher levels of institutional betrayal compared to heterosexual participants. These findings underscore the critical role of expectations in shaping perceptions of IB in the CLS. The study highlights the importance of understanding how individual expectations of victim/survivors affect experiences of IB and suggests that institutions must address these factors to offer more equitable and supportive responses.

Jared Blichfeldt

WI - University of Wisconsin-River Falls

Discipline: Education

Authors:

#1 Satomi Shinde

Abstract Name: Artificial Intelligence Use in Classrooms

The world of deep-learning artificial intelligence is still new and underexplored in a wide range of fields. One such area is that of education. Artificial intelligence use in classrooms is underutilized, and many educators still have mixed feelings about how A.I. might be integrated. Looking into the limited available research, as well as engaging with current and future educators, one finds the many different ways that artificial

intelligence can be used to assist educators with grading and creating assignments, as well as students in a wide range of classes, including those in special education (Rice, 2022). Based on prior research conducted regarding artificial intelligence use in classrooms, survey questions were developed and distributed to the participants (N = 188) (i.e., 76 teachers at different education levels, elementary to university, as well as 112 current undergraduate teacher education students). These responses were analyzed using SPSS 29 to investigate differences among grade levels, fields of education, and those with and without classroom teaching experience. Amongst the responses, participants generally agreed that artificial intelligence could be used to grade close-ended questions, though greatly opposed letting A.I. grade open-ended questions. There were significant differences in the responses based on the participants' levels. Responses also indicated that educators believe older students would be more likely to use A.I. to cheat. Many current educators also believe A.I. will become commonplace in schools, though many undergraduate students said the opposite. The responses to the survey indicate that many people are still unsure about A.I. or do not feel confident or knowledgeable about it. While education is a human-focused field, deep-learning artificial intelligence has the potential to be of great benefit to both students and educators provided more research is conducted.

Autumn Blommer

MN - St. Catherine University

Discipline: Biology

Authors:

#1 Autumn Blommer

#2 Kellie Agrimson

Abstract Name: Tsc1 Gene Annotation in Newly Sequenced *Drosophila*

Diabetes Mellitus (Type I and II) represents a growing health crisis, with over 10.5% of the U.S. population diagnosed and 34.5% of adults prediabetic, as reported in the 2020 National Diabetes Statistics Report. Both conditions increase the risk for a range of comorbidities, including cardiovascular diseases, blindness, and neurodegeneration. Insulin resistance, a hallmark of Type II diabetes, is influenced by genetic factors, obesity, and diet. Studies in model organisms like *Drosophila melanogaster* have revealed conserved genetic pathways related to insulin signaling that may provide insights into the molecular mechanisms underlying insulin resistance. For example, *D. melanogaster* genes like Tuberous sclerosis complex 1 (Tsc1), and insulin-like peptides, play critical roles in insulin signaling, with mutations in these genes affecting oxidative stress, growth, and lifespan. This study is part of the Genomics Education Partnership's (GEP) Pathways Project, which focuses on annotating genes within conserved metabolic and signaling pathways, particularly the insulin signaling pathway, across various *Drosophila* species. The primary aim of this project is to annotate the genes Tsc1 in nine newly sequenced *Drosophila* species, to explore the evolutionary conservation of these genes and their regulatory regions. Using bioinformatics tools such as the UCSC Genome Browser, FlyBase, Gene Record Finder, and NCBI BLAST, we identified gene orthologs, examined their genomic neighborhoods, and constructed gene models based on the genomic data. By comparing the gene structures and their evolutionary conservation across species with decreasing similarity to *D. melanogaster*, we aim to deepen our understanding of insulin signaling and its regulation. Ultimately, this research will contribute to the broader goal of elucidating how gene regulatory regions evolve in the context of conserved pathways and their implications for human health.

Katy-Jan Bobseine

AZ - Embry-Riddle Aeronautical University

Discipline:

Authors:
#1 Katy-Jan Bobseine

Abstract Name: Mentoring Beyond Our Ken: Uncovering Interdisciplinary Research Potential

While a growing body of literature speaks to the benefits, best practices, and methodologies of undergraduate research, relatively little guidance exists for faculty mentoring research outside their disciplines. We tend to supervise projects that advance our own research areas or, at a minimum, pertain to those subjects we teach, and most students gravitate toward mentors who are experts in their proposed field of research. Given a natural inclination to build upon our core expertise, what cause is there to deviate from a well-established formula for mentor-mentee relationships? This researcher proposes three reasons, based on firsthand experience, to consider deviating from the standard path: meeting student need, facilitating interdisciplinary collaboration, and uncovering exciting new opportunities for mentor and student growth. My ongoing role in advising research beyond my discipline began with two students seeking a mentor who could help them investigate incentives and barriers to cybersecurity education. These undergraduate researchers recognized the potential for a professor outside cybersecurity to lend fresh perspective on their topic and needed someone willing to engage with sometimes unfamiliar terminology, concepts, and issues. The ensuing partnership has illuminated how much good communication, strong research methodology, and equal amounts of humility and curiosity can transcend topical divides. Crossing subject matter borders is not without its challenges. When faculty from disparate fields team up to co-mentor interdisciplinary projects, they benefit from a safety net of both resources and knowledge, supporting each other in times of need. Navigating this process alone whilst guiding research outside your area of expertise can be uniquely taxing, yet also provides opportunities for mentor resourcefulness and academic enrichment. Additionally, students may feel more empowered to contribute in areas that draw primarily from their major focus. This research aims to further an exploration of the limitations, benefits, and different approaches to interdisciplinary mentoring partnerships.

Sathvik Bodepudi

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:
#1 Steven Pogwizd

Abstract Name: Exploring circadian variations in autonomic input preceding ventricular tachycardia and ventricular fibrillation: a pathway to predictive models for sudden cardiac death

This study investigates circadian variations in heart rate variability (HRV) and nonlinear dynamics (NLD) leading up to VT/VF cardiac arrests among in-hospital patients, with a focus on comparing these patterns with a standard control group, ultimately aiming to develop predictive models for sudden cardiac death (SCD). Sudden cardiac death (SCD) remains a significant public health concern, affecting between 300,000 and 400,000 Americans every year. Ventricular tachycardia (VT) and ventricular fibrillation (VF) are leading causes of SCD, often occurring unpredictably. There is a time-of-day variation in SCD with an early morning predominance that corresponds to early morning increase in sympathetic nervous activity. Analyzing HRV and NLD can reveal autonomic changes that precede these life-threatening arrhythmias. We examined telemetry ECG data from patients who experienced VT/VF cardiac arrests at UAB Hospital, excluding those in ICUs or with conditions such as metastatic cancer. Using Kubios HRV Scientific analysis software, we assessed HRV indices (e.g., LF/HF ratio, RMSSD, TINN, AC) and NLD parameters (e.g., DFA α 1, DFA α 2, sample entropy). Our study underscores the importance of considering temporal patterns in arrhythmogenesis and supports the potential for HRV analysis in predicting sudden cardiac death. By comparing these patterns with a control, insights into the specific mechanisms underlying ventricular arrhythmias can be elucidated.

This will also allow us to develop predictive analytics to help identify patients who are at risk for sudden death using HRV analysis of their ECG along with clinical factors (e.g. presence of CAD and/or CHF).

Courtney Boese

MT - Montana State University - Northern

Discipline: Education

Authors:

#1 Courtney Boese

#2 Emily Kolstad

#3 Chad Spangler

#4 Barbara Zuck

Emily Kolstad

Abstract Name: Impact of Live Harp Music on College Students' Heart Rates During STEM Exams: Role of Anxiety and Learning Style

This study explored the effect of live harp music (LHM) on the heart rates of college students during a series of STEM exams. The initial research questions aimed to determine if LHM would decrease students' heart rates during an exam, and if students' anxiety and/or learning style mattered. Music has been associated with its ability to reduce anxiety, but research related to how live harp music interacts with individual traits like anxiety levels and learning styles is lacking. Insights into how music interventions may improve testing performance may be valuable. Within a repeated-measures experiment, college students in a STEM course completed one exam in a quiet environment and the next exam, 3-weeks later, in the same environment but with music from a therapeutic harpist. Mean heart rates, state anxiety scores, and learning style preferences were recorded and analyzed. ANOVA analyses resulted in a linear model with an adjusted R² of 79.97% in which learning style, state anxiety and live harp music interacted to account for the majority of the variance found in students' exam heart rates. Results suggest that the effect of harp music during an exam depends on students' state anxiety and learning style preference. Increased heart rates were observed in students with higher state anxiety and preference for visual learning during the exam with live harp music. Students with non-visual learning preferences and lower state anxiety were less affected by live harp music or protected from exam-related physiological arousal.

Samantha Bogart

FL - The University of Tampa

Discipline: Exercise Science and Nutrition

Authors:

#1 Samantha Bogart

#2 Abraham Miller

#3 Erin Koterba

#4 Amy Elliot

Abraham Miller

Erin Koterba

Abstract Name: The New Way to Train: Social Anxiety Related to Exercise, Online Fitness Programs, and the Motivators and Barriers to Exercise in College Students

Feelings of hesitancy and anxiety when attending a gym are common among those who exercise less frequently and can significantly impact one's motivation to engage in physical activity. On average, university students report being sedentary for 7.29 hours per day. To meet the CDC recommendation of 150 minutes of moderate weekly physical activity, students must have consistent, frequent exercise habits. The goal of the current study was to explore how anxiety is tied to gym attendance. Participants included 333 individuals who were, on average, 19.5 years old (SD=1.55, Range=18-34). Most participants (263) were female, and over half had attended a gym within the last week. Participants completed an online questionnaire that assessed gym and exercise habits, motivators and barriers to exercise, and anxiety levels, including social anxiety related to exercise. Preliminary t-test results suggested that frequency of gym attendance was tied to both perceived barriers and motivators related to their gym attendance. Namely, people who attended the gym less than once a week cited more barriers that prevented them from going than those who attended more than once per week. Conversely, those who exercised more than once a week identified several motivators to exercise compared to those who did not exercise as frequently. In addition, those who exercised less frequently reported higher levels of social anxiety related to exercise than the more frequent exercisers. Finally, correlational analyses revealed that those with higher levels of general anxiety perceived more barriers to exercise than those with lower levels of anxiety. Similarly, those with higher levels of anxiety had fewer motivators. Our results suggest that anxiety may be related to reluctance to attend the gym. Addressing the major barriers anxiety may present could play a role in encouraging more consistent gym participation and promoting physical activity.

Abrianna Bohn

OK - University of Central Oklahoma

Discipline: Art History

Authors:

#1 Abrianna Bohn

Abstract Name: Experiencing Multiculturalism in a Cultural New World Order

In a world of ever-increasing connectivity, our society's stratification through the use of identity rhetorics and monocultural dominance has established an unwelcome precedent for multicultural people. While many scholars focus on this endless diversification of identities by which to seclude ourselves within multiculturalism, this paper will examine the challenges of existing as simply a multicultural person. The paper poses questions as to what defines multicultural people and the positives and negatives of their multicultural existence. This study is based on sociological research of multiculturalism, personal perspective, and critical analysis of modern artists that fall within the multicultural category. I will argue that multiculturalism is vastly misunderstood on academic, social, and artistic levels, while still reflecting the positive ideal of what modern society should be striving for in the general populace.

Murphy Boksanski

CA - University of San Francisco

Discipline: Anthropology and Archaeology

Authors:

#1 Murphy Boksanski

Abstract Name: Communicating Scientific Research to the General Public: Eutrophication in the Red Cedar Watershed, Wisconsin

The Red Cedar Watershed, located in Western Wisconsin suffers from eutrophication; an over enrichment of phosphorus and nitrogen. While eutrophication and the green coloring it brings to Dunn County's lakes, Menominee and Tainter, has been a great community concern in recent years, there is no clear discourse on the causes and effects of eutrophication in the Red Cedar Watershed. Since 2014, UW-Stout's Linking Applied Knowledge in Environmental Sustainability, or LAKES program has been conducting research to find what is causing lakes Menominee and Tainter to turn green. In 2024, with the help of mentors Dr. Tina Lee and Arthur Kneeland of the University of Wisconsin-Stout, I researched how we can communicate the LAKES findings from 2014-2023. This process consisted of familiarizing myself with the topic by reviewing all eighty-six past LAKES research projects, conducting a literature review on scientific communication, and by interviewing local experts in scientific communication and media fields. Next, short and long term plans were created on how to communicate the LAKES findings to the general public. By the end of the summer of 2024, a general use infographic was created containing the causes, effects, and possible solutions to the eutrophication in the Red Cedar Watershed. This infographic was posted to local news webpages, posted in the Menomonie Public Library, and spread with help from the Dunn County Democrat and Republican offices. As for long term plans, different mediums of spreading LAKES research have begun to be designed, such as drink coasters containing a QR-code to LAKES research and K-12 lesson plans regarding eutrophication in the Red Cedar Watershed. Data has also been collected in 2019 and 2024 regarding where Dunn County residents get their news, this can be used in future years to get LAKES research on news outlets which most locals use.

Reagan Boledovic

AL - Auburn University

Discipline: Exercise Science and Nutrition

Authors:

#1 Katherine Frick

#2 Daniel Lawson

#3 Russell Lowell

#4 JoEllen Sefton

Abstract Name: The Effectiveness of Microbreaks in On-Duty Patrol Officers

This study evaluated the effectiveness of micro-breaks in reducing musculoskeletal pain and stress levels among police department employees, a population often exposed to prolonged sitting while on duty. **METHODS:** Micro-breaks, defined as short, scheduled stretching sessions with mindful breathing, were implemented once an hour during shifts over a 16-week period. Participants completed a weekly survey reporting full and partial micro-break completions as well as stress and pain levels using a 10-point scale (0 = no stress/pain; 10 = max stress/pain). The full micro-break stretching protocol targeted the upper and lower back, neck, legs and feet, shoulders, and hips. **RESULTS:** Week 1 stress levels positively correlated with decreased upper back pain ($r = 0.73$, $p = 0.003$), neck pain ($r = 0.52$, $p = 0.055$), and lower back pain ($r = 0.61$, $p = 0.111$). Strong negative correlations were observed between stress levels and both partial ($r = -0.70$, $p = 0.016$) and full ($r = -0.64$, $p = 0.035$) completions of the micro-breaks protocol. Mixed-effects models revealed no statistically significant effect of time on stress levels ($\beta_1 = -0.037$, $p = 0.373$) or lower back pain ($\beta_1 = -0.066$, $p = 0.260$). Individual analysis revealed a moderate reduction in neck pain ($r = -0.55$, $p = 0.125$) and a statistically significant reduction in upper back pain ($r = -0.93$, $p < 0.001$) over time for Subject 1. Statistically significant reductions in stress ($r = -0.72$, $p = 0.043$) and low back pain ($r = -0.81$, $p = 0.017$) over time were observed for Subject 2. **CONCLUSION:** These findings suggest that while group-level effects of micro-breaks did not significantly reduce stress or pain levels over a 16-week period, individual-level improvements in pain and stress indicate the potential for individualized micro-break strategies to mitigate occupational health risks among police officers.

Hanna Bolinger

PA - Westmoreland County Community College

Discipline: Health and Human Development

Authors:

Madison Blythe

Abstract Name: Povidone Iodine: The Hidden Strength in Dental Care

10% Povidone Iodine (PVP-I) is a potent antimicrobial agent that identifies specific pathogens of dental caries and periodontal disease, disrupting pathogenesis. This study aims to determine if implementing a PVP-I protocol in the oral cavity is a primary preventative agent against bacteria contributing to dental caries and periodontal disease. The credibility of this research is supported by peer-reviewed studies, journals, articles, and reports through quantitative data. The accumulation of bacteria initiates both periodontal disease and dental caries. With over five hundred species of bacteria in our mouth, PVP-I is a broad antiseptic that fights against the most dangerous pathogens. Dental caries prevails as the most preventable chronic disease affecting people of all ages. When PVP-I was used to halt the progression of decay by terminating *Streptococcus mutans*, patients exhibited a 95% disease-free oral environment for 12 months. Likewise, periodontal disease affects one in every three adults over thirty. Subgingival irrigation of PVP-I adjunctive to periodontal therapy decreased pathogen counts by 95% in 44% of pockets with ≥ 6 mm pocket depths. With the rise of antibiotic-resistant bacteria, the need for effective alternatives is critical. PVP-I offers a compelling solution, as it remains effective without developing resistance in dental settings. This analysis will broaden the knowledge of the uses of PVP-I as an adjunct to periodontal therapy and as an addition to fluoride varnish to prevent and remineralize dental caries. Prevention is the primary focus of dental hygiene. Dental professionals should consider utilizing PVP-I in their practice due to its effectiveness, safety, and alignment with the core value of maintaining and improving oral health.

Emma Bollech

IN - Valparaiso University

Discipline: Chemistry

Authors:

#1 Abraham Orozco-Munoz

#2 Christopher Iceman

Abstract Name: Quantitative Comparisons of Three Colocated Air Samplers with Simultaneous PM2.5 [Particulate Matter] Measurements

The quality of the air that we breathe has tremendous impacts on our health; bad air quality can lead to short-term eye, nose, and throat irritation, and long-term chronic respiratory conditions. It is important to monitor air quality and understand what metrics indicate potential hazards, in attempts to better measure the healthiness of communities and indirectly its' individuals. Not all air sensors are calibrated to measure metrics the same, and this study will compare values across air sensors via the PM2.5 air quality standard. In this study we focus on measuring particulate matter – which can come from dust kicked up on roads from cars, vehicle exhaust, wildfires, industrial site emissions, and more – using PurpleAir sensors located across Northwest Indiana. PurpleAir does not release proprietary information regarding the formulation of parameters included in the Air Quality Index that is posted on their publicly-available website. Due to potential discrepancies between standardized air sensors and PurpleAir instruments, we are evaluating the accuracy of our measurements against industry standard air sensors. In order to more confidently determine PurpleAir measurements' validity for air quality metrics, we compared them to commercial-grade sensors

such as the TSI DustTrak, Thermo Fisher pDR-1500, & DRUMAir cascade impactor using qualitative graphical and quantitative statistical tools. These sensors are of the caliber used by government agencies such as the EPA, and these research efforts provide a novel and necessary service to communities that depend on these sensors as their only local full time air quality measurement. We expect relative trends in particulate matter concentration to be well reproduced amongst the sensors and absolute comparisons to require scaling factors. As part of our community projects, we also study archived air quality measurements in our attempts to inform future community health and policy decisions.

Clare Bolon

CO - University of Northern Colorado

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: The Missing Void: Womenswear, Lack of Pockets and its Effect on Daily Life

More than half of the United States population is frequently left out of having useful pockets, which are an essential, yet often overlooked feature in clothing. Historically, womenswear has been molded to match the beauty standards of the day, sometimes allowing for pockets, while at other times, the feature has been left out completely. This study brings into the conversation a nuanced anthropological perspective on gender differences in modern clothes in the United States, specifically through the difference in pockets. The current research study created space for discussion and investigation into the fashion industry and cultural norms set around gender and clothing. The researcher recruited a hundred and sixty-two participants from a medium-sized regional midwestern university for a mixed-methods survey. The survey included Likert scales, multiple choice, and open-ended questions to explore the attitudes and experiences of people who wear women's clothing regarding pockets and how the accessibility of pockets affected their daily lives. Open-ended questions were analyzed qualitatively using manual coding for thematic meanings specifically through a gender lens, while quantitative questions were investigated using chi-squared tests and analysis. Preliminary themes from the qualitative analysis found that participants believe that the lack of pockets in womenswear stems from aesthetic expectations in fashion as well as due to the primarily female use of purses. Other themes discovered included the impacts of capitalism, sexism, sexualization of female bodies, blaming of the fashion industry, forced reliance on others, men's expectations, historical values influencing modern clothing, and the devaluing of essentials carried by people who dress in womenswear. Lack of pockets in womenswear is an often-overlooked phenomenon that relates to gender inequality and other cultural factors.

Corrie Bonomi

CT - Eastern Connecticut State University

Discipline: Education

Authors:

#1 Sudha Swaminathan

Abstract Name: Emergent Bilingual Preschoolers' Math Proficiencies and Development

Emergent bilingual children are typically born and raised in family settings where the primary language of communication is other than the one used as the medium of instruction in their school settings. While these children may carry unique assets in working memory, they typically demonstrate significantly lower achievement levels when compared to their monolingual peers. Research is needed to identify practices that

would embrace the learning characteristics of emergent bilinguals and further nurture their growth. In this mixed-methods study, we tracked the Math development of emergent bilinguals across one year and supplemented this data with classroom observations to arrive at characteristics of supportive environments for emergent bilingual students. The Math abilities of seven emergent bilingual preschoolers of mixed age and gender from a campus lab school were measured at four-time points. On average, these preschoolers scored lower than their monolingual peers at all four times but demonstrated significant growth from time one to time 4, with an average growth of 37 points, thereby attesting to the supportive classroom environment. Between times 3 and 4 of the study, qualitative case study observations were conducted of the bilingual children along with an ethnographic photo study with a classroom teacher. Analysis of the qualitative data yielded valuable information on effective teaching practices for emergent bilinguals. While primary instruction was in English, teachers emphasized key discourse and content words in their interactions with the children. This appeared to provide the children with a vocabulary for connecting their acquired knowledge. Additionally, teachers engaged in culturally sensitive pedagogy, welcoming the children's bilingual funds of knowledge and practices. In this context, they encouraged translanguaging and gender-neutral discourse, further widening the scope of interactions for all children. Further research is necessary to unravel the nuances of classroom practices that support emergent bilingual students from specific language backgrounds.

Matthew Bonvissuto

GA - Kennesaw State University

Discipline: Physics and Astronomy

Authors:

#1 David Joffe

Abstract Name: Using Transit Photometry to Search for Systems With Multiple Exoplanets

Transit photometry is a well established method of searching for exoplanets in which photometers measure the luminous flux of stars, looking for periodic dips in the flux. If there are regular dips in the flux, each occurring with a regular duration, it is possible that there is an exoplanet orbiting the star. However, this method can only be applied when an exoplanet orbits along Earth's line of sight of the star. Even a few degrees of inclination in a planet's orbit will prevent it from blocking its star's light from our point of view. It is unlikely that all planets in a system will be on the necessary orbital plane to observe a dip in flux. This makes it difficult to find multiple planets in a system using the transit method. Our research focuses on using the changes in the orbital characteristics of transit-applicable exoplanets to search for systems with multiple planets. Using data from NASA's Transiting Exoplanet Survey Satellite (TESS), we examined several years worth of observations of a known exoplanet. The planet orbits HD 219666, a main sequence star roughly 300 lightyears from Earth. In this data, we have detected an increase in the inclination and decrease in transit time of the planet. We suspect the changes to be caused by the gravitational effects of another planet in the system. We aim to apply this method to other systems with known exoplanets in an attempt to observe similar changes

Ella Booe-Scott

TX - Lubbock Christian University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

Abstract Name: Child Sex Trafficking, Occupational Therapy, and the Biopsychosocial Model of Health

It is estimated that nearly 300,000 children in the U.S. alone are trafficked for sex each year. Globally, it is estimated to be closer to 1.7 million. There are many organizations seeking to rescue children from these horrific environments, resulting in a need for specialized aftercare programs. The purpose of this paper is to investigate the role of occupational therapists in the recovery process of children coming out of sex trafficking settings, using the biopsychosocial model of health. Because there is such a broad set of implications and needs for these children, this holistic model is valuable to identifying the biological, psychological, and social needs of children, and how each of these can be addressed by occupational therapists as they interact with survivors. There has historically been a gap in the field of occupational therapy for how to handle these delicate situations, so through a review of literature identifying the needs of survivors, this study proposes means to identify and improve upon these shortcomings using an interdisciplinary cohesion of psychology, rehabilitative therapies, and social work. In bridging these gaps, there is a hope to improve the recovery experience for survivors, prevent retraumatizing patients, and assist occupational therapists in their fieldwork surrounding an often hidden or ignored social issue, making it more easily approachable.

Foster Boom

WI - University of Wisconsin-Whitewater

Discipline: Chemistry

Authors:

#1 Steven Girard

Abstract Name: Enhanced Bioactivity of Titanium Implants via Silicide-Bioglass Coating

In recent years, the field of biomedical engineering has seen significant advancements in the development of biomaterials for implantable devices and tissue engineering applications. Titanium (Ti) and its alloys have gained widespread popularity due to their excellent mechanical properties, but they have low bioactivity (fusion with bone tissue). In this study, we propose a novel approach to enhance the bioactivity of Ti implants and integration of titanium within the human body by coating the titanium surface with bioactive glass, mediated by a titanium silicide layer. The experimental methodology involves depositing a silicide coating on titanium substrates using a combination of reactions with eutectic salts, a reducing agent, and heat. Then, bioactive glass is grown onto the metals using a general sol-gel method. Analysis is accomplished using scanning electron microscopy (SEM) and X-ray diffraction (XRD) to assess the morphology, phase composition, and surface properties. We show that the interfacial silicide coating on titanium significantly enhances adhesion of bioactive glass, thus improving the biocompatibility of titanium, whereas bioactive glass has little affinity and cannot be grown onto bare titanium. The results of this study have the potential to contribute to the development of improved biomaterials for orthopedic and dental applications, where a strong and stable bond between the implant and surrounding tissue is crucial for long-term reliability.

Elise Boorom

NC - North Carolina State University

Discipline: Biology

Authors:

#1 Erin McKenney

#2 Carlos Goller

Abstract Name: Dynamics of Microorganisms in Compost

Composting is nature's way of recycling - reducing waste, enhancing soil health, combating climate change, and offering economic benefits. Central to this process are microorganisms, yet limited research exists on which species dominate throughout compost curing and how environmental conditions influence their presence. Partnering with NC State's compost facility, we established a representative compost pile (17' L x 17' W x 7' H) equipped with 24 HOBO loggers to continuously record temperature. Over a seven-week period, weekly samples were collected using 50 mL test tubes and preserved with QIAGEN Bacterial DNA/RNA Protect for subsequent DNA and RNA sequencing. This analysis aimed to identify the microbial communities present and examine their succession in relation to composting conditions. Specifically, we focused on the interplay between temperature, humidity, and depth from the surface on microbial composition and activity. The findings of this study contribute to a deeper understanding of the microbial dynamics that drive composting efficiency and offer insights for optimizing composting practices.

Anvitha Boosani

MO - University of Missouri - Columbia

Discipline: Biology

Authors:

#1 Jonathan Green

Abstract Name: Role of TET1 in the early stages of atherosclerotic plaque development

Context: Among the vital organs in our body, the heart is a key organ where acute conditions may lead to severe adversities. Their underlying causes often cannot be diagnosed until hospitalization of the patient. A typical example of this phenomenon is atherosclerosis, as its progression in blood vessels is asymptomatic, only detected by ultrasound or CT scan. High cholesterol (mostly oxidized LDL/oxLDL) levels within blood vessel walls are a known causative factor: macrophages (immune cells) intake oxLDL and transform into large, obtrusive foam-cells that build up within blood vessels and form atherosclerotic plaques. In most cases, by the time the patient first presents with symptoms, the disease has already advanced and surgery is required to save the patient. Rationale: In patients with atherosclerosis, multiple plaques are often seen in different stages of growth, ranging from initial to advanced. Surgery is inevitable to remove advanced-stage plaques. In current treatment regimens, medications are prescribed to lower blood cholesterol. However, there are no treatment plans in place to stop growth of already-existing plaques that are in the initial stages. Purpose: Epigenetic proteins were reported to initiate molecular mechanisms in several disease conditions. However, their role in the development of atherosclerotic plaques, and the cellular proteins they regulate during foam-cell formation, are yet to be deciphered. Research question: Does intercepting early-acting disease mechanisms prevent initiation and/or progression of atherosclerosis? Methods: Through cell culture, the role of a unique epigenetic protein, TET1, was investigated. In my study, monocyte-derived macrophages were first treated with the TET1 inhibitor Bobcat339. Then, they were treated with oxLDL, and the effect of TET1 inhibition on foam-cell formation in presence of oxLDL was studied. Results and conclusions: Inhibition of

TET1 protein prevents plaque development by preventing foam-cell formation, and also by indirectly initiating autophagy-induced cell death in existing foam-cells.

Jemma Booth

IL - Eastern Illinois University

Discipline: Biochemistry

Authors:

#1 Jemma Booth

#2 Michael Beck

#3 Emmanuel Adusah

Abstract Name: Design And Synthesis of a Library Of Fluorescein-Based Fluorogenic Carbonates For Human Carboxylesterase Structure-Activity Relationship (SAR) Studies

Human carboxylesterases (CESs) play a major role in the metabolism of many drugs, however, existing tools to study CES1, one of the two forms of CESs, are plagued by various limitations. To address these issues, we have previously developed a fluorescein-based fluorogenic carbonate chemical tool (FCP-1) and demonstrated that FCP-1 can report on CES1 activity in live cells. The aim of the current study is to improve specificity for CES1 by determining a structure-activity relationship (SAR) of fluorogenic carbonates. To achieve this, a library of fluorescein-based fluorogenic carbonates are being synthesized in one step from fluorescein and corresponding chloroformates. The compounds were subsequently characterized using ¹H and ¹³C NMR spectroscopy to confirm the structures before evaluating if they are suitable for use in live cells. This work aims to deepen the understanding of the substrate scope of CES1 to improved tools that study CES1-mediated drug metabolism and better design of drugs that are metabolized by CES1.

Marisa Boretti

NC - North Carolina State University

Discipline: Engineering

Authors:

#1 Marisa Boretti

#2 Kyla Bosh

#3 Jacqueline Cole

#4 Katherine Saul

Abstract Name: Myokine Expression in Subscapularis, Supraspinatus, and Biceps Muscles following Brachial Plexus Birth Injury

Brachial plexus birth injury (BPBI) is caused by extreme stretching in the neck during childbirth, damaging the brachial plexus nerve network spanning the neck and shoulder. Presenting in roughly 1 out of 1,000 human births, BPBI often leads to inhibited muscle function, bone deformation, and paraplegia. While the extent of injury varies with severity and type (nerve avulsion or rupture), affected muscles often experience muscle atrophy and reduced functionality. Transforming growth factor beta 1 (TGF-B1) and fibroblast growth factor 2 (FGF-2) are necessary for cell repair and protein synthesis. Previous studies show that TGF-B1 regulates muscle repair, while FGF-2 contributes to cell proliferation in injured skeletal muscle. However, the impact of these myokines on muscle growth and repair following BPBI is unknown. This study aims to determine myokine expression during neuromuscular growth following preganglionic (mimicking nerve

avulsion) and postganglionic (mimicking nerve rupture) BPBI. To replicate BPBI, Sprague Dawley rats underwent preganglionic or postganglionic neurectomy, forelimb disarticulation (mimicking disuse), or sham surgery at 3-6 days postnatally. Rats were euthanized at 2, 3, 4, 8, or 16 weeks post-injury. Subscapularis, supraspinatus, and biceps brachii muscles from injured and uninjured limbs were each harvested, digested, and centrifuged to produce a tissue lysate. The lysate solution was analyzed for FGF-2 and TGF-B1 levels by enzyme-linked immunosorbent assay (ELISA). Preliminary results indicate that at 4 weeks, both injured and uninjured biceps muscles have greater FGF-2 expression than the corresponding subscapularis and supraspinatus muscles in both disarticulation and sham groups ($p < 0.01$). Ongoing analyses are focused on 2, 3, 8, and 16 week timepoints. Once adequate data are collected, groups will be compared using two-way ANOVA with Tukey's corrections for multiple comparisons. These findings will provide insight into potential mechanisms underlying muscle detriments following BPBI, which can be used to test new treatment strategies.

Marjon Borjian

FL - Florida Atlantic University

Discipline: Business

Authors:

Abstract Name: The Cost of Being Female: A Survey on the Pink Tax

The "pink tax" refers to the price disparity between products and services marketed to females, often for items that are nearly identical to those marketed to males. My research explores public perceptions of this economic phenomenon, specifically testing if male and female responses differ. I hypothesized that females would view the pink tax as unfair, while males would find it fair. I also hypothesized that more females would support laws against the pink tax. To test my hypothesis, I created a 16-question survey and distributed it through Amazon MTURK, where I was able to collect 180 responses which were then analyzed using IBM's SPSS. Contrary to my hypothesis, I found that a significant portion of females (47.8%) viewed the pink tax as somewhat fair, with only 9.8% finding it somewhat unfair. Furthermore, 86% of males supported legislative action to make the pink tax illegal, compared to 73.93% of females. A notable 26.1% of females disagreed, compared to just 8.1% of males. These results suggest that many females do not see the pink tax as unjust but still support policy changes to address it. Interestingly, a higher percentage of males favor legislative action, revealing a discrepancy between public perception and actual support for legislative reform. The findings are significant at the 2% and $< 0.001\%$ levels, respectively, challenging commonly held assumptions about gender-based views on the "pink tax," therefore advancing research about gender-focused economic studies.

Marco Boscolo

FL - The University of Tampa

Discipline: Anthropology and Archaeology

Authors:

#1 Carmela Martinez

#2 Anna Ragni

Abstract Name: Morphometric analysis of the human jaw through time

Understanding the evolution of mandibular morphology provides key insights into the interplay between diet, technology, and human adaptation. Ancient human mandibles were typically larger and more robust,

reflecting the mechanical demands of tougher diets. In contrast, more recent mandibles are smaller and less robust due to dietary shifts and technological advancements, which have reduced masticatory demands. Very few studies, however, have quantified the differences between ancient and present-day mandibles, which may be particularly gracile due to ultra-processed foods in the contemporary diet. In this study, we compare mandibular morphology of contemporary Floridian populations and agricultural populations from Sudan 350 BCE-350 CE to explore how changes in diet and lifestyle influence jaw shape. We hypothesize these two groups will have significantly different mandibular shape, with the ancient agricultural population exhibiting greater overall robustness and larger muscle attachment sites than the modern Floridian population. To test this hypothesis, mandibles will be 3D scanned and compared using geometric morphometrics quantitative methods. Comparative analysis will be focused on indicators of shape, thickness, and masticatory muscle attachment sites. We expect to find support for our hypothesis, showing that softer, processed diets in modern contexts require less chewing effort, resulting in less mechanical demands on the jaw, and ultimately shaping morphology over time. This study will highlight the role of dietary and technological shifts in shaping mandibular evolution and the functional pressures that contributed to the modern human jaw's smaller, less robust morphology. Understanding these evolutionary changes has broader implications for studying craniofacial adaptation

Emanuele Bossi

AZ - Embry-Riddle Aeronautical University

Discipline: Computer Science

Authors:

#1 Sameer O. Abufardeh

Maliah Juker

Daniil Gorshkov

Abstract Name: AI-Based Phishing Countermeasures

Phishing attacks are among the most prevalent forms of cybercrime, exploiting human vulnerabilities to deceive individuals and organizations. This research seeks to explore the human element in phishing attacks to develop more effective prevention strategies. Phishing's success is deeply rooted in psychological and behavioral factors, which influence an individual's susceptibility to these attacks. Our study aims to identify these key psychological traits and behaviors that heighten vulnerability, such as cognitive biases, trust in online communications, and lack of cybersecurity awareness. In addition to this exploration of human factors, we will conduct a comprehensive literature review of the latest Machine Learning (ML) techniques used to detect and prevent phishing attacks, examining their strengths, limitations, and real-world applicability. To deepen the understanding of human vulnerabilities in phishing, we will also gather data through surveys, interviews, and Open-Source Intelligence (OSINT), ensuring a diverse and multidimensional perspective on the issue. By analyzing this data, we aim to bridge gaps in current knowledge and provide new insights into how human behavior can be better addressed in phishing prevention strategies. Furthermore, the study will explore potential areas for improvement in existing mitigation methods, considering both technological and behavioral approaches. The findings will contribute to the body of knowledge by offering practical, data-driven recommendations for designing more targeted and effective countermeasures to protect individuals and organizations from phishing attacks. Ultimately, this research aims to provide a foundation for future developments in both human-centered and Machine Learning-based phishing defense strategies.

Brianna Botello

NY - Colgate University

Discipline: Linguistics and World Languages

Authors:
#1 Brianna Botello

Abstract Name: Subversive women: Trauma, violence and nation building in Ernesto Sábato's trilogy

This presentation proposes a (re)examination of Ernesto Sábato's trilogy *El túnel*, *Sobre héroes y tumbas*, and *Abaddón el exterminador* from both gender-based and juridical perspectives. Through a re-reading of the trilogy, I introduce the concepts of suicidio-femicida as a lens to explore how the female protagonists experience distinct forms of sexual and ideological violence due to their transgressions of Argentine societal gender norms. This analysis not only brings to light historically overlooked forms of gender violence but also employs a juridical framework to (re)evaluate past and present contexts, denouncing the patriarchal structures that perpetuate oppression, injustice, and impunity. Building on the theoretical frameworks of gender theorists like Judith Butler and Rita Segato, and drawing from psychoanalytic theory and trauma studies as articulated by Giorgio Agamben and Cathy Caruth, I will investigate how the female body and identity were central to the construction of national identities and nation-building processes across Latin America in the post-independence period. I argue that these novels, through their portrayal of female characters, reflect the broader cultural and political dynamics of nation-making and the deeply embedded gender hierarchies that persist within them. While existing scholarship on Sábato's trilogy offers valuable contributions, it overlooks the gendered dimensions of violence and the psychoanalytic underpinnings of these texts. My contribution lies in applying an interdisciplinary approach that integrates gender theory, trauma studies, and juridical analysis to explore the intersections of trauma, gender-based violence, and national identity formation in Sábato's work. Considering the current political context in Argentina under President Javier Milei, my research aims to examine how national political discourses legitimize gender-based violence, reinforcing harmful ideologies that threaten to reverse advancements in women's rights. Through this, I aim to deepen our understanding of how gender violence operates in the collective imagination and historical memory of the region.

Samkit Bothra

FL - Florida Atlantic University

Discipline: Interdisciplinary

Authors:
#1 Samkit Bothra

Abstract Name: Exploring Gender Differences in Perceptions of AI's Impact on Social Media

Artificial Intelligence (AI) is increasingly shaping social media through content personalization and moderation, raising questions about its influence on public opinion and trust in digital news. Gender plays a key role in shaping perceptions of AI's impact, with men and women potentially viewing its applications differently. This study explored gender-based perspectives on AI's role in social media, focusing on its effects on information credibility and privacy. Data from 155 participants, collected via Amazon Mechanical Turk, were analyzed using IBM's SPSS. The first hypothesis proposed that women would be more skeptical than men about AI's use in news, citing greater concerns over misinformation. The second suggested that women would view AI as less problematic when applied to creative content. The results confirmed these hypotheses and were statistically significant at the 1 percent level. Women were more likely than men (56.3% vs. 43.4%) to see AI as 'somewhat beneficial' for creative content applications. However, they also expressed greater caution about AI-generated news, with 37.5% of women strongly agreeing that AI contributes to more believable fake news, compared to 18.4% of men. These results indicate that women perceive AI as more beneficial for creative purposes but harbor greater concerns about its role in spreading misinformation. Understanding these gender-based differences can guide the development of AI tools that better address diverse concerns, enhancing both trustworthiness and user satisfaction on social media platforms.

Braden Boucher

MA - Bridgewater State University

Discipline: Engineering

Authors:

#1 Elif Demirbas

Joshua Andrews

Abstract Name: Optoelectronic Characterization of III-V Laser Diodes

Light emitting sources commonly made from III-V materials are used in photonic integrated circuits (PICs). The application for PICs that we are interested in is for light detecting and ranging (LiDAR) that can be used for autonomous vehicles. I took optoelectronic measurements of GaAs (gallium arsenide) and InP (indium phosphide) laser diodes and compared them to a packaged laser diode. I recorded their characteristics to determine which lasers could be incorporated in PICs for LiDAR applications. Optoelectronic characterization consists of current-voltage (IV), light-current-voltage (LIV), and intensity vs wavelength characterization and provides important information about the laser's properties, including operating point, threshold current, turn on voltage, and efficiency.

Meriem Boukaabar

PA - University of Pittsburgh

Discipline: Mathematics

Authors:

#1 Bismark Oduro

Abstract Name: Congenital transmission of Chagas disease: The role of newborn therapy on the disease's dynamics

Chagas disease is caused by the protozoan blood-borne pathogen *Trypanosoma cruzi*. The World Health Organization (WHO) classifies Chagas disease as one of 21 neglected tropical diseases worldwide, with an estimated 6–7 million people currently infected. The disease is primarily transmitted through Triatomine bugs. It can also be spread congenitally, orally (food-borne), or through blood transfusions and organ transplants. Congenital transmission plays a significant role in new infections in both endemic and non-endemic regions. In endemic areas, 22.5% of new cases result from mother-to-child transmission, while in non-endemic countries, it is the primary source of new infections. In this talk, I will present the impact of congenital transmission on Chagas disease dynamics using a mathematical model. The main question guiding this research is: how does treating a proportion of infants born to infected individuals impact the progression and spread of Chagas disease? To address this, ordinary differential equations were used to model disease transmission through vector-to-human, human-to-vector, and congenital routes. The control reproduction number (R_0) was calculated from these equations, and MATLAB simulations were used to visualize the model's behavior under various conditions. The results illustrate the importance of treating a high proportion of newborns to reduce the number of infected cases. However, the findings show that while the therapy given to newborns is necessary, it is not sufficient to curb the transmission of Chagas disease. Strategies to reduce vector transmission must also be in place. If vector transmission can be controlled, then treating at least 55% of the newborns could be enough to eliminate the disease. This study highlights that a comprehensive approach, including both vector and congenital transmission control strategies, is essential for eradicating the

disease. Ultimately, this provides useful information for shaping policy and developing better strategies to control the spread of Chagas disease globally.

Natalie Bowen

VA - Virginia Commonwealth University

Discipline: Film/Photography Studies

Authors:

Abstract Name: The Romanticization of Human-Vampire Relationships: How Twilight and The Vampire Diaries May Prime Young Women to Accept Dating Violence and Abuse

The first literary vampire can be traced back to 18th century Germany, with Johann Wolfgang von Goethe's poem "Die Braut von Korinth," but the stereotypical features of a vampire are traditionally accredited to Bram Stoker's Dracula. Modern vampires, such as Edward Cullen and Stefan Salvatore of the Twilight and The Vampire Diaries series respectively, have managed to win the hearts of teenage girls all across America with their sex appeal and charismatic nature. According to Bandura's Social Cognitive Theory, individuals learn new behaviors by modeling and imitating the actions of those around them. This comprehensive literature review investigates the connection between the human-vampire relationships in Twilight and The Vampire Diaries and teenage girls' acceptance of dating violence and abusive behaviors from intimate partners. This study aims to examine how both Twilight and The Vampire Diaries create popular modern vampire narratives that may promote harmful messages to female youth regarding future romantic relationships. This analysis of peer-reviewed studies finds that harmful gender stereotypes and literary tropes are used on both female and male characters, the vampires exhibit manipulative and predatory behaviors, and the idea of true love overpowers the abusive behaviors of Edward and Stefan in the eyes of young girls, possibly creating a link between sex and violence. The findings of this study display a positive correlation between exposure to media violence and acceptance of dating violence among teenagers, as well as a positive correlation between exposure to sexually-oriented television and both the acceptance of the sexual double standard and earlier sexual timing expectations in relationships. New vampire media is still being produced, so it is important to understand what messages are being portrayed to teenage girls and how exactly these messages are altering their values regarding love in heterosexual relationships.

Gracie Bowman

MN - Minnesota State University - Mankato

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Brenna Sommer

#2 Hsinhuei Sheen Chiou

Adelyn Baker

Allison Eichorn

Abstract Name: Montessori-Based Dementia Care: A Path to Meaningful Engagement

Few programs provide dementia friendly environments and activities for adults with Alzheimer's disease and related dementias (ADRD) (Buettner, Lundegren, Lago, Farrell, & Smith, 1996). Montessori-based activities focus on ability and facilitate positive engagement and affect (Jarrott, Gozali, & Gigliotti, 2008). This research project aimed to enhance clinical skills of undergraduate students by focusing on

creating and implementing Montessori-based activities for adults with ADRD. Research participants were four college students who majored in Communication Sciences and Disorders. The students created two Montessori-based activities aiming to capitalize on their abilities including the five senses and engaging in meaningful conversation topics with the participants. The flower activity provides opportunities for students to appropriately set up and guide adults with ADRD to arrange vases, choose flowers based on color, texture, scent, and personal preferences with visual and auditory support. The toolbox activity offers opportunities for students to guide adults with ADRD to sort common household items and the tools (hammer, screwdriver, tape measure, etc.) and to discuss the function and sensory qualities of each with visual and auditory support. Each activity was implemented for 30 minutes two times a week for an 8-week duration in a local memory care facility. A student was paired with 1-2 adults with ADRD, set up and implemented the activities, and used one of the two versions of a script (downward/simplified and upward/more challenging) to facilitate meaningful conversations based on the abilities of the adult with ADRD. Engagement and communicative behaviors of the students and adults with ADRD were documented using a 5-point rating scale and descriptively. Qualitative and quantitative data will be analyzed. The expected outcome is for college students to develop clinical and interpersonal skills to support adults with ADRD and curate a dementia friendly environment.

Samhitha Boyana

TX - The University of Texas at San Antonio

Discipline: Biology

Authors:

#1 Aranis Muniz Perez

#2 Kaisha Meyer-Acosta

#3 Courtney McMahon

#4 Adyasha Aruk

#5 Varsha Ponnala

#6 Jenny Hsieh

Abstract Name: Investigating the link between APOE4 and severe COVID-19 infection with human cortical organoids

As of September 2024, SARS-CoV-2, the virus responsible for the COVID-19 pandemic, has infected over 750 million people worldwide. Up to 30% of COVID-19 patients have also reported neurological symptoms, such as brain fog, anosmia, and delirium, that can last weeks after infection. Previous research suggests that APOE4, the leading genetic risk factor for late-onset Alzheimer's Disease (AD), induces more severe SARS-CoV-2 infection in patients and more severe neurotropism in human stem cell models. Additionally, prior studies using 2-D and 3-D stem cell models of the human brain indicate that COVID-19 infects neurons and glia and that APOE4 increases infection of both cell types. However, whether APOE4 directly or indirectly alters cell-type susceptibility to SARS-CoV-2 infection is unclear. To address this question in a human-relevant model system, we generated human cortical organoids (CO) enriched in excitatory neurons from induced pluripotent stem cells (iPSCs) from patients with either the APOE3/3 or APOE4/4 genotype. At late developmental time points, COs were infected with SARS-CoV-2 for 1 hour and harvested at 7 days post-infection for RT-qPCR and immunohistochemistry. Preliminary results show that APOE4 does not affect overall SARS-CoV-2 infection in COs but does increase glial populations post-infection, suggestive of heightened astrocyte reactivity. COs from both APOE genotypes had increased neuron maturation following infection with SARS-CoV-2. This data suggests that APOE4 may alter astrocyte reactivity, potentially inducing neuroinflammation, to increase vulnerability to SARS-CoV-2 without increasing SARS-CoV-2 neurotropism in the cortex. These findings provide insight into the mechanisms through which APOE4 increases COVID-19 severity and highlight the importance of understanding how genetic risk factors influence viral infection in different patient populations.

Emma Boyden

VA - George Mason University

Discipline: Environmental Science and Sustainability

Authors:

#1 Rosalina Stancheva

#2 Jennifer Salerno

#3 Esther Peters

#4 Jennifer Keck

Abstract Name: Cyanobacterial Mat Communities Associated with Caribbean Coral Reefs

Coral reefs are sensitive indicator ecosystems that support a wealth of biodiversity in marine environments, and their decline is a global concern. Benthic cyanobacterial mats (BCMs) are increasingly present in coral reef ecosystems and may contribute to coral death and disease. However, the composition of BCMs and their competitive relationship with corals remains in question. We conducted field sampling of BCMs from the coral reefs of Roatan, Honduras, in order to determine their species composition (e.g. cyanobacteria and other microorganisms including microalgae). With the help of the Roatan Institute for Marine Sciences (RIMS), ten samples were collected in May 2024 from three dive sites within Roatan Marine Park. Each benthic mat sample was taken at a depth of 6-18 m from sand and macrophyte substrates. Mats ranged from dark red-purple, to brown, to light yellow-green in color, and from typical crustose benthic mats, to small spherical growths, to feathery coverings of macrophytes. The samples were preserved with TEM fixative (4% concentration) and DNA/RNA shield (4%) for microscopic and genomic analysis, respectively. Common cyanobacterial genera microscopically identified in our samples were *Lyngbya*, *Oscillatoria*, *Phormidium*, *Pseudanabaena*, and *Spirulina*. Future molecular analysis will provide species and/or strain-level taxonomic resolution, as well as toxin gene presence. Our study did not measure toxin production; however, further research should be conducted to determine cyanobacterial contributions to water column toxin levels. Cyanobacterial mats should continue to be characterized and monitored. In order to progress with coral transplantation and recovery efforts, more data needs to be collected regarding the full ecological impacts of microalgae and cyanobacteria on reef ecosystems.

Tanner Braddy

GA - Georgia Southern University

Discipline: Nursing and Public Health

Authors:

#1 Nikiya Lewis

Abstract Name: How Does Racial Bias Impact the Perceptions of Black Women Regarding Maternal Care?

Between 1999–2002 and 2018–2021, the maternal mortality rate in the United States increased by 144% from 9.65 to 23.6 deaths per 100,000 live births. Although women of all races are affected by maternal mortality yearly, it is especially prevalent in black women. In the United States, black women are three times more likely to die from pregnancy-related causes than non-black women. Despite advancements in medical technology and obstetric care, Black women continue to experience adverse maternal health outcomes at alarmingly high rates. Research suggests that perceptions of racial bias and discrimination during maternity care contribute to this disparity. These experiences can lead to mistrust in healthcare providers, delayed or inadequate care, and heightened stress levels, all of which can negatively impact maternal health. Despite advancements in medical technology and obstetric care, Black women continue to experience adverse maternal health outcomes at alarmingly high rates. Research suggests that perceptions of racial bias and

discrimination during maternity care contribute to this disparity. These experiences can lead to mistrust in healthcare providers, delayed or inadequate care, and heightened stress levels, all of which can negatively impact maternal health. The purpose of this thesis project is to explore Black women's perceptions and experiences of racial bias during maternity care.

Kamilah Bradley

VA - Norfolk State University

Discipline: Political Science

Authors:

#1 Kamilah Bradley

Aleila Rankin

Abstract Name: Policy Implications for Relocating Socially Vulnerable People Out of Public Housing

Relocating people from public housing is a critical issue for policy analysis. Policy initiatives such as Moving to Opportunities, HOPE VI, and Choice Neighborhood have presented significant challenges that have negatively impacted residents who are poor, people of color and who are socially vulnerable. This process also disrupts established communities, threatens access to essential services, and raises fundamental questions about social equity. As cities redevelop, we must carefully consider the impact of moving these communities to ensure that progress in a way that promotes social justice. The election of Barack Obama as the first African American president marked significant progress toward America's ideals of equality and liberty. His presidency symbolized a step forward from the nation's history of racial injustice, with impactful policies like the Affordable Care Act and DACA promoting inclusion and equity. However, challenges such as political backlash, xenophobia, and voter suppression persist, threatening these advancements. This can be seen in the recent housing policies aimed at relocating poor and Black families out of public housing. The rise of discriminatory policies emphasizes the need to protect civil rights. This research will explore the potential impact relocation policies have on socially vulnerable communities. Using data from the Choice Neighborhood relocation project, this study will explore the impact this policy has on residents in an urban community in Virginia. Preliminary data suggest that the Choice Neighborhood policies have negative impacts on residents' access to resources, but significant improvements in living conditions. Implications for policy analysis and practice will be discussed.

Curtis Bradley

CA - Cuesta College

Discipline: Mathematics

Authors:

Abstract Name: Calculus, Geometry, Numerical Analysis, and Beyond: New Developments in Harmonic Numbers and Circumcenters

The work introduced here presents new developments on old concepts in geometry and calculus, such as the concepts of circumcenter and harmonic numbers. These developments are presented analytically and the work displayed here also shows how to prove them numerically. The analytical proofs involve known results and concepts, including but not limited to the Riemann Zeta function, famously related to the Riemann Hypothesis. The Riemann Zeta function is a summation that has uses in the field of number theory and statistics. The Riemann Hypothesis, which provides a framework for predicting prime numbers, is often used

in physics, statistics, and other fields dealing with random numbers. The work introduced here presents solutions to two open problems published in the College Mathematics Journal during 2024. One problem, proposed by Ovidiu Furdui and Alina Sîntămărian, involves evaluating the summation of a product of harmonic numbers. In this problem, we can see a clear connection to higher powers of the Riemann Zeta function. The solution involves manipulating series, applying the definition of the Riemann Zeta function, and research conducted by the author of the problem. The other problem, proposed by Tran Quang Hung, states that the circumcenters of a particular collection of circumcenters fall into the same circumference under certain circumstances. The solution to this problem presented here involves creating an equation to find the cartesian coordinates of the circumcenter, the reduction of trigonometric identities, and analytic reasoning. The analytical solutions to both problems were developed in parallel to numerical procedures that hinted at the correct solution.

Madeline Bradley

OK - University of Central Oklahoma

Discipline: Mathematics

Authors:

#1 Brittany Bannish

Abstract Name: Mathematical Model of Fibrin Networks Under Tension

Stroke is a leading cause of death and disability worldwide, so understanding how blood clots degrade is critical for improved treatment efficacy and safety. Blood clots are polymer networks composed of fibrin fibers under tension, though existing models of blood clots do not account for this tension. We created a mesoscale mathematical model of fibrin fibers under tension, beginning with simple spring and mass networks. We initially tried to leverage software with pre-existing mass/spring capabilities, but ultimately decided that constructing our own customized Python model was necessary. Using AI and open source code, we built a numerical model that can be extensively adjusted to account for various biomechanical conditions. Our model includes small networks of masses and springs under tension that rearrange each time a fiber (spring) is degraded. In this poster, we present our model and preliminary results. In the future, we will incorporate laboratory data to refine the simulations and obtain physiologically realistic results. Ultimately, this research may provide greater precision in stroke treatment for individual patients and reduce adverse or even fatal side effects.

Keyana Bradshaw

PA - Moravian University

Discipline: Biology

Authors:

#1 Christopher Jones

Abstract Name: The Use of a *Granisotoma rainieri* Antifreeze Protein to Cryopreserve *Drosophila melanogaster* Eggs

Many cell types can survive being frozen for long-term cryogenic storage; unfortunately, *Drosophila* eggs cannot. When fruit fly eggs are frozen, the ice crystals that form as a result pierce the cell membrane of the eggs, leaving the egg unable to hatch due to the damage. Other species avoid freezing damage by synthesizing antifreeze proteins which *Drosophila* do not make. In this experiment, we will be transforming

fruit fly eggs with the gene which codes for GrAFP, an antifreeze protein found in *Granisotoma rainieri*, snow fleas, in an attempt to breed fruit flies which can express the GrAFP protein. If this experiment is successful, it would allow researchers around the world to maintain stocks of genetic interest without the need to maintain live animals. As there are thousands of *Drosophila* laboratories all around the world, the ability to cryopreserve fruit fly eggs would save money and many thousands of hours which could be better spent carrying out experiments. We will subclone the gene for GrAFP into a plasmid which will allow us to incorporate the gene into the *Drosophila* genome. The plasmid will then be sent off to another lab to be microinjected in *Drosophila* eggs. We will receive the larvae back and breed the transgenic flies. The transgenic flies will be tested to see if their eggs are freeze-tolerant and to test whether the GrAFP protein is being expressed in the eggs.

Paige Brady

PA - Carnegie Mellon University

Discipline: Psychology

Authors:

#1 Laurie Heller

Abstract Name: The Effect of Rise Time and Timbre on the Perception of Plucking and Bowing

This research aims to investigate the acoustic components of instrument timbre that convey to listeners whether a string is being plucked or bowed. Past research has focused on whether plucks and bows are perceived categorically, with mixed results (Cutting, 1982; Rosen & Howell, 1983; Kewley-Port & Pisoni., 1984; Smurzyński, 1985). However, much less work has been done on what other factors can be manipulated to create hybrids and how people actually perceive them (Peynircioğlu et al, 2016). This project intends to extend auditory categorical perception research by looking at multiple stimulus dimensions. I will create hybrid stimuli that transition from a bow to a pluck by blending temporal and spectral aspects of the sounds, with the goal of creating a plausible morph. Participants will provide judgments of the sounds on the degree of blending and quality of morph via a Qualtrics survey. Expected results will reflect modulations of these ratings depending on the level of the parameters mentioned above. We hypothesize that morph ratings will be highest when the pluck and bow ratings fall within a mid-range, as opposed to them being at either extreme or the pluck having dominance over the bow, and vice versa. The results will provide insight into human auditory perception and inform methods for creating realistic morphs, which can be applied in music technology as well as in AI sound creation.

Rachel Brady

PA - Westminster College

Discipline: Computer Science

Authors:

#1 Adam Blumenthal

Abstract Name: Measuring the Distance of an Indoor Shotput Throw Using Computer Vision

On the Westminster College track and field team, we throw implements indoors for practice during the winter season but cannot measure the distance of the indoor throws due to limitations in the indoor set up. Because of this, the task was undertaken to create a program using Python to extract data from a video of a throw, input the data into a projective motion model, and extract the distance the throw would have gone. We

processed the video frame by frame, identifying the location of the implement using its color. Since the implement is a fast-moving object, we used a frame comparison technique to verify that the identified objects were the implement. Once the object was successfully identified, we then used the frame rate and throwers height to estimate the distance assuming the throw travels along a parabolic path.

Hailey Brady

MN - Hamline University

Discipline: Chemistry

Authors:

#1 Urvashi Sandhir

#2 Peter Bruggeman

#3 Cal Athmann

#4 Carin Huset

#5 Sara Dooley

Abstract Name: Chemical Reaction Pathways for the Degradation of PFOA via Pin to Water Cold Atmospheric Pressure Plasma

In recent years, chemicals known as PFAS (per- and poly-fluoroalkyl substances) have risen to the forefront of the public eye due to health organizations issuing a health warning, citing likely carcinogenic effects starting at extremely low levels of exposure. Moreover, PFAS is a major problem for both the environment and humans because it cannot degrade naturally due to the resilient fluorocarbon bonds that cannot be broken down by standard chemical water treatment processes. This study was conducted to determine the degradation of PFOA in water and elucidate the chemical reaction pathways via pin-to-water discharge CAP (Cold Atmospheric Pressure Plasma). CAP is a promising technology due to its ability to generate both oxidative and reductive species, unlike standard chemical processes, making CAP technology equipped to handle the PFAS contamination crisis. In this study, 20uM solutions of PFOA in water were treated under plasma with or without a surfactant (to bring PFOA to the site of degradation). Treatment times ranged from 0-120 minutes. Solutions were quantified using a Liquid Chromatography Mass Spectrometer to determine how much degradation was achieved. Results indicate that CAP degraded PFOA by 80% in 120 minutes. Using a surfactant, PFOA was degraded by 90% in 30 minutes. To understand the reaction pathway of the plasma, scavengers were used to target the reducing species (isopropanol for the H radical and sodium nitrate for the hydrated electron) since they are the most common in plasma. Results indicate that the hydrated electron is responsible for 64% of PFOA degradation, while the hydrogen radical is responsible for 51% of PFOA degradation, with marginal error due to detection limitations. The advances made with the degradation of PFOA utilizing CAP technology, and the understanding of chemical pathways CAP produces, show promise in eradicating toxic forever chemicals while highlighting the lesser-known world of plasma technology.

Madelyn Braho

PA - Grove City College

Discipline: History

Authors:

Abstract Name: Designing the New Frenchman: The Creation of a National Costume of France

The French Revolution attempted to entirely refashion society, including its clothes. Artists like Jacques-Louis David designed a distinct new style for the French Republic, yet despite the names attached, the style did not survive. Some of these designs have endured as fashion plates, including eight by David. They range from costumes for the civilian to the legislator, as well as a couple for military use. Toga-like mantles, close cut hose, and tri-color sashes were a break from the cutaway coats of the time. By comparing these illustrations to the other prominent Revolutionary fashion- the sans-culotte- it is possible to see where these designs failed to meet the practicalities of the day. However, they also display the ideological weaknesses of the Revolution, such as not considering the working man, like the sans-culotte, to be worthy of imitation. These designs have received relatively little research focus, excepting Aileen Ribeiro's chapter on them in *Fashion in the French Revolution*. Nevertheless, they are a useful case study of the Revolution in the time before the Terror. The efforts to create a new national costume for France in 1794 demonstrate the inherent conflicts in creating the new system, as well as the aesthetic and philosophical inspirations that drove the Revolutionaries.

Joao Branco Chaves

PA - Gettysburg College

Discipline: Business

Authors:

#1 Joao Branco Chaves

#2 Alice Brawley Newlin

Abstract Name: Behind the Curtain: The Influence of Tourism and Production Costs on Broadway Success

Broadway serves as a cultural and economic cornerstone of New York City, yet the financial success of its productions is shaped by an intricate interplay of external and internal factors. This study investigates the relationship between Broadway's economic performance, NYC tourism numbers, and production costs, focusing on the central research question: To what extent is Broadway's success dependent on increasing tourism and decreasing production costs? By analyzing this key relationship, the study builds on limited existing research, offering new insights into the economic drivers of one of the world's most iconic entertainment industries. Using quantitative methods, data from four decades (1980–2023) were analyzed across three hypotheses. The first explored the correlation between annual NYC visitor numbers and Broadway grosses (N = 44 years of data). The second tested the relationship between Broadway grosses and material production costs (as indexed by the key costs - i.e., lumber and cotton price; N = 521 months of data). The third examined the combined effects of tourism and production costs on Broadway's financial outcomes through multiple regression analysis (N = 44 years). While findings strongly supported the impact of tourism on grosses (e.g., $R^2 = .95$, $p < .001$), production costs alone showed no significant correlation. However, when considered alongside tourism (via multiple regression), cotton prices emerged as a significant predictor $\Delta R^2 = .006$, $p = .023$, emphasizing the multifaceted nature of Broadway's financial success. These results emphasize Broadway's reliance on tourism while highlighting the nuanced role of cost management, particularly the significance of cotton prices over lumber, in balancing creative excellence with financial sustainability. The study also encourages future research to examine broader success metrics, emphasizing adaptability and resilience amid external disruptions like global crises and economic shifts. Overall, this research enhances understanding of Broadway's economic dynamics while providing a framework for addressing challenges in a changing cultural and financial environment.

Patrick Brannon

WI - University of Wisconsin-La Crosse

Discipline: Sociology

Authors:
#1 Nick Bakken

Abstract Name: The Effect of Spirituality and Religion on the Cessation of Drug use and Crime Among Reentering Offenders

The role of religiosity in post-release substance use and criminal activity has produced mixed findings in the prisoner reentry literature. While some studies highlight its protective effects, few have explored the distinct impacts of religiosity and spirituality on post-release behavior. This study addresses that gap by analyzing a contemporary sample of 352 formerly incarcerated individuals. Results indicate that spirituality significantly influences the cessation of substance use, though its effect on reducing post-release criminal activity is moderate. In contrast, religious involvement, while offering some protection, has a weaker impact on both outcomes. These findings offer valuable insights into how religiosity and spirituality shape the reentry process, with implications for policy and practice.

Preston Brantley

GA - Kennesaw State University

Discipline: Computer Science

Authors:
#1 Preston Brantley
#2 Razvan Voicu
#3 Muhammad Hasan Tanveer

Abstract Name: The AI-Cancer Annotation and Recognition Evolution (AI-CARE): Transforming Pathology

The exponential advancement of Large Language Models (LLMs) such as OpenAI's GPT-4o has unlocked transformative potential across diverse sectors, with healthcare emerging as a critical area of application. The global healthcare system faces a persistent shortage of medical professionals, coupled with increasing demands for accurate and timely diagnoses. Annually, millions of cancer cases are diagnosed worldwide, with early detection significantly enhancing patient outcomes. However, the diagnostic process often involves time-consuming image analysis, which can be prone to human error. To address these challenges, this research explores integrating multi-modal GPT sophisticated image recognition capabilities into the healthcare framework. We propose developing a Python-based diagnostic tool leveraging GPT's image processing strengths to accurately identify and classify cancerous cells in medical images, focusing on breast cancer biopsies. The tool aims to provide reliable preliminary screenings that can assist pathologists in making informed decisions by training the model to recognize phenotypic traits associated with malignant cells. The system is designed to accept user prompts for labeling and distinguishing between healthy and cancerous cell groups, thereby streamlining the diagnostic workflow. Preliminary results demonstrate that the GPT integrated model achieves high accuracy in pattern recognition tasks, showing promise in reducing diagnostic errors and expediting the screening process. However, challenges such as response consistency and the necessity for extensive training data remain. Ongoing refinements aim to enhance the model's precision and reliability, making it a viable adjunct tool in clinical settings. This research marks a crucial stride in harnessing AI-driven technologies to bolster medical diagnostics. By enhancing the precision and efficiency of cancer cell identification, the proposed system has the potential to ease the burden on healthcare providers, expedite patient recovery, and ultimately enhance clinical outcomes. The successful implementation of this model could reshape pathology practices, offering scalable solutions to meet the burgeoning demands of global healthcare.

Lydia Brassington

MN - Hamline University

Discipline: Criminology/Criminal Justice

Authors:

#1 Jamie Spaulding

Abstract Name: A Study in the Standardization of Automotive Vinyl Wrap Examination

Automotive vinyl wraps have increased in popularity with their numerous benefits over alternative methods like repainting. The increase in vinyl-wrapped vehicles presents new challenges for forensic investigations in cases such as general accidents or hit-and-runs. While there are standardized methods for automotive paint analysis, no such methods exist for automotive vinyl wraps. There is currently no defined way to examine evidence involving vinyl effectively and consistently, making such evidence difficult to process and potentially unusable. This project aims to understand the physical and chemical properties of vinyl wraps and their discrimination abilities to evaluate the possibilities of vinyl wrap comparisons for future examinations. Vinyl from multiple manufacturers, of different colors and finishes, was observed optically using microscopy and chemically using an ATR-FTIR (Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy). Initial variations in patterns and behaviors were documented to assess distinguishability. With RStudio, spectral data was analyzed using pairwise comparisons and PCA analysis for each tested sample to determine whether differences in specific variables affect the discernibility of samples. From the preliminary data analysis, a general decrease in correlation was observed between colors, finishes, different roll positions, and manufacturers. With current findings from this project, we aim to offer general methods for examination that may also provide discriminating thresholds for evidence leading to inclusion or exclusion.

Ella Brastad

NE - Creighton University

Discipline: Computer Science

Authors:

#1 Ella Brastad

Abstract Name: Enhancing Bee Colony Health Monitoring through Non-Invasive Acoustic Analysis with LSTM Neural Networks

The health of bee colonies is vital for ecosystem sustainability and agricultural productivity due to bees' critical role in pollination. Traditional monitoring methods are often invasive and labor-intensive, lacking the ability to detect early signs of colony distress. This research proposes the utilization of advanced LSTM neural network models to analyze acoustic bioindicators as a non-invasive approach for monitoring bee colony health. We employ a meticulously curated dataset comprising monthly audio recordings from various bee colonies across different countries, enriched with metadata such as colony number and country of origin. The dataset also includes comprehensive biological data on pathogens, hormones, metabolic indicators, and parasites, featuring specific markers like ABPV, BQCV, DWV, IABPV, KBV, LSV1-4, P.larvae, SBV, V.apis, and V.ceranae. Leveraging the temporal sequence modeling capabilities of LSTMs, the proposed model is designed to capture intricate patterns within the audio data that correlate with changes in colony health. The LSTM neural network's proficiency in handling sequential data makes it particularly suited for analyzing the dynamic acoustic signals produced by bee colonies, which may contain subtle indicators of stress or disease not detectable through conventional analysis. The anticipated outcome is a predictive model capable of identifying early signs of unhealthy conditions within bee colonies. This early detection system would enable beekeepers to implement preventive measures promptly, potentially averting colony collapse and supporting

sustainable apicultural practices. By providing a real-time, non-invasive monitoring tool, this approach could significantly enhance bee health management, with positive implications for agricultural output and ecological balance. This research aims to bridge the gap between advanced machine learning techniques and practical apicultural applications, demonstrating the potential of combining acoustic analysis with LSTM neural networks to monitor and preserve bee colony health effectively.

Natalie Brattain

FL - Embry - Riddle Aeronautical University

Discipline: Chemistry

Authors:

Ashley Lunt

Abstract Name: Biosensors for Space-flight Neuro-Ocular Syndrome

This project aims to develop miniaturized devices using nanotechnology and advanced materials like graphene and carbon nanotubes to continuously monitor physiological pressures, particularly intraocular pressure (IOP). Elevated IOP is a key marker in the diagnosis and treatment of Spaceflight Associated Neuro-ocular Syndrome, which is recognized as a health risk for NASA astronauts. Our approach involves designing a contact lens tonometer embedded with graphene-carbon nanotube nanocomposite films, which offer heightened sensitivity and real-time, non-invasive monitoring of IOP. Methods include the synthesis and fabrication of nanocomposite films, characterization of their mechanical and electrical properties, and integration into flexible contact lenses. Simulated ocular environments are going to be used to test the biosensors sensitivity and accuracy under dynamic pressure conditions. Preliminary results indicate that the carbon nanotube films provide reliable and highly sensitive IOP measurements, outperforming traditional tonometry methods. These findings suggest that the contact lens tonometer could offer a more effective way to monitor IOP, improving patient care for elevated IOP which can be seen in SANS or glaucoma. This research not only advances healthcare technology but also provides undergraduate students with valuable interdisciplinary research experience in biomedical engineering and materials science. The project contributes to future innovations in non-invasive medical devices, aiming to improve diagnostic accuracy and patient outcomes.

Bridan Braun

KY - University of Kentucky

Discipline: Law and Legal Studies

Authors:

Abstract Name: Judge Ed Johnstone and the Fight for Prison Reform: A Case Study in Justice, Humanity, and Dignity

In 1976, eight inmates from the Kentucky State Penitentiary filed suits alleging unconstitutional conditions and treatment. These cases were later consolidated into a class action with inmates from the Kentucky State Reformatory. Presided over by Judge Ed Johnstone of the U.S. District Court for the Western District of Kentucky, the case addressed issues such as vocational education, protective custody, and living conditions. Renowned for his dedication to justice and dignity, Judge Johnstone exemplified fairness and hard work. This analysis draws from the Ed Johnstone papers, 1970s-1980s, at the University of Kentucky Special Collections Research Center. These primary sources, including letters, court documents, and personal notes, offer insight

into his judicial philosophy and efforts to improve prison conditions. Secondary sources, such as legal commentaries and analyses of the era's prison reform movements, contextualize his work within broader systemic challenges. This study employs qualitative methods to establish a timeline of significant events and analyze the judge's direct interventions, including prison inspections and communication with inmates. His respectful treatment of inmates and hands-on approach significantly contributed to improving prison conditions in Kentucky, setting a precedent for fairness and dignity. Amid ongoing concerns about systemic inequities and inmate treatment, this research underscores the relevance of his methods today, offering valuable lessons for courts striving to implement fairer practices.

Gavin Brazanskas

PA - Duquesne University

Discipline: Computer Science

Authors:

Abstract Name: Proliferation and Consequences of Lethal Autonomous Weapons Systems Integrating Artificial Intelligence

This report explores the integration of artificial intelligence (AI) into Lethal Autonomous Weapons Systems (LAWS), with a focus on the ethical, regulatory, and technological challenges that arise from this convergence. As leading nations like the United States, China, Russia, and Israel advance their capabilities in autonomous systems, the use of AI in loitering munitions, sentry systems, drones, logistical systems, and more raise profound questions about accountability, security, and compliance with international humanitarian laws. Public awareness and perception on the matter is suboptimal, with an outspoken minority standing opposed to their usage and the major militaristic power's decision to abstain from diplomatic efforts of regulation. Some of the sources referenced include a report from MIT science policy review, the government of China's website, the book "Four Battlegrounds" by Paul Scharre, and more (all citations included in poster). The methodology consisted of aggregating data on AI usage from these sources, and putting it in historical context of ethical warfare. While intending to leave the audience with several questions to deeply consider, the conviction is asserted that unchecked AI integration will present disastrous consequences unseen in any advancement previously seen in warfare, including the atomic bomb.

Aurora Breidenbach

MN - The College of St. Scholastica

Discipline: Psychology

Authors:

#1 Aurora Breidenbach

#2 Amber Schlater

Abstract Name: Curling Connections: Exploring the Impact of Team Cohesion on Performance

Team cohesion is most often described as the strength and existence of interpersonal connections within a team, and remains an essential element for team work and ultimately for team success. Several studies have looked at the effect of team cohesion on success in various sports, such as basketball, volleyball, Nordic skiing, and soccer both at collegiate and professional levels. However, no prior research has been done to explore the relationship between team cohesion and performance within curling teams. Curling is a team sport with four players on a team; each player has a different role within the team, but all roles are important

in influencing the success of the team through constant, clear communication. Miscommunication and misinterpretations can quickly cause issues within the team atmosphere and the game itself. The aim of this study is to examine the relationship between team atmosphere and cohesion on performance within curling teams. In this correlational study, which has been approved by the College of St. Scholastica's Institutional Review Board (IRB), data was collected through a secure online survey administered via Qualtrics. In addition to minimal demographic information, content of the questions addressed curling experience, personal experience within curling teams, and team performance. Preliminary results show that self-reported cohesive curling teams are associated with higher performance and that teams with positive environments have higher cohesion than teams with negative environments. This research will impact the curling community and greater sports community by generating and expanding knowledge on the role team cohesion plays in affecting performance.

Thomas Breil

PA - Pennsylvania State University

Discipline: Biology

Authors:

#1 Jiřina Medalová

#2 Patrik Matušů

Abstract Name: The Immunomodulatory Effect of Plasma-Treated Biomaterials

Cardiovascular disease is the leading cause of death in the United States, with over 700,000 deaths reported in 2022 alone. Autologous vein replacements, a common procedure performed after heart attacks, can only be used a limited number of times to repair damaged blood vessels, highlighting the need for alternative replacement methods. One potential solution is the use of biomaterials to create cell scaffolds, which can form artificial veins. However, to overcome the challenge of achieving a biocompatible surface, a surface modification technique called plasma-enhanced chemical vapor deposition (PECVD) can be used to add amine groups to the biomaterial, creating an amine plasma polymer. The primary aim of this project is to evaluate the immune response of neutrophils when exposed to plasma-treated biomaterials. Biomaterials induce a foreign body reaction that activates the immune system, with neutrophils being the first immunological cells to contact the material. While much research has focused on macrophages, there is limited understanding of how surface modifications of biomaterials trigger the pro-inflammatory response in neutrophils, known as NETosis. In this study, we analyzed cytokine content, the percentage of apoptotic cells, and the presence of NETosis in neutrophils exposed to biomaterials with varying quantities of amine groups. Our findings suggest that higher levels of amine groups on the biomaterial surface increase the likelihood of a pro-inflammatory neutrophilic response. This was supported by increased IL-8 protein release (a marker of the pro-inflammatory pathway in neutrophils) measured by ELISA, elevated apoptosis levels observed through flow cytometry, and a trend of increased citrullinated cells (a marker of NETosis), also detected by flow cytometry.

Grace Bricker

NC - University of North Carolina at Charlotte

Discipline: Criminology/Criminal Justice

Authors:

#1 Jesse Mckee

Abstract Name: The Impact of Childhood Abuse on Female Gang Membership

This review is written to collect, engage with, and analyze the current literature by examining gendered disparities in terms of influences on gang membership and violence within the gang. This review seeks to determine how predictor experiences like violence during childhood influence violent behavioral outcomes such as gang membership among adolescent females. This paper seeks to holistically examine the prevalence of female gang membership, reasons for joining a gang with an emphasis on the effects of ACE (adverse childhood experience exposure), disparities in crimes committed and roles within the gang, and differences in perceptions of the gang. This paper evaluates the presumptions and accepted notions surrounding female gang membership both historically and in a more modern context. This review challenges the existing literature to bring to light the experiences of female gang members and bridge the gap between the understanding of domestic violence and trauma and its influential nature on behavior for females in the context of criminality.

Mohamed Khalil Brik

EGY - The American University in Cairo

Discipline: Computer Science

Authors:

#1 Mohamed Khalil Brik

Abstract Name: AI-Powered System for Improving 911 Emergency Response

Classical emergency response systems, such as 911, fail to process a large number of emergency calls in populated areas. Such systems are prone to human errors. Human operators work for very long hours handling exhausting calls, which puts them under huge mental pressure. In this research, we propose a full system that uses Artificial Intelligence to support human operators in responding to 911 calls. The first stage of the system is to use Sentiment Analysis on the caller's voice to determine their Age Group and the Urgency Level of the call. The second stage is to convert the voice into text using the Whisper Model. The third stage uses our Named Entity Recognition model to derive the Caller's Name and the Emergency Address. The third stage uses the Classifier Model to determine the Emergency Type: Medical, Mental Health, Crime, Fire, Animal Control, National Security Threats, or Natural Catastrophes. The fourth stage invokes the trained Modular Large Language Models to handle each type of the seven emergencies. The LLMs are trained on official manuals from official public safety organizations. If the caller's name is mentioned, the system will access their health records database and tailor the recommendation based on their medical conditions. The final stage is to produce questions to ask the caller, resources to deploy by the operator, procedures to follow until help arrives, and help the operator with their conversation with the caller. First, we show how the modular approach improved the efficiency of our overall system. Second, we show how to use context awareness of the environment and the individual to give more personalized responses. While this research is focused on AI use in Public Safety, our contributions could be viewed as a reference for developing other AI-powered systems.

Olivia Brill

MI - Northern Michigan University

Discipline: Biology

Authors:

#1 Olivia Brill

#2 Kristian Choate

#3 Paul Mann

#4 Robert Winn
#5 Matthew Jennings

Abstract Name: Development of a Rapid Assay for Detection of the Isocitrate Dehydrogenase 2 (IDH2) R172K Point Mutation using Recombinase Polymerase Amplification (RPA)

Mutations within the Isocitrate Dehydrogenase 2 (IDH2) gene are associated with the diagnosis of low-grade gliomas. The prevalence of IDH2 mutations in glioma is approximately 2.2%, however, these point mutations found within the catalytic site of IDH2 confer survival benefits compared to their wild-type (WT) IDH2 counterparts. Mutations found at IDH2 R172 are prognostic indicators for life with progression free survival and overall survival increasing roughly four-fold. Rapid detection of these mutations and maximal resection of the tumor allows patients to receive these benefits. Utilizing synthetic DNA and the isothermal nucleic acid amplification technique, Recombinase Polymerase Amplification (RPA), rapid discrimination between WT and mutant sequence was achieved. Six RPA primer sets were screened for amplification of the IDH2 R172 gene region. Upon successful amplification of the IDH2 R172 region, the selected primer set was optimized utilizing a Locked Nucleic Acid (LNA) to successfully discriminate between R172 Wildtype (WT) and R172K mutant sequences. The optimized assay is able to discriminate between the IDH2 WT and IDH2 R172K point mutation within 5 minutes at 44 degrees Celsius. This rapid detection allows for potential use of this technique during the surgical window. Current endpoint analysis uses agarose gel electrophoresis for confirmation that the IDH2 R172K point mutation is being amplified. However, this is a time-consuming analysis for a rapid nucleic acid amplification technique. Future iterations of this RPA include the use of a real-time fluorescence-based reporter system allowing for specific identification of mutational status. Another option for detection would be using a cleavase assay to detect the specific sequence. Once a reporter system is established, the RPA for detection of the IDH2 R172K SNP will be tested in more complex biological matrices and discrimination will be tested against other IDH2 R172 mutants such as R172M, R172W, and R172G.

Trinity Brisbane

GA - Georgia Southern University

Discipline: Nursing and Public Health

Authors:

#1 Marian Tabi, PhD, MPH, RN

Abstract Name: Do Nursing Students Perceive That They Are Educationally Prepared to Care for Minority and Ethnically Diverse Populations upon Graduation?

Every individual has the right to receive safe and efficient care in the healthcare setting. As healthcare grows and demographics evolve rapidly, it is crucial that frontline workers, particularly nurses, are adequately prepared to address the unique needs of minority and ethnically diverse populations. Over recent years, the importance of culturally competent nursing care has gained significant attention in the literature. However, a significant gap exists in understanding how effective current nursing school curricula is in preparing students for this critical aspect of patient care. This study intends to address the central research question: "Do Nursing Students Perceive That They Are Educationally Prepared to Care for Minority and Ethnically Diverse Populations upon Graduation?" The purpose of the research is to assess how current nursing students perceive their readiness to provide culturally competent care and evaluate their views on how well the nursing school curriculum has prepared them for this responsibility. This study will use a quantitative research methodology using an online survey distributed to currently enrolled nursing students across different cohorts at Georgia Southern School of Nursing. The expected findings will suggest that due to insufficient prioritization of cultural competency education in nursing school curricula, the students will lack confidence in preparation to care for ethnic and minority patient populations. The results from this research aim to contribute to existing

research on cultural competence in nursing education and propose potential improvements in current nursing school curricula.

Jesse Britt

PA - California University of Pennsylvania

Discipline: Biology

Authors:

#1 Jesse Britt

#2 Michelle Valkanas

Abstract Name: The Effects of DEAD-Box Protein Overexpression on *S. cerevisiae* 23S RNA Narnavirus Viral Load

The utility of DEAD-box proteins (DBPs) in remodeling RNA secondary structures and ribonucleoprotein complexes across prokaryotic and eukaryotic kingdoms has long been known to the scientific community. In recent years, DBPs have been investigated regarding their role in viral infections, particularly if they impose a pro-viral or anti-viral influence. The 23S +ssRNA Narnavirus is a ubiquitous virus within *Saccharomyces cerevisiae* which exists in a low copy number, is considered non-detrimental, and presents with no obvious phenotypic effects. In an opportunity to investigate the viral roles of DBPs, *S. cerevisiae* which possessed the 23S virus was grown in nitrogen deficient media to artificially increase the viral RNA copy number. Likewise, viral positive *S. cerevisiae* groups were transformed with expression vectors to upregulate one of two proteins, DBP1 or DBP2. Overexpression of these DBPs allowed for the assessment of their effects, if any, on the overall viral load and strand quantity under variable nitrogen conditions using RT-qPCR. In the following study, we attempt to assess the quantitative effects of two overexpressed *S. cerevisiae* DBPs on the viral load of a 23S RNA Narnavirus. The minimal virulence of the 23S virus offers an advantageous model to investigate DBPs as a potential anti-viral agent.

Jacqueline Britton

PA - Lafayette College

Discipline: Economics

Authors:

#1 Hongxing Liu

Abstract Name: Cost-Benefit Analysis of the Lafayette College Composting Program

This thesis evaluates the costs and benefits of the Lafayette College composting initiative. The urgency of environmental sustainability has prompted many campuses to explore composting programs as a solution for waste management, particularly for food waste, which constitutes nearly a quarter of landfill content. The study employs a comprehensive cost-benefit analysis to assess both financial and environmental impacts of the program. Key costs include capital and labor needed for production, measured using invoices from the Lafayette College Office of Sustainability. The rebound effect, where increased awareness may lead to higher food disposal rates, is also considered a cost. My study will follow prior literature to estimate the magnitude of this effect on Lafayette's campus. Benefits of composting include reductions in carbon and methane emissions, savings from decreased waste hauling, potential revenue from selling compost, and community benefits from the program, which is a non-market value. These benefits will be assessed using compost volume data from the Office of Sustainability, EPA values for greenhouse gas emissions, market prices for

compost, and a community survey that uses contingent valuation to gauge willingness to pay for the program. This research addresses a gap in the literature by providing a holistic view of composting's impact, incorporating both economic and environmental aspects, including market and non-market values. It discusses short-term and long-term net benefits and offers strategies for managing high startup costs, such as optimizing resource use. Additionally, it cautions against relying solely on composting, advocating for a comprehensive sustainability approach. By demonstrating that composting programs can be financially sustainable and beneficial over time as a strategy for waste reduction and environmental stewardship, this study serves as a model for similar institutions seeking to enhance their sustainability efforts through compost, fostering a culture of sustainability in higher education.

Megan Brock

PA - Grove City College

Discipline: Health and Human Development

Authors:

#1 Lisa Hosack

Lisa Hosack

Abstract Name: Pittsburgh's Untapped Resources: Enhancing Support for the Rising Number of Unaccompanied Children

This mixed-methods research study had two primary questions. We examined policies and practices related to the care of unaccompanied children (UC) — persons under 18 years of age without legal immigration status and a parent or guardian crossing the southern border of the U.S. with them — to learn the effects of those policies and procedures on their well-being. We further sought to understand the role played by our local region — Pittsburgh — in UC care. For context, we examined several factors including the historical context of policies impacting UC, the “push and pull factors” for UC and their families, the roles played by local, state, and federal governments as well as non-profit organizations, and the trajectory for UC from the time of their border crossing to a legal proceeding determining their long-term status. We conducted our research with the empirically based assumptions that (1) UC require protection from both malicious actors and further traumatization and (2) UC should be reunited with family members or other safe adults as quickly as possible. Our methods included an analysis of secondary data and semi-structured interviews with experts involved in policy or direct practice with UC, particularly in Pittsburgh. We noted significant recent improvements in UC-related policies and procedures which will likely contribute to increased UC well-being and protection. We recommend further development by creating child-friendly immigration courts and employing trauma-trained professionals at the border. We also noted a growing number of UC and a corresponding increased need for temporary residential care and services, especially in non-border states. And while Pittsburgh has one temporary residential facility currently serving UC, we concluded that Pittsburgh is underutilized and has both the capacity and willingness to serve many more persons within this vulnerable population.

Omari Brockington

NY - Pace University

Discipline: Economics

Authors:

Abstract Name: The Financial Fallout of Divorce

Divorce income trajectories for men and women. This paper investigates the economic consequences of divorce, with particular attention to how income changes and recovers between the genders. Most often, women experience tremendous economic declines in terms of earnings, increasing risks related to poverty and declining opportunity costs for wealth formation. These findings reported here are often determined by system-level factors, such as the persistent gender wage gap, the financial burdens incurred by child custody responsibilities, and the uncompensated work associated with caregiving responsibilities. Meanwhile, men generally experience far more uniform economic outcomes with many reporting improved economic fortunes after divorce. This paper investigates these determinants of inequities by analyzing the impacts of alimony, child support enforcement, and remarriage on economic outcomes. Alimony and child support policies seldom go far enough in the relief of women's financial burdens, while remarriage often confers greater economic benefits on men due to their established sources of income and societal norms that favor them. It further investigates long-term economic consequences of divorce for different income groups and reveals that individuals from low- and middle-income groups are more affected by divorce compared to their counterparts in the higher-income groups. This article synthesizes findings from the existing economic literature and conducts a rigorous analysis of policy interventions with a view to shedding light on the strengths and weaknesses of extant systems in place to reduce income inequality. It highlights the now pressing need for equitable policies that support both genders—through strengthened child support enforcement, progressive alimony reform, and other measures aimed at dealing with the gendered dimensions of unpaid care work.

Morgan Broderick

NC - Elon University

Discipline: Biology

Authors:

#1 Eryn Bernardy

Abstract Name: Development of low-cost antibody binding assay using *Staphylococcus aureus*

Antibody binding assays are a vital component in healthcare research and play a crucial role in understanding biological processes, diagnosing diseases, developing therapies, and much more. While there are multiple assays on the market testing for antibody binding, they are all very expensive which limits their use in research, especially at primarily undergraduate institutions. The interactions between antibody and *Staphylococcus aureus* were investigated to determine if a novel and inexpensive antibody binding assay could be developed. To do this, we incubated a fluorescent nonspecific antibody with *S. aureus* for 5 hours. At the same time bacteria alone and antibody alone were incubated in the same conditions for the same amount of time to serve as negative and positive controls, respectively. Each tube was then split in two, with one being centrifuged to form a pellet comprising of bacteria or antibody or both, and the other one left alone. Fluorescence was measured for the liquid in each tube. We hypothesized that any fluorescent antibody that was bound to bacteria would end up in the pellet, while antibody that is unbound would stay in the liquid component. Therefore, by measuring only the liquid component, we hypothesized the fluorescence would decrease in the bacteria with antibody tube that was centrifuged when compared to the bacteria with antibody tube that was not. We also hypothesized that the bacteria alone and antibody alone tubes would have no change in fluorescence. Trends in the fluorescence readings showed that there was not a decrease in the antibody alone tube, not a decrease in the bacteria alone tube, but there was a decrease in the centrifuged tube with both bacteria and antibody. Indicating that this method could potentially be used in the development of a new antibody binding assay.

Henry Brooks

TN - University of Tennessee at Knoxville

Discipline: Engineering

Authors:

#1 Henry Brooks
#2 Carter Blessing
#3 Stephen Young
#4 Dayakar Penumadu

Abstract Name: Mechanical Properties of Ultra High Performance Concrete reinforced with Basalt Minibars

A major challenge for civil engineers working on more sustainable infrastructure is the reliance on steel for concrete reinforcement. The high cost of production and susceptibility to corrosion associated with steel rebar promotes research into potential alternatives. Basalt fiber presents a viable solution that is naturally occurring, releases less CO₂, and lighter weight. Basalt fiber mini bars could be used in concrete mixes to provide more reliable reinforcement. However, there is a need for comprehensive process-structure-property relationship for basalt reinforced concrete mixes. Furthermore, the mechanical behavior of the concrete is influenced by critical factors including fiber orientation, fiber volume fraction, and porosity within the resulting part. This research evaluates the mechanical properties resulting from randomly dispersed basalt mini bars in an ultra high performance concrete mix. American Society for Testing and Materials standards were used to test flexural beams, compression cubes, and tensile samples after 28 days of curing. Select samples were examined qualitatively using high-resolution micro X-ray computed Tomography to evaluate the distribution of the mini bars within the mixes spatially. It was found that basalt mini bars improved the compressive, tensile, and flexural strengths compared to tests of samples without reinforcement. Increasing the percent volume of mini bars further improved sample performance, showing promise for basalt minibars as a reinforcement for concrete mixes.

Faith Brooks

TN - Trevecca Nazarene University

Discipline: Psychology

Authors:

Abstract Name: Gratitude, Fear of Failure, and Mindfulness as Predictors of Neuroticism

This study sought to identify predictors of neuroticism in undergraduate students. Previous literature revealed connections between neuroticism, mindfulness, gratitude, and fear of failure. Specifically, negative correlations between neuroticism and the following facets of mindfulness were found: non-judging, acting with awareness, non-reacting, and describing. Additionally, gratitude has been shown to correlate negatively with neuroticism. The relationship between fear of failure and neuroticism was also investigated based on literature indicating high levels of worry relating to both neuroticism and fear of failure. Thus, the following hypothesis was proposed. Mindfulness test scores (describing, observing, acting with awareness, non-judging, and non-reacting), gratitude scores, and fear of failure scores would predict neuroticism scores. To test this hypothesis, the Five Facet Mindfulness Questionnaire– Short Form (FFMQ–SF), Gratitude Questionnaire 6 (GQ–6), Performance Failure Appraisal Inventory– Short Form (PFAI–S), and the neuroticism subscale of the Revised Eysenck Personality Questionnaire– Abbreviated Form (EPQR–A) were administered to one hundred twenty-six (N = 126) undergraduate students from statistics, positive psychology, marriage and intimate relationships, Christian tradition, and general psychology classes. Upon IRB approval, instrument packets and consent forms were distributed with professor permission. Participation was voluntary and confidential. The data were analyzed by a multiple regression analysis using SPSS software. A significant regression model was found: $F = 12.458$, $p < .001$, $R = .652$ and $R^2 = .425$. From this model, the following were found to be significant predictors of neuroticism: fear of failure ($\beta = .308$, $p < .001$); describing ($\beta = -.283$, $p < .001$); non-reacting ($\beta = .239$, $p = .002$); acting with awareness ($\beta = -.195$, $p = .019$); and

observing ($\beta = .181$, $p = .016$). Limitations included the homogeneity of the sample; future researchers were advised to include more sample diversity.

Finn Brooks

MI - University of Michigan - Ann Arbor

Discipline: Biology

Authors:

#1 Mohammad Farazuddin

Abstract Name: Role of vitamin A in the activation of dendritic cells innate immunity against the virus:

They aim to study the role of retinoic acid signaling in dendritic cells in their innate immunity activation against viral infections. Vitamins are essential to our diet as they play a crucial role in various biological processes and building immunity. Vitamin A is a fat-soluble vitamin found in foods from animal sources and some vegetables containing beta-carotene. It gets metabolized inside the body to produce retinoic acid which regulates different cellular functions. Retinoic acid modulates the function of many types of immune cells, and its specific role in dendritic cell activation has not been fully characterized. This research will help illuminate retinoic acid's effect on dendritic cell functions and its role in innate immune activation against different viruses. The team is currently utilizing flow cytometry, Western blotting, and real-time PCR techniques to study dendritic cell activation in response to viral exposure and document its effects on T lymphocyte activation. The anticipated results of this study will be conclusive of retinoic acid signaling in dendritic cells playing an essential role in immune activation.

Barbara Broschat

IL - Governors State University Honors College

Discipline: Nursing and Public Health

Authors:

#1 Barbara Broschat

Abstract Name: Sleep and Stress in Higher Education: Investigating the Interplay and Academic Performance

Sleep health is a crucial aspect of total well-being; nevertheless, it is increasingly undermined among college students due to multiple circumstances, with stress being a primary culprit. This literature review examines the intricate relationship between sleep patterns, stress, and academic life among young adults in higher education environments. College students frequently encounter substantial academic, social, and personal pressures, resulting in impaired sleep and diminished sleep quality, which can further intensify stress and adversely affect cognitive function, emotional regulation, and academic achievement. The review analyzes recent studies on the impact of chronic stress on sleep cycles and the reciprocal influence of sleep deprivation on stress levels. Furthermore, it examines the influence of lifestyle factors, like screen time, caffeine intake, and irregular schedules, in sustaining this cycle. The review evaluates interventions and tactics demonstrated to enhance sleep quality and alleviate stress among college populations, including mindfulness, cognitive behavioral therapy for insomnia (CBT-I), and improved time management techniques. This review synthesizes existing research on the interrelated concerns of sleep health and stress management, emphasizing their significance in college wellness programs and providing recommendations for future study to enhance students' sleep and mental health.

Christopher Brosnan

PA - Lafayette College

Discipline: Engineering

Authors:

#1 Julia Nicodemus

#2 Joshua Smith

#3 Chris Allen

Abstract Name: Effect of a Baffle Shroud on a Submerged Heat Exchanger in a Thermal Storage Tank with a Charging Loop

The effect of a cylindrical baffle on the heat transfer to a submerged copper coil heat exchanger in an experimental solar thermal storage tank with a charging loop is explored. Previous studies have been conducted to optimize the geometry of the tank, with the charging loop being explored in this study for the first time. The heat exchanger is located within the annular region created by the baffle and the wall of our storage tank. The charging loop functions by pulling cold water from the bottom of the tank, reheating it, and returning this heated water on top of the tank. Three initial tank temperature cases are investigated: a stratified tank with the top 60% of the tank at 60°C and the bottom 40% at 40°C; an isothermally charged 60°C tank; and an isothermally charged 40°C tank. The effect of the baffle on heat transfer is investigated by comparing experiments with and without the baffle for all three cases. For the stratified tank, the baffle has been shown to increase the heat transfer over the first 30 minutes by 7%. For the 60°C isothermal tank, the baffle has been shown to increase the heat transfer over the first 30 minutes by 18%. For the 40°C isothermal tank, the baffle has been shown to increase the heat transfer over the first 30 minutes by 10%. The primary factors for increasing heat transfer are velocity of storage fluid over the heat exchanger and tank stratification. Tank stratification was increased with the baffle for the isothermal cases, but decreased with the baffle in the stratified case. Velocity of the storage fluid always increased with the baffle. The improved heat transfer when the baffle is in place is attributed to increased velocity for the stratified case, and both velocity and stratification for isothermal cases.

Daliyah Brown

MD - Bowie State University

Discipline: Biology

Authors:

#1 Daliyah Brown

#2 Anne Wiley

Abstract Name: Quantifying Barn Owl Plumage Coloration and Its Relationship with Diet

Sexual ornaments are traits that increase the sexual fitness of a species by attracting mates. Melanin-based sexual ornamentation appears widespread in birds. However, the mechanistic basis of these ornaments remains unclear, along with their link to diet and environmental conditions. Here, we examine the impact of diet on melanin deposition in Barn Owls (*Tyto alba*), a species known to advertise individual quality via melanated plumage. Specifically, we test the hypothesis that diet impacts melanin deposition indirectly via body condition using a unique owl population from Kauai, Hawaii with highly varied diet (ranging from

rodents and insects to seabirds). Stable carbon and nitrogen isotope data from feathers were used to quantify diet, then compared with body condition indices and melanin deposition in Primary 5 for 19 Barn Owls. To estimate melanin deposition, we manually measured the width of transverse bars (melanated bars on the feather) on Primary 5, then measured transverse bar size as a percent of total feather surface area using ImageJ. We found that transverse bar width alone was significantly correlated to diet, such that owls consuming higher quantities of rodents (prey conferring higher body condition) had wider transverse bars. Our results provide partial support for the hypothesis that diet and body condition can control melanin deposition.

Ja'Mya Brown

TN - Tennessee State University

Discipline: Education

Authors:

#1 Ja'Mya Brown

#2 Linzee Nelson

#3 Beatrice Magombana

#4 Kaleb Gibson

#5 Ty'Kuan Smith

#6 Andrea Tyler

Beatrice Magombana

Linzee Nelson

Abstract Name: Representation, Resilience, and Challenges: The Journey of Black Female Engineering Students at an HBCU

By providing an equitable environment and fostering a strong sense of community, Historically Black Colleges and Universities (HBCUs) can create an environment that enables underrepresented students to thrive. The study aims to reveal HBCUs' unique role in affirming racial identity and representation while addressing systemic inequities in engineering spaces. Using Crenshaw's Intersectionality Theory and narrative analysis, the authors report findings from a 40-minute focus group of four Black female undergraduate students majoring in engineering at an HBCU. The focus group session was conducted via Zoom, recorded, transcribed verbatim, and analyzed manually. Key themes related to identity, representation, community, and inequities emerged through thematic analysis. Analysis of key themes suggests that participants highlight the importance of representation in engineering, describing how seeing successful Black females in similar roles fosters empowerment and validates their capabilities. Despite these positive aspects, participants also described challenges, such as overcoming stereotypes, earning respect in male-dominated spaces, and navigating microaggressions. Institutional gaps were identified, particularly the need for more funding and targeted programs for Black female engineers, such as initiatives to support professional development and peer networking. However, participants noted areas for growth, particularly in expanding resources for engineering programs and fostering inclusivity within academic and professional spaces. The significance of community was another recurring theme, with participants emphasizing how peer and faculty support at an HBCU contributes to resilience and academic motivation. These results contribute to a larger urban context by offering valuable insights into the lived experiences of Black female engineering students at HBCUs and the importance of tailored support and advocacy to promote equity and inclusion for Black female students in engineering spaces.

Maria Brown

OK - Langston University

Discipline: Nursing and Public Health

Authors:

#1 Katherine Madden

#2 Kayla Polcari

#3 Yalini Vigneswaran

Abstract Name: Understanding Barriers To Bariatric Surgery

This study explores factors influencing patient dropout rates from the bariatric surgery program at The University of Chicago to improve access and outcomes. Bariatric surgery is the most effective long-term treatment for morbid obesity, a condition affecting over 20 million U.S. adults and linked to severe health risks. Despite its benefits, high attrition rates, particularly among socioeconomically disadvantaged patients, remain a significant barrier. The research examines how socioeconomic challenges, limited healthcare access, psychosocial factors, and communication gaps contribute to attrition, based on preliminary data from a questionnaire at The University of Chicago. Using a mixed-methods approach, it combines quantitative analysis of patient demographics with qualitative insights from interviews to understand these barriers comprehensively. Initial findings highlight the role of systemic inequities, such as low income and healthcare inaccessibility, in driving dropout. Future efforts will focus on developing targeted strategies to reduce attrition, ensuring equitable access to bariatric surgery and its life-saving benefits.

Peter Brown

NH - Southern New Hampshire University

Discipline: Political Science

Authors:

#1 Peter Brown

Abstract Name: War in the Age of AI: Strategic Decision Making

This study examines the transformative impact of AI on strategic decision-making in modern warfare. Scholarly and Research Context: While existing literature often focuses on the technical capabilities of AI in military applications (e.g., autonomous weapons, target recognition), this project examines the crucial intersection of human and machine intelligence in the high-stakes environment of strategic decision-making. By analyzing how AI interacts with traditional military doctrines and human cognitive biases, this research seeks to identify potential vulnerabilities and unforeseen consequences of incorporating AI into military command structures. This project draws upon and contributes to scholarship in military strategy, human-computer interaction, and AI ethics to provide a comprehensive analysis of AI's influence on the future of warfare. Central Research Question: How does the integration of AI impact strategic decision-making in modern warfare, specifically regarding: The evolving roles of human commanders and AI systems. The influence of AI on the speed and accuracy of strategic decisions. The ethical implications of using AI in warfare. The potential consequences of AI integration for strategic outcomes. Methodology: This research employs a three-pronged approach: Literature Review: Examining existing research on AI, military strategy, and decision-making. Expert Interviews: Gathering insights from military strategists, AI developers, and defense analysts. Comparative Analysis: Analyzing different military doctrines and approaches to integrating AI into strategic decision-making across various nations. Conclusions and Expected Results: This research aims to provide a nuanced understanding of the complex interplay between human judgment and AI-driven

insights in military contexts. It is expected to identify best practices and potential pitfalls in leveraging AI for strategic advantage, highlight ethical implications (accountability, bias, unintended escalation), and offer insights into how AI might shape the future of warfare. The findings will contribute to ongoing scholarly and policy debates surrounding the responsible development and use of AI in the military domain.

Kourtney Brown

KS - Kansas State University

Discipline: Biology

Authors:

#1 Kourtney Brown

#2 David Grieger

Abstract Name: THE STAINING OF BOVINE EMBRYOS TO DETERMINE CELL NUMBER AS A POTENTIAL PREDICTOR OF IN VIVO VIABILITY, AND SINGLE EMBRYO PCR ANALYSIS.

The efficiency of embryo transfer in cattle is dependent on the pregnancy rate of recipient females that receive transferred embryos. A significant proportion of embryos are freezing in liquid nitrogen then later thawed for transfer. This study aimed to stain thawed bovine embryos immediately after thawing to determine the number of cells present. Bovine morula and blastocyst stage embryos were stained with Hoechst and Propidium Iodide (PI). PI is a fluorescent dye that binds to DNA and penetrates only dead cells. This property makes it useful for identifying non-viable cells. In contrast, Hoechst attaches to the DNA in both living and dead cells, giving an estimate of the number and distribution of cells. Embryos were stained by incubating them in PI solution at 38.5°C. To get rid of extra dye, they were then thoroughly washed in PBS/PVP. The embryos were then incubated at room temperature and stained with Hoechst. After that, stained embryos were put on a glycerol-coated slide and observed with blue and red filters under an epifluorescent microscope. The second objective of the work was to use PCR to determine if single embryos could be analyzed to determine sex. A thorough method for examining bovine embryos is provided by the combination of staining and PCR techniques, which combine molecular and visual data to improve comprehension of embryonic progress and viability. For objective 1, the results of our study were 56.5 of cells per embryo ($n = x$ embryos). For objective 2, PCR analysis of single embryos was able to determine a Y-specific gene.

Miles Brown

MD - Bowie State University

Discipline: Computer Science

Authors:

#1 Soo-Yeon Ji

Abstract Name: Enhancing Bankruptcy Prediction: A Comparative Study of Imputation Techniques in Financial Data

Bankruptcy, the legal status of an entity unable to repay its debts, carries significant consequences for economies, businesses, and individuals. Predicting bankruptcy is crucial as it helps stakeholders make informed financial decisions and mitigate risks. In this study, we utilize a dataset on Taiwanese bankruptcy cases to explore methods for improving prediction accuracy through effective preprocessing—a crucial step in data preparation that ensures cleaner and more reliable inputs for analysis. The preprocessing techniques used include mean, median, and k-nearest neighbors (KNN) imputation to address missing values. While

mean and median imputation replace missing data with simple statistical measures, KNN imputation leverages patterns in the dataset by filling gaps based on the most similar instances. Each approach offers unique benefits: mean and median are computationally efficient, while KNN captures complex relationships, making it a robust option. However, KNN imputation did not always outperform other methods, particularly when missing data was clustered or when outliers and non-linear relationships between variables were present. In these cases, simpler methods like mean or median imputation sometimes provided better results. Observations from correlation analysis revealed that KNN imputation preserved variable relationships better than the other methods, particularly for financial ratios with high interdependence. However, in cases of extreme skewness, the correlation patterns deviated, making mean or median imputation more reliable. Visual representations were employed to illustrate the performance differences. Results reveal that KNN imputation outperformed the other techniques overall by retaining underlying data structure and reducing biases. This study highlights the importance of preprocessing in building accurate predictive models. By demonstrating that KNN imputation leads to better outcomes, this research emphasizes the value of sophisticated techniques in financial risk analysis and lays a foundation for improving bankruptcy prediction.

Randy Brown

OK - University of Central Oklahoma

Discipline: Computer Science

Authors:

#1 Jicheng Fu

Abstract Name: Integrating a Local Large Language Model for Research and Education at the University of Central Oklahoma

Large Language Models like ChatGPT have made a devastating impact on our day-to-day lives. Their ability to generate code from a variety of programming languages and being able to solve complex problems has made new discoveries from different disciplines. It is imperative to conduct LLM research and explore the application of these models to maximize their full potential for research and education. Our vision is to make a local LLM ecosystem to conduct research and educational endeavors within our college. Some of the key elements we want to add are a Retrieval-Augmented Generation (RAG) system, a user-friendly chatbot website, and different LLMs. The first thing to do is to create an Application Programming Interface, or API, that grabs the sender's message from the website and uses that message to build a prompt and send back a response to display to the user. We intend to use the Torch library from Python to utilize a Graphics Processor Unit, or GPU, to run our back-end service for the website to connect to. The next thing to do is to build a user-friendly chatbot website that allows a user to send messages to our API. We intend to use Vite to help increase efficiency for our website. Some other things we are including are a history bar for users to create a new chat, allowing the user to open a different chat, giving them an option to delete their chat, and being able to export the conversation into a Javascript Object Notation (JSON) format.

Jackson Brown

MN - University of Minnesota - Twin Cities

Discipline: Environmental Science and Sustainability

Authors:

#1 Francoise Pierrot

Abstract Name: Comparative Analysis of Renewable Energy Adoption in France and Sweden

This research investigates the disparity in renewable energy adoption between France and Sweden, despite both countries operating under EU-wide programs such as the Renewable Energy Directive (RED) and the European Green Deal. Between 2017 and 2022, Sweden's renewable energy share increased from 53.4% to 66%, while France's share grew from 15.8% to 20.3%. Sweden's success is attributed to consistent policies, high carbon taxes, and community-driven projects, which have fostered investor confidence and public acceptance. In contrast, France's reliance on nuclear power, complex permitting processes, and fragmented policies have slowed renewable energy development. This study employs a mixed-methods approach, integrating quantitative data—such as energy adoption rates, emissions reductions, and financing mechanisms—with qualitative analysis of policy frameworks, regulatory processes, and cultural factors. Sweden's cohesive strategies reduced greenhouse gas emissions from 1.0 to 0.6 tonnes per capita and transport emissions from 148.2 to 66.6 g/km, while France saw declines from 6.8 to 5.7 tonnes and 133.8 to 103.1 g/km, respectively. The findings underscore the importance of stable, long-term policies, streamlined regulations, and community engagement in achieving renewable energy targets. Sweden's model provides a replicable framework for France and other EU countries seeking to accelerate renewable energy transitions. Recommendations include simplifying France's permitting processes, increasing carbon taxes, and adopting community-driven renewable projects. This research highlights the critical role of national policy execution in meeting EU climate goals and offers valuable lessons for countries navigating renewable energy transitions.

Elizabeth Brown

MI - Northern Michigan University

Discipline: Psychology

Authors:

#1 Elizabeth Brown

#2 Haillie McDonough

#3 Cory Toegel

#4 Forrest Toegel

Abstract Name: Effects of the Timeout Production Schedule on Behavior Maintained by Concurrent Schedules of Reinforcement

Timeout is a signaled, response-dependent, and time-limited period in which the prevailing schedule of reinforcement is suspended. Results from applied and basic research suggest that punishment effects of timeout depend, in part, on the punishment production schedule. The present study extends this work by evaluating effects of the timeout production schedule on rats' response rates in a two-lever concurrent arrangement. In each condition, concurrent variable interval schedules operated on two response levers. During Baseline conditions, no timeouts were delivered. During Timeout conditions, 30-s timeouts were produced according to one of the following schedules: FR1, VR2, VR5, or VR10. Results indicate that the punishing effects of timeout are an inverse function of the ratio programmed on the timeout production schedule. Results and their theoretical implications will be discussed in the context of contemporary and historical research on punishment.

Ophelia-Eden Brown

OK - Cameron University

Discipline: Physics and Astronomy

Authors:

#1 Ophelia-Eden Brown
#2 Susmita Hazra

Abstract Name: Understanding the Martian Atmosphere and Seasons Using and Analyzing Martian Cloud Data

Mars has a very thin atmosphere compared to Earth's atmosphere, but Mars has seasons and clouds like Earth. Several of the Mars Orbiters have collected data that allows scientists to combine and understand more about the clouds. Water-ice clouds and carbon-dioxide ice clouds are the types of clouds found on Mars. There is a correlation between what types of clouds are seen in specific locations based on the season that Mars is in. Mars data from the NASA Citizen Science Project in MY29 was split into 3 sets called the Clear Season (Ls= 0 to 140 degrees), another season in between (Ls= 150 to 230 degrees), and the Dusty Season (Ls= 180 degrees to 328 degrees). Each set has its own cloud characteristics. It is found that in the clear season, clouds are most often in the equatorial region. In the mid-range between the clear and dusty season, daytime clouds are found normally in the mid-latitudes and night-time clouds are seen in the equatorial region. In the dusty season, clouds are frequently found in the northern hemisphere and at night are primarily in the southern mid-latitudes to northern mid-latitudes. We are analyzing the data to visually understand the similarities between seasons. New information can give insight into the composition of the clouds as well as understanding thermal tides and gravity waves for temperature drops.

Alexandria Brown

NC - Winston-Salem State University

Discipline: English and Literature

Authors:

Abstract Name: Through Their Eyes: The Struggle for Identity Among Black Girls and Women in The Bluest Eye

Toni Morrison's exploration of Black identity delves deeply into the intersections of race, gender, and societal expectations, particularly focusing on the experiences of Black women and girls. Her novel *The Bluest Eye* examines how systemic oppression and internalized white beauty standards distort self-perception and self-worth, especially for young Black girls like Pecola Breedlove. By addressing themes of trauma, resilience, and community dynamics, Morrison critiques societal structures of racism and patriarchy while celebrating the strength and agency of Black women. Her narratives combine personal and historical dimensions, offering a profound critique of societal norms and their generational impact. This paper examines *The Bluest Eye* through a Black feminist critical lens, exploring how Morrison's work critiques oppressive systems and highlights pathways for resistance and self-empowerment. This study explores how beauty standards, especially Pecola's obsession with blue eyes, affect identity, showing how trauma shapes her self-perception through the Breedlove family's struggles. It also examines the different kinds of support in the community, particularly through the child protagonists. The analysis highlights Morrison's contribution to Black feminist criticism, emphasizing her call for cultural change, better representation of Black girls and women, and the importance of self-love in resisting systemic oppression, as seen in *The Bluest Eye*.

Daliyah Brown

MD - Bowie State University

Discipline: Biology

Authors:

#1 Abiola Bada

#2 Avrianna Blackshear

#3 Amiyah Chisley

#4 Onyinye Iheahuru

Skye Simms

Abstract Name: Food Forensics: Tetraplex PCR Analysis for Meat Type Authentication

Food fraud, including mislabeling and adulteration of meat products, poses significant risks to consumer health, religious and ethical compliance, and market trust. This study investigates the authenticity of processed mixed meat products sold in Maryland, addressing these critical concerns. A total of 56 products, including turkey, chicken, beef, and pork-based items, were analyzed using advanced molecular techniques. DNA was extracted using the Cetyltrimethylammonium bromide (CTAB) method, with Nanodrop spectrophotometry employed to ensure high DNA purity and concentration. Multiplex PCR was then used to simultaneously amplify the isolated DNA samples with species-specific genetic marker, Cytochrome c oxidase subunit I (COI) gene. Agarose gel electrophoresis confirmed the presence of DNA fragments corresponding to the labeled meat types. The results revealed accurate labeling in most products, but a subset showed adulteration, with undeclared meat constituents identified. Notably, two soy-based vegan samples were validated as meat-free, confirming their authenticity. This research highlights the effectiveness of DNA-based methods like multiplex PCR in detecting food fraud or errors unintentionally introduced or contaminations encountered during the sample processing, packaging and delivery, and this molecular technique ensures consumer trust, and promotes transparency in food labeling. Future work will expand the scope of testing to include a broader range of food products.

Jadyn Brueske

VA - Liberty University

Discipline: English and Literature

Authors:

#1 Nathaniel Valle

Abstract Name: The Mentality of Women: The accuracy of mental illness treatment in Dreaming in Cuban

Cristina Garcia's novel *Dreaming in Cuban* follows the life of Celia del Pino, telling her ill-fated tale of mental decline. Celia is a strong but obsessed woman, leading to her gradual insanity, subsequently Jorge, Celia's husband, admits her to a "hospital," which in truth is an insane asylum. During Celia's time within the mental institution, she endured conditions such as "The food [being] inedible" (Garcia 51). She also witnesses violence against her friend Felicia, who was "burned in her bed" (Garcia 51). Celia endured many similar incidents. Following Celia's release her obsession with Fidel Castro (referred to as El Líder) manifested. My essay continues the conversation Garcia began in *Dreaming in Cuban* about women and the treatment they endured within mental facilities. Little research has drawn attention to the "madhouse" in Havana known as Mazorra, an environment similar in conditions to Celia's asylum. Mazorra was one of the first and only Cuban public mental institutions that was opened on a former slave plantation. Mazorra was said to be "plagued by violence, shortages, disease, and the absence of verifiable mental treatment" (Lambe 95-96). The asylum was reported many times for frequent abuse but did not close until Fidel Castro's rule in 1959, which he vowed to rebuild the hospital and make healthcare a priority. However, in 1980, Castro gave Cubans permission to flee Cuba to South Florida in the Mariel boatlift. This group of Cubans consisted mostly of mental patients, who were undesirable to Castro. My essay uses these historical examples to describe the effect that Castro's rule had on Cubans who were mentally ill showing that, even after Celia's

treatment, her mental decline reveals how obsession with Castro's corrupt Cuba reflects the decline of mental health conditions on the island during the time of El Líder's reign.

Michael Bruk

DC - American University

Discipline: Political Science

Authors:

Abstract Name: Territorial Ambitions: A Comparative Study of Soft and Hard Irredentism in Russia

What explains state choices to pursue policies of Irredentism through violence instead of peaceful means? Irredentism, a strategy aimed at annexing territories based on historical, nationalist, or geopolitical claims, has been studied extensively by scholars of international relations due to its destabilizing effects, however, less is known about why states choose to utilize annexation policies through violence (hard) or peaceful (soft) means. This research employs a neopositivist small-n methodology comparative exploratory case study, based on Alexander George's and Andrew Bennett's Case Studies and Theory Development in the Social Sciences, to examine the factors influencing states to choose violent over peaceful irredentist policies. Focusing specifically on exploratory case studies of Russia's actions in Crimea (Ukraine), Abkhazia and South Ossetia (Georgia), Narva and Setomaa (Estonia), and Transnistria (Moldova), the study identifies key independent variables including economic disparities, military strength, regime types, cost of conflict, and international involvement. The findings ultimately support that lower economic differences, higher costs of conflict, democratic governance, and greater international oversight tend to reduce the likelihood of violent irredentism, challenging different existing social theories on state conflict and territorial integrity. Conversely, autocratic regimes and weak international responses correlate with more aggressive annexation strategies as seen in Crimea, Ukraine, and Abkhazia and South Ossetia, Georgia. While military power does not consistently predict violence, other factors such as economic considerations and political structures play a significant role in contributing to the understanding of irredentist behavior and offering insights for policymakers on how to prevent territorial conflicts through stability. Ultimately, the empirical data compiled in this study is an important contribution to developing conflict-related theory. The explanations offered are pivotal to the understanding of aggressor state policies and the prevention of frozen conflicts in the Russian sphere and beyond.

Bonnie Bruner

FL - University of West Florida

Discipline: Biology

Authors:

#1 Rodney Guttman

#2 Zina Yousef

Abstract Name: Epidermal Growth Factor Receptor Phage-Mediated Cancer Control

The focus of this research project is to identify potential bacteriophage inhibitors of the overactive Epidermal Growth Factor Receptor (EGFR) present in cancers. Receptor Tyrosine Kinases (RTKs) are transmembrane proteins that play a crucial role in transmitting extracellular signals to the interior of the cell, thereby regulating fundamental physiological functions. Epidermal Growth Factor Receptors (EGFR) represent a prominent subgroup of RTKs, primarily responsible for mediating the effects of epidermal growth factor

(EGF) and related ligands involved in numerous cancers. EGFR overexpression or mutations are frequently observed in cancers such as lung, colorectal, and glioblastoma, making them attractive therapeutic targets. EGFR-targeted therapies, including monoclonal antibodies and small molecule inhibitors, have been approved for clinical use in cancer treatment. A potential inhibitor of EGFR RTKs is bacteriophages. Bacteriophages, or phages, are viruses that possess a highly specific affinity for bacterial receptors, which allows them to infect and replicate within bacterial cells. This specificity in host recognition forms the basis of our research strategy, as we seek to adapt this property to target mammalian cells, specifically EGFR RTKs. To create a living model of overactive EGFR in mammalian cells, transfection of the EGFR plasmid, tagged with green fluorescence protein and G418 resistance, will be performed to create a stable cell line. The cell line will remain in G418-treated media and be tested with EGFR inhibitors and fluorescently tagged antibodies to confirm EGFR RTK presence. Lastly, the cell line will be panned with multiple bacteriophage libraries, and the results will be titrated to identify phages that are able to bind consistently to EGFR. Once successfully identified, the phages will be sequenced and tested for their effectiveness in blocking EGFR RTK transmission in the hope that they can induce apoptosis of the target.

Jaylin Brunnel

DC - Trinity Washington University

Discipline: Environmental Science and Sustainability

Authors:

#1 Jaylin Brunnel

#2 Shizuka Hsieh

Abstract Name: Detecting Volatile Organic Compounds in Urban Air

Ivy City and Brentwood neighborhoods in Washington, DC have auto body shops, factories and major roadways surrounding the area contributing to volatile organic compound (VOCs) air pollution. Families living in these areas are at risk of breathing in toxic VOCs. Toluene, xylene, and benzene are VOCs that come from vehicle gas emissions and can cause adverse health effects including cancer. Our goal was to identify and quantify the presence of VOCs in air collected from these two neighborhoods to generate quantitative data that the community can use to advocate for improvements in air quality. We collected outside VOCs onto sorbent tubes for 24 hours at residential homes. Then the sorbent material (Tenax) was transferred into glass vials for analysis by headspace gas chromatography-mass spectrometry (GCMS). Our results show that xylene and toluene are two major VOCs present in these areas. Comparison against standards prepared from a VOC mix yielded concentrations of toluene (0.08-0.85 ppb) and xylene (0.05-0.76 ppb) that we found were similar to those that the Environmental Protection Agency found in their Ivy City study. By collecting more data at different areas around Ivy City and Brentwood we will aim to monitor these compounds, raise awareness and inform the community of these volatile compounds.

Cooper Bruno

PA - Carnegie Mellon University

Discipline: Physics and Astronomy

Authors:

#1 Joseph Pugar

#2 Newell Washburn

#3 Luka Pocivavsek

Abstract Name: Development of the topographical pair correlation function for classification of aortic shape and pathology

Quantitative descriptors allow high-dimensional medical images to be converted into low-dimensional features capable of differentiating organ shapes that correlate with disease progression for diagnostic purposes. An important example is aortic dissection and aneurysm, which are imaged using high-resolution CT scans and for which morphometry has long been used to predict disease state and surgical outcomes. We present a novel and interdisciplinary approach to quantitatively describe aortic morphology for the better classification of the progression of dissection. The pair correlation function, commonplace in statistical mechanics, is adapted into the topographical pair correlation function (TPCF), which is calculated from the point estimates for curvature constrained to the surface of a meshed image and used as a metric to describe aortic shape. Comparison with single-point statistics suggests that the TPCF provides powerful features for classifying the state of aortas from CT images and more broadly in assessing morphological features of a diversity of organs.

Adam Buchalter

TN - University of Tennessee at Knoxville

Discipline: Engineering

Authors:

#1 Stephen Young

#2 Dayakar Penumadu

Abstract Name: Phase-Contrast Imaging Using X-ray Grating Interferometry with Application to Computed Tomography

Fiber-reinforced composites are highly attractive to several industries including defense, aerospace, and automotive, due to their high weight, high strength and stiffness, and resistance to corrosion. High-resolution X-ray computed tomography and imaging are powerful non-destructive evaluation techniques to characterize the internal microstructure of composite materials. Furthermore, X-ray imaging affords the ability to characterize spatially key microstructure features of interest including porosity, cracks, and fiber orientation that can significantly influence the material composite part's performance. However, conventional X-ray imaging techniques, based on detecting differences in the material densities, are not effective for materials such as carbon fiber reinforced composites where the matrix and fiber materials have similar densities, resulting in limited capability to sufficiently differentiate the fiber and matrix phases within the material. Phase-contrast X-ray imaging interferometry is an emerging technique to overcome this limitation based on the refractive properties of materials, boasting orders of magnitude more sensitivity to material variations, enhancing the contrast for low or similar-density materials. In this study, a custom high-resolution X-ray grating interferometry imaging system utilizing three interference gratings based on the Talbot self-imaging effect is developed to demonstrate phase-contrast imaging techniques for a fiber-reinforced composite part.

Fabiola Bueno

OK - University of Central Oklahoma

Discipline: Psychology

Authors:

#1 Alicia McLean

Abstract Name: Variations of Humor styles and their influence in well-being on forensic science students who are exposed to violent images

This research, using Martin's (2003) humor styles, explores humor diversity among students and Forensic professionals who are frequently exposed to graphic violence in their curriculum or job. It examines humor's impact on well-being, its psychological significance, and its role in stress navigation and social success. According to Martin (2003), a sense of humor can be seen as a cognitive ability, habitual behavior, and an emotion-related trait like a coping strategy or defense mechanism. In the area of violent and graphic images, research indicates that watching violent movie content increases anxiety in late adolescents (Madan et al., 2013). Exposure to violent media can erode mental well-being over time, affecting an individual's emotional state, interpersonal relationships, and overall life quality. Violent Content consumption and a higher rate of aggressive behavior were highly correlated (Mößle et. al., 2014). Using the Humor Styles Questionnaire (HSQ) and The Scales of Psychological Well-Being (SPWB) the purpose of this project is to explore: How students who have been exposed to violent images as part of their curriculum use humor and its impact on their well-being. Additionally, interviews will be conducted with professionals in the field to explore their coping strategies and how humor contributes to their well-being. As a current Forensic Science student who is also studying psychology, I find that maintaining a robust mental health is crucial for forensic scientists. The nature of their work involves delving into the darker aspects of human behavior, and its exposure can lead to heightened stress levels and emotional strain.

Friederike Buergin-Witt

MN - Hamline University

Discipline: Political Science

Authors:

#1 David Schultz

Abstract Name: An Examination of the Roberts Court: Bias in the use of Scientific Evidence

Scientific evidence is often a determinant factor in how the Supreme Court decides a case. Yet little research has been done examining its use. This project investigates how Justices of the Supreme Court of the United States have historically used or misused scientific evidence in landmark cases. Focusing on the Supreme Court under Chief Justices Roberts as the case study, it attempts to answer the question: "Is the Roberts Court's approach toward using scientific evidence consistent within itself over time and among Justices?" Additionally, this project seeks to determine how the presence of scientific or social scientific evidence or lack thereof has been used by Justices on the Supreme Court to support or influence decisions. Research methods in this project include analysis of landmark SCOTUS caselaw, as well as inquiries into specific scientific methods and evidence as needed to substantiate claims concerning cases reviewed. Research on scientific topics relies on peer reviewed articles, studies, and findings published by reputable scientific organizations. The hypotheses are that the Supreme Court of the United States does not consistently use scientific and/or social scientific evidence, if available, and these inconsistencies broadly fall along political and demonstrated ideological leanings of the Court. Ultimately, the purpose of this research is to determine how scientific or social scientific evidence plays a role in Supreme Court decisions, and whether there is a trend among Justices of purposefully misunderstanding or misusing scientific data to manipulate decisions.

Brieanna Buescher

TX - Lubbock Christian University

Discipline: Psychology

Authors:

Abstract Name: The Implications Natural, Fluorescent, and LED Lights Have for Academic Productivity in a College Classroom

The purpose of my proposal is to determine the physiological effects natural light, LED light, and fluorescent light have on the academic productivity of college students in an academic classroom. Previous studies have compared the effects of colored LED light, finding different advantages color can have for classroom activities while others have observed the impact natural and artificial light have on emotional wellbeing of students in educational settings that prove the benefits of natural light. However, there is a lack of studies comparing the effects of all three kinds of light (natural, fluorescent, and LED) as well as determining their effect on academic productivity. Therefore, the research design will be a between subjects' experimental design with a sample of 30 college-aged subjects who will be randomly assigned to one of three testing conditions: natural light (A), fluorescent light (B), and LED light (C). All students will complete a timed number test used in a study by Chaveznava-Treviño and colleagues to measure academic productivity. The test will be a single piece of paper with a column on the right-hand side for subjects to write the total of the numbers (0-9) they saw. The mean productivity scores from this test and standard deviations will be found and compared in a T-chart. The results will show the impact light has on academic productivity and its following implications for the development of optimal light systems in educational buildings.

Joseph Bui

MO - Missouri Western State University

Discipline: Engineering

Authors:

#1 Joseph Bui

#2 Jinwen Zhu

Abstract Name: Mini Satellites Efficient and Beneficial System

Information from space exploration and observation are always in demand but one of the issues that occur when wanting information is having reliable, powerful space applications to help deliver information back. Mini satellites are the best way for gathering space information as they are always growing, looking for ways to improve, cost efficient compared to other space applications, and can be sent in bulk for more space coverage and backups in case of errors or damages. Researchers and scientists are always trying to find ways to explore to obtain new information about space in the most efficient way possible. Mini satellites are the most efficient way space application possible for obtaining information as their lifespan on average is around a year, their energy system helps provide power for itself during times of eclipse, and being sent in quantities will cause less maintenance. Looking for efficiency in mini satellites is one of the huge factors that should be taken into account during constructing. Supercapitors and fuel cells will help with providing an excellent amount of power along with many benefits when used in space applications. This paper will go over briefly over mini satellites, introducing fuel cells and supercapacitors with what they can provide in space applications through thorough research from former and recent articles, academic papers, and case studies. A system is proposed regarding a mini satellite that will be powerful and efficient based on fuel cells and supercapacitors in gathering space information.

Javaughn Bullard

TX - Midwestern State University

Discipline: Environmental Science and Sustainability

Authors:

#1 Kashif Mahmud

#2 Javaughn Bullard

Abstract Name: A Statewide Study of Wildfire Impacts on Air Quality

In the last few decades, wildfires in Texas have increased in intensity and frequency. 1 in 6 Americans live in areas with significant wildfire risk in 2022. Between 2018 - 2022, 43,351 wildfires burned 1,789,914 acres across the state of Texas and during this 5-year period, 84% of all wildfires ignited within 2 miles of a community. The largest wildfire in Texas history occurred this year on February 26 in Hutchinson County, burning over 1 million acres of land. The wildfire smoke affected surrounding areas like El Paso, listing an air quality index (AQI) of about 126. This AQI indicates an unhealthy air quality for sensitive groups of people, especially elderly and kids. We use various geoprocessing tools and ArcGIS Pro to map the major wildfires in Texas during the last 10 years (2013-2023). Wildfires that burned at least 10,000 acres are considered major fire events. We investigate various attributes of wildfires such as acres burned, duration of fires, vegetation type burned, cause of fire, etc. and plot these data to illustrate the spatial distribution. Particulate matter (PM), an air pollutant, is emitted from wildfires, which can lead to cardiovascular and respiratory diseases. Using wildfire data from the National Interagency Fire Center and air quality data from the U.S. Environmental Protection Agency, we will find the impacts of wildfire events on PM concentrations in Texas. The outcome of this project will help us identify the contribution of wildfire-driven PM in Texas.

Emmanuel Bulted

PA - Moravian University

Discipline: Chemistry

Authors:

#1 Stephen Dunham

#2 Anastasia Thévenin

#3 Gwen Kester

Abstract Name: Synthesis and Characterization of Mixed Carboxylate Ligand Rhodium Complexes

Two rhodium compounds with similar structures have been investigated for their toxicity to cancer cells. Previous studies indicated they may not follow the same mechanism of toxicity because one is more toxic than the other in both HeLa (cervical cancer) and MDA-MB-231 (breast cancer) cells. Those two compounds contain a metal-metal bonded dirhodium core that is surrounded by four carboxylate ligands to form either dirhodium tetraacetate ($\text{Rh}_2(\text{OAc})_4$) or dirhodium tetrabutyrates ($\text{Rh}_2(\text{OBu})_4$). We proposed synthesizing new dirhodium compounds with a mixture of acetate and butyrate ligands to provide new complexes to investigate the apparent differences in toxicity mechanisms. This research project focused on synthesizing four new compounds: $\text{Rh}_2(\text{OAc})_3(\text{OBu})$, *cis*- $\text{Rh}_2(\text{OAc})_2(\text{OBu})_2$, *trans*- $\text{Rh}_2(\text{OAc})_2(\text{OBu})_2$, and $\text{Rh}_2(\text{OAc})(\text{OBu})_3$. Each compound was synthesized, purified by high-performance liquid chromatography, and characterized by mass spectrometry along with proton and carbon nuclear magnetic resonance spectroscopies. These four compounds have now been tested in cancer cell studies, and it was determined that their toxicities are greater than $\text{Rh}_2(\text{OAc})_4$, but still less than the toxicity of $\text{Rh}_2(\text{OBu})_4$. Future studies can focus on the determination of the mechanism of toxicity for these compounds.

Mary Bun

WA - University of Washington - Seattle

Discipline: Psychology

Authors:

#1 Lydia Zhang

#2 Sama Ahmed

Abstract Name: Using Optogenetics to Test the Limits of Multitasking in Drosophila

Multitasking, such as walking and talking, is common for humans and other animals, yet we are limited in how many behaviors we can perform simultaneously. The neural circuit mechanisms that limit multitasking are not well understood. Uncovering these mechanisms will help us understand how brains seamlessly combine some, but not all, behaviors. In turn, this will improve our understanding of some movement disorders wherein certain symptoms are exacerbated while multitasking. I am investigating the neural circuitry behind the ability to multitask in a genetic model system, the fruit fly *Drosophila*. *Drosophila* are ideal for these experiments because their relatively simple brains can control a large suite of stereotyped behaviors that can be experimentally driven via optogenetic stimulation of key neurons. During the first stages of my project, I developed a platform to record and manipulate complex behaviors, and started by testing the interaction between locomotion and courtship singing via wing vibrations by activating neurons that drive wing extension. I am now testing the ideal activation protocol to test how multitasking context shapes wing extension. I will then conduct closed-loop experiments to investigate wing extension during single and multitasking contexts. If performing multiple simultaneous behaviors creates interference between neural circuits, I expect to find a lower probability of wing extension in the multitasking context. The results of my project will help uncover how neural circuit interactions shape an animal's ability to multitask.

Olivia Bunch

FL - University of West Florida

Discipline: Computer Science

Authors:

#1 Olivia Bunch

Abstract Name: ArgoBot: Chatbot for Academic Engagement and Streamlined Information Delivery Utilizing Large Language Models

With the advancement and availability of generative AI tools, such as ChatGPT, education requires great understanding of regulations and protocols, as well as a basic understanding of technology in regard to accessing resources or receiving information, particularly as these pillars of education apply to the modern college student. This project examines the effectiveness of implementing ArgoBot, a chatbot agent built utilizing a large language model (LLM) to inform college students of their university's guidelines through harnessing the university's Student Handbook as the database for the LLM. Through this implementation, ArgoBot can answer a variety of questions regarding the UWF handbook for all students to utilize as a valuable resource. Langchain is used as the language model integration framework to facilitate document analysis, summarization, and building the chatbot application. Google Gemini is used as the base Large Language model and the API token generation and tracking platform, which is then fine-tuned utilizing the UWF handbook as the database from which query answers are refined. Finally, the Python-based software Streamlit is used to deliver the interactive data app that will be hosted on the open-source platform HuggingFace, featuring an engaging and user-oriented interface. Studies have shown that the results of implementing integrated chatbots for educational purposes have proven effective in delivering accurate information to input queries, increasing productivity for both students and faculty. These results suggest that a

similar approach implemented by ArgoBot will generate positive results and transform the learning environment to encourage more productive learning and academic engagement. This project will also work to expand the database to include the university's unique Public Knowledge Base as a resource for more specific questions that may arise in the future.

Alexia Bunge

WI - University of Wisconsin-Milwaukee

Discipline: Architecture, Construction Management, and Interior Design

Authors:

#1 Sergio Lopez-Pineiro

Abstract Name: Poll Houses of America: Architecture for the Act of Voting

Voting is an essential part of the democratic process and as such is a crucial part of any adult American's life. A polling place refers to a building in which voting occurs, a polling station is a room in which voting happens, and a voting booth is a semi-private stall where the voter marks their ballot. In the United States, voters usually cast their votes in public or municipal buildings, instead of in polling places built specifically for this purpose. From an architectural point of view, this condition begs the question, are there any purpose-designed and built polling places in the U.S., and if so what do they look like? This is important because in the field of architecture great significance is given and taken when creating buildings with symbolic purpose and public use. To answer this question, I began by searching through and contacting state and local historical societies and databases across the country. This included registries like the National Register of Historic Places and the Historical Marker Database. Several sources confirmed the previous existence purpose-built polling places in Wisconsin, Maryland, and Ohio, but none of these structures are still in use. All of these were small, single-room buildings built without an architect's participation. In the case of Ohio, many of the structures were portable for easy deployment in cities on election day. In Wisconsin and Maryland, the structures were permanently located in rural areas. It appears that this organization of small and single-room polling places was discontinued after World War II likely due to population growth, and the later enactment of the Americans with Disabilities Act. This still leaves the question of why is voting is not significantly represented in our architecture or why have architects not proposed any innovations in the architecture used by Americans for voting.

Elizabeth Burchart

MI - Hope College

Discipline: Nursing and Public Health

Authors:

#1 Vicki Voskuil

#2 Anita Esquerro-Zwiers

Abstract Name: Exploring Demographic Factors and Mental Health Personal Stigma Among Undergraduate Nursing Students

Nursing students face significant mental health challenges due to demanding coursework and clinical requirements. However, the relationship between demographic factors and mental health personal stigma (MHPS) is unknown. This study explored the relationship between age, gender identity, and racial/ethnic identity and MHPS among undergraduate nursing students (UNS). This study was guided by Tajfel's Social

Identity Theory, which examines how group identities shape perceptions. This cross-sectional study used a secondary data analysis from the 2022-2023 Healthy Minds Study, focusing on a subset of UNS (N=2,286) from over 100 United States colleges and universities. Age was treated as a continuous variable, while gender and racial/ethnic identity were dichotomized as female vs. non-female and White vs. non-White, respectively. MHPS was operationalized using Likert scales across three statements: 1) accepting someone who has received mental health treatment as a close friend; 2) perceiving mental health treatment as a failure; and 3) thinking less of someone who has received mental health treatment. Data were analyzed for descriptive and correlational statistics using SPSS Version 29. Age and stigma were examined with Kendall's tau, while gender and racial/ethnic identity differences were assessed with Mann-Whitney U. Older participants exhibited greater stigma regarding thinking less of someone who has received mental health treatment ($\tau=-.082$; $p<.001$). Non-female participants exhibited greater stigma regarding close friend acceptance ($U=1.998$; $p=.046$). Non-White participants exhibited greater stigma across all statements: close friend acceptance ($U=5.286$; $p<.001$), perceiving mental health treatment as a failure ($U=-6.029$; $p<.001$), and thinking less of someone who has received mental health treatment ($U=2.754$; $p=.006$). Findings indicate demographics may shape MHPS among UNS. Limitations include social desirability or recall bias and the inability to determine causality or track changes. Nursing programs can use these findings to incorporate targeted interventions for older, non-female, and non-White students to combat MHPS.

Tristan Burchett

NY - City University of New York - LaGuardia Community College

Discipline: History

Authors:

Abstract Name: Masked Capitalism in State-sponsored Settler Colonialism of Philippine Labor Bureau Settlement Programs under American Rule

In the first half of the 20th century, state-sponsored settler colonialism in the Philippines under American rule deployed colonists, often poorer Philippine urbanites, to displace and assimilate indigenous people of the interior. Drawing on Labor Bureau reports, this paper traces how the colonial government sought to “effectively and systematically” use homesteader migration to the interior to advance both explicit and unstated governmental goals. Explicit goals centered on the economic exploitation of indigenous land and resources, coupled with the erasure of indigenous land tenure systems, while the state’s propagandistic rhetoric framed these efforts as improving Filipino well-being. However, while the aims of replacing and assimilating indigenous people and denying their land rights for economic gain were overt, the stated goals of improving the non-indigenous Filipinos’ conditions were in tension with underlying capitalist aims. Settler colonists were selectively supported based on their capital sufficiency, ensuring their capacity to produce commodities within the colonial economy. Exceptions were made for capital-poor migrants deployed to interior regions where labor was required to sustain large-scale capitalist enterprises. Conversely, Filipinos from areas where industrial labor was in demand were excluded from homesteading opportunities. These strategies reveal the extent to which colonial settlement policies were shaped by capitalist interests, exposing the structural tensions between the overt goals of settler uplift and the covert priorities of economic exploitation. The geographies of governmental policies reveal hidden capitalist influences on indigenous displacement under empire.

Paige Burger

WV - West Virginia University

Discipline: Visual Arts

Authors:
#1 Joseph Galbreath

Abstract Name: Analysis of 18th-20th Century Ghost Show Letterpress Posters

With this work, I researched, designed, and printed letterpress posters inspired by late 18th through 20th-century advertising for spook shows—live magic shows that played with the idea of the paranormal. This research consists of analyzing the visual language of the genre and looking for similarities and differences in typography and illustrative elements used for these show prints. A large part of this project was inspired by author Mark Walker's book, *Ghostmasters*, a collection of research written to preserve the history of this rare piece of American theatrical heritage. These ghost shows were a large part of popular culture that has since been forgotten. My aim with the project was to analyze the posters designed and printed by Triangle Poster and Printing Company, a show card print shop based in Pittsburgh, Pennsylvania. Triangle Poster has served the entertainment industry since 1905 printing original posters, billboards, and other forms of outdoor advertising. They've created work for festivals, races, circuses and revues, and more fringe events like freak and ghost shows. In the 19th Century, the public became fascinated with spiritualism and the paranormal. Audiences flocked to local theaters to witness the claims of mediums and mystics, promoted via broadsides and posters in cities and towns. The tradition of these shows carried on well into the 20th Century, and Triangle played a part in its promotion of "ghost shows" by designing some of the most well-known posters of the genre. Inspired by Triangle and the ghost show aesthetic, I designed a poster and produced my custom print blocks with a CNC router, and printed them with a Vandercook proofing press. Combining analog and digital processes, I handwrote the typographical elements, manipulated old photography, and combined them using Adobe editing software. The design was routed onto a woodblock using CNC, then printed on letterpress.

Jordan Burks

OK - Oklahoma State University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Intersectional Limitations of the SDG Program: SDG 2 in Berlin, Germany

The United Nations' Sustainable Development Goals (SDGs) are 17 objectives designed to improve the economic, political, social, and environmental viability of nations across the globe. While these measures are widely used as a reliable measure of a country's well-being, this paper argues that the SDGs, and particularly SDG 2 "Zero Hunger," are designed in a way which ignores intersectionality, limiting the validity of SDG measures. Using the city of Berlin, Germany, as an example, this paper explores aspects of the concepts of food and hunger which are not considered in the United Nations' official criteria. These aspects include the appropriation of and capitalization on ethnic foods, the exclusionary politics and practices of community gardens and kitchens designed to promote food access, and the weight- and health-based discrimination in the wording itself of SDG 2 which leads to continued misinformation about fatness in Germany and abroad. This demonstrates not only continued social injustices in Germany, but also the limitations of using SDGs as a sole marker of a country's prosperity and long-term sustainability.

Johnathon Burleson

OK - East Central University

Discipline: Biology

Authors:

Abstract Name: RNAseq Analysis in Bulldog Fetal Hydrops

Fetal hydrops is a condition where excessive amounts of fluid build up in multiple places in the fetus. It often leads to serious birth complications and is usually fatal. It is relatively common, with 1 in every 1700 births being afflicted by fetal hydrops. Although the etiology and contributing factors are unknown, it has been noted that it follows an autosomal recessive pattern of expression. Bulldogs are a good model organism for this condition, due to genetic lineage logging by clubs and sample availability. Necropsies were performed on stillborn puppies diagnosed with fetal anasarca. Multiple organs were harvested and stored for expression or sequence analysis (RNA/DNA). The kidney samples were sent for RNA sequencing. Data received required further processing against healthy controls whereas the company report only compared expression changes between diseased pups. Due to the lack of appropriate controls and the complexity inherent in big data and RNAseq analysis, it was deemed necessary to try to reproduce the results from raw data, with more representative healthy control. As the initial experiments in RNAseq, the first steps required the establishment of a proper pipeline from published bioinformatic protocols. Several pipelines were tested until outputs were comparable to the company analysis. An initial review of the differential expression shows an abnormal amount of ribosomal genes that were downregulated.

Marjorie Burnes

CO - University of Northern Colorado

Discipline: Criminology/Criminal Justice

Authors:

Abstract Name: The Perceived Success of Rehabilitation and Reintegration Programs from the Perspective of Felony Offenders in Northern Colorado

Criminal justice reform programs in the United States of America have grown and developed as studies have found that older methods of criminal punishment are ineffective in terms of reducing the likelihood of an inmate being reincarcerated after release, referred to as "recidivism." With the growth of these reforms, ground-breaking systems have been integrated into prisons in the form of rehabilitation and reintegration programs which serve to reduce recidivism. However, with the development of numerous new unique and powerful programs, determining which rehabilitation and reintegration programs are most effective in reducing recidivism in felony offenders in the U.S. is critical. Past research suggests that different programs serve to reduce recidivism in a variety of ways. While an arts-based program shows significant success with those who have a knack for being creative, work-based programming has shown to be more successful for those in need of funds to save for post-release or restitution. This current research study seeks to address this question with a mixed methods survey that is being disseminated to halfway house clients in a medium-sized, mid-western city. The research participants are rating various rehabilitation and reintegration programs that they have experienced. Participants are also providing short answers to open-ended questions on the survey regarding what they view as the biggest barriers to reintegration and recommendations for programs. This research study emphasizes the importance of individual approaches in reintegration and rehabilitation programs for felony offenders, and the results can be used to inform possible future adjustments to offered programs within this community.

Emma Burnham

PA - Villanova University

Discipline: Biology

Authors:

#1 Matthew Youngman

Abstract Name: Investigating the role of DAF-18/PTEN in regulating the age-dependent activity of the DAF-16/FOXO transcription factor to preserve healthspan

The Insulin/IGF signaling (IIS) pathway determines longevity and lifespan in diverse species, including humans, by regulating gene expression through its control of the activity of FOXO transcription factors. In *C. elegans* roundworms, the activity of the FOXO transcription factor DAF-16 progressively increases during aging, leading to the upregulation of evolutionarily conserved genes that protect animals from environmental stressors. In fact, DAF-16-mediated innate immunity is the principal means of defense from microbial pathogens in older animals. One determinant of the age-dependent function of DAF-16 is the dual-specificity phosphatase DAF-18, an ortholog of the human tumor suppressor PTEN. We sought to find where DAF-18 is expressed in adult animals and to determine whether its lipid or protein phosphatase activity is more important for its function later in life. In adult animals we found that DAF-18 is primarily expressed in the nervous system where it is required for the increased expression of DAF-16 transcriptional targets in distal tissues including the intestine, indicating a cell non-autonomous function. To pinpoint the neurons in which DAF-18 is expressed, the progeny of males expressing DAF-18::GFP mated to a series of hermaphrodites expressing an RFP-tagged protein in subsets of known neurons were examined to look for a merger of the green and red fluorescent signals. Through this approach, we narrowed down the possible neurons in which DAF-18 may be expressed to five chemosensory neurons that produce neuroendocrine signals. Functional characterization of *daf-18(yh1)* mutants that lack lipid phosphatase activity but retain protein phosphatase activity suggests that DAF-18 dephosphorylates lipids and not proteins to modulate the age-dependent activity of DAF-16, suggesting that it may counteract and inhibitory signal transmitted through the IIS pathway. Our studies reveal a role for DAF-18 in preserving organismal health and have implications for the age-dependent function of PTEN in humans.

Jewell Burson

GA - University of West Georgia

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

Abstract Name: Baker's Constitution View and Degrees of Moral Value

In her book *Persons and Bodies*, Lynne Rudder Baker outlines her Constitution View, a form of person essentialism. I will argue that although I find the Constitution View to be a compelling account of what we as humans most essentially are, there is a problematic ethical implication that arises from her theory. The problem in question is that non-persons maintain radically inferior moral status in comparison with persons. To tackle this problem, I will first introduce person essentialism and explain Baker's Constitution View, including what capacity Baker believes to be the essence of a person. Then, I will introduce the idea of moral status as a matter of degree and discuss an accepted method of assigning an individual moral status that is contingent on present interests. Next, I will reject both this emphasis on the capacity for interests as well as Baker's assertion that non-persons will always have radically inferior moral value. I argue that although I believe moral value is a matter of degree, it should be based on the potentiality for future interests/first-person points of view, not on current capacity. I then apply my modification of Baker's Constitution View to individuals considered non-persons under her definition, including fetuses, infants, and adults who lack first-person perspectives (such as those in PVS or experiencing late-stage dementia).

Cora Burt

VA - Radford University

Discipline: Education

Authors:

#1 Joe Wirgau

#2 John Brummette

Abstract Name: Empowering Graduates: The Impact of Undergraduate Research in Developing Career Readiness Competencies

The value of higher education is a pivotal topic as students and families assess the return on investment of a college degree. Programs like the Virginia Talent and Opportunity Partnership aim to enhance career readiness through providing students resources that align with language employers use, as well as how to demonstrate and develop skill proficiencies. Undergraduate research experiences (UREs) are recognized for boosting workforce readiness and confidence, yet their long-term impacts, especially for non-STEM students, are underexplored. This study used a mixed-methods approach to evaluate the impact of UREs on students' professional and intellectual growth. Reflections from 186 fourth-year students with at least one year of URE participation were analyzed using the National Association of Colleges and Employers (NACE) career readiness competencies as a framework. A codebook was developed to link competency behaviors with research skills, and thematic content analysis identified trends in competency development. High inter-rater reliability, measured by Krippendorff's Alpha (≥ 0.7), validated the coding process. Results indicated that students frequently showed confidence and gratitude for their UREs, with career and self-development, along with communication, being the most developed competencies. The frequency of each competency mentioned did not significantly vary by first-generation status, gender, race, ethnicity, or socioeconomic background. Both STEM and non-STEM students exhibited comparable growth trends, affirming the value of UREs in preparing students for diverse career paths. Building on these findings, we are partnering with our career center to pilot the Career Readiness Report, a self-assessment tool, with first-year researchers. The tool evaluates NACE competencies through 360-degree feedback including peers, coworkers, faculty, and supervisors, providing a framework to track growth and align student development with workforce needs. This study underscores the lasting value of undergraduate research experiences in preparing students to succeed in a dynamic and diverse workforce.

Stella Burton

AL - Auburn University

Discipline: Social Work and Human Services

Authors:

Abstract Name: Supporting Children's Grief and Loss

Grief is a universal experience that displays itself in a plethora of ways, each unique to the individual. For young children, navigating grief is a challenge, as their brains are still developing and their understanding of death and dying is limited. They are also in the early stages of learning how to manage their emotions and may have difficulty expressing emotions as a result (Children's Bereavement Center, n.d.). Grief is something everyone experiences at one some point, and it is important that the prominent figures in a child's life are equipped with the proper tools to guide their children through their loss. One of the main ways to support

children's grief is by being straightforward with young children when discussing death and dying (Danielson & Colman, 2023). This may seem counterintuitive when trying to be sensitive to their needs, but young children have magical thinking. This means that children think that their thoughts or actions can influence the outcome, and they need concrete information to have an accurate understanding of reality. For example, a child may think that their sibling died as a punishment for their bad behavior, so if they behave really well, it will bring their sibling back to life. Therefore, clarity helps them to better process the situation. Alongside concrete information, there are many ways to encourage healthy grieving and coping strategies amongst young kids. This presentation aims to inform parents, caregivers, and other practitioners on how to help young children grieve in a way that is healthy and beneficial. It helps parents learn how to support their children's grief and how to be open about their own grieving process. The entire family benefits from this openness around grief and loss as it promotes healthy healing.

Chayse Busby

GA - Agnes Scott College

Discipline: Biology

Authors:

#1 Chayse Busby

#2 Dormarie Rivera

Abstract Name: You Are More Resistant Than You Think

Antibiotics are often a necessary part of a person's medical care. Many of these antibiotics are used to treat gastrointestinal infections, ciprofloxacin being one of them. Oral antibiotics can cause shifts in the microbiota and cause inflammatory effects creating more suitable conditions for pathogens. Although beneficial antibiotics can cause dysbiosis and further damage to the epithelial. Lactobacillus is a beneficial bacterium that lives in the gut. Previous studies have shown that some strains of this bacteria are inherently resistant. However how clinically relevant antibiotic doses, such as ciprofloxacin, alter Lactobacilli abundance and IL-10 production in intestinal T cells has yet to be studied. This research aims to study how clinically relevant doses of antibiotics alter the presence of lactobacillus. Using a technique called population analysis profile (PAP) the resistance of Lactobacilli species to ciprofloxacin will be examined. By conducting population analysis profiles, we were able to visualize how lactobacillus responded to different antibiotics to predict the outcome of its effect on IL-10 production.

Morgan Buskill

VA - Radford University

Discipline: Chemistry

Authors:

#1 Timothy Fuhrer

Fiona Steinour

Abstract Name: Protoporphyrin IX as a Candidate for Polariton Research

We are interested in conducting polariton candidacy research on protoporphyrin ix and other similar porphyrins. Polaritons are hybrids between molecules and light that are made by bombarding a sample of molecules with light in a mirror cavity that traps the light in the sample for a significant period of time, possibly changing the reactivity of the molecule and making chemical reactions possible that might otherwise

not be. Protoporphyrin ix is an aromatic molecule that can be readily isolated from brown eggshells and has a structure nearly identical to heme and very similar to that of chlorophyll. For this reason, we think that protoporphyrin ix polaritons may have significant and impactful applications in the alternative energy production area as well as in the medical area. In this presentation, we show the results of electronic structure calculations that demonstrate protoporphyrin ix's candidacy for polariton research as well as showing the steps required for isolating it as a natural product from brown eggshells.

Belen Busquets

UT - Westminster University

Discipline: Biology

Authors:

Abstract Name: Can Halophiles Be Present In Ice Nucleating Particles in the Atmosphere?

This project centers on the possibility of salt-thriving halophiles to serve as ice-nucleating particles (INPs) in the atmosphere. This task presents a challenge due to the diversity of the bacteria and archaea domain and the limited data available in bioaerosols to become cloud ice formations. Microorganisms such as bacteria, fungi, and pollen contain biologically derived materials that can act as INPs, initiating the freezing of water droplets in clouds even at relatively warm temperatures. Ideally, I would predict that different strains of haloarchaea will react differently based on their optimal salt concentrations: those from a less saline environment may be better microorganisms for INPs since they are able to interface with more water molecules in the moderately saline brine. This project consists of testing three different isolated strains of haloarchaea for optimal salinity and temperature profiles. These data would be coupled with measurements of their ability to induce freezing. Understanding the behavior of halophiles under specific environmental conditions is crucial to expanding our understanding of biological impacts on clouds, especially over saline lakes such as Great Salt Lake. What's more, forming INPs may have positive impacts on the water crisis of the west.

Ezequiel Busquets

UT - Westminster University

Discipline: Music

Authors:

Abstract Name: Natural Things - An Original Modern Jazz Composition

This project explores the development of my personal style as a jazz artist, focusing on idiomatic music writing for a quintet featuring tenor saxophone, piano, guitar, bass, drums, and voice. The work aims to express my understanding of jazz vocabulary, rhythm, melody, harmony, texture, and its rich cultural history, spanning from swing to modern jazz. It also examines improvisation as a form of intercultural communication and highlights the spirit of collaboration central to jazz. Through the composition of Natural Things, I aim to fuse traditional jazz elements with my evolving artistic voice. The research context of this project lies in the intersection of historical jazz forms—bebop, post-bop, modal, and modern jazz—and my personal creative exploration. This work builds on my deepening engagement with jazz as a language of improvisation, focusing on how each instrument in the ensemble communicates with the others. It contributes to the broader discourse of contemporary jazz by blending established idioms with modern sensibilities, while fostering collaboration in performance and composition. The methodology for this project involved writing idiomatic parts for each instrument, while also allowing space for improvisation within a cohesive structure. I

led rehearsals and managed the recording process, collaborating with a team of 12 professionals, including musicians, engineers, and designers. The album was released through Distrokid on all streaming platforms and in a limited vinyl edition, with original artwork. The expected outcome is to gain a deeper understanding of jazz as both a creative process and a cultural dialogue. The experience of composing, performing, and recording Natural Things has strengthened my grasp on jazz tradition while pushing my personal boundaries. This project represents my growth as a jazz artist, integrating history, culture, and collaboration into a unified musical expression. A recording is available via this link <https://music.apple.com/us/album/natural-things/1767742839>

rebecca bustillo

TN - Trevecca Nazarene University

Discipline: Psychology

Authors:

Mucyinka Asifiwe

Abstract Name: The Relationship Between Mindfulness, Repetitive Negative Thinking, and Worry

This study aimed to find the predictors of repetitive negative thinking and worry. Previous literature acknowledged connections between mindfulness and repetitive negative thinking and mindfulness and worry. For example, there was a negative correlation between mindfulness and repetitive negative thinking, as well as mindfulness and worry, and a positive correlation between repetitive negative thinking and worry. It was hypothesized that the five facets of mindfulness (observing, describing, acting with awareness, non-judging, and non-reactivity) would predict repetitive negative thinking scores as well as worry scores. To test this hypothesis, the Five Facet Mindfulness Questionnaire Short Form (FFMQ-SF), the Penn State Worry Questionnaire (PSWQ), and the Perseverative Thinking Questionnaire (PTQ) were administered. One hundred fourteen (N = 114) undergraduate students of all classifications participated in this study from different classrooms, such as General Psychology, Social Problems, Introduction to Criminal Justice, and Introduction to Biblical Faith. Results showed that mindfulness significantly predicted lower repetitive negative thinking scores, in addition to worry scores. Specifically, non-judging and acting with awareness were key predictors of repetitive negative thinking, while non-reactivity, acting with awareness, non-judging, and observing predicted worry. The study highlights the value of mindfulness practices in managing repetitive negative thoughts and worry. Limitations included similarity of the sample, and future research is advised to incorporate more diverse populations to further investigate these relationships.

Gabrielle Butler

WV - West Virginia University

Discipline: Dance

Authors:

Abstract Name: Know Your Every Move

Through personal experience, I have been deeply inspired by themes of lust and relationships and women empowerment and sexualization. Through my choreography, I focused on how women embody both sensuality and strength. Additionally, I aimed to explore the concept of male lust and its impact. When I first listened to Michael Jackson's Dirty Diana, the song sparked a vision of storytelling through dance. The intensity and narrative of the song provided the perfect framework to express these themes. This creative

process allowed me to interpret my ideas through movement, with the music serving as a guide. The piece became an exploration of emotions and dynamics, enabling me to translate abstract ideas into choreography. It also deepened my understanding of partnering and the interaction between dancers, highlighting the importance of connection and chemistry. Throughout this piece there is partnering in multiple ways to showcase the themes I wanted to explore. This project feels like a cornerstone in my portfolio, serving as a foundation for future works. It has not only refined my skills in crafting narratives through dance but also ignited my interest in addressing contemporary and social issues through movement. The experience has inspired me to delve deeper into themes that challenge societal norms, encouraging dialogue and introspection. Moving forward, I hope to continue creating pieces that provoke thought and resonate with audiences on a personal and societal level. This journey has taught me the power of dance as a medium for storytelling and advocacy, reinforcing my commitment to exploring meaningful themes in my art.

Skylar Butler

FL - Embry - Riddle Aeronautical University

Discipline: Physics and Astronomy

Authors:

#1 Ted von Hippel

Abstract Name: NGC 2168 Age Cluster

This research investigates the precision and accuracy of age determination in open star clusters using the astrostatistical software package BASE-9. The project is divided into two parts. First, the collective properties of the selected cluster, NGC 2168, are analyzed to derive its age by other researchers in our team. Second, we derive the ages of individual stars within this cluster, again using BASE-9. We will evaluate the reliability and validity of the age determinations by comparing the results for individual stars with those of the cluster. This research aims to contribute to the understanding of precision in age determination for both star clusters and individual stars. This research will also advance the knowledge of stellar evolution and star cluster properties.

Burhan Buttar

VA - Virginia Commonwealth University

Discipline: Health and Human Development

Authors:

#1 Khai Thompson

#2 Jordan Perchik

Abstract Name: Algorithm Bias in AI-Driven Technology: A Retrospective Analysis of Healthcare Equity Trends in Academic Radiology Journals

To develop a more equitable healthcare environment, algorithm bias must be overcome to reduce the prevalence of unsuitable treatments given to systematically disadvantaged groups. Algorithm biases are computational errors based on generalized datasets, due to incomplete AI data, design, and deployment. This issue should be confronted because AI bias is highly relevant to diverse patient groups and ascribing specific treatments. Publication trends can act as an indirect indicator for how relevant and reported algorithm bias is in each medical specialty. This investigation evaluates publication trends in algorithm bias within scholarly radiology journals and aims to mitigate algorithm bias by directing attention to the issue. Data was gathered from PubMed databases and a search string was then implemented to isolate terminology corresponding to

algorithm bias in radiology journals published from 2000 to 2023. Article information including title, publication, year, manuscript length, and number of citations were exported and analyzed. The trend in publications per year was assessed using linear regression. Results show that there were 3,276 algorithm bias related publications during the study period. Algorithm bias publications showed a generally linear increase ($r^2 = 0.943$) with notable increases (50+ more from the previous year) in 2013 and 2022. It was found that Medical Physics published the greatest abundance of algorithm bias related studies among radiology journals during the study period with 177 publications. The only other journal with over 100 or more publications was Magnetic Resonance in Medicine (100). Overall, the frequency of algorithm bias publications has increased rapidly since 2000, suggesting the increasing importance of eliminating algorithm bias while managing AI technology.

Enkhmaa Buyanbadrakh

MI - Albion College

Discipline: Economics

Authors:

Abstract Name: Exploring Factors Behind the Significant Decline in Accounting Graduates in Recent Years and Strategies for Promoting Accounting Careers

The American Institute of Certified Public Accountants (AICPA)—a non-profit professional organization representing certified public accountants (CPAs) in the United States—has reported in its recent 2023 Trend Reports that the number of bachelor's and master's degree graduates in accounting has dropped significantly since 2021. In this research, the interest lies in learning more about why the number of U.S. graduates with bachelor's and master's degrees in accounting majors is declining and identifying the influential factors behind the significant drop in recent years. The primary focus involves examining historical trends and statistical data related to the enrollment and graduation rates of accounting majors across U.S. educational institutions. Quantitative analysis was conducted to uncover patterns in graduation rates and explore contributing factors, including shifts in student preferences, economic conditions, and technological advancements such as automation and artificial intelligence. The study also highlights broader influences, such as the 150-hour CPA certification requirement, negative perceptions of the profession, and societal changes, including indirect factors such as declining birth rates and evolving career guidance. This study is crucial for informing educational institutions, industry stakeholders, and policymakers to ensure the sustained growth of the accounting profession in the U.S. Through a comprehensive exploration, this study aims to contribute meaningful insights to accounting education and the profession, with the ultimate goal of encouraging a revived and sustained interest in pursuing accounting careers in the United States.

Anabel Byars

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Nicole Riddle

Abstract Name: Circadian rhythm disruption by unpredictable disturbance and its effects on physical activity and lifespan

Circadian rhythms are vital for helping humans adapt to changes in their environment and regulate internal

physiology. With the emergence of technology, night-shift work, and jet lag, human sleep cycles are increasingly disturbed. Several studies have investigated the short-term outcomes of sleep disturbance and demonstrated the consequences of sleep disruption in terms of behaviors and diseases. However, research assessing the effects of varied amounts of unpredictable circadian disturbance, individual response, and long-term impacts is lacking. Here, we investigate how varied lengths of unpredictable, forced movement impact baseline activity and lifespan of *Drosophila melanogaster*. We used four strains from the *Drosophila* Genetics Reference Panel (DGRP) to compare animals with diverse activity patterns and both sexes. The unpredictable disturbance treatment consisted of four randomized 30-minute daily rotations on the TreadWheel. The TreadWheel is a device that rotates fly vials, causing the flies to climb the sides of their enclosure continuously. We measured daily animal activity and tracked mortality for disturbed and control groups. We found that 5-day and 20-day unpredictable disturbance treatments can influence the activity level of the animals. Activity levels varied depending on treatment, genotype, and sex. Across all genotypes and sexes, we found few effects on lifespan. Males from one genotype showed a significant increase in survival in response to both disturbance treatments. Our results indicate that unpredictable disturbance can have negative, positive, or no impact on daily activity. Furthermore, activity and lifespan are highly dependent on genotype and sex. These results make clear the complexity of predicting individual response to disturbance and pinpointing how much disruption is considered harmful.

Mackenzie Byrd

IN - Franklin College

Discipline: History

Authors:

#1 Mackenzie Byrd

Abstract Name: Honoring Sacrifice: The Repatriation of Fallen Soldiers of World War II

From May 1946 to December 1951, the United States government, with the help of civilian workers, undertook the Return of the Dead Program, a mass repatriation effort for fallen World War II soldiers. Through this program, the United States recovered more than 171,000 bodies -- all returned to the United States for burial. At the same time, another 110,000 bodies were buried in foreign American cemeteries. Although the program did return a significant number of fallen soldiers buried in temporary graves, it did not address the fallen missing in action. My research uncovers the efforts of civilian and governmental agencies to repatriate WWII veterans who were MIA in the European theater from the 1960s onward. Few historians have addressed the topic of the repatriation of these American soldiers. My research, therefore, utilized records from the Department of Veteran Affairs to reconstruct how civilian groups inspired federal action, culminating in the creation of the Defense POW/MIA Accounting Agency in 2015. Despite the DPAA's successful return of nearly 1,000 Americans missing from World War II, the continued recovery and return of soldiers missing in action would not be successful without the efforts of American and European civilian-led groups, like Archeologo Dell'Aria. The United States and non-governmental groups must continue their combined efforts to repatriate the dead.

Andres Cabello

TX - Laredo College

Discipline: Chemistry

Authors:

#1 Axel Garcia

#2 Qingguo Meng

Abstract Name: Experimental Study of Photocatalysis for Degradation of Common Agricultural Pesticides

The global expansion of agriculture has led to increased contamination of water systems, posing significant risks to both the environment and human health. Photocatalysis is an eco-friendly and energy-efficient process that utilizes light to activate titanium dioxide (TiO₂), producing reactive species that break down harmful and toxic chemicals into non-toxic byproducts. This research investigates the effectiveness of TiO₂ under varying conditions, including pH levels, exposure durations, and catalyst concentrations. Experiments were conducted using pesticides with various active ingredients, treated in a photoreactor system. Degradation efficiency was assessed by comparing pesticide concentrations before and after treatment. Results showed that TiO₂ effectively reduces pesticide concentrations, with optimal degradation achieved under specific conditions, particularly at certain pH levels and exposure durations. These findings highlight the importance of optimizing environmental factors for effective photocatalysis. Additionally, the study examined the reusability of TiO₂ to determine its potential for repeated use. This research demonstrates the potential of TiO₂ photocatalysis as a sustainable and innovative solution to water pollution caused by agricultural fertilizers.

Adriana Cabral

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

#1 Adriana Cabral

Abstract Name: Asymmetry Kitchen; A Design Solution for Left-Handed Users

Kitchen designs are typically optimized for right-handed users, often resulting in poor ergonomics and discomfort for left-handed individuals. The Asymmetry Kitchen project aims to address these challenges by creating a product tailored specifically to the needs of left-handed users. The objective is to develop a multi-functional, practical design that enhances the kitchen experience for left-handed cooks. The design process involved thorough research and evaluation, leading to valuable insights and practical solutions for improved usability. This strategic approach integrated multiple ideas to identify needs and develop a functional solution. Left-handers are three times more likely to have major accidents in the kitchen therefore increasing accidents and injuries that can be prevented with a functional solution. 10.6% of the population in the world are left-handers as of March 2020. The final product is an intuitive, accessible kitchen cart that offers comfort and efficiency, featuring a caster system for easy mobility. Customizable, durable, and easy-to-clean materials were carefully selected to ensure durability in a kitchen environment and adaptability to existing kitchen aesthetics. Key design elements include left-hinged doors, left-oriented handles, and a cutting board that swivels to accommodate left-handed use. By considering the unique needs of left-handed cooks, this design helps eliminate awkward workarounds and empowers users to move freely and comfortably for successful meal preparation. The cart's thoughtful design, from its smooth-rolling casters to its practical layout, provides a seamless integration into various kitchen spaces. Overall, this product offers an inclusive and practical solution that enhances usability, comfort, and joy in the kitchen for left-handed users.

Adriana Cabral

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: A Home Designed for the Visually Impaired: A Response to Diabetic Retinopathy

People with visual impairments have unique needs that differ from those of others. The challenges they face, such as distinguishing objects or navigating spaces, can be intensified by specific health conditions, such as diabetic retinopathy. Therefore, designing a home with contrasting tones, textured walls, and subtle changes in flooring can aid visual recognition, enabling individuals to more easily navigate and manage their living spaces. When designing for someone with a diabetic retinopathy visual impairment, it's crucial to take their specific needs and accommodations into account to support their daily tasks and overall well-being. After multiple case studies and research from previous visual impairments designs such as Rue Magazine and Architectural Digest, it concluded multiple design aspects emerging together for users with diabetic retinopathy. Prioritizing the layout of the home is also essential, ensuring clear pathways and reducing navigational challenges. Unfortunately, people with disabilities are often not given the full consideration they deserve in many design processes. While many homes may meet basic regulatory compliance, they can still fall short of offering comfort, independence, and a true sense of belonging for individuals with disabilities. By incorporating diabetic retinopathy-friendly color schemes, unobstructed walkways, and an accessible bathroom, environments can be created that allow people with visual impairments to navigate their homes with greater ease and safety. As these individuals move through spaces thoughtfully designed to meet their needs, they gain confidence in their ability to interact with their environment, ultimately enhancing their quality of life and fostering a sense of independence. Implementing moveable furniture, easy-to-clean materials, and accessible features, allows the end user to have confidence in navigating their space independently. Overall, this design is carefully tailored to the needs of an individual with visual impairments and intends to empower the end user.

Elvis Cabrera

FL - Miami Dade College

Discipline: Mathematics

Authors:

#1 Jyrko Correa-Morris

#2 Abel Urrea Yglesias

#3 Alex Aguila

Abstract Name: Factorizations in the lattice of the subspaces of a vector space over a finite field

Geometric lattices play a fundamental role in various fields such as combinatorics, algebra, and cryptography due to their rich structural properties and numerous applications. In this research, we consider a geometric lattice L whose atoms have been partitioned into two sets: A and B . We aim to address the following question: assuming that two subsets of atoms in A are equivalent if the join of their elements is equal, how many elements at the j -th level of L can be obtained by taking the join of atoms in A ? To answer this, we propose a recursive formula for this number, denoted as l_j . We approach this problem by studying the dynamics of the equivalence classes in the power set of A when an element is removed. We contextualize and extend this formula to the specific case of the lattice of subspaces of a vector space over a finite field. This allows us to find the number l_{sj} , which only considers the join of exactly s atoms in A . Finally, the lattices of this form have significant implications in cryptography, where the impact of our contribution is rigorously analyzed.

Isabel Cadavid Restrepo

COL - EAFIT University

Discipline: English and Literature

Authors:

#1 Jorge Alberto Uribe Lozada

#2 María Antonia Blandón Granados

#3 Laura Valentina Sepúlveda Jaramillo

#4 María Camila Muñoz

#5 Carolina Gil Correa

#6 María Lucía Giraldo López

#7 Sara Zuluaga Correa

#8 Luisa Fernanda Montoya

#9 Mariana Giraldo

#10 Isabella Echavarría

#11 Isabella Echavarría

#12 Camilo Herrera

Abstract Name: “No soy un robot”: implicaciones éticas y estéticas de la traducción literaria asistida por computadores

Literary translation is a field that presents itself as a spectrum of possibilities to carry meaning from one language to another or within the same language. In this sense, the translator carries out the task of interpreting the cultural and textual elements of a source text, so they can be brought into a different language and culture. The abundance of meaning that emanates from a text implies an abundance of possible outcomes for a translation. This process can be equated to that of scientific outreach, for it implies the transformation of specialized knowledge into terms more easily understood by the public outside of academia. The more a topic is discussed and theorized, the more knowledge becomes available to share. Furthermore, with the recent development of artificial intelligence technology, the role of Large Language Models (LLM) in the practice of the humanities is increasingly questioned. Literary translation, being a craft that requires constant interpretation of the source material and depends a great amount on aesthetics for its existence, serves as a perfect case study for the capacities of AI in the field of translation. This project seeks to develop instances of interaction between translators and LLMs, as well as to create outreach products such as workshops, zines and infographics to bring humanistic and translation theories to cultural spaces outside of academia to promote the social appropriation of knowledge.

Maximilien Caffery

LA - Louisiana State University, Baton Rouge

Discipline: Engineering

Authors:

#1 Maximilien Caffery

#2 Victoria Sartin

#3 Ashleigh Philips

#4 Hobbs McAllister

#5 Bruno Rego

Abstract Name: A Cost-Effective Biaxial Mechanical Testing System for Vascular Specimens

In vivo, blood vessels undergo continuous cyclic deformations and loading patterns as blood pressure fluctuates with every heartbeat. Mechanical characterization of blood vessels is thus pivotal for understanding how the vasculature (mal)adapts to various pathologies. Commercial mechanical testing devices pose significant cost barriers, warranting the development of affordable alternatives. Toward this end, we have designed a device to characterize the circumferential and longitudinal (thus biaxial) mechanical properties of small blood vessels using cost-effective and open-source hardware and software for approximately 10% of the cost of commercial systems. Circumferential distension is measured continuously via live tracking of the vessel's inner and outer diameters using a microscope camera, while intraluminal pressure is controlled automatically using a syringe pump. Each end of the specimen is attached to a parallel beam load cell to enable continuous measurement of longitudinal force, while longitudinal stretch is prescribed with automated translation stages. During testing, the vessel is submerged in a bath maintained at 37°C using a heating pad and thermistor. This setup replicates physiological conditions, ensuring accurate representation of mechanical behavior. All electronic components, including pressure transducers, load cells, and stepper motors, interface with custom open-source software through a microcontroller board. Our experimental setup allows live visualization and real-time analysis of inner/outer diameters, pressure, and longitudinal force/stretch as the software compiles data from the pressure transducers, load cells, and microscope camera. Validation studies using hydrogel conduits of known mechanical properties and murine arteries are ongoing. This device overcomes limitations of current open-source pressure myography systems, which do not measure longitudinal force or automatically control circumferential/longitudinal loads, while avoiding the prohibitive cost of current biaxial systems. More broadly, the measurement of such detailed mechanical properties facilitates future studies to enhance our understanding of vascular function, structure, and adaptation to diseases and therapies.

Zachary Cagiao

NJ - The College of New Jersey

Discipline: Biology

Authors:

#1 Donald Lovett

Alexander Gatsonis

Madelyn Grablauskas

Abstract Name: Differential Modulation of Gene Expression in the Green Crab *Carcinus maenas* in Response to Hypoosmotic Stress vs Elevated Temperature

The green crab, *Carcinus maenas*, lives in estuaries where salinity and temperature vary widely. Although exposure of crabs to either hypoosmotic stress or elevated temperature resulted in increased levels of the hormone methyl farnesoate (MF) in the blood, the time-courses for the responses to these two stressors were different. When crabs were transferred to seawater with elevated temperature, levels of MF in the blood increased after just 2 hours and attained maximum levels (3-fold above basal levels) within 10 hours of transfer. In contrast, when crabs were transferred from full-strength to dilute seawater, levels of MF in the blood did not increase until after 6 hours and did not attain maximum levels (10-fold above basal levels) until 48 hours after transfer. Even when crabs remained at elevated temperature, levels of MF decreased to basal levels within 24 hours. In contrast, following transfer to dilute seawater, levels of MF in the blood remained elevated at maximal levels for as long as the crabs remained in the dilute seawater. The purpose of the current study was to examine possible mechanisms for regulation of MF levels. Specifically, we measured expression of farnesoic acid O-methyltransferase (FAOMeT), the enzyme that catalyzes the final step of the MF biosynthetic pathway. While determining the gene sequence of the enzyme, two isoforms of FAOMeT were discovered. Each is coded by a different gene. The sequence of the short isoform of FAOMeT is identical to that of the long isoform, except that it lacks a 15-base pair segment of nucleotides. When crabs were transferred to hypoosmotic seawater, the short isoform of FAOMeT was upregulated (5-fold above basal levels at 10 ppt salinity). In contrast, when crabs were transferred to seawater with elevated temperature (from 14°C to 28°C), the long isoform of FAOMeT was upregulated (2.5-fold above basal levels).

Jennifer Cagnolatti

LA - Louisiana State University, Baton Rouge

Discipline: Biology

Authors:

#1 Naohiro Kato

Abstract Name: Exploring Enzymatic Degradation of New Plastic Materials for Digestible Pet Toys

Plastic materials used in pet toys often pose health risks when ingested due to being non-digestible. This research study investigates new plastic materials as alternatives to conventional plastic toy-fillings, such as polyester fibers. The newly invented materials have the potential to be digestible materials that create safer options for pets and reduce environmental pollution. To assess degradation in canine digestion, the samplers were put under five conditions to mimic the canine gastrointestinal environment. Preliminary findings suggest that they have enzymatic degradation. Approximately, ten percent degradation is observed after 14 days. Future studies will focus on other factors, such as pH levels, to understand if the materials are digested faster in different conditions.

Zhixin Cai

IN - Purdue University Main Campus

Discipline: Environmental Science and Sustainability

Authors:

#1 Zhixin Cai

#2 Keith Meyers

Abstract Name: From BirdNet to BugNet: Leveraging AI to enhance Cicada Detection through expanded Training Libraries

Insect biomonitoring plays a critical role in assessing habitat quality, informing conservation efforts, and in early detection of invasive species. Passive acoustic monitoring has the potential to revolutionize insect monitoring, but acoustic insect recognition is presently a challenge. Current deep learning and Tensor Flow models accurately identify thousands of bird species, but insect calls have been traditionally viewed as noise. As a continuation of previous research, we will advance the ability of the convoluted neural network BirdNet to identify periodical cicadas. BirdNet is an open-source deep learning program that ingests wave files, converts them to spectrograms, and then compares those images to a training data set. Last semester, we developed a custom cicada classifier for BirdNet using binary classification. After gathering extensive new data, we aim to improve the classifier's accuracy and precision. We will also modify the classifier to allow BirdNet to recognize specific cicada species using multinomial classification. Since our acoustic data mainly contains *Magicicada cassini* and *Magicicada septendecim*, we will create a training library for each species, plus a non-cicada library. After training, we will test the classifier using a separate validation library for both species and non-cicadas. In future work, we aim to perfect the cicada classifier for citizen use and allow public access. In addition to helping bridge the gap between scientists and citizens through citizen science, this project also supports insect biomonitoring for conservation, agricultural management, or invasive species identification.

Pallas Cain

PA - Allegheny College

Discipline: Computer Science

Authors:

#1 Pallas Cain

#2 Benedek Kaibas

#3 Josephine Reiter

Josephine Reiter

Benedek Kaibas

Abstract Name: AquaGator: Autonomous Underwater Robot

We present AquaGator, an automated underwater robotic sensor system designed for water quality monitoring. AquaGator is a portable system consisting of multiple sensors on a mobile robotic platform for autonomous data collection and analysis across varying depths of water. Motivated by the environmental challenges of toxic algae blooms in the Northwestern Pennsylvania region, our system addresses the limitations of the traditional methods that are often labor-intensive. AquaGator provides a cost-effective and accessible solution to streamline water quality data collection and facilitate efficient data analysis. The robotic platform can autonomously navigate to desired depths, measure water quality parameters over a set period, and provide live data graphs through a user-friendly dashboard. The system's dual functionality includes a manual control mode and an onboard underwater camera, providing visual insights into aquatic environments. The software developed for this project also facilitates the generation of in-depth analytics, providing actionable insights into the health of aquatic environments. This project is undertaken in collaboration with the local Conservation District, which plans to deploy AquaGators for routine water quality monitoring and educational initiatives. The successful implementation of depth automation is expected to significantly streamline the conservation district's water quality monitoring processes, providing a sustainable tool for the ongoing health assessment of local aquatic ecosystems. By providing a sustainable and practical tool for aquatic ecosystem assessment, AquaGator contributes to advancing environmental monitoring technologies and supporting informed conservation practices.

Pallas-Athena Cain

PA - Allegheny College

Discipline: Computer Science

Authors:

#1 Pallas-Athena Cain

Abstract Name: Am.I.: A Robotic Replacement Unrealized

The rise of artificial intelligence in the arts has sparked significant controversy, with many fearing it as a threat to the human experience and creativity in making and appreciating art. Generative artificial intelligence is at the crux of the conversation because it can train off of existing art, literature, and other media to provide near instant gratification through the creation of "new" content. Critics often argue the media created by artificial intelligence is mediocre or inherently lacking some quality only a human can produce. Posthumanism challenges these ideas of human supremacy and advocates for the dissolution of anthropocentrism and the boundaries of what society currently defines as the human experience. Am.I. is a robotic work of art that utilizes large language model artificial intelligence and robotics to create an immersive visual and auditory experience to challenge fears exacerbated by anthropocentrism and demonstrate how artificial intelligence acts as an extension of the human experience and creativity and not as

a replacement. Programmed in Python and housed in a 3D-printed skull with moving eyes and a jaw, Am.I. engages in Socratic dialogue with another artificial intelligence, exploring themes of human existence using a large language model. This project exemplifies the potential for artificial intelligence to provide a window into the human psyche as seen through the lens of technology and build upon our existing creative experiences while not replacing them.

Caroline Cairney

IL - University of Chicago

Discipline: Sociology

Authors:

Abstract Name: Passing on a Legacy: Understanding the Role of Identity Formation and Social Relationships in Succession Planning on Intergenerational Family Farms in Rural Georgia

While the vast majority of farms in the United States are family-owned and operated, the number of farms and the number of family farms continue to decline nationwide. Succession, or the process of educating a younger family member in preparation to inherit the farm, is a key factor in the continuance of intergenerational family farms. This project studies the succession process on family farms in rural Georgia which have remained owned and operated by the same family for at least two generations. Using qualitative data collected from fifteen semi-structured interviews with intergenerational family farmers in the state of Georgia, this study explores the social and economic factors that affected current family farmers' process of taking on responsibility on their family farms and how these same social and economic factors affect their approach to planning to pass the farm on to the next generation. The study finds that social factors, specifically personal identity formation and familial relationships, affect succession in ways which can either reinforce or contradict the overall negative effect that economic conditions, specifically rising costs of machinery and materials and volatility in crop prices, have on intergenerational family farm succession and succession planning. Finally, the study concludes by recommending broader, more extensive research into factors affecting succession planning on farms in different regions of the United States.

Linda calderon

TX - The University of Texas at San Antonio

Discipline: Psychology

Authors:

#1 Corrin Stines-Ringling

Abstract Name: Impact of Neural Stimulation of Ventral Attention Network (VAN) on Vigilance and Fatigue: Utilizing Electroencephalography (EEG) and Transcranial Alternating Current Stimulation (tACS)

Seminal research suggests a connection between the temporoparietal (TPJ) and inferior frontal gyrus (IFG). Testing of this region known as the Ventral Attention Network (VAN) has identified a theta band oscillation between (4-8 Hz) of connectivity during spatial attention tasks. Vigilance and spatial attention tasks induce high levels of mental workload, increase cognitive fatigue, and have an impact on mood. A prior randomized controlled study also suggests that VAN stimulation provided faster reaction times during an auditory spatial attention task compared to controls ($p < .01$). Previously, self-reported fatigue during auditory spatial attention tasks has been vague, with minimal documented connection between mood, fatigue, and cognitive workload. The present study focuses on targeting the VAN with direct stimulation using a transcranial

alternating current stimulation (tACS) technique. To stimulate the VAN, we are utilizing an oscillation frequency of 5 Hz. This frequency was identified using current density modeling in a prior study, showing an ideal VAN oscillation frequency amplitudes which decreased during time-on-task ($p < .01$). We will be utilizing randomization to administer either the 5Hz frequency or sham stimulation during an auditory psychomotor vigilance task (aPVT). This task will be performed by the subject for approximately 30 minutes. During this task, participants will be asked to identify beeping tones while simultaneously listening to white noise. Additional assessments examining mental workload, fatigue, and mood will be utilized to further compare experimental stimulation versus controls. We expect results to show a decrease in self-reported cognitive fatigue in our experimental stimulation group compared to sham stimulation. Results that are aligned with our hypothesis have wide-ranging implications and applications, including potentially using tACS to mitigate fatigue-related impairments which are common across a variety of neurological, autoimmune, and medical disorders.

Holmi Calderon

CA - University of California - Merced

Discipline: Nursing and Public Health

Authors:

#1 Holmi Calderon

Abstract Name: A Sick Country: Novelistic Representations of Venezuela's Disease Crisis Under Chavismo and Its Current Relevance

Since 1998, Venezuela has experienced the slow decay of democracy and the strengthening of its current authoritarian regime, leading to one of the largest humanitarian crises of our time, with 7.7 million Venezuelans having fled the country. In a nation where political, economic, and social structures have been dismantled by the Chavismo regime, the once-renowned public health system has deteriorated to the point where everyday citizens can no longer rely on the public or private sectors for even the most basic healthcare needs. This project focuses on the country's current health crisis, specifically the resurgence of preventable diseases and the critical lack of vaccination. Through the analysis of qualitative data from reports, articles, interviews, and contemporary novels, I aim to shed light on how Venezuelans are affected by these specific health challenges. Additionally, I highlight the resilience and coping mechanisms of Venezuelans, contributing to the global discourse on disease outbreaks and the failure of vaccination efforts in politically unstable regions.

Annik Caldwell

VA - Virginia Commonwealth University

Discipline: Visual Arts

Authors:

Abstract Name: It's All Endurance

I've always been a runner. My mother was a runner, my younger sister is a runner, it was sort of expected of me to do the same. At first, I was absolutely horrible. I could barely run a mile without stopping, however as time went on I improved. I made lifelong friendships with my teammates who pushed me to do my best. This piece shows that gradual improvement. From struggling in the back, to running, to racing; the complete story of my highschool running career. However, my highschool running career is over, and as I look back, I can

say that it wasn't completely what I wanted timewise, but the experience of having my teammates was more than I could have ever asked for. Now, I'm on a new team, with completely new people and I'm the only freshman girl on the distance side of the club team, so I have to restart. That is why I am looking forward to the second panel, away from all of my experiences that brought me to where I am today. I'm looking forward to the future, both figuratively and literally within this painting. I'm looking forward to becoming part of the team and making friends. I'm looking forward to racing and improving my times. And tomorrow I will, but I'll have to work for it. What's coming next is not a short sprint, it's all endurance.

Margaret Call

UT - University of Utah

Discipline: Geography/Geology

Authors:

#1 Margaret Call

#2 Peter Lippert

Abstract Name: What can magnetic biomarkers tell us about the Eocene-Oligocene Transition in the North Atlantic?

A significant episode of climatic change in the last 66 million years was the Eocene-Oligocene Transition (EOT), a global cooling that began approximately 33.3 million years ago. While the climate records for EOT have been investigated in detail in the Southern and Pacific oceans, there remain major geographic and ecological areas of impact that lack information. These gaps include the impacts of this change on thermohaline circulation in the North Atlantic, which serves a major control for global temperature regulation. My project aims to improve this knowledge gap by measuring high-resolution records of environmental change across the EOT by studying fossil remains of magnetotactic bacteria (MTB). MTB are a rich archive of environmental change which allows us to use their fossil record as a pathway to understand the impact of global cooling on deep sea communities. By using core samples retrieved from Site U1411, collected offshore of Newfoundland during International Ocean Discovery Program Expedition 342, we will document the concentration and preservation quality of these fossils across the Eocene-Oligocene Boundary. We will accomplish this by performing two measurements: First Order Reversal Curves (FORCs) and analytical electron microscopy. FORCs can be used to assess the relative contributions of magnetic particles within a bulk sample. We use these data to select samples of interest, prepare magnetic extracts, and examine them using a Scanning Transmission Electron Microscope. These observations provide physical images and chemical information of the fossils we are studying and allow us to understand their level of preservation and confirm our previous findings. By understanding the fossil remains of some of the smallest organisms in the ecosystem and how they are preserved over time, we can learn more about the deep-sea oxygen, nutrient availability, and redox conditions on the sea floor during the transition from a greenhouse to icehouse world.

Nallely Calles Ortega

VA - George Mason University

Discipline: Social Work and Human Services

Authors:

#1 Gisele Hernandez

Betzy Balladares Oviedo

Abstract Name: Unpaid Internships: Exploring the Hardships of Social Work Students

There is little empirical evidence regarding the consequences of unpaid internships, specifically among social work students. Despite unpaid internships bringing professional experience, this practice perpetuates socio-economic disparities and continues a cycle of exploitation. Under the Council of Social Work Education, bachelor's students must complete a minimum of 400 hours of unpaid internships and master's students must complete a minimum of 900 hours in a two year program. This study aims to identify and explore specific challenges faced by social work students in their senior year and Masters at George Mason University. Researchers distributed an exploratory survey to social work students through email. The survey included open-ended and closed-ended questions regarding the impact of unpaid internships on their mental health, financial circumstances, and living stability. Responses were systematically organized in Microsoft Excel for data collection and analysis. Researchers conducted a peer review process to examine each other's work to confirm the fidelity of data collection procedure and to ensure accuracy and reliability. Findings of this study demonstrate that social work students are at risk for mental health problems, emotional distress, and financial instability due to the demands of unpaid internships. This study highlights the intensified challenges encountered by social work students at the Bachelor's and Master's level. While this serves as an initial step in identifying the impact of unpaid practicums on students, future research with a representative sample is necessary to fully capture the challenges and experiences of social work students.

Janint Camacho

UT - University of Utah

Discipline: Biology

Authors:

#1 Cameron Metcalf

Abstract Name: Analyzing potential mechanisms of SUDEP correlated with Hypoxic conditions in Dravet Syndrome

Dravet Syndrome, a type of epilepsy caused by a mutation in the SCN1a gene, leads to an extensive range of symptoms, including seizures and premature mortality, with the leading cause of death being Sudden unexpected death in epilepsy (SUDEP). Other than its high premature mortality rate, this type of epilepsy has a high rate of pharmacoresistance, making it difficult to find a treatment for every patient. One of the observed side effects of Dravet Syndrome is generalized hypoxemia. Studies have shown that hypoxia following seizure activity may result from changes in brainstem neurotransmission in cardiorespiratory centers (amygdala), including changes in neurotransmitter function and oxidative stress. To better understand hypoxemia in relation to Dravet Syndrome, the amygdala and brainstem were analyzed through the use of a Pimonidazole assay to understand its role in respiratory insufficiency. The Pimonidazole assay allows for the assessment of hypoxia in different tissues and cell types. Developing a model simulating hypoxic exposure and an immunohistochemistry protocol with the pimonidazole assay will allow the identification of damage caused by hypoxic stress in the brain stem and amygdala. The data observed from this experiment will provide more data to help us determine SUDEP and the underlying mechanisms of the SCN1a gene. Using the pimonidazole assay, we hypothesize we will be able to identify a biomarker that will better help us identify Dravet syndrome in patients and better understand how it affects current patients with this condition.

Zainab Camara

WI - University of Wisconsin-Madison

Discipline: Environmental Science and Sustainability

Authors:

#1 Zainab Camara
#2 Grant Kirker
#3 Amy Bishell
#4 Katie Ohno

Abstract Name: Exploring Cellulose Nanofibrils for the Replacement of Agar in Media for the Cultivation of Wood Decay Fungi

Improved methods for fungal growth and maintenance are needed to generate more effective protection strategies that reduce degradation of wood products. Many current studies regarding fungal growth utilize agar, which is becoming an overused resource with negative environmental implications. The goal of this research is to evaluate gelling agents in conjunction with cellulose nanofibrils (CNF) as alternatives for agar in fungal growth media and its effects on fungal growth and decay rate. Our preliminary studies use Pectin, Xanthan Gum, or Gellan Gum dissolved in 1% CNF and 1.5% Malt Extract Broth to determine the conditions that result in solidification. Wood decay fungi is then cultivated on the alternative media/s, as well as the agar control. The radial growth rate of the alternative media and the control over time is recorded and their average is taken to record fungi growth. The results of these allow us to identify an alternative gelling agent that is more sustainable compared to traditional agar as the natural source of agar, algae, is being overly exploited. Gelling agents are used in a multitude of other scientific disciplines, causing this project to have far-reaching implications leading to better methods for fungal growth and maintenance.

Anthony Camaraza Diaz

FL - Florida International University

Discipline: Engineering

Authors:

#1 Katherine Kaiser

Abstract Name: Lipidomic and Proteomic Characterization of Calcifying Extracellular Vesicles

Vascular calcification, characterized by the deposition of mineral plaques in arterial walls, poses a considerable threat to cardiovascular health, potentially leading to complications such as myocardial infarction. Under conditions of stress, diabetes, hypertension, and hypercholesterolemia, vascular smooth muscle cells (VSMCs) in the medial layer of arteries can adopt a phenotype similar to osteoblasts (HOBs), which are responsible for bone formation and mineralization. These VSMCs can then produce hydroxyapatite, a key mineral involved in both bone and vascular calcification, which HOBs produce naturally. It has been shown that both VSMCs and HOBs secrete extracellular vesicles (EVs) that carry lipids and proteins to initiate the mineralization process. Despite these similarities, recent data suggest that VSMCs generate calcifying EVs through a mechanism distinct from that of HOBs. To further investigate this, our group is conducting lipidomic and proteomic characterization of extracellular vesicles (EVs) from both vascular smooth muscle cells (VSMCs) and human osteoblasts (HOBs) treated with osteogenic media, which creates an ideal environment for calcification. The collected EVs, isolated through ultracentrifugation, will be analyzed using mass spectrometry for their protein and lipid content. This analysis aims to provide a better understanding of the specific lipids and proteins within these EVs that contribute to calcification, advancing our knowledge of the underlying mechanisms of pro-calcified extracellular vesicles formed from each cell type.

Kira Campagna

NC - Elon University

Discipline: Environmental Science and Sustainability

Authors:

#1 Alyssa Kaufman

#2 Jill McSweeney

#3 Kelsey Bitting

Abstract Name: Impact of Sit Spots on College Students' Mood

There is a current mental health crisis on college campuses, with greater incidences of anxiety, depression, and other adverse effects among 18-22-year-olds. Many campus interventions have focused on a sense of belonging, but a lesser explored area is how instructional practices, specifically those relating to mindfulness, can support student well-being. Existing literature studying contemplative or mindfulness pedagogies (e.g., sit spots) has shown positive physical and mental health outcomes. Few rigorous studies have examined the effects of mindfulness practices over time or how an individual's disposition to mindfulness impacts engagement in these pedagogies. Building on this work, this research aims to evaluate the impact of a brief, repeated mindfulness practice (8 x 20-minute sit spots within 1 month) on student mindfulness disposition and positive and negative affects. The pre and post study will be conducted in three classes: ENS 1100, WHE 2850, and BIO 3642 over Fall 2024, Winter 2025, and Spring 2025. Student participants will complete the sit-spot intervention as a homework assignment at a location on or near campus. Two measures will be used to assess the research objective. The first is the Positive and Negative Affect Short-Form (PANAS-SF), a 10-item scale measured on a 5-point Likert scale that assesses positive and negative emotional experiences within the last week. The ten-item scale includes positive affective states such as active, determined, and attentive and negative affective states such as afraid, nervous, and hostile. The PANAS is a cross-culturally validated tool tested widely on college students. The second is the Mindfulness Process Questionnaire (MPQ), a scale that measures the process of repeated engagement in mindfulness activities, focusing on how the individual has intentionally practiced the mindfulness skill. Results will inform future teaching practices for faculty members invested in enhancing student mental wellness in their classes.

Isabella Campos

AL - University of Alabama at Birmingham

Discipline: Law and Legal Studies

Authors:

#1 Brandon Blankenship

Abstract Name: Limiting Attorney Fees Limits Access to Justice

Access to justice is a fundamental principle embedded in the rule of law. It places an emphasis on the idea that all individuals must have equitable access to the justice system, in tandem with the requirement for people to be treated equally within the bounds of the justice system. The United States embodies this principle in the governing documents of the country. There is a constitutional assurance that all people have the right to trial by jury, equal protection, due process, and the right to petition the government for redress of grievances, which includes access to courts. Despite these guarantees, procedural and systemic barriers persist. Alabama not only faces the issue of rural residents experiencing limited access to legal representation and justice, but there are statutory limitations that prohibit using recovered funds to pay for any kinds of legal fees. We hypothesized that this limitation further complicates and prohibits access to justice for Alabama residents who are seeking to be exonerated from wrongful conviction by the state. Upon utilizing qualitative methods of research, including surveying Access to Justice Commissions across the United States and finding that none of the respondents found anything comparable in their respective state statutes, we additionally performed a comparative content analysis of existing research on the topic. The Alabama statute is

representative of a systemic failure to provide justice to those who have already suffered the profound injustice of wrongful incarceration. Our findings underscore the necessity of reevaluating access to justice frameworks, all in the pursuit of understanding and applying due process and equal protection.

Joseph Canales-Kilmer

VA - Virginia Commonwealth University

Discipline: Film/Photography Studies

Authors:

Abstract Name: Monstrous Consequences: Bong Joon-ho's use of the Giant Monster Genre in *The Host* and *Okja* to Influence Audience Perceptions on Ecological Degradation and Urbanization

This paper examines two 21st-century South Korean giant monster films by Bong Joon-ho - *The Host* (2006) and *Okja* (2016) - to analyze how the plot elements and narrative characteristics of the giant monster genre are used to critique South Korea's socio-political landscape and environmental challenges. By portraying the eco-monsters as direct consequences of human actions - industrial pollution in the case of *Gwoemul* and corporate exploitation for *Okja* - both films link the greed-driven decisions of those in power to the ecological degradation that follows. Because *The Host* and *Okja* tell the stories of marginalized communities and their disproportionate exposure to environmental harm, both films expose the role of economic inequality in shaping societal responses to ecological crises. Bong Joon-ho also utilizes sensorial elements in these films - such as the human-animal interactions in *Okja* and the sounds and appearance of *Gwoemul* in *The Host* - to heighten the emotional and physical impact of the ecological issues presented. Through their exploration of ecological crises, power structures, and immersive storytelling techniques within the giant monster genre, *The Host* and *Okja* offer a compelling critique of modernity and survival. By blending South Korean cultural contexts with global concerns about environmental degradation, these films challenge the Eurocentric narratives that dominate much of international cinema and open the door for a broader range of diverse perspectives on ecological issues.

Carlos Candanosa

TX - The University of Texas at San Antonio

Discipline: Biology

Authors:

#1 Carlos Candanosa

#2 Karl Klose

Abstract Name: Characterization of Virulence Factor Expression in *V. cholerae* "Hyperswarming" Mutants

Vibrio cholerae is an aquatic, highly motile Gram-negative bacterium that serves as the etiological agent of the human disease, cholera. The disease is characterized by profuse watery diarrhea that can result in severe dehydration and death if left untreated. *V. cholerae* possesses an array of robust virulence factors that promote movement, colonization, and pathogenicity. The bacterium has a powerful, single polar flagellum which facilitates movement within the human host to reach its preferred niche in the small intestine. Following colonization of host epithelial tissue, *V. cholerae* expresses several essential virulence factors, the most notable of which are cholera toxin (CT) and the toxin-coregulated pilus (TCP). CT is an ADP-ribosylating enterotoxin that acts as the primary pathogenic agent and is responsible for the massive loss of fluid from intestinal host cells. TCP is a Type IV pilus that facilitates microcolony formation and CTX Φ toxigenic

conversion. These two elements are under the control of a key transcriptional activator, ToxT. Previous studies have observed an inverse relationship between motility and ToxT-dependent virulence factors. This study demonstrated this phenomenon in hypermotile *V. cholerae* spontaneous mutants, known as “hyperswarmers” (HS). Some of these mutants possess single point mutations in ToxT, which are predicted to result in a loss of function. Thorough analyses of ToxT activity have shown significant reduction in CT and TCP expression within the HS/ToxT mutants. These strains exhibited significantly reduced CT/TCP expression in β -galactosidase transcriptional assays. TCP expression was also found to be completely defective in a CTX Φ transduction assay. Future work will focus on further characterization of virulence factor expression, as well as interrogating other ToxT-dependent genes that may be responsible for the hyperswarming phenotype. This analysis may help elucidate the observed inverse link between *V. cholerae* motility and ToxT-dependent virulence factors.

Madeline Candline

WI - University of Wisconsin-Stout

Discipline: Chemistry

Authors:

#1 Madeline Candline

#2 Bryanna Hoffman

#3 Riley Strobush

#4 Ana Vande Linde

Bryanna Hoffman

Abstract Name: Changes in Chemical Properties of Surface Waters in Dunn County

The chemical properties of surface water are some of the indicators used to assess the health of lakes and rivers. Monitoring changes in chemical properties allows for action to be taken to resolve any developing or on-going problems in the body of water. This study monitored the pH, conductivity, levels of Na, K, Ca, Mg, and P in surface water locations in Lake Menomin, Lake Tainter, and the Red Cedar River in Dunn County, WI. Water samples were collected from June to September. Vernier sensors were used to measure the pH and conductivity, and an Atomic Absorption Spectrometer was used to determine the concentrations of Na, K, Ca, Mg, and P. Water samples collected from both sites in Lake Menomin, showed a decrease in pH from 8.76 ± 0.04 to 6.79 ± 0.01 ; the pH of samples collected from the same sites in September went back to the same level in June. In conductivity, the only significant change observed was an increase from 224 ± 0 mS/cm to 1545 ± 1 mS/cm in samples collected in one site; this can be attributed to increases in the Na and K concentrations. The P levels in the same samples decrease from 5010 ± 1036 ppm to 3000 ± 202 ppm. Water samples from Lake Tainter showed similar declining trend in pH from June to August in both locations. The only other change in the chemical properties that is significant is decrease in the K concentration from 14.70 ± 0.20 ppm to 4.98 ± 0.08 ppm. Except for the Ca concentration, no significant changes in the other chemical properties were observed in water samples from the Red Cedar River. The Ca concentration collected from the River Road Boat Landing increased from 18.88 ± 1.15 ppm to 27.84 ± 0.67 ppm.

Sam Cannon

VT - Norwich University

Discipline: Biology

Authors:

#1 Sam Cannon

#2 Alex Kellberg

#3 Jeffrey Kirkland
#4 Emma Barrett
#5 Simon Pearish

Abstract Name: Multispecies Algae Cultivation for Biofuel Production

Fossil fuels contribute to climate change and are non-renewable. Biodiesel has been proposed as a sustainable, renewable alternative to fossil fuels. First-generation biodiesel is produced from oilseed crops. The process of producing this form of biodiesel has shortcomings such as land use, energy consumption, and other negative externalities. A promising solution to this is biofuel produced from algae. Algae has higher yields of combustible oil than seed crops, it rapidly consumes CO₂, it grows rapidly, and it has a smaller production footprint than other feedstocks. Currently, research in this area involves growing algae strains in monocultures, which must be protected from contamination and grown in carefully regulated environmental conditions. Multi-species cultures might provide a low-maintenance alternative to monocultures if they are resistant to invasion or adaptable to fluctuating environmental conditions. In this project, we test the hypothesis that multi-species algae cultures can produce oil at a rate that is comparable to that produced in monoculture. Oils from several unique multi-species algae cultures were extracted via enzyme assisted extraction methods and converted into biodiesel via a base-catalyzed trans-esterification reaction. We report extracted oil yields, composition of extracted oils as determined by GC-MS, and the characteristics of the converted biodiesel as determined by ASTM fuel standards testing.

Ciara Cano

TX - Laredo College

Discipline: Biology

Authors:

#1 Ciara Cano
#2 Maria Reyes
#3 Gabriel Carranza

Abstract Name: The Potential and Functionality of 3D-Printed Organs for Transplant Recipients

Bioprinting technology for creating 3D-printed organs has been a concept since the late 20th century, but it is only recently being further developed and revolutionized as a solution to the organ shortage crisis. This technology holds the potential to assist thousands of people in need of transplants by being more cost-effective, reducing the likelihood of transplant rejection, and increasing accessibility. By using the recipient's own tissue samples, bioprinting can create customizable organs using techniques such as inkjet bioink. Information for this research was gathered from peer-reviewed articles accessed through platforms like Google Scholar, JSTOR, and Mendeley. Additional data, such as statistics unavailable in peer-reviewed sources, was obtained from reliable online resources. Results from clinical trials discussed in peer-reviewed articles demonstrated the promise of 3D-printed organs. These trials showcased success in creating anatomically accurate and functional structures that maintained functionality over specific periods. The purpose of this research was to evaluate the feasibility of creating 3D-printed organs and their potential to serve as an alternative to traditional organ transplants.

Emmett Cantkier

GA - Georgia State University

Discipline: Anthropology and Archaeology

Authors:
#1 Jeffrey Glover

Abstract Name: From Bottling Plant to Buried Trash: Archaeology of Atlanta's Soft Drink Industry

Atlanta, Georgia has been a major hub for soft drink production since the rise of the industry at the turn of the 20th century. The world's most popular soft drink, Coca-Cola, originated in Atlanta, and was first bottled in 1899, which attracted its lesser-known competitors and knockoffs from the surrounding Southeast and beyond. In this presentation, I discuss my work in analyzing the soft drink industry of 20th-century Atlanta based on the bottles, fragments, cans, and bottle caps found in the MARTA Archaeological Collection, an array of 100,000 artifacts excavated by Georgia State University alongside the construction of Atlanta's commuter rail in the 1970s. The study is within the realm of historical archaeology, which the Society for Historical Archaeology defines as "the study of the material remains of past societies that also left behind some other form of historical evidence" and "attempt[s] to discover the fabric of common everyday life in the past." Academic research on soft drink history and archaeology is scarce, but it is a relatable topic to the public. Throughout my ongoing research, I have compiled a catalog of all 350+ relevant artifacts from 54 brands spanning from 1900 to the 1970s, and by utilizing associated historical research, I can use the data to find possible socioeconomic preferences, patterns, and trends among Atlanta's consumers and industry alike. The scope of the collection presents substantial data for tracking brands throughout the time and space of 20th-century Atlanta to uncover an untold history of the Southeastern soft drink industry and its role in the city's history.

Tu Cao

VA - George Mason University

Discipline: Physics and Astronomy

Authors:
#1 Igor Mazin

Abstract Name: A toy model for 2-dimensional spin-fluctuation-induced unconventional superconductivity

Superconductivity had been one of the most enigmatic phenomena in condensed matter physics, puzzling the best theorists for 45 years, since the original discovery by Kamerlingh-Onnes in 1911 till the final solution by Bardeen, Cooper and Schrieffer (BCS) in 1957. The original BCS proposal assumed the highest-symmetry form for the superconducting order parameter Δ , namely, a constant, and a uniform pairing interaction due to attractive mediation of ionic vibration. While it was rather soon realized that generalizations onto k -dependent order parameters and anisotropic pairing interaction was straightforward, only thirty years later, upon the discovery of high-temperature superconductivity in cuprates, high-order angular dependence of Δ and repulsive interaction, mediated by spin fluctuations or Coulomb repulsion brought such "unconventional" into the spotlight. In 2008 yet another such system was discovered, and eventually the idea of repulsion-mediated unconventional superconductivity was generally accepted. Apart from the two specific systems mentioned above, a large number of various specific implementations of this idea have been proposed, and it is becoming increasingly clear that it is worth studying mathematically how unconventional superconductivity emerges, and with what properties, for a simple, but sufficiently general theoretical model. In our project, we study systematically unconventional superconductivity in an isotropic two-dimensional model system of electrons, subjected to repulsive interactions of a simple, but physically motivated form: a delta function peaked at a particular momentum (from 0 to twice the Fermi momentum), or Gaussian of varying widths.

Anna Cappella

PA - Carnegie Mellon University

Discipline: Biology

Authors:

#1 Anna Cappella

#2 Wei-Chien Chou

#3 Brooke McCartney

Abstract Name: Assessing the role of Pico in the spatiotemporal regulation of actin cable assembly in *Drosophila* oogenesis

Dynamics and organization of actin filaments contribute to cell motility, development, and many other cellular processes in a variety of organisms. Some actin structures are composed of bundles of actin filaments called cables. In *Drosophila melanogaster*, actin cable arrays with asymmetric growth dynamics in ovarian nurse cells carefully displace their nuclei to allow their cytoplasmic contents to move from the nurse cells into the developing oocyte. Without these spatially and temporally controlled actin cable arrays, the nucleus will block the flow of nutrients from cell to cell and prevent proper oocyte formation and reproductive success. It is already known that cortically localized Enabled (Ena) and Diaphanous (Dia) proteins work together to polymerize the actin filaments that are bundled into these actin cable networks. Further, the regional cortical enrichment of Ena produces the characteristic asymmetry, with faster-growing cables developing only where Ena localizes with Dia, but not where Dia is present alone. We seek to understand the molecular mechanisms responsible for the regional cortical enrichment of Ena. Lamellipodin (Lpn) contributes to the cortical localization of Ena in some contexts in mammalian cells, but its functions are poorly understood. We are testing the hypothesis that Pico, the *Drosophila* ortholog of Lpn, plays a role in the regional cortical enrichment of Ena in nurse cells. To accomplish this, we are examining actin cable assembly and Ena localization using immunofluorescence and live imaging in Pico mutant nurse cells. We predict that loss of Pico will result in mislocalization of Ena and short, symmetric cable networks that ultimately fail to displace the nucleus. These experiments will increase our understanding of fundamental mechanisms orchestrating the assembly and function of the actin cytoskeleton.

Juan Carcamo Dal Zotto

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:

#1 Caesar Hernandez

#2 Macy McCuiston

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#9 Nessa Patel

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#11 Amaya Coker

Abstract Name: Alzheimer's Disease Neuropathology Present in TgF344 Rat and Ketone Diester Effects on TgF344 Behavioral Impairments

Alzheimer's disease (AD) is a progressive neurodegenerative disease affecting millions worldwide. AD causes cognitive defects, such as memory loss, and is characterized by specific pathology such as amyloid-beta plaques, phosphorylated tau (phospho-tau), neuroinflammation associated with gliosis, and neurodegeneration. However, the role of neuropathology in the basolateral amygdala (BLA) in AD has not been well studied. In this study, we aim to elucidate the pathology trajectories which diverge between normative aging and AD in the BLA, as well as alleviate pathology and associated fear extinction impairment symptomology with a ketone diester dietary supplement. Using immunohistochemical approaches, we measured amyloid, phospho-tau, microglial and astrocytic activation (using Iba1 and GFAP, respectively) to determine pathology progression in BLA nuclei ranging from young, 3 months old, to aged, 24 months old, wildtype rats and transgenic Fisher-344 AD (TgAD) rats. Immunostaining highlighted pathologies of interest, including amyloid beta plaques, phospho-tau, gliosis, and neuronal nuclei count. Results suggest early amyloid and phospho-tau pathology is observable in the BLA. Additionally, we report greater activated microglia and astrocytes within the BLA of young TgAD rats. In TgAD rats, aging is associated with greater amyloid and tau accumulation. In the older WT rats, increased activated microglia and astrocytes irrespective of genotype is also seen. Young TgAD rats on a ketone diester supplementation showed decreased fear extinction impairment relative to controls as well. These results highlight the effectiveness of the TgAD rat model at simulating AD pathology in humans and show the BLA as an epicenter of early AD pathological and behavioral changes.

Guillermo Cardenas

IN - Indiana University South Bend

Discipline: Biology

Authors:

#1 Thomas Clark

#2 Mia Guerra

#3 Cordelia Bennett

Abstract Name: Analysis of Differences in Rural and Urban Moth Diversity

Our research was dedicated to comparing the diversity of moths in urban and rural areas. Last year, in a similar project, we observed a decrease in the percent macrolepidoptera, driven by collapse of certain families in urban habitats. We repeated observations at two of those locations, one urban and one rural, and added two additional locations to see how robust these observations were across years and sites. Night observations were conducted and with the deployment of a light trap we were able to photograph the moths as they landed. We observed a similar decrease in macrolepidoptera in urban habitats, but the responses of individual families was distinct from year one.

Sydney Cardieri

NY - Brooklyn College

Discipline: Anthropology and Archaeology

Authors:

#1 Patricia Antoniello

Abstract Name: Inequalities in Healthcare: A Comparison of Anthropological and Biomedical Approaches to Race, Class, and Gender of Ovarian Cancer Patients

Medical anthropologists aim to understand how health, healthcare, and illness manifest given sociocultural and political contexts. Comparatively, biomedicine utilizes research-based biology and physiology to develop medicine and healthcare. Despite studying the same topic of healthcare, the two fields approach it differently such that medical anthropologists consider biomedicine to be limited in breadth. These varied approaches raise the following questions, in order of increasing importance: In which ways might disparities based on race, class, and gender of patients with ovarian cancer manifest in clinical trials and medical treatment? What can political and anthropological concepts elucidate about these inequalities? How do medical anthropology and biomedicine differ in their respective approaches to recognizing and analyzing health disparities? This thesis compares biomedicine and medical anthropology through an analysis of published scientific articles of both medical anthropology and biomedicine regarding ovarian cancer, its diagnosis, and treatment. Their respective integrations of race, class, and gender with reference to ovarian cancer are to be established, if they exist. Then, the effects of these integrations on ovarian cancer treatment and patients are analyzed through the lenses of intersectionality, medicalization, and political economy. I suggest that biomedicine frequently fails to incorporate sociocultural intersectional approaches in the diagnosis and treatment of ovarian cancer. That is not to say that no biomedical scientists analyze ovarian cancer with respect to race, class, or gender, but they limit the number of sociocultural variables in their studies. I claim that if the racial, socioeconomic, and gender differences remain unaddressed by biomedical practitioners, the morbidity and mortality of ovarian cancer patients will persist.

Cameron Carmichael

MI - Michigan State University

Discipline: Visual Arts

Authors:

Abstract Name: the gender binary (I am bad at Math)

There has always been a masculinized relationship with technology. Coming from a background where I am bad at mathematics, I have always had a troubled relationship with technology. Concepts such as computer science and engineering are completely foreign to me. Binary language is taken towards an autobiographical approach, as a Nonbinary individual my existence within the gender binary is glitched. Within painting, I can create digitally abstracted spaces where I reference old internet user interfaces such as Windows 95—taking the calculator from that software and painting 80085 about my chest dysphoria. In this world there are 3 depictions of myself, two profiles and one in the middle, using repetition about glitched spaces. I paint an expression of despair and hopelessness due to gendered oppression. Using mediums such as spray paint on Masonite board I can create colorful abstractions of my queer identity. These bright saturated colors are expressions of myself, colors such as hot pink bring me intense joy. Then covering these up with mediums such as oil and acrylic to hide myself within the digital world. In addition, I use pixelated linework to convey the glitch of self in the binary world. On top, I added repurposed and used motherboards and technology to reference the engineering aspects of mathematics. Lastly, I pixelate the text boy girl to refer to the gendered spaces and assist the viewer in understanding the metaphor of the digital gender binary. As one exists within the gender binary as a glitch there is extreme discomfort and complexities based on my lived experience.

Benjamin Carnovale

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

#1 William Rabon
#2 Zayaan Tirmizi
#3 Raj Lavadi
#4 James Mooney
#5 D Kojo Hamilton
#6 Joseph Maroon
#7 Vincent Miele
#8 Nitin Agarwal

Abstract Name: Stratification of Martial Arts-Related Brain and Spine Injuries Presenting to the Emergency Room throughout the U.S.

IntroductionNeurological injuries may occur as a result of consistent blows during contact sports. To advance the safety of the sport, further understanding mechanism of injury is paramount. In this study, the prevalence and characteristics of martial arts-related cranial and spinal injuries were examined. **Methods**The National Electronic Injury Surveillance System (NEISS) was surveyed for martial arts injuries from 2014-2023. All case narratives were reviewed and fighting style, primary injury, mechanism of injury, and case notes were extracted. Hospital disposition, patient age, and gender were also extracted. Patients were grouped into age cohorts in ten-year increments. Weighted survey analysis was used to calculate national estimates and confidence intervals. The association between age and specific diagnosis was analyzed using logistic regression. All statistical analyses were performed in R. P value ≤ 0.05 was considered significant. **Results** A ten-year period of 1,104 martial arts narratives yielded 36,635 spinal and cranial injuries. The average participant age of injury was 24.5 years. Jiu-jitsu (26.9%) and karate (26.8%) were most frequently associated with injury. Lumbar (19.8%) and cervical (18.3%) strains were the most frequent injuries, with throwing or flipping an opponent to the ground (17.1%) identified as the prevalent mechanism of injury. Concussions (18.4%) were also prevalent with jiu-jitsu (26.8%) and karate (26.7%) being the most common modalities. Patients with concussions tended to be younger than those with other injuries, with the largest cohorts being 10-19 years (30.6%) and 20-29 years (23.4%). **Conclusions**Injuries sustained during martial arts are of increasing concern, particularly among younger populations. This study aims to raise awareness of the inherent risks associated with techniques like throwing or flipping opponents in combat sports, which can lead to serious injuries. Increasing awareness, can empower both physicians and participants to promote safer practices in contact sports such as martial arts.

Kaija Carr

IN - DePauw University

Discipline: Biology

Authors:

#1 Philips Akinwale
#2 Emma Jacobs
#3 Nina Shaffer
Thi Doan
Zoe Green

Abstract Name: Metabolic profiles and intrinsic antibiotic resistance of bacterial species isolated from Indiana Caverns

Investigations of cave ecosystems are limited due to the oligotrophic nature of caves and challenges associated with accessing sample sites. To increase our understanding of cave bacterial parameters, we examined metabolic properties and antibiotic resistance of cave bacteria. We hypothesized that antibiotic resistance is not limited to human-dominated environments but can be found in isolated ecosystems. Sediment and water samples were collected from the Deep Darkness section of the Indiana Caverns,

Corydon, IN. Using colony PCR and DNA sequencing three bacterial species were isolated: *Serratia surfactantfaciens*, *Pseudomonas soli*, and *Bacillus paramycoides*. We assessed their ability to metabolize a range of carbon substrates using 96-well BIOLOG Ecoplates. Heatmap analysis showed high carbon substrate utilization of polymers (Tween 40, Tween 80) and carbohydrates (D-Mannitol, N-Acetyl-D-Glucosamine) across all species. Others such as D-Cellobiose and α -D-Lactose were less utilized. *B. paramycoides* portrayed the highest levels of metabolic activity overall, disproportionately utilizing Pyruvic Acid Methyl Ester. Antibiotic susceptibility testing (AST) showed *B. paramycoides* was resistant to 57% of the antibiotics, including erythromycin, vancomycin, and clindamycin. *S. surfactantfaciens* was susceptible to 38% of the antibiotics such as amikacin, levofloxacin, and meropenem, with 62% resistance to antibiotics including nitrofurantoin and gentamicin. *P. soli* was resistant to 54% of the antibiotics such as nitrofurantoin, ampicillin, and aztreonam. AST revealed delayed growth responses beyond the standard 24-hour timeframe for some antibiotics, highlighting limitations of traditional testing protocols in capturing adaptive resistance mechanisms. This study implies that remote environments such as subterranean ecosystems harbor bacteria that have mechanisms which enable resistance to common antibiotics. Our findings emphasize the concern about antibiotic resistance, which may have great implications for natural ecosystems and public health. Further research should focus on identifying the resistant genes and patterns, and refine testing methods to better assess bacterial adaptation and resistance in clinical and environmental contexts.

Salomé Carrasco

CO - University of Colorado at Boulder

Discipline: Biology

Authors:

#1 Gina Calabrese

#2 Rebecca Safran

Abstract Name: Barn Swallows Size and Elevation: Testing Bergmann's Rule

Bergmann's rule suggests that endothermic animals in cooler, higher latitudinal regions tend to be larger than those in warmer, lower latitudes. Most studies in support for this rule focus on sedentary animals, while migratory and smaller animals tend to vary more in support or opposition to the rule. Barn swallows (*Hirundo rustica*) are a generalist species of migratory aerial insectivore that have breeding sites across the globe over various latitudinal and elevational ranges. The different temperatures at a barn swallows breeding site may have an impact on their body mass as well. Understanding how Barn Swallows' body size changes across elevation can provide insight into how this migrating bird may or may not follow Bergmann's Rule. Global data taken from 2009-2024 across the northern hemisphere was used to analyze three subspecies of barn swallows: (*H. r. erythrogaster*, *H. r. gutturalis*, and *H. r. rustica*), to determine if elevation and or latitude of their breeding sites would have an impact on their mass. Interestingly we found *H. r. erythrogaster* supported the rule, while *H. r. gutturalis* showed no significant impact in mass across elevation or latitude, and *H. r. rustica* displayed a negative impact for mass across elevation and a positive in relation to latitude.

Diego Carrillo

CA - California State University - San Marcos

Discipline: Biology

Authors:

#1 Diego Carrillo

#2 Sergio Nigenda-Morales

Abstract Name: Analyzing Relatedness of Fin whale populations in the Pacific using genetic markers.

This project consist of analyzing the relatedness of a fin whale population in the Pacific, more specifically, Gulf of California (GOC). This specific population has been isolated derived by a founder effect from the Eastern North Pacific (ENP) population of fin whales. Studies have shown that this fin whale population has low levels of genetic diversity, which can lead to series of consequences such as reduced fitness or possibly extinction. The more diverse, the better a population maintains its fitness. The goal is to identify the degree of relatedness of 156 individuals in GOC (107) and ENP (49) populations, using 14 microsatellite loci with two genetic analysis softwares (COLONY & CERVUS). Allele Frequencies were used to identify relatedness in which indicated that GOC presented more than ENP. This is because of their Heterozygosity and PIC scores being low, and Non-exclusion probabilities being higher. Other tests such as Identity Analysis and Full-Sibling and Half Sibling analysis which provided information about individuals who share at least 50-25% of their loci. The results for GOC population showed presence of a degree of relatedness, having high presence of individuals at least sharing $\frac{1}{4}$ of their microsatellites rather than $\frac{1}{2}$.

Nereida Carrillo

TX - St. Edward's University

Discipline: Psychology

Authors:

Abstract Name: Exploring the Transformative Effects of incarceration on Maternal Identity

Currently, 58% of women in prison are mothers, many of whom struggle to maintain their maternal identity in a restrictive environment (Bertram, 2023). Motherhood involves various practices that reinforce maternal identity, such as daily caregiving, emotional support, and involvement in children's education and routines. However, previous literature suggests that incarceration limits these opportunities, disrupting the mother-child bond and challenging the mothers' sense of maternal identity. This quantitative study explores the experiences of incarcerated mothers, focusing on how their maternal identities are affected and reformed during incarceration. Through a survey using a modified version of the Myself as Mother Differential Semantic Scale conducted with women across multiple penal institutions, this research aims to fill a gap in the literature that predominantly centers on the impact of maternal incarceration on children rather than on the mothers themselves. By giving voice to these women and examining their self-reported data, this research seeks to contribute to a deeper understanding of the complexities of maternal identity in the context of incarceration and to inform better practices and policies that support incarcerated mothers. The preliminary findings in this study found that incarcerated mothers vary in cognitive operations based on race/ethnicity, particularly Black mothers scoring higher in social support and well-being than other racial and ethnic demographics. Additional findings also indicate that neither offense type or age at separation significantly impact the cognitive aspects of maternal identity. These preliminary findings from an ongoing study could help raise awareness and inform programs that support incarcerated mothers particularly those in need of specific aid to strengthen cognitive aspects of maternal identity .

Teresa Carstetter

PA - Point Park University

Discipline: English and Literature

Authors:

Abstract Name: Claiming Her Own Voice(s):Wheatley-Peters and Al-Mansour's Battle(s) to Owning Self-Authorship

In light of the precarity of women's rights following the 2024 U.S. Presidential election, the significance of recognizing the narratives and contributions of female leadership and female creativity in male-dominated fields has never taken a higher priority than the present. This project seeks to amplify the social activist voices of two Women of Color creators, Black American poet Phillis Wheatley-Peters and Saudi Arabian filmmaker Haifaa Al-Mansour, respectively and conjointly drawing parallels between these two creators' mutual struggles of owning the female voice. The purpose of this research proposal is to critically examine how and to what extent female authors, specifically female authors of color, are allowed to retain literary and creative ownership over their own process of storytelling and how their own creations are validated or invalidated by the institutional and societal structures in which their respective work is preserved and examined. Despite her celebrated literary contributions in Early American Literature, Wheatley-Peters' own authorship is questioned before a "council" of white enslavers; Al-Mansour's logistical and social struggles of filmmaking in a country that limits both cinematic expression and female agency will be the second part in the comparative study of this project. By drawing upon the scholarship published in the Association of African American Studies and CIS Student Research Journal, this project will examine the poetry and letters of Wheatley-Peters and the cinematic productions of Al-Mansour. Both Wheatley-Peters and Al-Mansour's authorship, work and impact of legacy will be analyzed within the framework of feminist lens combined with intersectionality of race and ethnic liberation in post-colonialism political structures. Wheatley-Peters' work will open up analysis of the intersections between race and Black Womanhood in America. Al-Mansour will represent the intersectionality of feminism in Saudi Arabia and the post-colonialist structure, while acknowledging Western interference within the lens of post-colonialism in the Middle East.

Owen Carter

PA - Pennsylvania State University

Discipline: Biology

Authors:

#1 Owen Carter

#2 Ivy Laffan

#3 Joseph Lehotsky

#4 Jason Chen

#5 Lynne Beaty

#6 Sam Nutile

#7 Adam Simpson

Joseph Lehotsky

Ivy Laffan

Abstract Name: How Cooking Methods Affect Polychlorinated Biphenyl (PCB) Concentrations in A Lake Erie Game Fish

Polychlorinated biphenyls (PCBs) are persistent organic pollutants that are frequently detected in aquatic environments. These compounds accumulate in the fatty tissues of fish, including walleye (*Sander vitreus*), a popular choice among recreational anglers. Consuming PCB contaminated fish poses significant health risks, including developmental delays, neurological issues, immune system suppression, and potential carcinogenic effects. Although fish consumption advisories provide recommendations for safe intake, they often neglect to address the influence of cooking methods—such as baking, frying, and smoking—on PCB concentrations. This study explores how these cooking methods impact PCB levels in walleye fillets collected from Lake Erie. Fillets from 60 walleye were paired, with one fillet remaining raw while the other underwent one of the three cooking methods before PCB extraction and analysis. The PCB concentrations in raw and cooked fillets

were then compared to evaluate the effect of each method on PCB retention. The cooking methods evaluated in this study did not significantly impact the total PCB concentrations in fish fillets compared to raw samples. However, statistically significant increases were observed in the concentrations of specific PCB congeners. This increase is likely due to moisture loss during cooking, which concentrates the PCBs in the remaining tissue. These findings provide critical insights into the influence of cooking methods on PCB exposure, highlighting important considerations for food safety, public health policies, and dietary guidelines to minimize PCB-related health risks.

Zoe Carver

DC - The George Washington University

Discipline: Political Science

Authors:

#1 Zoe Carver

Abstract Name: Belonging in the Senegal River Valley: A West African Perspective on Kinship and Integration

Following the 1989 Senegal-Mauritania conflict, 50,000 black Mauritians were forcibly expelled into the neighboring state of Senegal. These Mauritians belong to multiple different ethnic groups that are also present in Senegal, though to varying degrees of social salience. This paper seeks to assess how different ethnic groups have experienced integration into Senegal, and analyze what factors – such as language, family, and finances – have influenced their ability to belong within the Senegalese community. In the thirty years since the conflict, these migrants and refugees have had several influences on their integration process, including kinship ties, ethnic ties, history of discrimination, and government and administrative influence. Starting with a detailed history of the conflict and a background into kinship and ethnic research in the region, I perform thematic analysis on qualitative interviews that I conducted with Mauritanian migrants and refugees who currently reside in Senegal to understand the individual and contextual drivers of integration and belonging. This study has broad implications for the future of refugee policy in West Africa, and scholars and policymakers can incorporate lessons about how refugees of different backgrounds were able to feel at home in a neighboring nation.

Valacia Casper

WI - University of Wisconsin-Stout

Discipline: Political Science

Authors:

Abstract Name: Political Opinions Over Women's Health Care and its Effect on Female Voters

The United States 2024 presidential election triggered discussions regarding the future of women's healthcare. News articles deemed this to be a top issue in this election, stating that healthcare is a mobilizing factor for voters, and how the future elected president will have an impact on women's healthcare (Levitt, 2023). One study examined the heightened concerns amongst young women, particularly on aspects regarding to overall healthcare, contraception, prices, availability, and safe abortions (Judge et al., 2017). In this project, I researched how women at UW-Stout view government involvement regarding women's healthcare, and how potential future impacts influenced who they planned to vote for, either Democrat representative Harris or Republican representative Trump. My goal was to better understand the views of

women at UW-Stout regarding their elected candidates, and what issues and factors were most significant to them when deciding who they would vote for. To accomplish this, an original survey was distributed to 1,000 female UW-Stout students, staff, and faculty. Questions included political demographics, opinions on the presidential candidates and government involvement, and emotional responses to politics. Results indicate that the majority of respondents voted for Harris, and that access to women's healthcare was an important issue to them, but not the most important. In addition, most felt neutral about the future of women's healthcare. Harris voters were very aware of her opinions on women's healthcare, while Trump voters were less aware of his opinions, and also unwilling to change their party affiliation. These findings document what a population at UW-Stout found most important when selecting their candidate. Contrary to predictions from the press, access to healthcare and keeping bodily autonomy were not decisive. Despite feeling that the government, specifically the president, should be protecting women's healthcare, women did not vote only on this issue.

Katie Cassady

VA - Liberty University

Discipline: History

Authors:

#1 Katie Cassady

Abstract Name: Faith Under the Führer: Protestant Churches in Nazi Germany

This research seeks to examine Protestant churches in Nazi Germany and their varied reactions to Hitler's Third Reich. The research was conducted using a variety of primary sources, including Dietrich Bonhoeffer and Martin Niemöller's writings and sermons. Scholarly secondary sources such as books and periodicals from experts in this field of study were also utilized. The research traces the Nazi rise to power, an overview of the *Kirchenkampf* (Church Struggle), and the Confessing Church's resistance with emphasis on figures like Bonhoeffer and Niemöller. Hitler campaigned on a platform purporting to support religious freedom. However, his subjugation of Christian churches to the state and persecution of dissenting Protestant pastors revealed that the Christian church was merely another pawn in his quest for political power. The *Kirchenkampf* exemplifies the reactions of Protestant German churches to Hitler's rule. The German Christian Movement (GCM) endorsed Hitler's radical racial theories against the Jews and abandoned Christian doctrines in favor of a neo-pagan religion based on pseudoscience. The Confessing Church, in contrast, confronted the unbiblical rhetoric used by both the Nazis and the GCM, with pastors like Niemöller and Bonhoeffer opposing Hitler's regime. Niemöller initially supported the Nazis but realized that Christianity and Nazism were incompatible, leading him to voice opposition that resulted in his imprisonment. Niemöller survived his incarceration and spoke publicly afterward about the complacency of both the Christian church and ordinary Germans in allowing the Holocaust. Bonhoeffer engaged with the ecumenical Christian movement abroad, arranged for the escape of Jews from Germany, and participated in an assassination plot against Hitler that resulted in his execution. These men remain admirable figures of the Confessing Church's struggle against Nazism. However, the Church also faced difficulties such as disunity and a hesitancy to criticize the German state that inhibited its efficacy in challenging Hitler's regime.

Kate Caster

OH - University of Findlay

Discipline: Psychology

Authors:

#1 Kate Caster
#2 Vincent Coppola
#3 Jessica Labuda

Abstract Name: Testing turn alternation in a species of Porcellio and Trachelipus: A pilot study

It's well documented that terrestrial isopods of the genera Porcellio and Armadillidium exhibit spontaneous turn alternation (TA), a navigational strategy aimed at maintaining a straight path while exploring new terrains, finding food, or escaping predators. Of the many extant species of Porcellio, research on TA has mainly focused on *P. scaber* and *P. laevis*, which leaves TA behavior of the other Porcellio species undocumented. With my planned honors thesis set to investigate spontaneous turn alternation between captive-bred and wild-caught Porcellio spinicornis, a pilot study was warranted to confirm if *P. spinicornis* exhibits TA at a rate significantly above chance. During the collection of *P. spinicornis*, a large number of Trachelipus rathkii were inadvertently captured and, considering TA has not been documented in any member of the Trachelipus genus, these animals were included in the pilot study as well. In order to test TA in *P. spinicornis* and *T. rathkii*, each subject was run through a commonly employed multiple T-maze. Analyses revealed that both *P. spinicornis* and *T. rathkii* perform TA at rates significantly above chance. Furthermore, when comparing sex within each species, it was found that *P. spinicornis* males, but not females, and *T. rathkii* females, but not males, significantly exhibited TA. The current study is the first to document TA in *P. spinicornis* and any member of the Trachelipus genus. Furthermore, the data suggests that TA may follow a pattern of sex-specific selection that could differ among species of terrestrial isopods. Ultimately, this pilot study confirmed that *P. spinicornis* are reliable models for TA research while expanding our understanding of TA across the many genera and species of the terrestrial isopod.

Ashley Castillo

CA - Chapman University

Discipline: Political Science

Authors:

Abstract Name: The Silenced Holocaust: How U.S Interference Has Affected Guatemalan Lives in Today's Society

While past research has been conducted on the effects of the United States' interference with Guatemala over the past century, and how that has affected the state of the country politically, there has been a lack of discussion regarding how this has affected Guatemalan people culturally. Guatemala is a country that often is outcasted by a large percentage of Latin America socially, and continues to be silenced in the politically, especially in the United States, due to false misconceptions that have been created and continue to be widespread based on the effects of the bioterrorism the country experienced at the hands of the U.S., as well as it's silent Holocaust and how that affected its people. This research is inspired by my experiences growing up as a Guatemalan American woman in the U.S., learning from my parents' cultural experiences growing up in Guatemala and migrating to the United States. Living in Los Angeles, where there is a significant percentage of the Guatemalans residing in the country, I've witnessed various first hand narratives. Through collecting data from digital sources such as online research journals and databases, I've also collected first-hand testimonies from the Guatemalan community about how these misconceptions have followed them throughout their lives and ultimately had a negative effect on them in various aspects. I have also collected examples of our government's repeated exclusion of the country, and how this has affected the Guatemalan people living in the United states, who make up a significant portion of our country's population as migration of Guatemalan immigrants continues to rise. Ultimately, I hope this research can inspire a call to action to bring more awareness, both culturally, and legislatively, to the issues Guatemalan people have faced at the hands of our country, and encourage the start of reparation.

Molly Castina

PA - Grove City College

Discipline: Social Work and Human Services

Authors:

Alexa Puckett

Lucia Isenberg

Abstract Name: Bridging the Divide Between Civic Knowledge and Civic Engagement: Navigating Pedagogical Tensions in Civics Education for Elementary Students

The terrain of civics education is vast and divided. While the literature points to the necessity of both the knowing and the doing of citizenship, much of the teaching and learning of civics in our current context fails to account for the complexities of this tension. Our study attempts to bridge the divide between transmissive (knowledge) and transformational (engagement) civics education approaches and is guided by the following research question: How do students, and teachers, come to think about citizenship after participating in an 8-week curriculum experience that privileges both civic knowledge and civic engagement? To do this, we fused elements of an action civics curriculum (The iEngage Civics Institute) with the components of a traditional civics curriculum (Hillsdale College's 1776 Curriculum). Our inquiry followed the methodological structure and assumptions associated with a qualitative multiple case study. We were interested in an in-depth understanding of how the study's participants (three inservice teachers, three preservice teachers, and 50+ students located across three different school sites and primary grade levels) came to think about citizenship after experiencing a curriculum bridging the divide between transmission and transformation. We relied on the three sources of evidence associated with case study design (documents or artifacts, semi-structured interviews, and observations) to construct a rich description of each case. While transmissive and transformational approaches appear oppositional, we highlight the necessary tension and complementary nature of these approaches. We discuss how a civics curriculum that embeds both knowledge and engagement cultivates students who are well-versed in understanding civic structures and the foundational principles undergirding these structures, while simultaneously encouraging youth to view themselves as necessary and influential civic participants who can affect change in their schools and communities.

Calla Castro

MT - Montana State University - Bozeman

Discipline: Health and Human Development

Authors:

#1 Daniel Gonzalez

#2 Daniel Benjamin

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#6 Courtney Hallock

Jessminda DiCello

Andrea Storer

Abstract Name: External Validation of a Caffeine Population Pharmacokinetic Model in Neonates with Congenital Heart Disease using Pragmatic Trial Design

Caffeine is a promising drug that has reduced rates of acute kidney injury (AKI) in preterm neonates and may prevent postoperative AKI in neonates with congenital heart disease (CHD). To understand the effects of caffeine on AKI in this population, caffeine disposition must first be characterized. We previously developed the first population pharmacokinetic (PopPK) model of caffeine in neonates with CHD undergoing cardiac surgery using an opportunistic, clinically-integrated trial platform. Bypass time significantly affected caffeine disposition. Here, we performed an external model validation in a new cohort of neonates with CHD. External validation is the gold standard in determining model generalizability but is often overlooked due to clinical trial burden. We enrolled neonates with CHD receiving caffeine and collected PK samples. Clinical and demographic data were extracted from the health record. Predictive accuracy of the model was evaluated graphically (prediction corrected visual predictive checks; pc-VPC) and quantitatively (root mean square errors, prediction errors, mean prediction errors, and mean absolute prediction errors). The fraction of model predicted values within 20% and 30% of observed values were calculated for both population and individual predictions. Dosing simulations were conducted to target exposures matching those in preterm neonates receiving caffeine for apnea of prematurity. Fourteen infants were enrolled in the validation cohort. Quantitative metrics of model performance were acceptable, suggesting that our model described the validation cohort well. The pc-VPC showed agreement between model-predicted and observed concentrations. Mean (SD) simulated caffeine concentration was 6.2 (5.2) mg/L, which is lower than the reference range of 15-25 mg/L. We successfully validated our PopPK model to improve caffeine dosing in neonates with CHD—a population that may require higher dosing to match reference exposures. Further, we demonstrated the feasibility of an efficient, opportunistic, clinically integrated trial platform that can be expanded to other drugs in other populations.

Calla Castro

MT - Montana State University - Bozeman

Discipline: Biology

Authors:

#1 Dana Skorupa

#2 Brent Peyton

Alex Myxter

Abstract Name: Thermophilic Biodegradation of Plastic and Lignocellulosic Wastes

Plastic and lignocellulosic biomass waste pose significant environmental challenges that require sustainable solutions, as much of this waste is disposed of in landfills instead of being recycled into value added products such as textiles and biofuel. Current methods for breaking down plastics and lignocellulosic biomass are often inefficient, hazardous, and energy-intensive, emphasizing the need for alternative approaches. Thermophilic biodegradation offers a promising bio-based solution to reduce environmental impact by recycling materials instead of discarding them, saving resources. This project focused on utilizing, isolating, and identifying thermophilic microorganisms from Yellowstone National Park (YNP) to address these challenges through biodegradation and downstream waste-to-product conversion. Thermophiles were isolated from hot springs in the Heart Lake Geyser Basin in southeastern YNP. The collected samples were enriched using either plastic or lignocellulosic biomass as the sole carbon and energy source for growth. The tested plastics included polypropylene, polystyrene, nylon-6, and low-density polyethylene. Some plastics were in their solid film form, while others underwent an oxidation treatment—heat, oxygen, and pressure to create a soluble wax. The tested lignocellulose biomass included Remazol Brilliant Blue R (a lignin analog) and dried corn stover. Promising strains demonstrating growth and degradation capabilities were monitored via optical density measurements to formulate growth curves, and direct microscopy to visualize culture growth. The promising strains were isolated on solid media, before transferring colonies back to a scaled-up liquid culture. After sufficient biomass accumulation, these strains were sequenced for taxonomic identification. By harnessing the unique metabolic properties of thermophiles, this project aims to develop sustainable pathways for

recycling plastics and converting lignocellulosic waste into renewable energy or products. This dual-purpose approach addresses global waste challenges with potentially significant environmental and economic benefits.

Cecilia Castro

PA - Mercyhurst University

Discipline: Political Science

Authors:

Abstract Name: Populist Division: Argentina and Brazil's Roles on the Global Stage

As populism is on the rise worldwide, it is easy to question why that is and what the implications will be. From small countries to the world hegemon, populist leaders are taking the stage and transforming their nation's domestic policies and in turn the world stage. In this study, the Most Similar Systems design will be used to analyze populist politics in Argentina and Brazil and how these have led to different outcomes. President Javier Milei and President Luiz Inácio Lula da Silva have entirely opposed political views, and their domestic policies have differed greatly despite both being populists. Considering this, it is hypothesized that their foreign politics, specifically their interactions with the United Nations, have also been impacted by their populist nature while being contrary to each other in political stances. The research will focus on the conditions that led to these governments being elected, and the impact these countries' internal politics have on international organizations. Specific emphasis will be placed on why the outcomes of populist politics are different for Argentina and Brazil domestically and in the United Nations, even though they hold similar positions as regional powers and world players.

Lillian Cavanagh

FL - The University of Tampa

Discipline: Biology

Authors:

#1 Kimberly Dobrinski

Abstract Name: Tissue Specific Compensatory Regulation of Gene Expression Associated with Copy Number Variants in *Danio rerio*

Copy number variants (CNVs) refer to the loss or gain of copies of a DNA region within the genome. While some CNVs enrich the diversity of an organism and play a role in species evolution, CNVs may also be linked to certain diseases such as neurological disorders, early onset obesity, and cancer. CNVs can affect gene expression sometimes leading to disease by direct overlap of the gene or by indirect effects (outside the gene location). *Danio rerio* (zebrafish) is an excellent model organism for human development as well as disease. Zebrafish share 70% of genetic similarities with humans with 84% of disease associated genes. Additionally, zebrafish genomes contain a large amount of variation with 14.6% of the zebrafish reference genome being variable. This study seeks to compare CNVs, miRNA expression levels, and gene expression levels within the kidney and liver of zebrafish. Array comparative genomic hybridization was used to determine CNV regions in 30 adult Tübingen zebrafish while expression arrays were used to measure gene expression as well as micro RNA (miRNA) expression in kidney and liver in these same 30 fish. Single cell RNA (scRNA) sequencing separating genes into their respective kidney and liver-specific cell types will be used to overlay the collected data, so that each gene will be assorted to specific cell types. Expressive

quantitative trait loci (eQTL) analysis (linear regression model in R) will then be used to explore how CNVs may affect gene expression and the regulatory role played by miRNAs.

Max Caza

NC - University of North Carolina at Chapel Hill

Discipline: Biochemistry

Authors:

#1 Adam Yasgar

#2 Anton Simeonov

#3 Alexey Zakharov

Abstract Name: Discovering HSD17 β 4 Inhibitors By Performing Virtual Screening Utilizing Machine Learning & AI Techniques

17 β -Hydroxysteroid Dehydrogenase (HSD17 β) regulates the formation of androgens and all estrogens. 15 HSD17 β isoenzymes have been discovered, which vary in function and tissue distribution. HSD17 β 4 promotes the production of estrone through the oxidation of estradiol and fatty acids. When metabolized, estrone becomes either non-carcinogenic 2-hydroxyestrone or carcinogenic 4-hydroxyesterone. The HSD17 β 4 gene has been shown to be upregulated nearly 5-fold in prostate cancer tissues, with no change in HSD17 β 1, 2, or 3. Additionally, prostate cancer tissues display increased levels of HSD17 β 4 mRNA as well as increased enzymatic activity, making HSD17 β 4 a potential target for prostate cancer. The aim of this study was to discover new HSD17 β 4 inhibitors using QSAR machine learning models. Three NCATS compound libraries (MLSMR, NPC, MIPE) had previously been tested in an HSD17 β 4 inhibition assay, and were aggregated into one large dataset, yielding a curated modeling set of 75,554 compounds, with 286 compounds showing proficient inhibitory activity (AC₅₀ < 10 μ M). This dataset was used to build 22 different QSAR models using various model architectures and feature sets. The best three models (Tree-based (RF and XGBoost) and deep learning-based (DLCA)), as selected by PPV and AUC values based on a 5-fold cross validation procedure, were used for a virtual screening campaign performed on two larger compound libraries. 64 compounds from each library were selected by the three models independently without overlapping. Thus, 348 compounds were nominated and tested in corresponding in vitro assay. This resulted in a 38% hit rate, a 3-fold increase compared to original qHTS hit rate (14%). When looking for more specific activity levels: 14% of the compounds had an AC₅₀ < 30 μ M, and 2% of the compounds had an AC₅₀ < 10 μ M. These 9 compounds with an AC₅₀ < 10 μ M serve as promising starting points for further medicinal chemistry optimization.

Daniela Ceballos

CA - University of the Pacific

Discipline: Biology

Authors:

#1 Keely Brown

#2 Anna Casto

#3 Malia Gehan

Abstract Name: Phenotypic Analysis of Threshed Barley Seeds Using PlantCV

Plant science has developed numerous approaches to breed plants with optimal genotypes and phenotypes for

agriculture, yet achieving a balance is often challenging. In barley, for instance, an ideal seed would require minimal threshing to remove chaff. However, if the chaff detaches too easily, seeds can break, reducing yield. Traditionally, "thresh-ability" in domesticated barley is assessed manually in the field, a method that is both error-prone and limited to binary classification. To address this, the Gehan Lab developed a quantitative approach for assessing thresh-ability. PlantCV was employed to analyze images of threshed barley collected by Dr. Yunqing Yu, enabling a more precise evaluation of thresh-ability across genotypes. Using PlantCV, barley thresh-ability could be characterized with continuous, numerical values instead of the binary "hard thresh" and "easy thresh" categories assessed by manual testing. Results confirm that PlantCV provides a successful, quantifiable measure of barley thresh-ability.

Natalie Ceccarelli

PA - University of Pittsburgh

Discipline: Engineering

Authors:

#1 William Clark

Abstract Name: Space utilization increases user interaction and satisfaction within academic settings

Effective space utilization and user interaction rely heavily on Human-centered design (HCD) principles and a psychological understanding of interior design. Key elements of HCD consist of understanding the project's context, identifying the underlying problems through stakeholder and shareholder engagement, and applying solution-oriented thinking to create meaningful modifications. This study emphasizes the importance of these elements in redesigning an academic building. The Gardner Steel Conference Center (GSCC), located on the University of Pittsburgh's campus, is underutilized, with its current layouts failing to support students' needs and preferences. Multiple surveying methods revealed that students sought designated individual studying areas, tables for conceptual group project work, and space for social interaction before and after lectures. These insights led the team to adopt a solution-driven approach aiming to redesign the space to achieve enhanced student utilization and satisfaction. The proposed redesign introduced several key modifications: additional individual study areas, designated Zoom conference spaces, collaborative group study areas, and an appointed social zone. The addition of Zoom conference spaces, a nonexistent feature in current campus locations, gives students a designated space to communicate with teams, project clients, and take job interviews online. The proposed changes increase seating capacity with usable tables by 83%, meeting the needs of stakeholders while also aligning with student preferences. Follow-up surveys with the student population showed positive feedback regarding the proposed changes, indicating vastly improved space utilization and user satisfaction. This study demonstrates how a Human-centered design approach, supported by thorough stakeholder engagement and solution-oriented thinking, can effectively transform academic spaces to better support the needs of students and enhance overall campus life.

Mathyas Cerda-Siezar

FL - Miami Dade College

Discipline: Computer Science

Authors:

#1 Jyrko Correa

Yohandris Noy

Isabella Felix

Abstract Name: Optimizing Course Registration and Academic Planning at Miami Dade College Using a Data-Driven System

This project focuses on developing a comprehensive course registration system to enhance academic planning and optimize scheduling at Miami Dade College, Padron campus. The system will allow students to securely log in, select their preferred courses and schedules for upcoming semesters, and provide data that academic departments can use to make data-driven decisions about course offerings and scheduling. By collecting students' course preferences and preferred time slots, this system will store the data in a SQL database, where it can then be analyzed to identify patterns and trends. These insights will inform decisions regarding which classes to offer, efficient faculty allocation, and time slots that align with student demand. The project's core architecture relies on a MySQL relational database supporting entities such as students, courses, majors, and course prerequisites. Python is used to handle application logic, data management, and security protocols, including password hashing and secure data storage. The physical setup incorporates a Raspberry Pi to run the system in a compact, standalone configuration, with an integrated touchscreen interface for ease of use. This approach provides a scalable and secure solution, enabling students to manage their academic plans with real-time guidance while also empowering administrators to allocate resources effectively and address evolving student needs. By aligning student demand with course scheduling, this system seeks to improve resource management and promote student satisfaction, offering a powerful tool for academic planning and institutional decision-making.

Angel Cermeno

CA - California State University - Northridge

Discipline: Biology

Authors:

#1 Lesslie Jocolperez

#2 Cindy Malone

Abstract Name: Characterizing the Promoter Elements Driving UVRAG Expression

Transcription converts DNA into RNA upon its activation at a gene's initiating promoter site through the binding of an RNA polymerase II enzyme and assisting basal transcription factor proteins. During activation, regulatory transcription factor proteins are recruited and bound at the promoter to positively or negatively modulate the rate of transcription beginning with the transcription start site indicated as +1. As a tumor-suppressor, UVRAG interacts with Beclin-1 protein to regulate autophagosome vesicles degrading the oncological epidermal growth factor receptor. By characterizing the UVRAG promoter, positive promoter elements required to maximally express UVRAG will be established to increase the functional understanding of transcriptional regulation and maintain autophagosome formation. UVRAG's putative promoter was identified, PCR amplified, and subsequently subcloned into a promoterless pGL3 Basic vector to gauge promoter activity by analyzing the expression of the fluorescent luciferase gene carried on the vector. The

synthesized recombinant plasmid was transiently transfected into human embryonic kidney cells where a dual luciferase assay revealed a 57-fold luciferase expressional increase when compared to pGL3 Basic indicative of a fully active promoter. Consensus transcription factor binding sites were then located and mapped using bioinformatics to identify positive regulators. Through site-directed mutagenesis of the promoter, deletion constructs were created around existing transcription factor binding sites at -1148bp, -935bp, -725bp, -478bp, -177bp, and -89bp relative to the preliminary transcription start site in order to evaluate discerned transcription factors based upon luciferase levels of ensuing transfections and assays. Determination of these positive promoter elements may allow positive transcriptional regulation to be used as a prophylactic tool upon further gene regulation studies.

Sophia Chabo

VA - Virginia Commonwealth University

Discipline: Business

Authors:

#1 Faye Prichard

Abstract Name: The Key to the Success of Barbie (2023): Combining Viral Marketing and Engagement Opportunities

Barbie (2023) by Greta Gerwig was a landmark film both in terms of marketing and audience reception on a global stage and brought in over 1.445 billion dollars at the box office. The general public's analysis focuses on the unique marketability factors in the film's success, such as the cultural significance of Barbie or the popular stars involved in the production, but ignores the underlying foundation to which the film was publicized. This foundation is replicable across campaigns, unlike the aforementioned factors which are highly unique to the film and irreducible. This study aims to address the most successful and universally applicable marketing method utilized by Barbie (2023), which is identified to be strategically released promotional material paired with opportunities for engagement. This study analyzes past viral film campaigns and the typical Hollywood campaign timeline to put the success of Barbie (2023) in a broader promotional context and examine the origins of the two-pronged engagement strategy, as well as the impacts of the contemporary movie-going culture. The research indicates that this campaign's leading the audience on a journey through the timed release of small pieces of information is the most successful and widely applicable strategy used by the Barbie (2023) team. By recognizing and analyzing this framework to which each specific promotional material was applied, other films can similarly amass a deeply involved audience and build engaging campaigns.

Aditya Chada

MI - University of Michigan - Ann Arbor

Discipline: Biochemistry

Authors:

#1 Mikel Gurrea-Rubio

Abstract Name: The Role of the CD6/CD318 Axis in Anti-Tumor Immunity

Checkpoint inhibitor blockade has revolutionized cancer immunotherapy. However, its clinical use is limited by the appearance of severe autoimmune side effects and resistance of cancer cells to lymphocyte killing. CD6, expressed by T cells and NK cells, plays a central role in the generation of autoimmunity. In both

CD6-/- mice and CD6-humanized mice treated with UMCD6, an anti-human CD6 monoclonal antibody, striking reductions in clinical signs of autoimmunity, pathogenic Th1/Th17 responses, and inflammatory cell infiltration into the target organs are observed. CD6 has two well-known ligands: CD166, also known as Activated Leukocyte Cell Adhesion molecule (ALCAM), and CD318 (CDCP1). Both CD6 ligands are highly expressed in cancer. We first tested the effects of interrupting the interaction between CD6 and CD318 with UMCD6 on the ability of lymphocytes to kill the cancer cells. Co-culture experiments of cancer cells and lymphocytes showed substantial enhancement of cancer cell death in the presence of UMCD6, which was more pronounced than that generated with pembrolizumab (anti-PD-1). Next, we demonstrated that the augmentation of lymphocyte cytotoxicity by UMCD6 was due to direct activation of NK cells and CD8+ T cells, which included profound changes in gene and protein expression of several activating and inhibitory receptors. Using advanced molecular techniques such single-cell RNA-sequencing and various in vivo cancer models, we are currently dissecting the mechanisms by which internalization of CD6 with UMCD6 enhances cytotoxic lymphocytes to kill cancer cells. Our most recent findings reveal that disrupting that interaction enhances lymphocyte-mediated tumor cell killing of breast and prostate tumors while minimizing immune-related adverse events, addressing key limitations of current immunotherapies. This work will advance the understanding of immune-tumor interactions and identify the CD6/CD318 axis as a promising, safer target for precision oncology, with the potential to improve outcomes for patients with cancer.

Rohit Chadalavada

CA - Dougherty Valley High School

Discipline: Engineering

Authors:

Ayati Vyas

Manroop Singh

Abstract Name: Ansys Flow Modeling of a Small Scale Dual-Rotor Helicopter with Multiple NACA Airfoils

Performance measurements are crucial for helicopter design and are typically derived from generated thrust. However, experimental thrust measurements can be influenced by various factors, potentially leading to inaccuracies in assessing a system's capabilities. Our previous experimental results show the impact of various NACA airfoils on the performance of a dual-rotor helicopter (SREJNGL-31.5"×3.5"×9.4") including the thrust at various operating conditions (~2000 rpm). The thrust measurements incorporated a load cell connected to a microprocessor to obtain thrust values. To validate our experimental results, our current work includes theoretical modeling of the rotating blades using Ansys finite element analysis. For this purpose, various NACA airfoils with differing maximum camber (0-4%) and maximum thickness (18-24%) were employed. The NACA airfoils coordinates were obtained from <http://airfoiltools.com/>. We hypothesize that ANSYS modeling will predict higher thrust values than the experimental results. The study employs a refined mesh approach, utilizing 57.97 mm elements and analyzing 175 mm airfoils operating at a maximum rotational speed of 2000 RPM. The computational methodology leverages high-fidelity ANSYS meshing to create a detailed numerical model of the helicopter's rotor dynamics. This model systematically calculates critical aerodynamic parameters, such as thrust generation and Reynolds number characteristics, across different NACA airfoil geometries. Preliminary results indicate variations in thrust and normal air velocity for five NACA airfoils (NACA #2412/6409/0024/0015/2415). The predicted thrust values ranged from 56 N-to-122 N, while vertical air velocity varied from 41 m/s-to-61 m/s. The study specifically focuses on modeling the complex fluid dynamics around the rotor blades, capturing intricate aerodynamic interactions and turbulent flow patterns. Theoretical flow visualization was conducted using advanced computational techniques. These results will be compared to experimental data obtained via laser sheet and high-speed camera visualization. Full results will be presented at the conference.

Shayna Chai

WI - Alverno College

Discipline: Chemistry

Authors:

Abstract Name: Determination of 2,3-Butanedione and 2,3-Pentanedione in E-cigarettes Using HS-GC

E-cigarettes are often marketed as safer alternatives to cigarettes. It is a common misconception that e-cigarette vapor is harmless and consists only of flavored water. A study previously published by Harvard suggests that over 90% of e-cigarettes contain 2,3-butanedione, also known as diacetyl, a food flavoring known for its intense buttery flavor. It is often substituted with 2,3-pentanedione. Both flavorings have been linked to severe respiratory disease and damage. In 2019, both were proposed as additions to the U.S. Food and Drug Administration's "Harmful and Potentially Harmful Constituents List", but they currently remain "generally recognized as safe" by the FDA. The goal of this study was to develop an effective method to analyze the 2,3-butanedione and 2,3-pentanedione levels in e-cigarette juice using headspace gas chromatography (HS-GC). HS-GC was used because of its effectiveness in detecting volatile organic compounds. This method allows for analysis of 2,3-butanedione and 2,3-pentanedione in the vapor phase, which minimizes sample preparation. Of the eight e-cigarette samples tested in this study, 75% contained detectable levels of diacetyl and 100% contained detectable levels of pentanedione. Given the increase in vaping in the United States, especially in younger populations, this data shows a need for further research and regulation of e-cigarettes.

Aressana Challand

CAN - University of Calgary

Discipline: Communications

Authors:

Abstract Name: From Harm Reduction to Forced Treatment: Neoliberal Governmental Discourse and the Decline of Alberta's Supervised Consumption Sites

Supervised consumption sites represent national and international action to address the growing opioid overdose mortality crisis through harm reduction. However, implementing spaces for supervised substance use remains controversial. In 2019, the Alberta United Conservative Government released with Alberta Health, 'Impact: A Socio-Economic Review of Supervised Consumption Sites in Alberta'. Following publication, the review became an important referent document used by governments to prevent supervised consumption sites from operating; as Alberta's overdose deaths increased, the provincial government froze site funding, shutting down North America's busiest sites while the Third Circuit Court of Appeals blocked plans to implement Philadelphia's site, 'SafeHouse'. This study informs communications literature by examining how the review frames the opioid crisis and addiction to legitimize the closing of supervised consumption sites, shifting previous academia's focus from supervised consumption site implementation as a health service to their closure as a socio-economic problem. This cross-sectional case study asks, what discourse is produced in Alberta Health's 'Socio-Economic Review of Supervised Consumption Sites in Alberta'? The methodology is informed by Van Dijk's Critical Discourse Analysis and Foucault's concepts of power and knowledge to examine how socio-economic claims are normalized as health knowledge to legitimize addiction treatment policy. Two themes—site inefficiency and societal risk—reveal a neoliberal discourse on health services. Findings indicate that neoliberalism silences the voices of site users and social issues to emphasize the negative community impact of supervised consumption sites. Consequently, Alberta Health's review produces a neoliberal governmental discourse that repositions the fundamental problem underlying drug addiction away from the silenced, systemic, socio-economic marginality site users face to the

salient, socio-economic challenges that harm reduction sites impart on the community. This discourse erodes health and social services like harm reduction to legitimize the Alberta Government's newest addiction treatment proposal, the forced treatment model, increasing disciplinary measures against society's most vulnerable.

Amarige Champion

FL - Stetson University

Discipline: Art History

Authors:

#1 Amarige Champion

Abstract Name: Bum Painter or “so-called” Architect?: Oscar Bluemner’s Transition to Painting

This paper explores Oscar Bluemner’s transformative journey from architecture to painting, a transition shaped by legal conflict, cultural critique, and a personal reevaluation of his professional identity. Educated in architectural theory and design at Berlin’s prestigious Königlische Technische Hochschule, where he was awarded the Royal Medal for a painting of an architectural subject, Bluemner’s early accomplishments positioned him for a successful career in Germany. However, after immigrating to the United States in 1892, he faced challenging circumstances and illness before eventually forming a partnership with New York architect Michael J. Garvin. Together, they undertook the design of the Bronx Borough Courthouse, an ambitious project in the Baroque Revival style. The courthouse project, however, marked a turning point. When Garvin claimed exclusive credit for the design, Bluemner sued for breach of contract in a prolonged case that finally settled in 1912. Though financially beneficial, the legal dispute deepened Bluemner’s disillusionment with the architecture industry, which he saw as increasingly driven by consumer values at the expense of artistry. His frustration with American materialism, expressed in a later essay condemning “the great stomach-question” that prioritizes profit over art, reflects a growing ideological divide that influenced his decision to leave architecture altogether. With the funds from his legal settlement, Bluemner embarked on a tour of Europe, where he immersed himself in contemporary art, studying diverse movements and experimenting with new techniques. Returning to New York, he devoted himself to painting, drawing on his architectural training to inform his compositions. This paper situates Bluemner’s transition within broader cultural contexts, illustrating how his professional and ideological conflicts catalyzed his transformation into an influential American Modernist painter.

Calvin Chan

PA - Carnegie Mellon University

Discipline: Business

Authors:

#1 Flora Feng

Glenda Tan

Abstract Name: AI vs Human Creativity: Investigating the Effectiveness of AI-Generated Advertisements

With rapid advancements in artificial intelligence (AI), many companies have begun incorporating generative AI into their advertising strategies, producing unique and engaging commercials that transcend the limits of traditional advertising. Given the immense success of these campaigns, this research aims to investigate if AI-generated ads can outperform their human-made counterparts in increasing consumer demand, and if so, the

factors contributing to their greater success. To answer these questions, we first conducted two case analyses on Nike's "Never Done Evolving" ft. Serena Williams campaign and Coca-Cola's "Y3000" campaign. Next, we devised a theoretical framework of three potential success factors for AI-generated ads (complexity, creativity, and familiarity). Finally, a week-long field study was conducted on 240 Carnegie Mellon University students across different years and majors to study the effectiveness of AI-generated ads in increasing club membership of campus organizations, with club membership serving as a proxy for consumer demand. In this study, participants were randomly partitioned into four groups, with each group surveyed on how likely they were to join a club after viewing one of four posters (three AI-generated posters based on each factor of success and one human-made poster). Through this study, we discovered that although AI-generated posters are generally more effective than human-made posters in capturing people's attention, their human-made counterparts are still more effective in increasing club membership. While AI-generated posters attract a larger audience, there is greater variation in the interest level of the audience. Future research can further explore the impact of AI advertisements on various aspects of marketing, such as click-thru rates and sales on different marketing platforms such as e-commerce.

Allison Chan

PA - University of Pittsburgh

Discipline: Chemistry

Authors:

#1 Carolyn Rosenblum

#2 Alexander Deiters

Abstract Name: Targeted Protein Deactivation Using Chromophore Assisted Light Inactivation

Light is an important tool in chemical biology and is often applied to investigate protein function in a complex biological system due to its high level of spatiotemporal control. Methods of optical protein activation exist, however, the deactivation of proteins using light is less common. Chromophore-assisted light inactivation (CALI) is a method of optical protein modulation that relies on a photosensitizer that generates reactive oxygen species when irradiated with a specific wavelength of light. This can result in the oxidation of the protein of interest and eventual removal of activity. Here, I describe a method of optical deactivation of the beta-lactamase enzyme, OXA-48 through the covalent delivery of three different photosensitizers using amine-reactive N-hydroxysuccinimide or isothiocyanate-activated small molecules. Through this work, I have demonstrated efficient labeling of the protein of interest and optical deactivation upon light irradiation of photosensitizer-labeled proteins.

Ayesha Chand

CA - University of the Pacific

Discipline: Biology

Authors:

#1 Emanuel Martinez-Abundiz

#2 Ryan Hill

Abstract Name: *Adelpha erymanthis fortunata*: Unraveling the Species and Subspecies Connection

Among nymphalid butterflies, the genus *Adelpha* is one of the most species rich genera, with over 300 named species and subspecies. This diversity is associated with adult color patterns that vary geographically and

exhibit mimetic convergence to signal unprofitability to predators. The mimetic similarity among *Adelpha* species has long been recognized for making species identification and taxonomic organization a challenge. Nearly a century ago, it was recognized that immature stage morphology and host plants often differ between *Adelpha* species, providing a potential solution to these challenges. Recent molecular evidence for several geographically widespread *Adelpha* species indicated high levels of intraspecies variation suggesting the presence of cryptic species, and the potential for other differences. This is evident in *Adelpha erymanthis*, which comprises four subspecies across Central America and northwest South America: *erymanthis*, *esperanza*, *adstricta*, and *fortunata*. Research in Costa Rica found that the immature stages and host plants of *A. e. adstricta* differ significantly from those of *A. e. erymanthis*, leading some researchers to propose treating them as separate species. Observations in western Ecuador further corroborate this distinction, with *A. e. fortunata* sharing similarities in immature stages and host plant use with *A. e. adstricta* and not *A. e. erymanthis*. Analysis of the mitochondrial gene cytochrome oxidase subunit I (CoI) provides additional evidence that *A. e. fortunata* and *A. e. adstricta* are monophyletic and distinct from *A. e. erymanthis*. Together, these findings indicate that *A. e. adstricta* and *A. e. fortunata* represent subspecies of the same species *A. adstricta*, separate from *A. e. erymanthis* and *A. e. esperanza*. This research highlights the utility of integrating molecular, morphological, and ecological approaches in insect taxonomy, even in butterflies, one of the most well-known insect groups.

Ariq Chandra

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Mohammed Asif Sherwani

#2 Erin M. Burns

#3 Israr Ahmad

#4 Ahmed Omar Jasser

#5 Nabiha Yusuf

Abstract Name: Tualang honey has a protective effect against cutaneous immune responses and skin cancer

Ultraviolet (UV) B radiation leads to DNA damage by generating cyclobutane pyrimidine dimers (CPDs). UVB-induced CPDs can also result in immune suppression, which is a major risk factor for non-melanoma skin cancer (NMSC). UVB-induced CPDs are repaired by nucleotide repair mechanisms (NER) mediated by xeroderma pigmentosum complementation group A (XPA). We have previously demonstrated that treatment with tualang honey (TH) led to a decrease in DNA damage and inflammatory markers following UVB in a keratinocyte cell line. The purpose of this study was to investigate the use of TH as a chemopreventive agent against development of skin cancer. SKH-1 hairless mice fed with TH (0.1% v/v) for two weeks prior to a single dose of UVB (180 mJ/cm²) led to a significant increase in XPA in skin and DNA repair cytokines IL-12 and IL-23 in draining lymph nodes. Furthermore, when subjected to the photocarcinogenesis protocol, mice fed with TH developed significantly fewer tumors in comparison to mice fed on drinking water. Our data demonstrate that TH has a protective effect against UVB-induced DNA damage, immune suppression, and skin cancer. Future studies will further investigate the potential of TH as a preventive treatment for NMSC.

Manya Chandra

CA - Chapman University

Discipline: Interdisciplinary

Authors:

#1 Manya Chandra

#2 Micol Hebron

Abstract Name: Unpacking Bias, Accountability, and Ethical Practices in AI

This study is based on understanding how text-to-image generative AI platforms perpetuate biases such as racism and sexism and decoding how this bias is programmed within large language models and datasets. In this study, the results of generative AI are analyzed through the lens of affect and affect theory, as they are applied to investigate the machine learning and computer theory behind generative AI algorithms. The purpose of the study is to explain why generative AI is biased and whether this bias is generated due to current trends or to deficits and biases within the database that it draws information from. By understanding how generative AI is coded, we seek to understand whether and how generative AI is able to predict trends, even outpacing human prediction. These conversations are all correlated to the ethical implications of generative AI, and whether as we move forward with the expansion of text-to-image AI platforms, there should be mechanisms of accountability imposed for ensuring that these platforms operate in ethical and responsible ways. This research also examines whether use of AI can also further perpetuate stigmas against race and gender by either further encouraging it by its use or rather that AI is being fed such stigmas by analyzing the current trends of the social and political climate of the world. The goal of this study, however, is to understand the origins and mechanisms of bias within generative AI, particularly with regard to tropes of sexism and racism, and to create a proposal for best practices which would help encourage and implement guidelines to create more ethical and conscientious use and application of generative AI platforms.

Elliot Chang

WV - West Virginia University

Discipline: Computer Science

Authors:

#1 Md Mushfiquur Rahaman

#2 Dr. Srinjoy Das

Abstract Name: Evaluating the Robustness of Discriminative and Generative Text Classifiers Across Various Noise Conditions

Text classification systems are fundamental to applications such as sentiment analysis, spam detection, and topic modeling. Deep learning models, particularly discriminative and generative classifiers, have become prevalent in addressing these tasks. Discriminative models classify text by directly modeling the conditional probability of class labels given input text in order to learn the decision boundaries. In contrast, generative models approach classification by modeling the joint probability between text and class labels, utilizing Bayes' Rule to infer classifications from class-conditional probabilities and priors. Previous studies have focused on comparing the peak performances between the discriminative and generative models, showing both linear and non-linear discriminative models reaching lower asymptotic errors compared to their generative counterparts. However, real-world text data frequently contains noise, arising from human input errors, web artifacts, or other disruptions. Robustness to noise is crucial for maintaining model performance during inference. This study investigates the robustness of text classifiers, comparing LSTM-based discriminative and generative text classifiers across varying noise levels and types. The evaluation provides insights into the resilience of these models under noisy conditions, highlighting their performance trade-offs and informing the development of noise-resistant classification systems. The expected findings aim to identify strengths and weaknesses of these two types of models which can provide a detailed understanding of the classification performance of the models under real world settings.

Grace Chang

ME - Bowdoin College

Discipline: Psychology

Authors:

#1 Kacie Armstrong

Chayma Charifi

Abstract Name: Nostalgia and Time Perception

Nostalgic reflection is linked to a number of psychological benefits, including enhanced mood, greater sense of meaning in life, and bolstered social belongingness—but its effects on everyday cognition are less clear. Given that nostalgia is a complex emotion linking the past to the present, this project explores its effects on time perception across two scales: subjective lifespan and perceived duration of tasks in the present. In a between-groups study, 112 participants completed an Event Reflection Task (Sedikides & Wildschut, 2018), during which they wrote about either a nostalgic memory or an ordinary autobiographical memory for five minutes. Then, participants completed three scales measuring subjective lifespan. One scale captured the perceived distance of the memory they wrote about (i.e., how far away the memory feels relative to when it actually occurred), and two scales captured perceived lifespan (i.e., how old one feels they have been alive relative to their chronological age). Participants then estimated the duration of three in-lab tasks, including time spent writing about their memory during the Event Reflection Task, the length of a neutral film clip (low cognitive load task), and time spent completing a pattern recognition test (high cognitive load task).

Preliminary analyses suggest that nostalgic memories feel further away in time than ordinary memories, that nostalgic reflection (compared to ordinary autobiographical reflection) expands the perceived length of one's life, and that nostalgic reflection increases the perceived duration of low cognitive load tasks, but not high cognitive load tasks. These findings contribute to emerging conversations surrounding the use of nostalgia as a therapeutic tool. Specifically, its effects on subjective flow of time may be relevant to mindfulness and stress reduction techniques. Furthermore, the benefits of nostalgic reflection may be relevant to those living with disorders known to alter time perception, such as ADHD and schizophrenia.

Che Hsuan Chang

IL - University of Chicago

Discipline: Health and Human Development

Authors:

Abstract Name: Aging in Displace: How do Aging Immigrants in Chicago Chinatown (Re)Construct Narratives on Successful Aging under Transnational Migration?

Asian-born immigrants are among the fastest-growing aging populations in the U.S. Despite this growth, older immigrants remain an under-researched population in the field of aging. This research explores how first-generation immigrants in Chicago construct narratives of successful aging within the context of their transnational life experiences. The study examines three central questions: (1) How does migration influence elders' perceptions of their life course and expectations of successful aging? (2) What cultural logics and categories do they employ to navigate the challenges of aging in the U.S.? (3) How does the timing of migration shape their life narratives? By addressing these questions, the study aims to expand scholarship on successful aging and aging in place. Community-dwelling older adults aged 62 and above (n = 100) were

recruited, and their conceptualizations of successful aging were evaluated using the Successful Aging Inventory. This is followed by semi-structured interviews with 20 elders, exploring life events, migration challenges, and current experiences. Regression analysis is applied to analyze the survey data. A grounded theory approach combined with an intersectional life-course analytical lens is used to analyze the qualitative data, emphasizing the interplay of identity, structural forces, and agency. Results reveal older immigrants adapt to transnational settings by reconstructing cultural norms of aging, and structure the narratives of wellbeing in current life in relation to the past challenges. The findings challenge the essentialist assumptions about older adults as passive and static agents that hold onto the ethnic traditions. This study shed light on the strategies that aging immigrants used to anchor themselves emotionally and symbolically in a transnational context, which will not only provide a broader conceptualization of successful aging by putting the subjectivity of immigrant elders at the forefront of the analysis but also expand the scholarship to be inclusive of the large ethnic-Chinese immigrant population.

Srichandrika Chandalvala

NC - University of North Carolina at Charlotte

Discipline: Nursing and Public Health

Authors:

Abstract Name: The Effect Of The 2011 Great East Japan Earthquake, Tsunami, and Nuclear Power Plant Disaster on Pregnant Woman

This research discusses the impacts of the 2011 Great East Japan earthquake, tsunami, and the Fukushima nuclear power plant explosion on pregnant women's health. Multiple aspects of these women's health are discussed including psychological impacts, effects on the mother and baby after birth, as well as a smaller examination on domestic violence on pregnant women after the series of natural disasters. The research process occurred through an extensive literature review of over 15 journals and science articles that were published after 2011. Major findings of this literature review include increased susceptibility to harmful pregnancies, increased psychological stress, and increased levels of domestic violence for pregnant women. These factors may play a factor in influencing the low birth rate in Japan. Understanding how the intersectionality of health influences the intersectionality of natural disaster (risk, resilience, and recovery) can serve as a strong basis for societal improvement in future disaster preparedness for at-risk populations. In some cases, this investigation may be a solution to a seemingly unrelated, pre-existing, long-term issue a nation has been facing as well. Future considerations for research include how varying levels of stress affect pregnancy and the long term effects of stress during pregnancy on the development of a child .

Molly Chapman

PA - Duquesne University

Discipline: Mathematics

Authors:

#1 Samantha Allen

Abstract Name: Integer Sequences of Five Stranded Spiral Knot Determinants

Spiral knots are a generalization of the well-understood torus knots, characterized by one moving strand and labeled by strand number, base word, and repetition. By fixing the strand number and base word, we obtain integer sequences of spiral knot determinants. This study explored such sequences for spiral knots with five

strands, following on the work done by Kim-Steers-Taalman in Sequences of Spiral Knot Determinants. We utilized two methods of finding the determinants of spiral knots: the crossing-matrix method and the chessboard coloring method. Both processes yielded identical resulting sequences which were unique from preexisting sequences recorded in the Online Encyclopedia of Integer Sequences (OEIS). In the future, we plan on proving a conjecture made about the resulting sequences, as well as determining if any of the integer sequences yielded from this study are a product of others found in the OEIS.

Yamir Chapman

VA - University of Richmond

Discipline: Psychology

Authors:

#1 Crystal Holt

Abstract Name: Beyond the Brochure: Admissions Videos as a Catalyst for Campus Belonging

The research project Beyond the Brochure: Admissions Videos as a Catalyst for Campus Belonging explores how diversity ideologies —whether universities adopt a multicultural or colorblind approach to racial diversity—might potentially impact students' belonging (Slaten et. al., 2017; Karaman & Cirak, 2017; Walton & Cohen., 2017) and psychological safety (Morton et al., 2024). The study involves two types of narratives presented in videos: one featuring a colorblind narrative, which downplays racial and ethnic differences by emphasizing commonalities and promoting the idea that "we are all the same," (and the other featuring a multicultural narrative, which celebrates and values diversity by highlighting the unique contributions of different cultural groups. This study will include undergraduate students from a University in S.E region of the United States and CloudResearch participants. Participants will be asked to imagine they are in the college application process and are watching a fictional admissions video about an institution they are eager to attend. Half of participants will be asked to watch a video that used a colorblind ideology, others were asked to watch a video that uses a multicultural approach. Afterwards they answered questions about their psychological safety and sense of belonging. Anticipated results based on the hypothesis assume that videos emphasizing multicultural ideologies will foster stronger feelings of belonging and psychological safety, particularly among underrepresented groups. I hope to highlight the critical role of the ideologies that inform institutional messaging that shape perceptions of equity and inclusivity before students even step foot onto college campuses, specifically through admissions promotional videos, and that this research contributes to the ongoing development of frameworks for implementing DEI programs and initiatives within colleges and universities that effectively address the needs of marginalized students. This research has been approved by the IRB of The University of Richmond and will be conducted beginning January of 2025.

Chayma Charifi

ME - Bowdoin College

Discipline: Psychology

Authors:

#1 Kacie Armstrong

Grace Chang

Abstract Name: Nostalgia Across Cultures

Nostalgia is a bittersweet emotion marked by a sentimental reflection on one's past accompanied by a sense

of longing for the irrevocable. Critically, nostalgic reflection is linked to several psychological benefits, including enhanced mood, bolstered sense of belonging, and greater sense of meaning in life—particularly in the face of psychological distress (Sedikides & Wildschut, 2018). However, given that much of this research has been conducted on Western populations, this study investigates whether the benefits of nostalgia persist cross-culturally, and whether these effects are moderated by cultural orientation (i.e., an individualist vs. collectivist mindset). In an online study, 179 participants from nine countries completed the Culture Orientation Scale (Triandis & Gelfand, 1998) and an Event Reflection Task (Sedikides & Wildschut, 2018), during which they wrote a short essay about a nostalgic memory. Both before and after this exercise, participants completed a mood scale, the General Belongingness Scale (Malone et al., 2012), and the Meaning in Life Questionnaire (Steger et al., 2006). Collapsed across all nine countries, nostalgic reflection resulted in a modest mood boost, a slightly bolstered sense of belonging in both the acceptance and rejection dimensions of the scale, and a greater presence of meaning in life paired with a diminished search for meaning. While these benefits appear to persist across cultures regardless of cultural orientation, individuals scoring higher in collectivism demonstrated a relatively greater increase in acceptance scores. While this study is ongoing, these early findings offer a note of hope for the use of nostalgia as a therapeutic tool in our increasingly globalized world. Given that deprivation of belonging can lead to severe anxiety (Baumeister & Tice, 1990), and presence of meaning predicts life satisfaction (Steger et al., 2006), the protective benefits of nostalgia could potentially enhance psychological well-being for diverse populations.

Mahika Chatterjee

PA - Pennsylvania State University

Discipline: Economics

Authors:

#1 Subhadra Ganguli

Abstract Name: The Saudi Economic Awakening: How is Vision 2030 Transforming Women's Economic Role?

This study examines the impact of Saudi Arabia's Saudi Vision 2030 policies on female labor force participation rates (FLFPR) and its economic contribution in Saudi Arabia (SA). While previous scholarly research has documented the historical constraints of traditions and religion on women's economic participation in SA, limited empirical and quantitative analysis exists on the effectiveness of recent reforms in increasing women's workforce participation. Using publicly available quarterly and annual SA census data, the research employs a quantitative analysis comparing pre-reform (2013-2017) and post-reform (2019-2023) periods, with 2018 designated as the reform implementation year. Methodology utilized after data collection includes both statistical processes (paired t-test, Mann-Whitney U test), as well as econometric time series & regression analyses to assess the significance of the relationships between FLFPR and SA's GDP. Findings reveal a statistically significant increase in FLFPR post-reform, as well as a significant relationship between the FLFPR and SA's GDP. Although the substantial growth is partially credited to Vision 2030 policies, the analysis discusses several shortcomings that remain as a hinderance to the women population in contributing to the national GDP. This research contributes to understanding how targeted policy reforms can transform women's economic participation in traditionally conservative societies, while highlighting areas requiring continued development to achieve Saudi Vision 2030's desired economic outcomes from women. Keywords: Saudi Arabia, Saudi Vision 2030, female labor force participation, economy, GDP, women, reform

Mahitha Chaturvedula

PA - Carnegie Mellon University

Discipline: Biology

Authors:

#1 Charles Ettensohn

#2 Macie Chess

Abstract Name: Making a mineral: the evolution of P58 biomineralization proteins in echinoderms and related animals

Background: Biomineralization is the process by which organisms produce minerals to harden tissues, an essential process for the formation of skeletal tissue. P58a and P58b are two closely-related transmembrane proteins required for the proper formation of the calcified endoskeleton of sea urchin embryos. The aim of this project is to reconstruct these proteins' evolutionary history. Methods: We identified P58a and P58b related proteins using BLAST to align the complete *S. purpuratus* proteome against hemichordate, chordate, and other echinoderm proteomes. Based on this analysis, a phylogenetic tree was generated using P58-related sequences from 3 echinoids, 2 holothuroids, 3 asteroids, and 3 vertebrates. This phylogeny was restricted to the Fc-binding protein-like domain, a highly conserved motif in P58 proteins likely important for function. Results: Our results (Figure 1) indicate the presence of echinoid-specific duplications. Single orthologs of three P58 family proteins, P58a, P58b, and P58-like, are found in all echinoid (sea urchin) species, strongly supporting the view that a duplication of these genes occurred prior to the evolutionary diversification of echinoids. In asteroids, the P58 protein is most closely related to P58a. No asteroid ortholog is more closely related to p58b than p58a, indicating no duplication. Hemichordates and chordates have only one P58-like protein similar to P58a/P58b, suggesting no duplication. P58 proteins appear to be specific to Ambulacraria as closely related proteins are absent in vertebrates, echinoderm relatives. This is because they form an outgroup that doesn't overlap with the P58 clades and have domains not present in the closely related P58 groups. Conclusions: Our phylogenetic analysis shows that the P58 family has undergone several lineage-specific duplications within ambulacrarians, with echinoids (sea urchins) exhibiting the greatest number of duplications. The expansion of this gene family in echinoderms may have allowed P58 proteins to adopt new functions associated with calcite-based endoskeleton formation.

Diya Chaudhri

IN - Indiana University Purdue University Indianapolis

Discipline: Biology

Authors:

#1 Mikayla Cadwell

#2 Kathleen Marrs

Anabel Moore

Abstract Name: PARE at IU Indianapolis

PARE is the prevalence of antibiotic research in the environment and it is the basis of this research project. Antibiotic resistance is prevalent when trying to treat diseases, but it is also present in the soil and other aspects of the environment. The presence of resistant bacteria is an issue because it can build from lower trophic levels and harm humans and animals. Most of the antibiotic resistance comes from human or animal waste or the runoff water from agricultural land. To combat antibiotic resistance in the environment, the prominent geographic regions of resistance must first be located. Several institutions across thirty of the United States and Puerto Rico, including Tufts School of Medicine, are investigating antibiotic resistance in the environment through the PARE project¹. The IU Indianapolis chapter of PARE has the following goals: determine the prevalence of antibiotic-resistant bacteria across Central Indiana and to examine the biological factors that antibiotic resistance is affected by. To achieve these goals, soil samples from different locations across Central Indiana were plated in a serial dilution on plates with varying concentrations of Tetracycline to test the antibiotic resistance. The biological factors that antibiotic resistance is affected by were tested by

growing the plates at varying temperatures and pH concentrations. Keywords: Antibiotic resistance, PARE project, soil sampling, Temperature, pH

Sumer Chaudhry

MI - Wayne State University

Discipline: Anthropology and Archaeology

Authors:

#1 Sumer Chaudhry

Abstract Name: Maternal Health and Climate Change through the Lens of Infrastructural Violence

The increase in climate disasters from rising temperatures and sea levels disproportionately affects pregnant women globally. Climate change has triggered infrastructural collapse in regions facing severe natural disasters. Structural violence, exacerbated by climate change, consists of/includes infrastructural violence that directly impacts global maternal health. The inadvertent oppressive nature of some infrastructure within cities may create barriers to maternal and neonatal care in crisis situations. This research will examine the negative impacts of infrastructural violence and will link how infrastructural violence can affect maternal health during/after climate related disasters. Approaching maternal health and climate change through the lens of infrastructural violence can help better address structural and social disparities. Maternal health research exposes health disparities among multiple vulnerable populations and their contributing factors. This project uses the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) to structure a rapid scoping review. Since infrastructural violence is a relatively new concept and is contained within the much larger umbrella of structural violence, words that could discuss infrastructural violence were added to the search terms. Inclusion criteria were studies published from 2011 through 2024, in English, that addressed climate, maternal health, and included terms that imply infrastructural violence. Exclusion criteria included grey literature and articles that do not mention infrastructure. Articles were searched through three core databases: PubMed, PsycINFO, and CINAHL. A rapid-scoping review along with a completed PRISMA diagram, will be created and published on literature that focuses on the concepts of infrastructural violence, climate change, and maternal health.

Sofia M. Chaves

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Sofia M. Chaves

#2 Jun A. Ebersole

Abstract Name: Building a comprehensive comparative osteological collection of Gulf of Mexico fishes for scientific studies

McWane Science Center (MSC), Birmingham, AL is building a comprehensive comparative osteology collection of marine fishes from the Gulf of Mexico. In the Gulf of Mexico, over 500 unique species of marine fishes have been recorded. Nearly all existing collections of Gulf of Mexico fishes are comprised of preserved specimens in jars. Therefore, there is no comprehensive publicly accessible skeletal collection of these fishes anywhere in the world. To date, MSC has obtained over 300 species of fishes that would have otherwise been discarded. In a collaboration with the Dauphin Island Sea Lab, Alabama Aquarium, and

Alabama Deep Sea Fishing Rodeo, specimens will continue to be saved for this project and will continue to increase the taxonomic scope of the collection. The specimens are prepared following a specific protocol that includes manual defleshing and chemicals. For larger specimens, flesh is removed with standard dissection tools. For smaller specimens, the flesh is dissolved in a bath of water and potassium hydroxide. Extracted skeletons are placed in 10% hydrogen peroxide bath which serves as a final cleaning and degreasing agent. Processed specimens are permanently cataloged into MSC's scientific collections. Our goal of building this osteological collection is to support various scientific studies, including paleontological, archaeological, and fisheries biology. Photographs of diagnostic elements, like dentaries, neurocrania, and otoliths, will eventually be uploaded into MSC's online Alabama Biodiversity Database to be accessible by a global audience.

Leah Chavez

NM - University of New Mexico - Valencia Campus

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Leah Chavez

#2 Anicca Cox

Abstract Name: The Impact of Transfer from 2-Year to 4-Year Campuses

This poster presentation will highlight the results of an ongoing study that looks at the institutional structure of a large, Hispanic-serving research institution that also supports four, two-year "branch" campuses. By examining both institutional data and student narratives collected via semi-structured interviews this study seeks to understand the experiences of students transferring from these two-year branch campuses to the main university branch. The particular focus looks at how the transfer process affects three metrics of student wellbeing: happiness, confidence, and sense of belonging. Further, this study aims to triangulate narrative data with outcomes such as graduation and drop-out rates of transfer students, and the tendency of some university students to return to their branch campuses. It does so by considering campus, regional, and racial/ethnic cultural ecologies (cultural rhetorics) alongside quantitative data on these outcomes via institutional records where trends will be identified. The poster will present some of this data and excerpt interviews with transfer students and "bounce back" students. The goal of the project and poster will be to present an assessment of the changes in students' social and emotional well-being during and after the transfer process. The research questions guiding the study are as follows: 1. In what ways does the transfer process influence student confidence, happiness, and sense of belonging? 2. From a student perspective, are there significant differences in the way branch campuses foster a strong sense of community? 3. How do students from branch campuses experience preparation and encouragement to transfer? The purpose and goal of this research is to make visible, the stories of transfer students by better understanding their challenges and successes so that the institution might better address their needs.

Alejandro Chavez-Mayoral

NJ - Kean University

Discipline: Computer Science

Authors:

#1 Alejandro Chavez-Mayoral

#2 Bin Hu

#3 Daehan Kwak

Abstract Name: Health Monitoring via RFID-based Respiratory Tracking System

Monitoring breathing rates using commercial off-the-shelf (COTS) RFID systems present a scalable and efficient solution for real-time respiratory tracking. In this system, an antenna emits radio signals reflected back by RFID tags, which are lightweight and easy to attach. For breath monitoring, periodic body movements caused by inhaling and exhaling, such as chest expansions and contractions, can be extracted. The unique tag IDs enable monitoring of multiple patients simultaneously, making RFID technology a promising candidate for multi-patient breath monitoring. Our goal is to develop a prototype system using COTS RFID technology to accurately monitor breathing rates, even in rooms with multiple patients. This allows for consideration of various scenarios, such as the material of clothing, placement on bare skin, signal noise in the room, and unwanted vibrations. To ensure effectiveness, the prototype must handle these scenarios while remaining practical, user-friendly, and efficient. It should provide real-time data that is easy to interpret and can be integrated into larger patient management systems for seamless sharing of vital signs. Currently, we have developed code in Java to extract signals from the antenna and in Python to process the data. Using methods such as phase calibration, normalization, and filtering, we identify relevant data while discarding noise. Environmental factors have posed challenges, as signals sometimes fail to accurately reflect breathing patterns post-processing. To address this, we are testing the system in different environments to identify conditions that produce cleaner signals. The ultimate aim is a robust system capable of adapting to diverse environments and accurately monitoring breathing patterns, paving the way for broader clinical applications. By overcoming these challenges, RFID-based breath monitoring could become a valuable tool in patient care, offering a scalable, efficient solution for real-time monitoring in various settings.

Jason Chen

PA - Pennsylvania State University

Discipline: Biochemistry

Authors:

#1 Jason Chen

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#4 Jason Bennett

Abstract Name: Mercury and Selenium in Round Goby from the Pennsylvanian Waters of Lake Erie and its Tributaries

The round goby (*Neogobius melanostomus*), an invasive species in the Great Lakes, accumulates harmful contaminants such as methyl mercury, due to its diet of zebra mussels (*Dreissena polymorpha*) and interaction with sediment. Methyl mercury's properties facilitate bioaccumulation in goby tissues, enabling trophic transfer to higher levels in the food web, potentially affecting significant fish species. Selenium, however, can reduce the bioavailability of mercury in the diet. A higher selenium-to-mercury ratio in tissues can mitigate mercury transfer. While mercury accumulation in round gobies has been documented in Lake Erie's western basin, little is known about levels in the central basin. This study assessed mercury concentrations and selenium-to-mercury ratios in round gobies from Pennsylvania's Lake Erie waters and tributaries. Round gobies were collected, euthanized, homogenized, and acid-digested for analysis. Mercury and selenium concentrations were measured using an inductively coupled plasma mass spectrometer (ICP-MS).

Preliminary findings showed gobies from Presque Isle Bay had the highest mercury levels (up to 17.3 ng/g), while those from other areas exhibited lower levels. Analysis revealed a decline in selenium-to-mercury ratios as gobies increased in size, resulting in higher mercury bioavailability. This raises concerns for native game fish that prey on gobies, potentially leading to mercury accumulation and human health risks through fish consumption. These findings highlight the importance of understanding contaminant dynamics and trophic

transfer in invasive species to protect aquatic ecosystems. Further research and management strategies are needed to address ecological and public health concerns linked to mercury bioaccumulation.

Katelyn Chen

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Alison Kohan

#2 Lihong Teng

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Abstract Name: Bad Blood, Good Guts? Inhibition of Apolipoprotein C3 Induces Increased Lymph Triglyceride Output and Intestinal Lipid Absorption

Heart disease is the leading cause of death in the world. A major predictor of heart attacks and cardiovascular disease (CVD) is accumulation of plasma triglycerides due to overproduction of apolipoprotein C3 (apoC3), an important regulator of triglyceride metabolism. As such, medication inhibiting apoC3 (e.g. Olezarsen®) is currently in clinical trials to reduce risk of CVD. Recent research determined that apoC3 inhibition by a liver-targeting anti-sense oligonucleotide (ASO) led to an unexpected increase in intestinal triglyceride output, suggesting that while loss of apoC3 in the liver may reduce liver-derived triglycerides, a compensatory effect occurs in the gut. We investigated this hypothesis using an apoC3 knockout (KO) murine model where we could directly test triglyceride secretion into the intestinal lymphatics. Our studies used 8–12-week-old male apoC3KO mice compared to age-matched C57BL/6J mice (n=9). Both groups were given an intraduodenal infusion of 3H-triolein in a lipid emulsion (SMOFLipid®) and mesenteric lymph flow was collected for 6-h post-infusion. Total lipids were then extracted from the gastrointestinal tissue. Using thin-layer chromatography (TLC) and enzyme-linked immunosorbent assay (ELISA), we determined the relative uptake and distribution of 3H-labeled lipid throughout the small intestine and lymph. Preliminary results analyzed using Student's t-test with $\alpha=0.05$ show a statistically significant increase in lymph triglyceride output in apoC3KO mice, confirming previous findings. Further, we found an increase in the appearance of 3H-triolein in the small intestine of apoC3KO mice (compared to C57BL/6J), indicating that in the absence of apoC3, dietary triglyceride is absorbed more quickly from the luminal to lymphatic space, or that enterocytes in apoC3KO mice package dietary triglycerides more efficiently than their wild-type counterparts. These outcomes suggest that treating hypertriglyceridemia with apoC3 ASO may increase intestinal lipid absorption, which could have significant clinical ramifications.

Jari Chen

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:

#1 Jari Chen

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Abstract Name: Bridging the Gap in Parathyroid Research: Comparing Classic and Normocalcemic Hyperparathyroidism Using the TriNetX Database

Objective: Previous studies from single-institution cohorts have shown that patients with normocalcemic primary hyperparathyroidism (ncPHPT) are just as symptomatic as patients with classic PHPT. There is currently no large-scale database analysis of ncPHPT, so with the TriNetX database, a large international database, trends on ncPHPT can be studied over a large cohort of patients. The aim of this project is to characterize the diagnostic and treatment paradigm for ncPHPT in the TriNetX database. **Methods:** We conducted a retrospective cohort study of patients with ncPHPT using the TriNetX Research Network, which includes patients from 52 health care organizations from 2007-2023. ncPHPT was defined as having $PTH \geq 66 \text{ pg/mL}$ and calcium between $8.4\text{-}10.4 \text{ mg/dL}$. We excluded patients with secondary, tertiary, and classic hyperparathyroidism and other hypercalcemia inducing factors. **Results:** We found 5,092 patients with ncPHPT; 78.2% were female, average age was 69 ± 13 years, and 78.9% were white. The average serum calcium was $9.7 \pm 0.5 \text{ mg/dL}$, while the average serum PTH level was $97 \pm 77.5 \text{ pg/mL}$. Of these, 2,036 (40%) underwent a parathyroidectomy. Pre-surgery, calcium averaged $9.9 \pm 0.1 \text{ mg/dL}$ and PTH averaged $96 \pm 152 \text{ pg/mL}$. Post-surgery, calcium averaged $9.3 \pm 0.6 \text{ mg/dL}$, while PTH averaged $52 \pm 33 \text{ pg/mL}$. **Conclusion:** In this large multi-institutional cohort, the minority of patients with ncPHPT underwent a parathyroidectomy. Education about the benefits of surgery for these patients to these providers is needed.

Jacky Chen

NY - University of Rochester

Discipline: Biology

Authors:

#1 Melissa MacLiesh

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#5 Shu-Chi Yeh

Abstract Name: Effects of Modulating Bone Remodeling on Hematopoietic Stem Cell Expansion

The strong, positive correlation between aging and accumulation of somatic mutations has been well-documented in research. While most of these mutations remain inconsequential, if a cell does not repair this error before proliferation, it can become cancerous. Hematopoietic stem cells (HSCs) are a type of cell with the ability to duplicate and differentiate into all types of blood cells, including lymphocytes, monocytes, and erythrocytes. In rare circumstances, a mutation can arise in an HSC that creates a growth advantage, leading to the selective proliferation and overrepresentation of blood cells derived from these mutant “clones”. This process is known as clonal hematopoiesis, and mutations in genes involved in epigenetic regulation (TET2, DNMT3A, IDH2) are the major drivers of clonal hematopoiesis in humans. The medical term for the mutant expansion is clonal hematopoiesis of indeterminate potential (CHIP) where a mutated clone accounts for at least 4% of derived blood cells. Individuals with CHIP are at increased risk of developing hematologic malignancies, atherosclerosis, and myelodysplastic syndrome (MDS). HSCs mainly reside in the bone marrow, a dynamic heterogeneous environment characterized by cavities undergoing resorption and/or deposition activities. Cavities exhibiting both are known as M-type cavities, and these microdomains have been shown to support the proliferation of mutants specifically. Clinical data from TriNetX database on osteoporosis patients reveal that bisphosphonates, a class of drugs with anti-resorptive effect, reduce the risk for MDS. Using in vivo intravital imaging and peripheral blood analysis, we investigated the potential suppressive effect of zoledronic acid, the most commonly prescribed bisphosphonate, on inhibiting clonal expansion. While engraftment data from the peripheral blood analysis showed seemingly no suppressive effect, in vivo imaging depicted a clear decline in mutant clones, leading us to believe that secondary

hematopoietic organs like the liver and spleen may play a previously unaccounted role in clonal hematopoiesis.

Nico Chen

FL - University of Central Florida

Discipline: Visual Arts

Authors:

#1 Viviana Arroyo Rodriguez

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#4 Viviana Rivera

Abstract Name: Collaborative Design: Effective Theming of Personalized Prosthetics

Vuillermin et. al. estimate congenital limb differences are present in approximately 5 in 10,000 children, with many rejecting prosthetic devices. Among pediatric users, a lack of aesthetic appeal is a significant factor contributing to rejection. To address this, Limbitless Solutions cultivates collaboration between users and designers to understand individual visions for personalized prosthetics, reducing the likelihood of rejection. This research explores the principles of effective theming, emphasizing artistic representation and user collaboration to create tangible outcomes from unique concepts. This proposal outlines an iterative design process for creating uniquely themed cosmetic sleeves, progressing through four stages: theme analysis, concept art creation, experimental paint development, and actualization. Instrumental to the application of this methodology is the active participation of users and a focus on translating preferences into tangible artistic outcomes. Select pieces are displayed in the Franklin Institute's Body Odyssey exhibit. This creative research was applied to the development of four uniquely themed cosmetics to showcase the iterative experience. The first integrates UV reactive paint to emulate the fluorescent patterns under black light in an arcade, using the design elements of variety, shape, and contrast to create visual dynamics. In the next, a light-sensitive color shifting pigment and stencils are used to mimic comic stylization. Harmony is created through an analogous color scheme and the use of pattern furthers variety on the cosmetic. The third draws inspiration from lava lamps using a glow-in-the-dark paint additive, organic shapes, and fluorescent colors to achieve visual contrast. Rounded shapes promote affinity throughout the cosmetic, while a tetradic color scheme creates contrast and movement. The final design employs weathering techniques modeled off character armor design, using texture and balance to further the narrative. By integrating user preferences into this design process, this research demonstrates how effective theming of personalized prosthetics can reduce rejection rates.

Jasmine Cheng

WI - University of Wisconsin-Madison

Discipline: Nursing and Public Health

Authors:

#1 Dr. Johnny Uelmen

Lily Ho

Abstract Name: Global Mosquito Observations Dashboard (GMOD): Advancing Mosquito Surveillance Through Citizen Science and Artificial Intelligence

Mosquitoes are recognized as the “world’s deadliest animal” according to the U.S. Centers for Disease Control and Prevention, posing as the leading global health threat, causing more fatalities than any other animal. Addressing this prevalent issue requires enhancing public awareness and strengthening mosquito control measures worldwide. Traditional mosquito surveillance and control methods, such as hand landing catch and natural repellents, are often time-consuming, costly, and lack scalability. In contrast, the widespread availability of mobile devices equipped with high-resolution cameras presents a unique method to approach mosquito monitoring. To leverage this potential, the Global Mosquito Observations Dashboard (GMOD) was developed as a free, public platform to improve the detection and monitoring of invasive and vector mosquitoes. GMOD is an interactive web-based application that collects and displays real-time mosquito observations and habitat data generated globally by citizen scientists. By integrating data from four data streams, the platform enables comprehensive visualization of mosquito population trends and geographic distributions worldwide. Furthermore, GMOD acts as an educational resource that highly promotes global data sharing and collaboration in mosquito management. With continuous data collection, GMOD has provided valuable and actionable insight into the distribution, abundance, and prevalence of mosquito species globally. This research aims to leverage the free platform to actively engage citizen scientists in community-based surveillance efforts, thereby expanding the global monitoring of mosquitoes. As GMOD continues to evolve, the integration of artificial intelligence for species identification holds significant promise to enhance public health initiatives in reducing mosquito-borne diseases, particularly in regions where traditional surveillance methods face challenges.

Siekleng Chhuon

TX - Texas Woman's University

Discipline: Computer Science

Authors:

#1 Siekleng Chhuon

Abstract Name: ECLIPSE: Enhanced Containerized Lab Infrastructure for Platform-Independent Student Engagement Using Virtualization

The ECLIPSE Project addresses disparities in student access to computing resources in computer science courses. This applied research project explores the application of virtualized infrastructure and containerization to provide platform-independent, remote access to lab environments, creating equitable learning opportunities for students with heterogeneous hardware and software configurations. Current educational resources often depend heavily on students having specific hardware or software, creating an inequitable learning environment. Utilizing hypervisors, VLANs, and automated provisioning, the infrastructure delivers Virtual Machines (VMs) or containers tailored to specific course requirements in computer science. This approach provides a scalable solution that removes traditional educational platform barriers, allowing students to access the same consistent environment from any device. By automating the provisioning and management of virtualized resources, ECLIPSE enhances the speed of deployment, simplifies maintenance, and minimizes the need for specialized local hardware. Ultimately, this project aims to create a sustainable and inclusive infrastructure for computer science education that can quickly expand to other disciplines.

Tsu-Ming Chiang

GA - Georgia College and State University

Discipline:

Authors:

Abstract Name: Mentoring Interdisciplinary Undergraduate Research: Benefits and Challenges

A plethora of literature highlights the benefits of Undergraduate Research (UR), including the development of critical thinking, problem-solving, and communication skills. These skills are essential for preparing students for competitive employment. Employers increasingly seek recent graduates who can communicate effectively with people from diverse backgrounds and perspectives. Furthermore, problem-solving in the workplace has progressively shifted toward a team-based approach, often involving experts from various disciplines who bring different perspectives and expertise to the table. Furthermore, collaborating with colleagues from diverse fields fosters the development of integrated solutions. As the real world relies on a multidisciplinary workforce, this presentation addresses how faculty mentors from two disciplines bring their students to collaborate on an interdisciplinary project that benefits the community. The project began as an intervention aimed at improving children's social-emotional well-being within the community. The UR project covered a range of psychological topics, including parenting and gender roles, with a primary focus on helping children develop emotional intelligence and social skills while documenting their progress. Due to the impact of the pandemic, the project transitioned to virtual lessons, which highlighted the need for additional tools. This led to collaboration with a faculty in the field of Computer Science (CS). An undergraduate student in CS developed an emotional app designed for children and their families, while psychology students tested the effectiveness of this educational tool. The process required students from both disciplines to collaborate in the app's development and testing phases. This experience allowed them to appreciate the benefits of teamwork and work collectively on an interdisciplinary project. Since the project has multiple phases, it necessitates ongoing efforts over time. As such, there are challenges for faculty mentors to ensure that junior researchers can continue the project's momentum. More benefits and challenges will be shared and discussed at the upcoming conference.

Tsu-Ming Chiang

GA - Georgia College and State University

Discipline:

Authors:

#1 Tsu-Ming Chiang

#2 Kevin Kevin Bucholtz

Kevin Bucholtz

Abstract Name: It Takes a Village: Strategic Planning and Administrative Support for UR Success

Higher education faces challenges in providing students with the broad knowledge and skills necessary to succeed in a fast-changing world. To effectively apply classroom learning to solve real-world problems, higher education needs to reimagine how to deliver high-impact learning. As Georgia's designated Public Liberal Arts University, Georgia College & State University (GCSU) prioritizes mentored undergraduate research and creative endeavors as part of its signature high-impact learning experiences called GC Journey. Early access to undergraduate research through collaboration with faculty mentors, has yielded long-term benefits. This approach guides students to actively explore their areas of interest while building research capabilities and developing critical thinking skills essential for employment and advanced studies. This presentation shares a model of how Undergraduate Research is integrated into a series of signature experiences valued by our university with administrative support. It requires students to graduate with five transformative learning experiences and high-impact practices. All students must participate in a first-year seminar and engage with GC Milestones, a career services program that spans all four years of their education. Students then choose three additional transformative experiences from the following options: undergraduate research, leadership, community-based engagement, internship, and study abroad. The goals of the session are: To discuss how to integrate UR and high-impact learning through administrative support. To

demonstrate how to embed undergraduate research in curricula and collaborate with faculty across disciplines. This presentation is tailored to faculty, staff, and administrators seeking ideas and/or solutions to create high-impact learning from mentored projects. The audience will be invited to share their strategic planning and experiences to facilitate a continuing dialogue about creating high-impact learning in undergraduate education.

Fernando Chiang Goldenhorn

FL - Miami Dade College

Discipline: Mathematics

Authors:

Abstract Name: An AI-Driven Approach to Optimizing Academic Scheduling

Academic scheduling in higher education, particularly within highly interconnected departments such as mathematics and science, presents a complex optimization challenge with significant implications for student success and institutional efficiency. This research frames the scheduling process as an optimization problem, utilizing historical data and artificial intelligence (AI) to develop a mathematical model aimed at increasing enrollment, accelerating graduation timelines, and improving student satisfaction. The study leverages institutional data, including class enrollment trends, classroom availability, course co-enrollment patterns, and demand fluctuations, to construct predictive equations. AI techniques are applied to uncover patterns and constraints, facilitating the development of a robust optimization model. Using Python-based solvers, the model generates mathematically efficient schedules designed to support academic schedulers in making data-driven decisions. This approach highlights the potential to streamline academic operations while aligning institutional objectives with the needs of students.

Donald Chick

TN - Middle Tennessee State University

Discipline: Psychology

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#1 Caitlyn Wells

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Abstract Name: Intranasal Oxytocin and L-Dopa Alter Social Motivation in Mice as Measured by the Weighted Door and Ladder Task

Social motivation is a driver of social interaction and is reduced in multiple clinical disorders including ASD, depression, and schizophrenia. We recently developed and validated two measures of social motivation for mice: the ladder task and the weighted door task. These tasks require mice to exert increasing effort to access a social partner. The willingness to exert effort to access a social partner by performing increasingly difficult trials demonstrates their motivation for social interaction. We currently aim to demonstrate that social

motivation can be manipulated by altering oxytocinergic and dopaminergic activity. Male and female, adult C57BL/6J mice were administered oxytocin, L-dopa, or saline intranasally and then tested on the ladder task and weighted door task. In the weighted door task, oxytocin increased the frequency of approaching the weighted door in early trials with less weight. In later trials with higher weight, oxytocin groups approached the door with the least frequency. L-dopa administration was associated with maintaining a high frequency of door approach over the higher weights. Time spent pushing the door was higher in later trials when mice were administered L-dopa. In the ladder task, oxytocin administration produced the shortest latency to climb the ladder when at the earliest trials in which the ladder is horizontal. Oxytocin administration produced the highest latency in later trials with increased steepness. L-dopa administration resulted in sustained lower latency across the trials. Taken together, the intranasal administration of oxytocin is associated with increased social interaction when low effort is required and decreased social interaction when high effort is required suggesting a decrease in social motivation. However, L-dopa is associated with sustained motivation as required effort increases suggesting an increase in social motivation. Understanding the neurochemical basis of social motivation will further the development of pharmacological treatments for decreased social motivation in clinical disorder.

Ananya Chilakamarri

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Diego Hernandez Espinosa

#2 Amantha Thathiah

Abstract Name: How Tau and Etoposide Shape Microglia Activation in Alzheimer's Disease

Microglial activation plays a crucial role in neuronal death during Alzheimer's disease (AD). In healthy brains, homeostatic microglia maintain physiological immune responses and neuronal health. In AD, microglia respond to the accumulation of amyloid-beta (A β) and tau pathology by increasing their phagocytic activity and cytokine production. The initial neuroprotective microglial response becomes dysregulated and neurotoxic significantly. While the mechanisms behind this damage are known, the key factors that influence the microglial response in AD remain unclear. We aim to investigate how tau, A β , and other damaging stimuli affect the microglial response and subsequent neurotoxicity. We treated a mouse immortalized microglial (IMG) cell line with different tau isoforms ON3R and ON4R tau to mimic early increases in tau levels. IMG cells were also treated with etoposide to simulate the damage resulting from the failure in DNA repair mechanisms. In addition, we used a combination of lipopolysaccharide and interferon-gamma, pro-inflammatory, and interleukin-4, anti-inflammatory, microglial activation controls. All treatments were performed at 37°C for 24 hours. We then utilized flow cytometry to assess changes in the expression of markers associated with pro-inflammatory activation (CD11c, CD45). We also evaluated morphological changes through surface area quantification. Our results indicate that tau-driven activation leads to decreased CD45 and CD11c expression. Conversely, etoposide activation increased the CD45 expression. These findings were corroborated through surface area quantification, which showed increases in the area of cells treated with etoposide, a change not observed in tau-treated cells. Our findings suggest that the microglial activation phenotype promoted by tau does not exhibit changes typically associated with pro-inflammatory activation; instead, it appears to align more closely with an anti-inflammatory profile. Conversely, the microglial response to etoposide resembles the pro-inflammatory profile. This indicates that different AD-associated stimuli activate microglia in distinct ways, potentially resulting in differences in neurotoxicity.

Jordy Chimborazo

MI - University of Michigan - Ann Arbor

Discipline: Biology

Authors:

Abstract Name: Targeting Hepatic E4BP4 to Treat Metabolic Associated Liver Disease

Metabolic dysfunction-associated steatotic liver disease (MASLD) is the most common chronic liver disease in the US. 20% of these patients develop steatohepatitis and eventually progress to cirrhosis (scarring of liver), liver failure, or liver cancer. At the moment, there are no effective therapeutics. Our lab has discovered a critical role of hepatic E4BP4 in promoting the disease progression of MASLD. E4BP4 is a transcription factor that is originally implicated in circadian rhythm regulation. We found that decreased E4BP4 levels can lead to reduced liver injury, inflammation, and lipid accumulation in mice with fatty liver disease. What this suggests is that blocking E4BP4 may be a potential target to treat liver disease and slow down fibrosis progression. To uncover underlying molecular mechanisms, we want to generate a conditional knockout mouse model to express an E4BP4 mutant specifically in the liver using CRISPR gene-editing technology. We will design gRNA primers to delete E4BP4 using CRISPR technology. We will then insert the gRNA into our CRISPR Cas9 expressing plasmid and then insert the plasmid into an AAV vector which will let us knockout E4BP4 in-vivo. With our results we hope to show and validate the successful CRISPR mediated in-vivo knockout of hepatic E4BP4. In the future we hope to use this CRISPR system to knock out E4BP4 in mice and study the role of this protein in MASLD progression. A very long term goal would be one day putting this to clinical use in real patients, although the path remains a very long one.

Tamuda Chimhanda

NY - University of Rochester

Discipline: Business

Authors:

Lizmairi Vargas Santa

Abstract Name: PenPal Cards: A modern way to share your research

In the fast-paced world of academia, effective networking and sharing research findings are essential for advancing knowledge and fostering collaboration. However, traditional methods—like exchanging paper business cards or distributing lengthy resumes—often fall short in meeting researchers' modern, digital needs. These outdated approaches make it challenging to share work, connect with peers, and build meaningful, long-term professional relationships. To address these challenges, we conducted a comprehensive study to develop PenPal Cards, a customizable digital tool tailored for academic professionals. Our research methodology involved interviews and surveys with over 200 researchers, academic professionals, and conference organizers. This extensive data collection allowed us to identify key pain points in academic networking and design a solution that meets these needs. PenPal Cards enable researchers to seamlessly share their portfolios—including publications, affiliations, and contact details—via a simple tap or scan. The tool also generates concise, shareable summaries of research and integrates with widely used platforms such as ORCID, Google Scholar, and ResearchGate. An analytics feature tracks engagement, providing insights into profile views and facilitating meaningful follow-ups with potential collaborators. Through iterative testing and deployment in academic environments, PenPal Cards have demonstrated significant impact. Early adopters reported greater engagement at conferences, improved follow-ups with collaborators, and enhanced visibility for their work. By creating a more accessible and impactful way to network, PenPal Cards are poised to transform how researchers connect and collaborate, ultimately fostering innovation and knowledge-sharing across disciplines.

Sanjana Chittimalla

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

#1 Deborah Polk

Abstract Name: Analysis of Pain Scales for Multifactorial Assessment

Experiencing acute pain during childhood is common, but assessing the pain of pediatric patients can be difficult for healthcare professionals, and mis-assessment can lead to improper care and increased discomfort for the patient. Pediatric dentists use pain assessment scales to provide their patients with effective pain management and to track the effectiveness of this management over time. However, commonly used assessment scales, such as the Wong-Baker FACES pain scale, only assess pain intensity, a single component of an inherently multidimensional pain experience. Because the pain experience is individualized and subjective—affected by factors like intensity, discomfort/agitation, development, and culture—a multifactorial approach would create a better representation. This project aims to provide dental professionals with information on validated unidimensional assessment scales for different dimensions of pain. By compiling and analyzing existing literature, this project identifies and categorizes validated assessment scales based on the pain component measured and the relevant age group. Additional information such as reliability, validity, benefits, and drawbacks are summarized in a table. This study found that while a majority of assessment scales measure pain intensity, lesser known and used scales measuring other pain dimensions can be used in combination for more accurate assessment and appropriate treatment implementation. Dental pain varies depending on the cause, so which scales are used can be left up to the dental professional based on the situation and which aspect of pain needs to be assessed. Proper use of these scales aids the dentist in a more robust understanding of the patient's pain experience, setting up better communication and effective pain management.

Cecelia Chmelik

MN - Hamline University

Discipline: Biology

Authors:

#1 Leif Hembre

#2 Sydney Howard

#3 Joey Roberts

Abstract Name: Patterns of Gene Flow Among Invasive Earthworm Populations

Earthworms are invasive to Minnesota, decreasing the species diversity of native forests. Little is known about how these worms spread and maintain their hold in Minnesota forests. Invasive species, like earthworms, usually start out as small populations with low genetic diversity, yet they are able to adapt and spread quickly. This is considered to be a genetic paradox since genetic variation in populations is necessary for adaptive evolution to occur. One way that populations can gain genetic variation is through gene flow—an evolutionary process that occurs when individuals from one population migrate and reproduce with individuals from another population. Gene flow among earthworm populations may occur through natural dispersal (individuals traveling on their own) or through human-assisted dispersal (through soil or bait). Natural dispersal by earthworms is limited by how far individuals can travel, and by barriers in their way typically causing a positive correlation to exist between geographic distance and genetic distance. In contrast, human-assisted dispersal/gene flow is not limited by the same constraints as natural gene flow, allowing

earthworm populations to become more genetically diverse and potentially breaking the correlation between geographic and genetic distance. This study investigated the relationship between geographical and genetic distance in earthworm species *Aporrectodea rosea* in Itasca State park. Using two allozyme genetic markers we genetically analyzed earthworms collected at known distances apart from 16m to 5km. We expected to see a clear positive trend that would align with natural gene flow. We found that there was a statistically significant positive trend between geographic distance and genetic distance. However, there remained a lot of variation within that trend that may suggest the impact of human activity. Understanding how earthworms and other invasives maintain their hold on the environments they inhabit is needed as we find methods to mitigate their spread.

Ohanna Cho

OH - The Ohio State University

Discipline: Psychology

Authors:

#1 Ohanna Cho

Abstract Name: Analyzing the Influence of Personal and Professional Factors on Central Ohio Public High School Teachers' Attitudes and Practices Towards Students with Visible Limb Differences

Inclusive education is a critical component in teaching, particularly in creating environments where students with disabilities can thrive. This research investigates Central Ohio public high school teachers' attitudes and practices toward students with visible limb differences, focusing on personal and professional factors influencing these attitudes. While inclusive education has expanded significantly, particularly for students with physical disabilities, gaps remain in understanding teachers' specific experiences and preparedness to accommodate students with visible limb differences. This study addresses the gap by examining the attitudes, experiences, and educational backgrounds of secondary school teachers, particularly how these factors shape their confidence and ability to foster inclusive classrooms. Using a mixed-methods approach, data were collected through questionnaires distributed to 45 teachers and semi-structured interviews with 9 participants. The study identified correlations between teachers' years of teaching experience and their confidence in accommodating students with limb differences. Additionally, qualitative analysis revealed seven major themes from teacher interviews, including the role of personal experiences, approaches to modifications, and collaboration with special education professionals. The findings suggest that while teachers generally support inclusive education, their practical implementation strategies and confidence levels are significantly impacted by their previous interactions with individuals with disabilities and the professional development they have received. The implications of this research are twofold. First, it emphasizes the importance of targeted professional development and continuous education on accommodating students with physical disabilities. Second, it highlights the need for more research on specific disabilities, such as visible limb differences, as opposed to broader categories like physical disabilities in general. By exploring these specific experiences and perceptions, this study provides insights into improving teacher preparedness and enhancing inclusive education practices. The results will contribute to ongoing discussions about ways to support students with disabilities, ensuring that all students, regardless of their physical differences, have equitable access to education.

Yeajin Cho

IL - Trinity Christian College

Discipline: Biology

Authors:

#1 Yeajin Cho
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Abstract Name: The Investigation in *C. elegans* of Genes That Affect CMT Type 1 Disease

Charcot-Marie-Tooth (CMT) type 1 is a genetic disease that results from the damage of the myelin sheath, a protective cover of the nerves. This damage does not allow the nerve signals to be properly transmitted to the brain, leading to problems associated with movements and sensations. CMT type 1 is known to be caused by mutations in the human genes of PMP22, LITAF, and EGR2. *Caenorhabditis elegans* (*C. elegans*) are microscopic nematodes. The genes that cause CMT type 1 in humans are found to be similar to the *C. elegans* genes of *vab-9*, *F36G3.3*, and *EGRH1*. Mutation in these genes that cause CMT type 1 disease in humans can be observed in the *C. elegans*. The goal of this project is to perform experiments on *C. elegans* to find which specific genes contribute to CMT type 1 disease. To study how each gene affects CMT type 1 disease, the characteristics (swimming, crawling, number of body bends) of each mutant *C. elegans* with individual mutation of *vab-9*, *F36G3.3*, or *EGRH1* were observed. To study the effect of mutated genes on the worm's anatomy, each mutant *C. elegans* was mated with wild-type worms that had fluorescently colored nerve or muscle cells. Each offspring was observed under a fluorescent microscope. Comparing the fluorescently colored nerves and muscles of mutated and wild-type *C. elegans* will allow us to further determine how these genes contribute to the CMT type 1 disease.

Mirae Choe

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Hannah Kang
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Abstract Name: An In vivo *C. elegans* Model for Assessing Virulence of Food-borne Salmonella Pathogens

Salmonella bacteria are a major cause of foodborne illness in the United States, responsible for approximately 1.35 million infections and 26,000 hospitalizations annually. While the mechanism of some Salmonella strains' infections are well-characterized in humans, emerging variants require a deeper understanding of the molecular infection processes. *Caenorhabditis elegans* (*C. elegans*) presents a promising platform for this research, due to its established use as a model organism and the similarity of its intestinal cells to those of humans. By feeding *C. elegans* with strains of Salmonella isolated from previous outbreaks in the United States, this project aims to investigate the infection mechanisms of emerging pathogenic strains by modeling the differential kill rate. Results have indicated that *C. elegans* is well suited to modeling the nuanced differences between pathogenic strains, even genomically equivalent serovars isolated from different outbreaks. This is evidenced by the significantly different survival time experienced by worms feeding on each strain of bacteria. As an invertebrate, *C. elegans* provides a method of modeling foodborne pathogens, with the possibility of expansion into the modeling of other pathogens with implications in human health.

Jena Choi

WI - University of Wisconsin-Milwaukee

Discipline: Environmental Science and Sustainability

Authors:

Abstract Name: Quantifying and Analyzing Microplastics in Northern Wisconsin Beach Sand Samples using National Oceanic and Atmospheric Administration Method

The unfortunate characteristic of microplastics is that they are everywhere, ranging from the human body to beaches. Their resistance to environmental decomposition and potential to absorb pollutants poses them a hazard for all organisms and environments. Therefore, studies were conducted to develop methods to recover and quantify microplastics from different sourced samples, including beach sand. In this experiment, a developed method produced by the National Oceanic and Atmospheric Administration (NOAA) was utilized and adapted to test for their efficiency in extracting microplastics, size of 0.3-5mm, from beach sand samples collected from beaches of Wisconsin's peninsula. Pink polyethylene microspheres, a microplastic typically used for cosmetic, industrial, or medical applications, were used as our example to test for the recovery rate accuracy of microplastics in beach sand. Based on NOAA's method, our samples first undergo density separation, which separates floating microplastics in a NaCl and lithium metatungstate solution from settled solids, such as sand and rocks. The floating solids pass through wet peroxide oxidation (WPO), which eliminates any organic material that may be present or attached to microplastics. It undergoes a second density separation to collect any floating solids, which is later identified under a dissecting microscope. A common trend in our results was the lack of pink microspheres appearing in the second density separation, which meant the method yielded little to no recovery rate. In addition, organic materials were still present, which was not wanted due to their potential to latch onto microplastics, making identification difficult. There were some signs of pink microspheres with the settled solids instead of the floating solids, meaning WPO could cause microplastics to attach to the settled solids. Overall, adjustments to the NOAA method must be made to investigate where microspheres may have gone and if this impacts other microplastics found in beach sand samples.

Miso Choi

WI - University of Wisconsin-Milwaukee

Discipline: Political Science

Authors:

#1 Miso Choi

Abstract Name: Political orientation and Global Crises: How political orientation Affects Awareness of Children in Conflict

This study explores how political orientation influences the awareness and perceptions of humanitarian crises affecting children in conflict zones around the world. Specifically, it examines the correlation between individuals' political views, ranging from liberal to conservative, and their recognition of how wars and civil unrest affect vulnerable populations, particularly children. The research situates individuals within the political spectrum, focusing on key issues in contemporary U.S. politics such as abortion, immigration, international relations, and climate change to assess whether and how these ideological stances shape empathy and concern for global humanitarian crises. Through survey methods, participants are asked to indicate their relative positioning on these issues, and their awareness of attitudes toward the plight of children in conflict zones is evaluated. The questionnaire will include questions to assess participants' awareness and engagement with the Russo-Ukrainian War and Israel-Hamas War as well as the exposure to news reports about children affected by war. This study aims to contribute to the broader understanding of how domestic political divisions may extend to global issues and potentially influence public support for international humanitarian efforts. The findings may provide valuable insights for academic institutions, researchers international agencies, and non-governmental organizations working to bridge political divisions

and promote greater awareness constructive discussion, and social engagement with respect to global child welfare issues.

Swara Chokshi

VA - Virginia Commonwealth University

Discipline: Health and Human Development

Authors:

#1 Swara Chokshi

Abstract Name: Metacognium: A Novel Neuroscience-Informed Psychoeducation Program for Substance Abuse

Substance abuse is prevalent among college students, with nearly half meeting the criteria for alcohol or cannabis use disorder within their first three years. During this critical age of adolescence, neurobiological alterations make young adults more prone to pursue impulsive, maladaptive coping behaviors such as substance abuse, which in turn detrimentally impact neurodevelopment. To prevent these implications and the emergence of substance use disorders (SUDs), there is a need for a comprehensive prevention and intervention program informed by neuroscience tailored to adolescent populations that translates our understanding of the neurobehavioral basis of addiction. Metacognium is a novel neurocognitive program designed to enhance metacognitive awareness, cognitive resilience, and stress-coping skills, thereby preventing substance misuse. Delivered via mobile and web platforms, it combines psychoeducation with game-based training targeting cognitive functions like impulse control, emotion regulation, stress management, and problem-solving. This program offers students evidence-based psychoeducation on key neurocognitive functions implicated in substance use and cognitive components of resilience and instructs participants on how to implement metacognitive and compensatory strategies within the context of real-life scenarios that involve substance use. A preliminary study was conducted on students at VCU, which involved delivering this application and assessing its clinical potential by conducting pre- and post-intervention assessments. Among participants (n=68), 55.9% reported alcohol use, 47.1% cannabis use, and 16.2% tobacco use prior to the intervention. After engaging with Metacognium's sessions, participants demonstrated a statistically significant increase in metacognitive awareness and delay discounting alongside a significant decrease in alcohol intention intoxication, anxiety, and depression levels. Future enhancements include integrating additional Research Domain Criteria-based modules, cross-cultural adaptations, and daily exercises to reinforce neuroscience-based practices in everyday life. Metacognium demonstrates promise as an accessible, evidence-based approach to mitigating substance misuse among adolescents.

Natalie Chong

MA - Babson College

Discipline: Education

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Abstract Name: Exploring Sustainability Education in Babson's First-Year Entrepreneurship Course

Sustainability is often not emphasized enough in business courses for students to learn how to solve business problems with an ecological mindset. As such, entrepreneurial courses need the appropriate frameworks and teaching methodologies to enable students to understand what being sustainable means and how to embed it

in their decision-making. By studying examples of how professors teach sustainability in Babson College's Foundations of Management and Entrepreneurship (FME) course, this project hopes to synthesize and suggest ways for professors to better engage students in learning about social and environmental sustainability and applying those concepts. This study considers how sustainability can be successfully embedded into a disciplined-based course, rather than a short-term course or program. It considers both professors' and students' perspective. The results are based on the quantitative and qualitative analysis of interviews and surveys with 14 professors and 11 sections of students during the Fall 2024 semester of the first-year entrepreneurial course (where teams of students develop and propose business ideas and the three most-voted-on ideas in each section are launched as real businesses in the Spring semester). More than 200 student survey responses were collected in the beginning and end of the semester. In addition to these, an analysis of the business ideas developed by all 18 sections of students during the first semester was conducted to understand how students incorporated ideas of social and environmental sustainability. FME Professors who 1) emphasize sustainability throughout the semester, 2) provide strong value propositions of why students should care about sustainability and 3) effectively implement diverse methods of teaching sustainability, will result in students caring more about it and implementing such ideas into their ventures. Their teaching methods should be applied for other FME courses to more effectively engage students in learning about social and environmental sustainability.

Devna Chopra

PA - University of Pittsburgh

Discipline: Psychology

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Abstract Name: Exploring the Associations between In-Person Peer Rejection and Online-Only Friendships for Sexual and Gender Minority Youth

When transitioning to adolescence, youth shift from viewing family as a primary source of support to relying more heavily on their friends for support. This is especially true for sexual and gender minority (SGM) youth, who face higher levels of in-person social threat, such as increased peer rejection, discrimination and victimization. These youth may not be able to safely turn to those around them for social support and may find other ways to gain friendship support. Online-only friends (OOFs) can provide additional social support for adolescents who may face higher levels of in-person peer rejection. SGM youth, who may experience higher levels of peer rejection, may be more likely to seek friends online and may engage in more intimate disclosure with these online communities. The current study aims to explore the associations between SGM youth's experiences with OOFs and the levels of in-person peer rejection they experience. Because of the mix of positive and negative online experiences SGM teens can have with OOFs, it's important to keep exploring whether this vulnerable group has more OOFs and considers them supportive. We hypothesize that levels of in-person peer rejection will have an indirect effect on the link between SGM status and OOFs, such that SGM youth will have higher in-person peer rejection which in turn will predict likelihood of having OOFs. We also hypothesize that among those with OOFs, SGM youth will have higher levels of intimate disclosure with OOFs than their non-SGM peers. This study will add to the growing literature about OOFs, and specifically SGM OOF experiences on social media, which opens the door for future research on the role of supportive OOFs have for SGM teens

Aditi Choudhary

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Abstract Name: Microsoft Copilot Accurately Extrapolates SRS-22r Pain and Management Satisfaction

Outcomes based on Clinical History

Introduction: Patient-reported outcome measures (PROMs) play a crucial role in spine surgery research. However, maintaining a robust database presents logistical challenges, including the need for data vendors and research coordinators, often resulting in missed assessments. Artificial intelligence (AI) chatbots, like Microsoft Copilot, may offer a free solution by predicting patient outcomes based on clinical history. This study evaluates Microsoft Copilot's ability to predict a patient's preoperative quality of life using provider-documented patient history. **Methods:** Copilot was given de-identified preoperative notes from patients with spinal deformity (n=29) who underwent surgical correction and was prompted to predict five SRS-22r subscores. Paired t-test analysis was utilized to then compare these AI-generated subscores against the patients' actual SRS-22r sub-scores to assess for variance. **Results:** Of the five subcategories, the analysis failed to detect a significant difference between the patient-reported pain score (2.39 +/- 0.63) and Copilot-generated pain score (2.21 +/- 0.56; p = 0.39). Paired t-test was also unable to detect a significant difference between the patient-reported management satisfaction score (2.9 +/- 1.0) and Copilot-generated management satisfaction score (2.90 +/- 0.67; p = 0.9845). The remaining SRS-22 subcategories (mental health, function, and self-image) showed a significant difference between patient-reported and Copilot-generated scores (p < 0.05) suggesting that Copilot is unable to predict these with equal variance. **Conclusion:** No significant differences were found between patient-reported and Copilot-generated SRS-22r pain and management satisfaction subscores, indicating that chatbots may offer a viable and feasible retrospective method of PROM collection. This approach could be especially beneficial for low-resource institutions looking to develop a research enterprise.

Anmol Chowdhary

DC - The George Washington University

Discipline: Political Science

Authors:

Abstract Name: India in the Middle: India's Behavior across Formal and Informal Organizations

India's rising influence as a middle power has the potential to contribute to the transformation of international organizations and the dynamics of the international system. India's foreign policy centered on non-alignment has allowed it to advance its position through building relationships with diverse sets of countries. However, how these varied relationships, positions, and engagement objectives differ across organizational settings (e.g. formal versus informal) remains unclear. This research project uses India as a model to understand how emerging state participation and behavior differ across formal and informal organizations. Using BRICS and the United Nations General Assembly (UNGA) as prototype informal and formal organizations, respectively, this study uses hypothesis testing and document content analysis to evaluate India's health and environmental policy from 2021-2023. The hypotheses test India's behavior through its engagement with leadership, institutional reform, research and technology, international relationships, and colonial history. The research study finds that in BRICS, India uses health and environmental policy to strengthen its leadership as a representative for the Global South and motivate international institutional reform. However, in UNGA, India prioritizes its own agenda and role in the international system, relying on technological and research advancements and a specific interest in reforming the United Nations Security Council. This study finds that India is using different methods to grow its power across, and in both, informal and formal international organizations as evidenced by its engagement with leadership, reform of traditional institutions, and technology.

Brayden Chrisman

MI - Michigan State University

Discipline: Interdisciplinary

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Abstract Name: Redefining Accessibility in Museum Spaces: Methodologies and Practices for a More Inclusive Future

Our presentation assesses Creativity in the Time of COVID-19: Art as Medicine, an exhibition drawing on a database of art collected between 2020 and 2022 in response to the Covid-19 pandemic. We examine the showcase done by the Digital Humanities and Literary Cognition Lab (DHLC) at Michigan State University in the Fall of 2024 to determine how successful we were in creating a uniquely inclusive space and further using it as a case study for accessibility in museum spaces at large. Our exhibit was structured around an accessible design philosophy that goes beyond ADA compliance to connect diverse audiences to our archive. The DHLC actively sought to platform artists from BIPOC, LGBTQIA+, disability, and international communities to reflect the diverse nature of responses to COVID-19. We also selected art pieces representing a range of sensory modalities to accommodate varied access needs and preferences. Alongside these selections we provided audio descriptions for visual impairment, tactile artworks for multisensory engagement, audio captioning for aural impairment, and a respite space to promote the mental wellbeing of our visitors. We also ensured the gallery prioritized adequate space for mobility aids. To evaluate the success of the exhibit at depicting diverse pandemic experiences through highly accessible art, the DHLC gathered visitor feedback through an online survey accessed via QR code and written responses from artists, keynote speakers, and accessibility experts. We analyze this feedback and synthesize it into an effective action plan for coordinating future exhibitions. Our methods, including the iterative improvements based on feedback responses, can be applied to various learning and exhibition spaces. The results of this exhibit demonstrate how accessibility benefits all visitors, enriching museums by redefining how art can be experienced and appreciated in a more inclusive future.

John Christian

TN - University of Tennessee at Knoxville

Discipline: Environmental Science and Sustainability

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Abstract Name: Spatially Resolved Mechanical Properties of Glass Fiber Reinforced Thermoplastic Composites for Automotive Applications

Fiber-reinforced composites (FRCs) are attractive to the automotive industry due to their high specific strength, low weight, resistance to corrosion, impact, and wear. FRCs reinforced with glass fiber yield superior mechanical and physical properties including excellent tensile strength, stiffness, and low density. However, a comprehensive process-structure-property for FRCs on multilength scales is not well understood. Manufacturing processing considerations such as fiber length, orientation, and defects such as voids can largely influence the resulting mechanical behavior of the part. Tensile properties evaluation involves subjecting a FRC material to an uniaxial force in tension until failure, providing key data such as tensile modulus, strength, and strain. Digital image correlation (DIC) is an increasingly used non-contact full-field

strain measurement technique tracking surface displacement through high-resolution imagery, affording the ability to measure local strain variations along the gage section of the tensile part and identifying local stress concentrations as the part is subjected to tensile loading. These local variations result from changes in fiber volume fraction and alignment and matrix-rich regions along with possible occurrence of porosity. In this work, glass fiber-reinforced polypropylene composites are evaluated for tensile properties using DIC to measure tensile deformation behavior as a function of strain evolution. Also, high-resolution X-ray computed tomography is used to visualize and obtain qualitative information on the fiber bundle and resin composition within the composite material. These initial results composites show promise for further development of the structure-property relation of FRCs.

Emery Christian

WI - University of Wisconsin-Stout

Discipline: Political Science

Authors:

Abstract Name: College Students Opinions on Workers unions, Minnesota and Wisconsin

Unionization efforts in the workplace have made the news in recent years, with the very public writer and actor strike in 2023 and ongoing efforts to unionize service industry jobs. Gen Z has been at the forefront of efforts to unionize service industry jobs for organizations such as Starbucks and Amazon. An article by the Center for American Progress found that Gen Z is more supportive of unions than any other generation, with a mean approval rating of 64.4% (Glass, 2023). This paper analyzes survey data collected from University Wisconsin-Stout undergraduate students to see what level of support unions exist at the college level and what specific factors may cause this increase in support. The research found significant support for unions at the college level, with 90% of students feeling somewhat positive, positive, or neutral towards unions and 60% viewing unions as Positive or somewhat positive, aligning closely with the results from previous literature. Factors such as gender, knowledge, previous work with a union, and state of origin were found to be statistically significant predictors of view of workers' unions at the .05 level.

Emery Christian

WI - University of Wisconsin-Stout

Discipline: Political Science

Authors:

Abstract Name: The Loneliness Epidemic and Political Alignment, Exploring How Politics Influence the Social Connections of College Students

In the United States, the positions of the Democrats and Republicans have become more divisive, increasing polarization and partisanship among the American public. Alongside this trend, we have also seen an increase in Americans reporting experiencing loneliness. Could the growing partisan divide contribute to a person's sense of being alone? Through analysis of an original survey, results indicate a correlation between Ideology, political party, and feelings of loneliness. Those identifying as Republican or having a conservative ideology had lower levels of loneliness compared to Democrats or those with more liberal ideology. Part of this loneliness may be from Democrats' feeling uncomfortable or unsafe around those with more right-leaning ideology, leading to a greater willingness to cut people off or avoid others based on political affiliations. Democrats were more likely than those from any other political party to report they had cut someone off due

to politics. However, in interviews, people described avoiding friends as mutual rather than one person cutting the other off. This may indicate that conservatives may be cutting people off at similar rates but citing different reasons than “political affiliation.” This research suggests that, in a polarized political climate, relationships can suffer and contribute to loneliness. Finding ways to bridge partisan divides might have broader positive impacts in terms of individual well-being.

Seoyoon Chun

PA - Carnegie Mellon University

Discipline: English and Literature

Authors:

#1 Seoyoon Chun

Abstract Name: Making Meaning Out of Learning: a Rhetorical Analysis on Medical Pedagogy and Its Contributions to Physician Bias

Rhetoric studies the construction of meaning through language, and exists in every realm of discourse. This concept extends to pedagogy, in that the rhetoric of educational material shapes how students apply this knowledge later on. While this relationship is not inherently harmful, one must consider how rhetoric can be applied when constructs such as sexism and racism permeate into systems of learning, particular in medicine. Research demonstrates that across different demographics, there tends to be discrepancies in treatment and care based on preconceived notions that medical providers hold, some starting from pedagogy. My research, therefore, attempts to identify exactly how educational language can contribute to physician bias. To determine this relationship, I will conduct a rhetorical analysis of medical textbooks and observe how they attend to two particular topics: pain, and cardiovascular disease (CVD). I will parse through two separate texts and consider how information is presented, and then compare my findings to current research that suggests different outcomes for women and people of color. At the time of this proposal, I have found particular cases of biological differences not being considered when discussing cardiac exams, which I have linked to poorer accuracy for cardiac exams on female patients. I have also found gaps in consideration for social determinants as a factor in medicine, and hope to extend this further as I proceed with my research. By observing these two topics and how rhetoric tactics are used to discuss them, I hope to track how language shapes medical discourse, and in turn, possible avenues of bias. This project aims to not only apply a rhetorical perspective on current medical pedagogy, but also encourage the considerations of the humanities when developing medicine, particularly so that no marginalized population gets left behind.

Michelle Chung

PA - University of Pittsburgh School of Nursing

Discipline: Nursing and Public Health

Authors:

#1 Michelle Chung

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Abstract Name: Association Between Area Deprivation Index and Subarachnoid Hemorrhage Risk Factors

Subarachnoid hemorrhage (SAH) is a life-threatening hemorrhagic stroke caused by bleeding in the brain's arachnoid space. While global incidence has decreased due to reductions in SAH risk factors, they have not been reduced in all areas, and socioeconomically disadvantaged populations still experience higher SAH incidence. This study examined relationships between measures of socioeconomic status (SES) and SAH risk factors in a single stroke center. We hypothesized that lower SES would be associated with higher rates of hypertension (HTN), diabetes (DM), tobacco, alcohol, and drug use, and a higher body mass index (BMI). Demographics and past medical history, including HTN, DM, tobacco, alcohol, and drug use, and BMI, were obtained from the patient, family, or record. Tobacco was recorded as no/never and yes/quit. BMI was categorized using WHO standards as low, normal, overweight, and obese. The area deprivation index (ADI), obtained from the University of Wisconsin School of Medicine Neighborhood Atlas and patient zip codes, was used as a measure of SES, with higher scores indicating increased deprivation. This retrospective analysis of 215 SAH patients (mean age 54 years, 76% female, 84% white) used logistic and linear regression models to examine ADI measures (state decile, national percentile) and rates of risk factors controlling for race, gender, and age. Significant relationships between ADI and tobacco use were identified: a one-unit increase in ADI state decile raised the odds of tobacco use by 1.2345 times ($p < 0.001$), and a one-unit increase in ADI national percentile increased the odds by 1.0258 times ($p < 0.001$). No associations were found between ADI and HTN, alcohol and drug use, BMI, or DM. This analysis suggests that individuals from more deprived areas have higher rates of tobacco use, emphasizing needs for targeted patient education to reduce SAH risk and diseases associated with similar risk factors.

Haley Chung

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Adrian Morelli

Abstract Name: Cell Sources of Donor-derived Extracellular Vesicles that Elicit Transplant Rejection

Transplantation involves grafting donor organs, tissues, or cells into a recipient, but rejection can occur when the recipient's T and B lymphocytes in secondary lymphoid tissues (i.e. lymph nodes and spleen) recognize the transplant's foreign proteins (allo-antigens) and initiate an immune response against them. Recent studies have shown that donor allo-antigens are released cell-free from transplants (allografts) via secretion of small extracellular vesicles (i.e. exosomes) that traffic to secondary lymphoid tissues where they initiate the anti-donor immune response. The goal of my project is to investigate in mice the lineage(s) of the cells in allografts that release the vesicles that promote transplant rejection. This will lead to an understanding of the mechanism of communication between allografts and the recipient's immune cells through graft-derived exosomes, so that future donor-specific therapies can be developed to prevent rejection. I will use a mouse model of skin transplantation to test whether graft-derived parenchymal cells (e.g. keratinocytes), endothelium, or antigen-presenting leukocytes (e.g. dendritic cells) are the source(s) of donor-derived exosomes that carry allo-antigens to the graft-draining lymph nodes. Exosomes released by these specific cells in skin allografts will be tagged with red fluorescent protein (RFP) linked to the exosome-specific protein CD63, in a transgenic mouse model generated in my mentor's laboratory. RFP expression will be targeted to exosomes released only by a specific cell type in each mouse line. I will perform skin transplants on BALB/c mice with these cell-type specific RFP-CD63 C57Bl/6 donor mice. Two days after surgery, detection and quantification of uptake of graft-derived RFP⁺ exosomes by the recipient immune cells in the graft-draining (brachial) lymph nodes will be done by immune-fluorescence confocal microscopy on tissue sections. The presence of RFP⁺ exosomes in the graft-draining lymph nodes after transplantation will allow us to pinpoint the cell types of the skin allografts that release the exosomes.

Elizabeth Church

OK - University of Central Oklahoma

Discipline: Education

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Jenna Farrell

Joey Rivera

Abstract Name: Art Criticism Activity: Look Out, Look In, Look Forward

As future art educators, an important part of our job is to critique art and engage students in the process of critiquing. We have designed a new format to use as a tool and guide when considering a work of art. This model uses simple terms to reflect on the aesthetics, meaning, and potential future of a work. Because we are observing visual art, we will focus on the sense we use the most: sight. To think more deeply about a work of art, we invite students to “Look Out, Look In, and Look Forward.” First, the student looks at the exterior of the piece, then reflects on their inner thoughts and feelings, and finally expands into alternative ideas.

Chloe Chwalik

NC - Elon University

Discipline: Biology

Authors:

#1 Eryn Bernardy

Abstract Name: Investigating Interactions Between Bacteria Infecting Patients With Cystic Fibrosis

Cystic Fibrosis (CF) is an autosomal recessive genetic disorder characterized by mucus buildup in the lungs, leading to chronic bacterial infections that drive high morbidity and mortality rates. *Staphylococcus aureus* (SA) and *Pseudomonas aeruginosa* (PA) are the primary pathogens in CF lung infections, with SA more common in younger patients and PA predominating as patients age. Co-infection with both bacteria is associated with a rapid decline in health, yet the mechanisms of this interaction are not well understood. This study aims to investigate interactions between clinical isolates of SA and two PA strains—PAO1, a wild-type strain that typically kills SA, and PDO300, a strain known for its ability to coexist with SA. A control SA strain, JE2, is used to validate PA behavior. SA clinical isolates are cultured alone and in combination with each PA strain, with survival assessed through cell counts after 24 hours. SA survival is measured as fold change, with a 100-fold decrease in survival considered indicative of significant killing. There are three distinct responses among the clinical SA isolates: isolates killed only by PAO1, isolates eliminated by both PA strains and isolates that survive coculture with both strains. So far, out of 14 SA isolates tested, five have been found to be killed by PAO1 only, five were killed by both, and four to coexist with both PA strains. Additionally, this research aims to deepen the understanding of how SA and PA coexist and contribute to mucus buildup and chronic infection within the CF lung environment, ultimately guiding the development of more effective treatments to prevent lung function decline in CF patients.

Mara Cicchetti

PA - University of Pittsburgh

Discipline: Biology

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Abstract Name: The Effect of Ultrasound-Targeted Microbubble Cavitation on Microglial Activation and Amyloid-Beta Clearance in an In Vitro Alzheimer's Disease Model of the Blood-Brain Barrier

Alzheimer's Disease (AD) is a devastating neurodegenerative disease that affects millions of Americans. Among other pathological hallmarks, AD is characterized by a buildup of amyloid-beta ($A\beta$) aggregates in the brain. Unfortunately, there is currently no cure for AD and treatment options are limited. One of these limitations is the blood-brain barrier (BBB), which decreases the therapeutic efficacy of potential treatments by inhibiting their brain permeability. Ultrasound-targeted microbubble cavitation (UTMC) causes transient BBB hyperpermeability and has shown great promise for improving drug efficacy in humans. Microglia are the resident immune cells of the brain, they play an important role in AD because they are responsible for clearing $A\beta$ from the brain via phagocytosis. However, $A\beta$ is known to cause microglial pro-inflammatory activation which can promote neurotoxicity and cause further cognitive decline. UTMC has been shown to affect microglia, but the relationship between $A\beta$, microglia, and UTMC is poorly understood. This project studies the effect of UTMC on $A\beta$ uptake by microglia and clearance across the BBB, and its impact on microglial inflammation. I developed an in vitro co-culture transwell model of the BBB to study the interaction with microglia proximal to the endothelial monolayer that comprises the BBB. I aim to determine whether UTMC increases microglial uptake of $A\beta$ via immunofluorescence imaging. I also aim to elucidate the inflammatory response of microglia to UTMC through quantitative polymerase chain reaction and have shown that UTMC promotes inflammation. I hypothesize that UTMC induces microglial inflammation as well as increased uptake and clearance of $A\beta$. Due to the pivotal role of microglia in AD and the emergence of UTMC as a promising therapeutic for the treatment of AD, studying the effect of UTMC on microglia in this context is important to predicting both its safety and potential therapeutic benefits.

Elaina Ciecierski

PA - Seton Hill University

Discipline: Biology

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Abstract Name: Moth wing flexural stiffness is tuned to flight behavior

Insect wings are flexible appendages deforming under applied force, critical for aerodynamics, stability, and sensation. Wing deformation patterns are dictated by wing flexural stiffness, which quantifies the bending

magnitude of an object due to an applied force. Across insects, wing flexural stiffness increases with wing size; however, interspecific variation in locomotor behavior may independently impact flexural stiffness. For example, fishes swim utilizing flexible fins, and fin stiffness is strongly influenced by species-specific locomotor behavior. Like fishes, insect locomotor behaviors are highly variable. This study examines the relationship between flight behavior and wing stiffness using species from two moth sister-families known for differences in flight behavior, hawkmoths and wild silkmoths. Hawkmoths, flying with long, slender wings at high frequencies, are hypothesized to use stiffer wings than silkmoths, which use short, square wings at slow frequencies. To test the hypothesis, stiffness along the span (length) and chord (width) of each forewing and hindwing of 14 hawkmoths and 34 silkmoths was measured in vitro using a force transducer. Consistent with existing literature, forewing and hindwing flexural stiffness increase with wing size. For a given wing, spanwise stiffness is greater than chordwise stiffness and forewings are stiffer than hindwings. Significantly, when comparing the sister-families, hawkmoths utilize stiffer wings than silkmoths, supporting the hypothesis that interspecific differences between flight behavior and wing flexural stiffness are correlated. In both families, a direct relationship exists between wing shape (aspect ratio, AR) and stiffness, and silkmoth wings are stiffer than hawkmoths at a given AR. These results demonstrate that wing size and shape have different relationships with stiffness, suggesting unique and complex wing deformation patterns between silkmoths and hawkmoths. Thus, wing stiffness and deformation are features contributing to the divergent flight behavior between these two moth families.

Kyle Cink

UT - University of Utah

Discipline: Biology

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Abstract Name: Nanopore sequencing as a tool supporting taxonomic research in historically neglected marine micromollusks

Natural product-derived compounds offer exceptional chemical diversity compared to those artificially synthesized. Marine micromollusks, defined as mollusks less than 1 cm in shell size, represent an untapped source of these compounds. Despite their ecological significance, micromollusks remain understudied—particularly in Southeast Asia, a region characterized by high marine biodiversity. Given the bioprospecting potential and the lack of systematic research on Southeast Asian micromollusks, there is a pressing need to implement Operational Taxonomic Units (OTUs) and catalog the biodiversity of these organisms. In the Philippines, local fishermen often collect micromollusks using a traditional method known as lumun-lumun, which involves creating artificial microhabitats for mollusk larvae settlement by placing nets in different water depths. Our study leveraged nanopore DNA sequencing technology to identify micromollusk specimens collected using the lumun-lumun technique in the Philippines over the past decade. From 68 lumun-lumun specimens, we successfully obtained mitochondrial DNA sequences (~658 base pairs) from 23. Those sequences were matched with the NCBI BLAST (Basic Local Alignment Search Tool) to three mollusk families and 8 OTUs: Triphoridae (n=1), Cerithiidae (n=4), and Columbellidae (n=3). This research highlights the efficacy of our in-house nanopore sequencing pipeline to overcome taxonomic ambiguities in historically understudied marine micromollusks. The barcoding approach supplements traditional morphological classifications, providing an integrative framework to enhance biodiversity cataloging. Furthermore, our findings support the exploration of bioactive compounds in these organisms, offering critical insights into potential pharmacological applications. Our work bridges traditional knowledge and modern molecular techniques, setting the stage for future discoveries in natural product pharmacology while promoting the conservation of marine biodiversity.

Sophie Clark

FL - University of Florida

Discipline: Physics and Astronomy

Authors:

#1 Uma Gorti

Abstract Name: Modeling JWST Observations of Protoplanetary Disk Outflows with RADMC-3D

Young stars are surrounded by protoplanetary disks that must shed angular momentum via outflows to sustain the process of star formation. The dynamics governing protoplanetary disk outflows are not very well understood, although theory indicates they may be magnetically driven. The high resolution of the James Webb Space Telescope (JWST) has allowed to observe these disk outflows and infer their morphologies and origins. We have created a program to model H₂ emission from protoplanetary disk outflows using the radiative transfer software RADMC-3D. This program allows users to input parameters for the star and disk, generate models based on magnetohydrodynamic outflow theories, and compute synthetic images and fluxes of H₂ emission. We used our program to model JWST observations of the HH30 protoplanetary disk outflow, deriving key parameters such as the mass-loss rate. Here, we present our model of the HH30 H₂ outflow and its morphology, highlighting the broader implications of modeling molecular emission in high-resolution outflow observations. As more data from JWST becomes available, these modeling methods will provide deeper insights into the physics of protoplanetary disk winds.

Coral Clark

NC - Elon University

Discipline: Nursing and Public Health

Authors:

#1 Yanica Faustin

Abstract Name: Silenced and Sidelined: Examining the Intersectional Impact of Ableism and Racism on Maternal Health

While access to maternal health services and technologies have increased for some over recent years, historically marginalized and oppressed populations in the United States are still facing barriers to quality care. Women of color and disabled individuals have faced reproductive oppression, such as forced sterilization and inadequate healthcare, often rooted in traditional views of who is considered a "fit" mother. The reproductive justice framework provides an in-depth perspective on the roots of health inequity as it relates to reproductive health and highlights advocacy, social justice, and human rights. There is currently a lack of research on the outcomes and experiences of disabled birthing persons. This study will utilize the PRAMS data to analyze the adverse maternal health outcomes of disabled birthing persons, especially those who are located at the intersection of ableism and racism. Using STATA, the analysis will calculate the prevalence of adverse maternal health outcomes, examine differences by ability status and racial identity, and explore their intersection. Preliminary findings support disparities in maternal health outcomes by race and ability status. We hypothesize that the rates of adverse maternal health outcomes will be higher among non-white birthing persons across the varying levels of ability status for gestational diabetes, premature rupture of membranes, and hypertension, with racism having a stronger impact. This project will highlight the impacts of racism and ableism, contribute knowledge on maternal health disparities, and contextualize findings using

a reproductive justice framework. Findings of this study seek to inform evidence-based practices in the field of maternal health and improve health outcomes for birthing persons with various racial identities and abilities.

Emily Clarke

GA - Kennesaw State University

Discipline: Psychology

Authors:

#1 Cody Mashburn

#2 Erica Holliday

#3 Sharon Pearcey

Abstract Name: Impulsivity regulation through COMT Val158Met gene expression in relation to substance abuse, mental health, and risk for adverse life events

This study examines the relationship between impulsivity and mental wellbeing. Previous studies show that high impulsivity can have drastic social/economic consequences (Schutte et al., 2023). Because poor impulse control may increase substance abuse and negatively affect finances/social activities, impulsivity may increase stress, anxiety, and depression (Du et al., 2023). Thus, impulsivity likely increases drug use and traumatic adverse life experiences which increases stress, anxiety, and depression. Dopamine is a key neurotransmitter involved in impulse control and other neural functions (Bondrescu et al., 2024). Dopamine reuptake rates may be regulated by the COMT Val158Met rs4680 gene (Bondrescu et al., 2024). Given the genotype may affect a person's dopamine reuptake and impulsivity, the COMT genotype is predicted to have a relationship with impulsive decisions and propensity for engaging in high-risk behaviors. Faster dopamine reuptake may leave the brain with lower dopamine levels which may lead participants to artificially raise dopamine levels through substance use or other negative sensation-seeking behaviors. Participants took surveys to assess previous adverse life experiences (Life Events Checklist; LEC), substance use (Alcohol, Smoking, and Substance Involvement Screening Test; ASSIST), depression, anxiety, and stress (Depression, Anxiety, and Stress Scale; DASS-21). A delay discounting task (millisecond.com) measured impulsive decision making. Participants provided a saliva sample for DNA extraction, allowing analysis of COMT Val158Met genotype expression. Our preliminary analyses ($N = 88$) show a positive relationship between frequency of negative life events (LEC) and substance use, ($r(83) = .35, p = .001$). Additionally, a greater number of adverse life events (LEC) suggests higher stress ($r(87) = .26, p < .05$) and anxiety levels ($r(86) = .26, p < .05$). Data collection and analysis is ongoing. We hypothesize that impulsivity is regulated by COMT gene expressions, and that increased impulsivity would affect participants' substance abuse, mental health, and risk for adverse life events.

Meredith Clark-Wiltz

IN - Franklin College

Discipline:

Authors:

#1 Katie Streit

#2 Lourdes Hurtado

#3 Meredith Clark-Wiltz

Katie Streit

Lourdes Hurtado

Abstract Name: Building a Community of Mentors and Scholars

The Franklin College Department of History cultivates undergraduate research using a holistic approach where each faculty member serves as a mentor for each major across various stages of development. The curricular design provides intentional sophomore, junior, and senior coursework that enables students to hone their independent research, writing, and presentation skills, while they also build their own supportive community of scholars. Beginning with their sophomore public history course, students participate in a community-facing group project that fosters professionalism, confidence, and awareness of archival research. Often supported through grant projects, these public history projects expose students to resources that support research, as well as a broad understanding of scholarly work. In a re-imagined junior-level course, students grapple with historiographic understandings of the past, as they develop their own research questions. Every department faculty member provides constructive feedback on the initial prospectus and its presentation as these students transition to their senior research seminar. Their efforts to produce original scholarship require independent research, peer collaboration, and faculty mentorship. Recognizing the diverse range of strengths and abilities, the history program provides one-on-one faculty mentorship, while encouraging students to rely on each other for support, guidance, and feedback. Cultivating a culture of mentorship and celebration around undergraduate research has become an intentional focus of the history department. Highlighting opportunities to build relationships among students within cohorts has led to increasing efforts to create activities that bridge cohorts, so that, for instance, seniors provide guidance for juniors and sophomores and juniors celebrate seniors. This culture has increased the level of student work, resulting in national conference presentations and statewide awards. This larger student community has attracted students invested in scholarship, research, and campus leadership, which reinforces the department's efforts to foster a community of mentors and scholars.

Elizabeth Clary

MT - Montana State University - Bozeman

Discipline: Communications

Authors:

Abstract Name: Negative Stereotypes of Greek Life and their Effect on Fraternity and Sorority Members

This project's objective is to understand how negative media coverage of Greek life affects those who take part in it. News media commonly talk about Greek life in a negative light, but people continue to be strongly affiliated with these communities. Studies of media coverage have shown that it has a negative impact on mental health (National Library of Medicine), whereas many studies of Greek life have shown a positive trend on mental health of its participants (Newport Institute). My study, however, examines the intersection of such findings: how media portrayals of Greek life affect those in it. I want to look at the common stereotypes of this community to try to understand where they come from and their effects. Montana State University's divided student population (Greek and non-Greek) offers a good opportunity for the study of the translation of such stereotypes from news media to student attitudes. My study engages the Greek life community through an initial survey and then, where applicable, follow up interviews. Additionally, I have interviewed university faculty who work with the fraternities and sororities to broaden perspective on this topic. Although this research is still in progress, survey results are demonstrating that members of the fraternity-sorority life community feel negative effects from what they hear around campus and on social media that most often leads to members not wanting to wear their Greek letters out and refraining from telling others of their association. My presentation will review further findings and discuss what would be required to reshape the discourse.

Jaeson Clayborn

FL - Miami Dade College

Discipline:

Authors:

Abstract Name: Entomophagy in Education: Exploring the Role of Insects as Sustainable Food Sources

Entomophagy, the practice of consuming insects, offers a sustainable alternative to traditional protein sources like cattle and chickens, which are more resource and land intensive practices. Insects have been a part of the human diet for centuries, providing a rich source of protein and micronutrients. In the Entomophagy Lab (Miami Dade College), biology students explore this practice through hands-on activities with mealworms (*Tenebrio molitor*). Students construct mealworm containers to support their life cycle, from egg to larvae to adult and back to egg, while harvesting a portion of the larvae for consumption. Throughout the lab, students learn about the biology, ecology, and sustainability of mealworms, integrating these topics with real-world applications of entomophagy. During the cooking phase, students develop personalized recipes using mealworms and other ingredients, presenting their creations to food critics, including peers, staff, and faculty. This experiential learning lab merges sustainability, nutrition, entomology, and ecology, offering students a unique, interdisciplinary approach to biology. A detailed lab handout, rubric, and a video featuring highlights from the lab will be shared with conference attendees.

Tayler Cleveland

PA - Point Park University

Discipline: English and Literature

Authors:

Abstract Name: The Complexities of Identity in the Works of Phillis Wheatley-Peters and Honoreé Fanonne Jeffers

This poster explores the complexities of identity in the works of Phillis Wheatley Peters and Honoreé Fanonne Jeffers, emphasizing how personal heritage, race, and historical context shape self-perception and the struggle for recognition. Through an analysis of Wheatley-Peters's poems "To the Right Honorable William, Earl of Dartmouth" and "On Being Brought from Africa to America," as well as Jeffers's poetic exploration in *The Age of Phillis*, the paper examines how both poets navigate the tension between African heritage and colonial American society. Wheatley-Peters's work highlights the negotiation of identity through her literary craft, where she simultaneously asserts her voice and challenges the societal constructs imposed on her as an enslaved woman. Jeffers, in turn, delves into Wheatley-Peters's life, reflecting on themes of family, lineage, and heritage, suggesting that self-identity is shaped by both personal resilience and the cultural legacies passed down through generations. Jeffers, in her examination of Wheatley-Peter's life and work, furthers this exploration by highlighting the intricacies between personal and collective identity, especially through the lens of connections to her family and homeland. Together, these poets shed light on the never-ending impact of heritage on self-discovery, emphasizing that identity is not merely a reflection of where one comes from, but a complex, evolving narrative shaped by personal resilience and cultural history. This poster will demonstrate how both poets illuminate the ongoing struggle for identity and belonging, particularly for Black Americans whose individual narratives were erased through the transatlantic slave trade. By engaging with their works, this poster contributes to a deeper understanding of how history, family, and personal agency intertwine to form complex and evolving identities.

Kelly Clevenger

FL - University of Central Florida

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Kelly Clevenger

#2 Richard Zraick

#3 Bonnie Slavych

Abstract Name: Using ChatGPT to Improve Readability of Spasmodic Dysphonia Patient Education Websites

Online patient education materials often exceed the recommended 6th to 8th grade reading level, limiting accessibility and creating a challenge for the average consumer with low health literacy. At the same time, AI large language models (LLMs) are being increasingly used as a tool across the healthcare field and as an everyday search tool. This study examines how utilizing AI LLMs, specifically ChatGPT, can improve the readability of online patient education materials about spasmodic dysphonia, a neurological voice disorder which causes involuntary spasms in the muscles of the larynx. Fourteen patient education websites addressing the questions “What is spasmodic dysphonia?”, “What causes spasmodic dysphonia?”, and “How is spasmodic dysphonia treated?” were selected to provide baseline content for comparison with AI-generated output. ChatGPT was then prompted to generate responses to the same three questions using each of the websites as its primary source of information. The readability data of the original and ChatGPT-generated content are currently being analyzed using four readability formulae through the Oleander Readability software and Microsoft Word for Mac. Initial findings suggest that the use of AI LLMs like ChatGPT have the potential to generate patient education materials which more closely meet recommended readability levels, allowing for more accessible patient education materials and promoting the use of plain language in the healthcare field.

Kaz Clift

OK - University of Central Oklahoma

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Pain, Pleasure, and Performance: Transforming Gender and Sex Through Body Modification

“Modern primitives” are a group of individuals that came to prominence in the modern body modification subculture in the late 1980s. “Body modification” as used in my research refers to alteration of the body that falls outside of the cultural norm; this includes, but is not limited to, piercing, tattooing, scarification, and various types of surgical modification when done within an underground subcultural setting. Modern primitives’ role in the progression of body modification as a subculture and industry is contested. My study examines the history of this movement within modern body modification, using a research methodology that includes a literature review of *In the Flesh: The Cultural Politics of Body Modification* by Victoria Pitts, *Body Art: Body Modification as an Artistic Practice* by Matthew Lodder, as well as publications from various body modification websites, books, and zines, such as the *Body Modification Ezine*. I also utilize documentaries and texts from prominent modern primitive figures, including Roland Loomis (also known as Fakir Musafar) and Jim Ward. I analyze the ways that the modern primitive movement has influenced Queer culture, SM/fetish culture, and the broader development of the modern body modification community and industry. I also evaluate criticisms of modern primitives, including the claim that they are culturally appropriative. I create a synthesis that recognizes the role of modern primitives in the development of modern body modification, while identifying other ideologies that focus on queer affirmation and ways to feel

embodiment/validity through body modification. I aim to contribute a nuanced perspective to the existing literature on modern body modification, and challenge societal perceptions of body modification. I explore the way that gender is conceptualized, altered, and transformed through body modification, on both a personal and societal level.

Nicholas Climes

PA - California University of Pennsylvania

Discipline: Chemistry

Authors:

#1 Nicholas Climes

Abstract Name: Quantification of Organic PM_{2.5} from Biomass Burning

Particulate matter (PM) has been identified to be one of the main contributors to air pollution. The PM vary in size with typical particle diameters ranging from <0.1 to 10 µm where particles with 2.5 µm in diameter were the focus of this study. Varying amounts of human exposure to PM_{2.5} has shown to increase the risk of cardiovascular, respiratory, neurological, and reproductive disorders and disease. The main contributors for PM_{2.5} emissions have been identified to be agricultural, prescribed, and wildfires (biomass), crops and livestock, and fuel combustion. The chemical composition and concentrations of organic PM_{2.5} from biomass burning was determined via gas chromatography mass spectrometry (GC-MS). Biomass was sampled locally which included leaves and twigs from various deciduous tree species during the span of January 2025, through March 2025. Levoglucosan (LG) and various carboxylic acid species including saturated straight chains, unsaturated chains, and oxo and hydroxy acids were the focus of the study.

Trevor Coates

PA - Villanova University

Discipline: Engineering

Authors:

#1 Lilianne Kopack

#2 Claire Steckley

#3 Charles Coe

#4 Michael Smith

Molly Znachko

Abstract Name: Synthesis of Lithium Orthosilicate Composites for High-Temperature CO₂ Capture

Precombustion CO₂ capture, used in integrated gasification combined cycle (IGCC), sorption-enhanced steam-methane reforming (SE-SMR), and sorption-enhanced water-gas shift (SE-WGS), offers efficient hydrogen production by simplifying traditional processes. SE-SMR combines reforming and water-gas shift into a single step, reducing both capital and operational costs. Operating at 550-650°C, SE-SMR produces nearly pure CO₂, ideal for sequestration or industrial use. The development of this single-step technology is key to transitioning from grey to blue hydrogen, accelerating decarbonization in the transportation industry. While most sorbent development has focused on CaO-based materials, lithium orthosilicate (LOS) shows unique potential for SE-SMR applications. LOS has a high theoretical CO₂ uptake (>35% by mass) and favorable thermodynamics in the target temperature range. Unlike CaO-based sorbents, which require energy-intensive temperature swing adsorption, LOS operates in a pressure swing mode, simplifying reactor design

and enabling less capital-intensive hydrogen production systems. Our group has developed a nanostructured LOS composite material that shows rapid uptake kinetics and cyclic stability up to 80 cycles. These composites were synthesized using wet chemistry methods, followed by extensive characterization through thermogravimetric analysis (TGA), X-ray diffraction (XRD), N₂ adsorption, Fourier transform infrared spectroscopy (FTIR), and electron microscopy. The ultimate goal is to integrate the LOS material into a laboratory-scale swing reactor system, where a combined catalyst-sorbent system generates hydrogen in one reactor while regenerating the sorbent in a sister reactor for continuous operation. Future work will focus on refining synthesis methods and optimizing reactor conditions. Additionally, further characterization will assess the impact of varying conditions on the material's composition, behavior, and ideal reaction settings for scalable, cost-effective hydrogen production and CO₂ capture.

T'Asia Cobb

MD - Bowie State University

Discipline: Biology

Authors:

#1 Ya'Mar McCoy

#2 Adriana Ganthier

#3 Jada Johnson

#4 Erin Ferguson

Abstract Name: Freshwater Turtle Abundance & Biodiversity in the D.C.-Baltimore Corridor: Impacts of Habitat Protection and Temperature

Freshwater turtles are important components of wetland and pond ecosystems throughout the world. Unfortunately, >60% of all turtles are endangered or recently extinct, and a variety of threats – from wetland habitat loss to an onslaught of invasive species – face remaining populations. To help understand local drivers of turtle community composition and population health, we characterized the diversity of freshwater turtles found in wetlands and ponds adjacent to Bowie State University campus and in the nearby Patuxent Research Refuge in Bowie and Laurel, MD. We also measured the abundance of a locally common species, the eastern painted turtle (*Chrysemys picta picta*). By contrasting our two major study sites, a wildlife refuge and a campus edge, we aimed to investigate the general impact of habitat modification and protection on local turtle communities. We also investigated the impact of daily temperature on painted turtle catch rate to understand how the temporal distribution of trapping effort impacted our dataset. Based on 42 days of trapping distributed among three years, we found that daily high and daily low temperatures were unrelated to the abundance of trapped painted turtles (catch per unit effort, CPUE, measured as number of turtles/number of traps per day). In addition, we found that the mean Simpson's Diversity Index was significantly higher at the Patuxent Research Refuge, but the mean CPUE of eastern painted turtles was significantly higher around Bowie State campus. Our data show that extensive habitat protection benefits rarer turtle species – those most likely to require conservation action. However, our data also suggest that eastern painted turtles could benefit from reduced competition in more human-modified sites.

Mekhi Cobbs

OK - University of Central Oklahoma

Discipline: History

Authors:

Abstract Name: Frontier Femininity: Gender and Power in Oklahoma's Territorial Era

Prior to statehood, the Indian territory, which would later become the 46th state of Oklahoma, was a hotbed of radical and progressive political movements. In the era before the 19th Amendment, women played an instrumental role in the social and cultural development of the state. On an institutional level, they helped shape the future of the state through militant advocacy, and their words were later put into the Oklahoma State Constitution. These influential women of all backgrounds also helped shape and redefine the narrow gender roles prescribed to them by the traditional, patriarchal social order. I plan to clearly demonstrate on a systemic and local level the nuanced position these women occupied. Because of all the shared struggle between them, their actions and beliefs were anything but uniform. I will juxtapose two of the arguably most influential women of the time, both Kate Bernard and Alice Robertson, to highlight this fact. Bernard was a revolutionary firebrand who passionately spoke on the social injustices inherent to the territory, while Robertson was a staunch traditionalist and anti-suffragist. They also occupied both sides of the political aisle but shared a common goal, whether intentionally or unintentionally, in radically changing the gendered status quo. Aside from these two influential activists, I will also dedicate a portion of my presentation to other individuals. Many other women share in Barnard's and Robertson's influence, from indigenous voices, the many black women who either migrated or were forcefully brought over, and many prominent socialist writers. My medium for this research will be an oral presentation. This topic is important because it has largely been left to history, and more people need to know about the contributions made to society by traditionally marginalized people.

Rashieq Cockerham

TN - Middle Tennessee State University

Discipline: Biochemistry

Authors:

Abstract Name: Characteristics of the Structure and Selected Biological Activities of Polysaccharides Isolated from Hemp

Hemp (*Cannabis sativa* L.), an industrially significant crop, holds vast potential for various applications due to its rich composition of bioactive compounds, including polysaccharides. This research aims to characterize the structural properties and explore the biological activities of polysaccharides isolated from hemp. By investigating these compounds, we seek to uncover their potential applications in industries such as pharmaceuticals and biotechnology, with a focus on their antioxidant, anti-inflammatory, and immunomodulatory properties. The study will employ techniques such as gas chromatography, mass spectrometry, and NMR spectroscopy to analyze the molecular composition and linkage patterns of hemp-derived polysaccharides. Through these methods, we aim to bridge existing knowledge gaps and optimize extraction processes for the efficient utilization of these bioactive molecules. Ultimately, this research will contribute to the growing understanding of hemp polysaccharides and their potential in enhancing both scientific and industrial applications.

Brandon Matheus Codera

VA - Virginia Polytechnic Institute & State U

Discipline: Engineering

Authors:

#1 Aliison Hagee

#2 John Santosuosso

#3 Kartik Chokkavarapu
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#8 Antonio Romero
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#10 Pavani Nimmagadda
#11 Pavani Nimmagadda
#12 Jung-Min Hong
Leah van Gelder
Julia Hocker

Abstract Name: Hands with EMG for Low-cost Prosthetics: Elastic and Rigid

Myoelectric devices are the industry standard technology for prosthetic devices. However, the average cost for a myoelectric prosthesis ranges from \$20,000 to \$60,000, depending on the degree of upper limb amputation and the hand features. Most prosthetic hands on the market today are made of hard, specialized materials that quickly drive up the price of production and thus are not equitable to all in need. A team of engineers at the University of Melbourne developed a prosthetic that featured a flexible 3D-printed body called the X-Limb, with a total cost of \$200. Although compliant, it had decreased rigidity and a shorter lifespan of use. The purpose of this abstract is to describe the development of an affordable, quality, and sustainable prosthetic hand that can be of help to low-income families through 3D printing and commercially available electronics. The myoelectric team is comprised of 15 multidisciplinary undergraduate engineering students and is further broken down into a design team – focused on the morphology and mechanics of the prosthetic hand, and the programming and electronics team – focused on the internal circuitry of the upper extremity prosthetic device and an EMG sensor that captures electronic signals from the muscle. Determining the ideal balance between hard and soft robotics to address their respective challenges is one of our core objectives. At the time of writing, the design team tested various models developed by the members to explore different levels of filament elasticity and finalized the finger and thumb designs. The electronics team is researching EMG sensors and control strategies to closely mimic hand and wrist movements. Ultimately, our design will be validated by an upper-limb amputee using our prosthetic device in activities of daily life (ADLs), such as gripping different door handles and fine motor skills, like eating or dressing oneself.

Elisabeth Cohen

VA - Longwood University

Discipline: Biology

Authors:

#1 Grace Cohen

Abstract Name: Costimulatory domains in chimeric antigen receptor T cells alter cytokine responses and contribute to a more toxic CAR T cell therapy in acute lymphocytic leukemia

The survival rate for adults with acute lymphocytic leukemia (ALL) is 74%. Current treatments have debilitating side effects so safer and more effective treatment options are needed. Novel cancer immunotherapies use chimeric antigen receptor (CAR) expressing T cells. CARs target tumor-associated antigens and enhance T cell responses. CAR T cell therapy is a new treatment for ALL however toxicities include cytokine release syndrome (CRS) caused by an overactive immune response. One way to reduce CRS is to alter the costimulatory domain in the CAR T cell. Therefore, we developed CAR T cells containing different costimulatory domains to test the role of costimulation in CRS induction. We used a chimeric-PD1 (chPD1) receptor with the Programmed Death 1 receptor as the tumor-targeting domain. The purpose of this

study was to compare if inclusion of different costimulatory domains, CD28, 4-1BB, and Dap10, in the chPD1 receptor altered tumor cell cytotoxicity and cytokine secretion in response to ALL cells. Additionally, whether T cell secretion of inflammatory cytokines was required for tumor cell cytotoxicity and release of CRS-inducing cytokines was evaluated. Using LDH cytotoxicity assays, it was determined that chPD1 T cells had significant tumor cell killing compared to control T cells. ELISAs and LEGENDplex assays were used to assess chPD1 T cell cytokine secretion. Compared to 4-1BB and Dap10, inclusion of CD28 in the chPD1 receptor increased secretion of CRS-related cytokines. Blocking antibodies were used to test the requirement of T-cell cytokine secretion in CRS induction. Blockade of IFN γ , GM-CSF, and IL-10 alone or in combination did not decrease tumor cell death. However, blockade of these cytokines did alter release of CRS-related cytokines from leukocytes. Therefore, CAR T cell costimulatory domains alter CRS induction and CAR T cells containing 41BB and Dap10 may be safer options for ALL treatment.

Sarah Cole

PA - Duquesne University

Discipline: Biology

Authors:

#1 Meghan Wells

#2 Wook Kim

Abstract Name: Investigating Collective Functions of Diverse RsmE-regulated Extracellular Secretions in *Pseudomonas fluorescens*

Microbial cells frequently interact and aggregate to form densely populated biofilms. Localized clusters of cells develop spatial structures that optimize selfish (genotype-specific) access to space and resources, but also those that promote cooperative interactions among different genotypes. In densely populated laboratory colonies of *Pseudomonas fluorescens*, diverse mutations in the *rsmE* gene, encoding a translational repressor, are exclusively selected through the formation of a unique spatial structure that alleviates the problem of overcrowding. When *rsmE* is non-functional, multiple secretions are de-repressed that consequently form the dominant spatial structure. An extracellular polysaccharide (EPS) creates a region of low cell density by pushing away the neighboring wildtype (WT) cells, while a biosurfactant establishes a defined genotypic boundary for this region by locally sequestering the EPS. However, when both the EPS and biosurfactant genes are knocked out in a *rsmE* mutant, the resulting triple mutant (MS*) retains the ability to form much smaller and high-density patches. These observations suggest the involvement of additional RsmE-regulated secretions that provide a fitness advantage, albeit at a reduced level. Here, we aim to identify these additional secretion genes through random transposon mutagenesis of the MS* genome. The mutants were screened for the absence or reduction of patch formation within the WT population, and they were further screened to ensure an equal growth rate as the WT in monoculture. We report our findings of the disrupted genes through whole genome sequencing and interpret their collective functions with the EPS and biosurfactant through confocal microscopy. Disentangling individual and collective functions of diverse secretions within a dense population remains a significant challenge in the field. However, understanding these processes is crucial, as the secretions are expected to be functionally conserved across many clinically significant microbial species.

Simon Cole

FL - Embry - Riddle Aeronautical University

Discipline: Computer Science

Authors:

#1 Mustafa Akbas
#2 John Thompson
Daniel Machado
Sharif Adeptu

Abstract Name: Investigating Neural Network Design Through the Analysis of Weight Distribution Patterns

Motivation: Neural networks (NNs) are continuously being integrated into increasingly more critical aspects of society, however our understanding of the underlying organizational patterns within NNs is limited. Biological NNs are highly organized in physical space with proximal regions activating together at higher rates than non-proximal regions. In this work, we develop a set of tools to elucidate the design and organization of weights in NNs. While software tools for the creation and development of NNs are robust, there exists a shortage of tools aimed at analyzing and visualizing the distribution of weight values across large numbers of these NNs. Understanding the distributions of NN weights can provide researchers with practical insights like how to most efficiently initialize weights in order to reduce network training time. It may also help draw a more explicit link between organizational patterns in artificial and biological NNs. Methods: Here, we present a suite of tools to generate, visualize, and compare the statistical distribution of weights across large numbers of small NNs. Key features include a pipeline to generate networks given some architecture and functions to visualize and analyze the statistical distribution of weights in networks generated by the pipeline. Weight values are partitioned into discrete bins and aggregated across networks. We then fit probability distributions to these aggregated data and compare them via KL-divergence. This allows for the identification of unique and conserved distributions of weight values in the set of networks. To date, we have trained and analyzed the distributions of weight values across >50k networks utilizing this suite of tools. Going forward, we aim to develop Bayesian tools to analyze conditional probabilities between distributions. Availability: The tools are available free and open-source at: github.com/sharifware/Large-Scale-Design-and-Analysis-of-Neural-Networks/

Hannah Coleman

PA - Westminster College

Discipline: Psychology

Authors:

#1 Eric Fields

Abstract Name: Effects of caffeine on risk-taking behaviors in decision-making tasks

Attention-deficit/hyperactivity disorder (ADHD) is a disorder characterized by hyperactivity and impulsivity. Caffeine is used more frequently amongst those with ADHD. Research on caffeine's effects on risk-taking is conflicted. Some research suggests caffeine may have adverse effects on cognitive abilities, but other research suggests caffeine may be useful in the treatment of impulsivity symptoms associated with ADHD. Some research on caffeine indicates there could be benefits on the clinical implications of caffeine, but research is severely limited and needs to be further explored. The present study will examine the effects of caffeine on risk-taking in those with high and low ADHD symptomology. Participants will be asked to come into the laboratory for two sessions; participants will randomly be assigned to receive a caffeinated beverage during one session and a placebo beverage during another session. The first session will measure risk-taking, impulsivity, ADHD symptomology, and mood, while the second session will only measure risk-taking and mood. The present study seeks to determine whether ADHD serves as a moderator between caffeine and risk-taking behaviors in decision-making tasks. It is hypothesized that ADHD is a moderator of the relationship between caffeine and risky decision-making, and caffeine consumption will result in decreased risk-taking scores on a decision-making task for those high in ADHD symptomology and increased risk-taking scores on a decision-making task for those low in ADHD symptomology.

Tobi Coleman

OK - University of Central Oklahoma

Discipline: Art History

Authors:

#1 Tobi Coleman

Abstract Name: Portrayal of Hatshepsut and Lady Six Sky: Transcending Gender in Ancient Egyptian and Mayan Civilizations

This research examines ancient Mayan and Egyptian art depicting queens of their respective civilizations including a stone relief sculpture of Lady Six Sky (702 A.D.) from the Mayan culture and a large granite kneeling statue of Hatshepsut (1479-1458 B.C.) from Egypt. Both women are depicted in a masculine manner. This study's significant questions are as follows: What social, political, and religious structures existed in each civilization, how are they different, if at all and why? What significance did each woman hold in her respective society? Did sexism play a role in how these women were portrayed in relation to their respective civilizations? Through my research, I will demonstrate that various similarities existed regarding not only their societal structures, but also the social position of women. This study, based on a formal and historical examination of these two works of art, demonstrates that women were powerful social figures and leaders within the cultural and political context of their respective civilizations, regardless of existing in a patriarchal society. While there is some disagreement among scholars regarding the masculine depiction of these female rulers in roles typically held by men, it is important to evaluate these works and explore their similarities regarding representation.

Tobi Coleman

OK - University of Central Oklahoma

Discipline: Art History

Authors:

#1 Tobi Coleman

Abstract Name: Indigenous Protest Art in the United States and Australia: Edgar Heap of Birds and Richard Bell

Protest art by Indigenous peoples in the United States and Australia has exposed contemporary colonialism in various ways. However, there is limited scholarly research on the topic. This study examines the similarities and differences in contemporary Indigenous protest art by Cheyenne Arapaho artist Edgar Heap of Birds (Hok E Aye Vi) in the United States, and Aboriginal artist Richard Bell in Australia. This examination demonstrates that both artists produce work that highlights stolen land and appropriation of Cheyenne Arapaho and Aboriginal cultures by exposing transgressions in the United States and Australia and therefore controlling indigenous histories. To begin, the similarities and differences regarding colonization of their native lands will be provided. Second, the examination of how the artists demonstrate the past and continued colonization of their Indigenous peoples and land through their art. Third, the difference in the subject matter of these artworks will be addressed, followed by a discussion of obstacles the artists faced when exhibiting their protest art. This research is based on information discovered in historical and scholarly documents, formal examination of artworks, and interviews with the artists. This study is important because of persisting

colonization tendencies in both countries that need to continue to be exposed and challenged in many ways, including protest art.

Katelin Coleman

GA - Fort Valley State University

Discipline: Biochemistry

Authors:

#1 Katelin Coleman

#2 Tiffani Holmes

Abstract Name: The Computational Study of Peptide and Small Molecule GLP-1 Receptor Agonists

The Computational Study of Peptide and Small Molecule GLP-1 Receptor Agonists Katelin C. Coleman¹, Tiffani M. Holmes² ¹Department of Animal Sciences, College of Agriculture, Family Sciences and Technology Faculty & Staff, Fort Valley State University ²Department of Natural and Computational Sciences, College of Arts and Sciences, Fort Valley State University The objective of this study is to investigate the interactions (i.e. London dispersion forces, hydrogen bonding, and pi stacking) of GLP-1 receptor agonist compounds with the GLP-1 receptor (GLP-1R) using molecular modeling techniques, further leading to better understanding of these compounds and developments of more proficient drugs. GLP-1, or glucagon-like peptide 1, is a hormone that naturally releases within the gastrointestinal tract, specifically the pancreas, in response to the intake of glucose, regulating blood glucose levels. As the body consumes glucose, GLP-1 directly binds to the GLP-1R at the surface of pancreatic beta cells, triggering the release of insulin and inhibiting glucagon secretion. Health conditions like obesity and diabetes are linked to a reduction of GLP-1 within the body, further leading to insulin resistance and metabolic complications. The developments of GLP-1 receptor agonists drugs like Wegovy, Saxenda, and Ozempic are utilized to combat these conditions. Two highly produced types of GLP-1 receptor agonists drugs include small molecule GLP-1 agonists and peptidyl GLP-1 agonists. The small molecule GLP-1 receptor agonists dargulipron, berberine, and orforglipron and the peptidyl GLP-1 receptor agonists liraglutide, tirzepatide, and exenatide are reviewed in this study. The docking of dargulipron and berberine result in a bonding affinity of -10.3 kcal via conventional hydrogen bonding and pi-type intermolecular forces, indicating the presence of strong interactions. The analysis of the remaining molecules is in progress. The interactions of these compounds will depict the degree of bonding that they have to the receptor, helping to understand which drugs are potentially most efficient.

Miles Collier

TX - Texas Woman's University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Everybody Needs a Hero: Body Politics, X-Men, and Transgender Futures

From the post-World War II era onwards, superhuman bodies have become a site of conflict, described as a contested, unstable ground wherein multiple parties attempt to control the same space - which in this case, implies the body of an individual, positioning the self as inherently political in nature. In turn, this has led to the continued relevance of the superhero genre into the 21st century. As new laws targeting the transgender community continuously emerge, audiences can draw parallels between the embodied political conflict of

mutants in fiction and the real-world marginalization and disempowerment of trans individuals, with focus given to the unique intersections of race, gender identity, and sexual orientation. This in turn provides the space for the examination of governmental control over an individual's body, including the allowance and denial of access to gender affirming healthcare, reproductive care, education, and overall societal perceptions of gender and its expected norms. I intend to propose a new direction for the superhero genre to explore in the future that more directly addresses the conflict between the state and the marginalized self. Emerging from the previous restrictions and guidelines put into place by the Comics Code Authority, I propose that the inclusion of these embodied themes of autonomy and conflict in mutant-centric superhero media allows for connections to be drawn between transgender and mutant identities. Utilizing Ramzi Fawaz's concept of fluxability, as well as a queer-feminist theoretical framework, I argue that these characters and themes directly connect to the present-day experiences of the transgender community. I will be analyzing how these aspects serve as both a mirror to the reality of embodied advocacy, as well as a means to more closely examine the role – or lack thereof - that the government has on the body of an individual.

Jasmine Collins

IN - Valparaiso University

Discipline: Music

Authors:

#1 Jasmine Collins

Abstract Name: The Double Life of Franz Schubert: Der Doppelgänger and Homosexual Identity in 19th Century Vienna

The poet Heinrich Heine and the composer Franz Schubert faced persecution in their social and cultural contexts due to certain aspects of their identities. Heine's upbringing as a Jewish man living in the 19th Century led to conflicting feelings about his own faith and, eventually, he converted to Protestantism in order to find more commercial success as an author. Nevertheless, his heritage as a Jewish man still followed him and caused his work to be not taken seriously by others. Due to the discrimination he faced, Heine felt deeply connected with the term *doppelgänger* which refers to a person or an apparition that has the exact same appearance of another person that they are not directly related to. Heine went on to write a poem titled *Der Doppelgänger* and, later on, Schubert would use this poem to provide lyrics for his song cycle titled *Schwanengesang*. Though Schubert wrote compositions including Hebrew and texts from the Jewish tradition, there is speculation that he did not compose *Der Doppelgänger* with Heine's original intentions in mind. Schubert manifested his own life in two different avenues by being a successful composer and a homosexual, which was taboo in Vienna in the 19th century. Schubert utilizes unique musical elements to illustrate Heine's themes, such as the consistent use of the note F# and a double articulation. The ideas of a notable queer theorist named Gayle Rubin combined with the analysis conducted by musicologists David Bretherton and David Løberg Code allow thematic and musical connections to blossom in *Der Doppelgänger*. This paper will utilize a musical, literary, and New Historicist framework to analyze the events in Schubert and Heine's life, as well as conditions of life in Germany and Vienna during their lifetimes, to evaluate what meanings each artist intended in their individual settings of *Der Doppelgänger*.

Ariel Colón-Rodríguez

NC - Western Carolina University

Discipline: Engineering

Authors:

#1 Bora Karayaka
#2 Andrew Clarke
Brandon Blankenship
Nate Winebarger

Abstract Name: Investigation of Time Impact of Power Flow Solver Algorithms on Transmission Outage Scheduling

The increasing complexity of power grid systems, driven by renewable energy integration, growing electrification, and climate change-induced uncertainties demands a time-efficient approach to optimize transmission outage scheduling. The recent devastation caused by Hurricane Helene in western North Carolina, which led to prolonged power outages, underscores the critical need for resilient tools to enhance grid reliability. This research aims to develop an optimization tool using MATPOWER, an open-source package for solving steady-state power system simulation and optimization problems, to streamline optimized outage scheduling while maintaining grid reliability that meets N-1 contingency criteria. Outage scheduling is an extremely time-intensive power flow simulation process that involves constraints such as transmission branch and generation outages scheduled throughout the year. Studies on the usage of power flow solver algorithms and their simulation time impact on outage scheduling remain limited in the literature. The research goal is to provide a tool that is a flexible, user-friendly platform that adapts to real-time conditions, reducing simulation time and operational costs, and improving grid resiliency. The tool allows for the dynamic integration of constraints, including resource availability, outage duration, and operational limits, which will enable the tool to generate precise and efficient schedules for an IEEE 118-Bus System case; a test case representing a portion of the Southeastern Electric Reliability Council (SERC) region. Preliminary analysis in a workstation with a 32-core Xeon CPU indicates that integrating power flow algorithms like Newton-Raphson and Gauss-Seidel enhances scheduling efficiency. Extensive simulation results identify the Newton-Raphson Sparse Hybrid solver as the fastest, improving power flow processing time by an order of magnitude compared to the standard Newton-Raphson solver. These time-efficient solvers coupled with multi-core processing capabilities will address growing challenges in outage scheduling and support efforts to maintain reliable and efficient power systems in the face of increasing demands and climate-induced uncertainties.

Melissa Colorado Origua

TN - Trevecca Nazarene University

Discipline: History

Authors:

#1 Melissa Colorado Origua

Abstract Name: Navigating the Complexities of Colombia's Armed Conflict: From Historical Legacies to Contemporary Challenges and Prospects for Peace.

The Colombian armed conflict has caused a significant impact on the lives of millions of Colombians and has deeply affected several generations, but to understand the conflict, there must be a historical context and an analysis of the causes, the phases, the impact on the civilians and the resolution attempts and prospects of the Colombian armed conflict. This paper argues that the Colombian armed conflict has deeply entrenched itself in Colombian society, resulting in human rights abuses, displacement, economic instability, and collective psychological trauma inflicted on ordinary people. Although there have been attempts at resolution, peace negotiations, and demobilization of the guerrillas, significant challenges remain in addressing the root causes of the conflict to achieve a sustainable and stable peace in Colombia. This project emphasizes the voices of civilians who have experienced the conflict firsthand through a series of interviews conducted by the author called Survivors of Life. These oral histories include the stories of Diego Zamorra, who immigrated to the U.S. due to safety concerns, and Herlinda Martinez de Origua, who remained in Colombia. At the same time,

her daughter and granddaughters chose to leave in search of a brighter future. These personal accounts offer a window into the civilian experience—voices too often overshadowed by the political and military aspects of the conflict. By sharing these narratives, this paper seeks to illuminate the complex, shared trauma among Colombians and challenges the quick judgments often made about immigrants without understanding the full scope of their experiences. Through these oral histories, this paper aims to illuminate the human cost of the Colombian armed conflict, raising awareness of its deep and lasting impact on ordinary lives while contributing to the ongoing conversation about conflict resolution and peace-building.

Arlo Colvard

TN - Lipscomb University

Discipline: Biology

Authors:

#1 Arlo Colvard

#2 Kyle Brawner

Abstract Name: Investigating the interplay between TLR4 signaling and AHR activity in small intestinal epithelial cells: implications for necrotizing enterocolitis

Necrotizing enterocolitis (NEC) is a gastrointestinal inflammatory disease that primarily affects premature infants. In NEC, bacterial factors are thought to elicit an excessive response by the immature immune system. In the gastrointestinal tract, this robust inflammatory response leads to excessive apoptosis of the epithelial cells comprising the barrier between the lumen of the gastrointestinal tract and the underlying tissue allowing for bacterial invasion of the underlying tissue, leading to ischemia, necrosis, and potentially sepsis and death. Activation of the aryl hydrocarbon receptor (AhR), an immune system modulator, has been shown to be preventative against the pathogenesis of NEC in a murine model. However, no research has been conducted on the potential benefits of AhR activation following pathogenesis. As such, we focused on the effects of AhR activation following pathogenesis within a model system: rat small-intestinal epithelial cells treated with lipopolysaccharide (LPS), a bacterial endotoxin implicated in NEC. qRT-PCR revealed a decrease in AhR expression following LPS treatment. In this model, AhR activity, assessed by expression of the AhR target gene Cyp1a1 following treatment with the ligand indole-3-carbinol (I3C), was comparable to no LPS control. MTT assays indicated that treatment of the cells within our model with I3C rescued cytotoxicity. Surprisingly, scratch assays revealed a decrease in wound healing ability in the LPS + I3C treatment group, while no differences were observed with either treatment alone. These results may reflect the ability of I3C to rescue relatively mild insults (LPS) but not more significant injury (LPS+Scratch). Our continued research has sought to determine the potential for another AhR ligand, indole propionic acid (IPA), to rescue LPS-induced cytotoxicity. Currently, our findings do not suggest that IPA is capable of ameliorating LPS-induced metabolic deficits. Overall, our research indicates that I3C treatment, and potentially AhR activation, rescues LPS-induced cytotoxicity but not wound-healing ability.

Rex Colvard

NC - North Carolina State University

Discipline: Engineering

Authors:

#1 Rex Colvard

#2 Zach Park

#3 Michael Dickey

#4 Peter Fedkiw

Abstract Name: The Future of Monovalent Cation Energy Storage: Liquid Metal and Red P

The demand for energy storage in applications such as electric vehicles, consumer electronics and grid storage is ever increasing. Lithium-ion batteries (LIBs) are currently the state-of-art in electrochemical energy storage. The annual EV Li-ion battery demand for sustainable development is projected to grow to up to .7 TWh per year by 2030, a 7x increase compared to the current demand projection. In order to meet this energy demand, we propose to use EGaIn, a liquid metal, as a “self-healing” agent for red phosphorous in anodes to achieve longer cycle lives and higher capacities. Red phosphorous (RP) has been the subject of extensive research due to its relatively low cost compared to other commonly used anode materials in LIB’s, stability in air, low toxicity, and extremely high theoretical capacity for Li⁺ ions at 2596 mAh g⁻¹. Graphite, a currently commercially used anode material, has roughly a 7x lower capacity of 372 mAh g⁻¹ compared to RP for Li⁺ ions. RP’s main drawback is that it has a volume expansion of up to 300% during charging. This can cause delamination of the RP from the anode, resulting in capacity fade due to the RP becoming electrically disconnected from the anode. To mitigate this delamination, we propose to use EGaIn to maintain electrical contact with delaminated red P particles. EGaIn has been used as a “self-healing” agent for silicon, another high-capacity anode material in LIB’s, that also suffers from high volume expansion. In our work, we fabricate a composite film electrode comprising EGaIn and RP nanoparticles in a carbon polymer matrix. We perform material characterization of the electrode before and after electrochemical characterization of the electrode. This strategy of using EGaIn in combination with RP may help develop effective approaches for the integration of other high volume expansion active materials in anodes.

Jack Colwell

IN - Valparaiso University

Discipline: Environmental Science and Sustainability

Authors:

#1 Korbin Opfer

#2 Kora Stephey

#3 Nicole Smar

Abstract Name: Environmental Restoration Target Estimation Around Dale B. Engquist Nature Preserve

This project analyzed soil parameters from multiple locations owned by the Shirley Heinze Land Trust in Porter County, Indiana, some of which are being ecologically restored or have been restored in the past. The samples were collected from prairie, forested wetland, riverine wetland/floodplain ecological areas, and current agricultural areas that are to be restored to each of those same environmental types. To measure the effectiveness of the rehabilitation mentioned above, this project compared bulk density, soil chemistry, organic matter, aggregate stability, and particle size analysis from the agricultural area to those from restored and natural settings. This allowed the estimation of targets and a baseline to assess the effectiveness of future rehabilitation projects. The results show SOC content varied by environment type, with highest values found in forest soils. Furthermore, bulk density was found to be highest in prairie and previously cultivated soils. These results helped us to learn more about restoration projects on plots of land that have been used for agriculture for an extended period of time and can help other environmental projects find effective ways of rehabilitating formerly cultivated land.

Kyra Comstock

CA - University of the Pacific

Discipline: Computer Science

Authors:

#1 Ethan Donley

Ethan Perez

Koby Izunaso

Abstract Name: Comparison of Virtual Currency Methods in a Virtual Reality Exergame

This study investigates the use of the Infinadeck omni-directional treadmill, a "360-degree moving floor" that enables users to naturally walk in virtual reality (VR) environments by continuously returning their position to the center of the treadmill. This research aims to determine user preference between two methods in a VR game for earning virtual currency: walking points versus kill points. Additionally, participants' heart rates will be recorded to assess the potential of the application as an exergame, a game that users play for both fun and exercise. As a relatively new technology, use of omnidirectional treadmills in VR applications has not been thoroughly explored, with even less research regarding their potential to combine physical activity and gaming. This study seeks to contribute new insights into the features of VR walking games that encourage prolonged and vigorous engagement to meet the criteria for effective exercise. Participants will be tasked with completing a 30-minute playtest session in which they complete both walking objectives and enemy kill objectives. After each playtest session, subjects will complete a brief questionnaire to provide feedback on their preferred virtual currency-earning method and offer suggestions for improving the game. The anticipated outcomes include increased heart rates during gameplay and positive reception to the game's features, highlighting the omnidirectional treadmill's potential for combining entertainment and fitness. This research aims to bridge the gap between immersive VR technology and exercise, offering practical insights into how game mechanics can enhance user motivation and physical activity within virtual environments.

julia condes

FL - University of Central Florida

Discipline: Art History

Authors:

Abstract Name: Remedios Varo: Peregrinaciones

At the time of her death, the artist Remedios Varo (1908-1963) left behind over 500 works of art, the majority of which were created in her adopted country of Mexico. Known for her meticulously crafted fantastical paintings, Varo underwent exile and displacement due to first the Spanish Civil War, and later World War II, which led her to relocate to Mexico, where she would create prolifically for the remainder of her life. This paper will examine the effect of those experiences on the artist and the work she produced, attesting to Varo's ability to translate complex emotions regarding the human condition and uniquely communicate her personal history. Using biographical, formalist, and contextual analyses informed by the concepts of exile and of the Other in modern art, I aim to investigate the theme of pilgrimage- both physical and metaphysical- in the artwork of Varo's mature artistic period. Surveys of medieval art and alchemical culture, contemporary research on pilgrimage, and scholarship on Otherness in the canon of European art will be cited as frames of context for approaching Varo's artwork. Although the theme of pilgrimage in Varo's work is noted in existing scholarship, my research seeks to more thoroughly articulate the relationship between Varo's work and her own experiences, synthesizing significant through lines in Varo's life and work to create a comprehensive view of the artist. By focusing on the continuity of movement, I explore how Varo's migrations informed her artistic development and the narratives present in her paintings; first looking at images suggestive of liminality, then conceptual journeys, and finally, literal movement.

Jack Conley

VA - Virginia Military Institute

Discipline: History

Authors:

Abstract Name: The Vindolanda Tablets: Understanding Romanization on the Northern Frontier

The Roman frontier has been the subject of much research and debate among those historians concerned with understanding Roman authority and acculturation in the far reaches of the Empire. The interactions between Romans and recently conquered indigenous peoples with concern to cultural diffusion represent a topic which has previously suffered from a lack of evidence. The Vindolanda tablets, discovered in 1973 within a few miles of Hadrian's Wall, help paint an immensely detailed picture of the Roman frontier and the interactions which took place there. The discovery of this newfound corpus of evidence shows that the process of Romanization which took place on the Roman frontier was a highly complex matter. It is clear that Romanization takes place as a consequence of interaction between Roman or Romanized peoples with non-Romans, with specific emphasis placed on economic interaction within the context of supplying the Vindolanda fort. The tablets detail these economic interactions which either imply or explicitly state interactions between the Roman state and the indigenous peoples of Britain. Therefore, the Roman military, as a byproduct of its economic interactions with the local non-Roman civilian populace, was an agent of Romanization, especially in a recently pacified area like Vindolanda. Ultimately, the Vindolanda tablets illustrate that the Romanization process which took place on the Roman frontier was an intricate matter that involved economic interaction between the Roman garrison and the nearby indigenous population of Britons. These interactions represented a catalyst for Romanization to take place through both direct contact and a restructuring of the local economy to focus around the supply of the garrison.

Gabrielle Conover

NC - Elon University

Discipline: Biology

Authors:

Abstract Name: Examining the Impact of the Blood-Brain Barrier and the Gut-Brain-Axis on Brain in Zebrafish

Through the bidirectional communication along the gut-brain axis (GBA), microbial metabolites interact with the central nervous system (CNS), influencing neuronal development and cellular health. A key factor in CNS health is the blood-brain barrier (BBB), a semipermeable structure that surrounds brain microvasculature. The BBB regulates the movement of molecules and ions between the blood and the brain, helping to maintain a stable brain environment. Novel studies in mice have shown increased blood-brain barrier (BBB) permeability in response to knockdowns in the microbiome, supporting the BBB as a communication mechanism in the GBA. In this study, zebrafish were treated with an antibiotic cocktail (ABX) for 6 days to knock down gut microbial colonization. RT-PCR was used to quantify the relative bacterial abundance post ABX treatment and to analyze expression of BBB-related genes in brain tissue. *Mfsd2a*, a transcytosis regulator, was assessed. It is hypothesized that the expression of these genes will decrease in response to microbial knockdown, which correlates to increased barrier permeability. Bacterial abundance increased by a 1.4-fold change in ABX fish ($n = 10-12$), while *mfsd2a* expression had a 1.5-fold increase ($n = 10-12$, $p = 0.05$). Though these results are unexpected, we suspect that the ABX treatment administered allowed for the colonization of bacterial species that promoted BBB integrity. Future studies will identify changes in specific

bacterial species and analyze a broader range of genes implicated in BBB integrity to understand further how these two systems interact.

Hailey Conrad

PA - Duquesne University

Discipline: Environmental Science and Sustainability

Authors:

#1 Brady Porter

#2 Emily Bierer

Abstract Name: Using DNA Metabarcoding of Diatom Communities in the Buffalo Creek Watershed for Water Quality and Forensic Application

Diatoms are unicellular algae that are found in freshwater and are directly impacted by water quality. This research was to compare diatom community assemblies for 2 tributaries of Buffalo Creek from 2022 and 2024 using eDNA metabarcoding. Diatom community assemblies can vary based on year, season, and other environmental factors. Environmental factors that can change the community makeup of a location include pH, conductivity, and nutrient levels. Community profiles, aka biotic profiles, are records of the diatom community taxa and what environmental conditions make up the current habitat. These profiles can be used to determine water quality through indicator species as well as used in environmental forensic evidence linking diatoms to a specific tributary or watershed with trace evidence. These diatom community profiles were determined with eDNA metabarcoding using the *rbcL* gene and were validated with morphological taxonomic determinations. In order to determine if either extraction technique would give a biased result, DNA was extracted from both a filtered supernatant and the pellet (sediment) of each sample. Comparing the community profiles of the two tributaries in the Buffalo Creek watershed reveals differences and similarities in the community makeup between the two sites. This could be due to the two tributaries being from the same drainage system and having the same water chemistry. However, there is also variability in diatom communities across two years and potential bias toward certain diatoms in a community when using only the sample supernatant versus the pellet. These community profiles can guide future applications in creating full biotic profiles that can be used to study diatom transference in forensic science casework.

Tanya Contreras

AL - University of Alabama at Birmingham

Discipline: Business

Authors:

#1 Tanya F Contreras

#2 Tamanna Patel

#3 Charles A. Gorman

Tamanna Patel

Abstract Name: Kinship and Character: Assessing Dark Personality Traits in Relation to Sibling Presence and Absence

The Dark Triad theory, which includes three socially aversive personality traits—Machiavellianism, psychopathy, and narcissism—helps explain negative interpersonal behaviors that impact workplace productivity and well-being. Traits characteristic of the Dark Triad theory can inform how individuals interact

with others and their behavior in team settings, potentially influenced by family dynamics in childhood such as parent-child and sibling relationships. While existing research has primarily focused on correlations between these traits and parental relationships, the direct relationship between Machiavellianism and psychopathy and growing up with siblings has not been thoroughly explored. This study aims to examine the relationship between Machiavellianism, psychopathy, and work ethic with the presence or absence of siblings. The research will be conducted through a Qualtrics survey that includes the 16-item Machiavellian Personality Scale, the 20-item Psychopathy Checklist-Revised, the 50-item International Personality Item Pool questionnaire, and a short form of the Multidimensional Work Ethic Profile, along with demographic information. The survey will be anonymous, it will be administered electronically via email and social media (Instagram), and responses will be stored in password-protected folders and servers. Results will be reported in an aggregated and de-identified format to ensure confidentiality. This study aims to contribute to the limited research on Machiavellianism and psychopathy in relation to sibling relationships. From this study we expect to find individuals without siblings will exhibit higher levels of Machiavellian and psychopathy traits compared to those with siblings. Findings could provide insights into developing these traits and inform workplace strategies, such as employee training, leadership development, improving interpersonal dynamics, enhancing collaboration, and promoting ethical behavior. Keywords: Machiavellianism, Psychopathy, Siblings, I-O Psychology, Workplace Behavior

Jalyn Cook

PA - California University of Pennsylvania

Discipline: Biology

Authors:

Lucia Pasquale

Abstract Name: RND Efflux Pumps as Survival Mechanisms in *Pseudomonas* Species

Abandoned mine drainage, a widespread issue in Pennsylvania, creates harsh conditions that influence bacterial evolution and behavior. Specifically, the development of enhanced resistance traits and adaptive mechanisms in *Pseudomonas* species has been observed in these contaminated environments. Looking at specific mechanisms of toxin excretion in gram negative bacteria, such as *Pseudomonas*, RND (Resistance-nodulation-division) efflux pumps are one of the major contributors. RND efflux pumps are multi-protein complexes that transport a variety of substances, such as toxins, out of the cell. In *Pseudomonas* species there are 4 major RND efflux pumps, which are MexAB-OprM, MexCD-OprJ, MexEF-OprN, MexXY-OprM. Among these 4 pumps, MexAB-OprM pump is the primary efflux pump in *Pseudomonas* species. The MexAB-OprM efflux pump consists of three parts, MexA, the periplasm linker protein, Mex B, the cytoplasmic transporter pump, and OprM, the outer membrane channel protein. By silencing the different components of the MexAB-OprM RND efflux pump, the overall function of the pump in contaminated environments can be assessed. This experiment targeted the periplasmic linker protein, MexA. Using environmental strain, BL10, and lab strains *Pseudomonas aeruginosa*, *P. fluorescens*, and *P. mendocina*, the organism's ability to grow in the presence of antibiotics, metals, and toxic organic molecules was tested. In order to assess if any other RND efflux pumps compensated for the difference, changes in gene expression were tracked using RT-qPCR for all 4 major RND efflux pumps in *Pseudomonas*. Resistance mechanisms that arise in bacterial species living in contaminated environments pose significant ecological and public health concerns, and this project aims to examine the importance of RND efflux pumps in *Pseudomonas*.

Hannah Cook

CA - Cuesta College

Discipline: Environmental Science and Sustainability

Authors:

#1 Emily Kane

Abstract Name: Effects of Winter Events on Central California Beach Sediment

Sediment on any beach is constantly moving. Sediment volume varies due to longshore drift, tides, wind, wave action, and runoff. This is most obviously seen when comparing the low beach sand elevations of winter to high beach sand elevations of summer. Higher wave energy and storm strength in winter remove sand from the beach while calmer summers allow for transport of sand back onto the beach. Beach profiles have been taken twice a year since 2018 to measure these seasonal changes in sediment volume on two beaches on the Central Coast of California. The profiles have captured an area where creeks run to the beach and may or may not reach the ocean depending on the season. In this study, measurement intervals have been increased to observe the more immediate changes due to rainfall events, periods of high wave activity, and spring tides. Understanding how individual events effect erosion rates and sediment removal gives a clearer picture of what is happening to the beaches between the seasonal measurements. With ongoing analysis throughout the winter 2024-2025 season, larger discontinuous changes caused by winter events are predicted versus steady, gradual change throughout the time observed.

Allison Cooke

IL - Eastern Illinois University

Discipline: Education

Authors:

Abstract Name: Factors that Impact Burnout in Music Majors

The effect of burnout on music majors has become more prevalent and studied within the past decade. Researchers have found that burnout and imposter syndrome have highly impacted undergraduate music majors (Nápoles, et. Al., 2024). Some research shows that burnout is more prevalent among music education majors, compared to performance and other types of majors. (Vandenberghe & Huberman, 1999). Mak et. Al. (2019). Investigating the common denominators for burnout and the unique characteristics of music students, we can hopefully shed light on why students are feeling overwhelmed, overworked, and fatigued. The purpose of this study is to investigate the factors that impact burnout in music education majors and examine and explore ways that it can be prevented in undergraduate music programs. A survey was created using Qualtrics software that was distributed to undergraduate music majors. Questions addressed course load, ensemble participation, outside employment, degree concentration, and demographic information. Open-ended questions asked students to comment on their feelings of burnout, contributors to burnout, and personal experiences. The results of this study will inform undergraduate music education majors and the educators who work with them and can assist in creating a plan of action to positively impact the mental health of students. By analyzing data from various programs, majors, and degree concentration areas, we can use the information to make burnout less common and more manageable in undergraduate music majors. With more knowledge on this topic, we can develop strategies and initiatives to better support retention in music education programs. This work will help students create strategies for dealing with burnout and imposter syndrome.

Emma Cooper

NY - St. John Fisher College

Discipline: Biochemistry

Authors:

Zachary Murphy

Abstract Name: Generating an in-vitro Model of MPS-IIIA “Sanfilippo Syndrome” via CRISPR/CAS9 and Exploring Potential Therapeutics in a PUI Setting

Autosomal recessive inheritance of a defective SGSH gene coding for the enzyme sulfamidase is responsible for mucopolysaccharidosis (MPS) type IIIA, characterized by the effects of heparan sulfate accumulation in lysosomes. The syndrome presents with coarse facial features, central nervous system dysfunction, behavioral difficulties, intellectual disability, sleep disturbance, hyperactivity, loss of communication skills, and loss of mobility. Failure to develop cost effective research methods and long-term treatment options leaves the average age expectancy at just 10-20 years of age. Gene editing techniques including ZFNs, TALENs, and CRISPR/Cas9 have been explored as both models and potential therapeutic interventions for mucopolysaccharidosis types I, II and III. However, an in-vitro model of MPS IIIA, the most severe type of MPS, has yet to be developed. Therefore, we present a model test an in-vitro human cell line model of MPS IIA using a K562 lymphoblast cell line, CRISPR/Cas9 gene editing, and a heparan sulfate enzyme-linked

immunosorbent assay (ELISA). We hypothesized that disruption of SGSH would reduce or eliminate function of the sulfamidase enzyme, resulting in toxic heparan sulfate accumulation in the cell that could be quantified by an ELISA. Furthermore, we hypothesized Fluoxetine, an experimental drug treatment, would reduce heparan sulfate levels in the cell based on previous evidence in an MPS-IIIa murine model. Our work demonstrated the K562 lymphoblast cell line is a cost-effective and viable cell type for quantifying heparan sulfate levels. Preliminary drug treatments also suggest Fluoxetine may be capable of reducing cellular heparan sulfate levels in-vitro. Altogether, this work points to the potential of creating a sustainable cell model of MPS-IIIa, with the possibility of recapitulating specific patient mutations via the CRISPR/Cas9 editing system in the future.

Robert Cooper

FL - The University of Tampa

Discipline: Economics

Authors:

#1 Suzanne Dieringer

#2 Robert Beekman

#3 John Stinespring

Abstract Name: Wilderness or Theme Parks? Addressing National Park Overcrowding Through Entrance Fees

The National Park Service (NPS) is undergoing a strategic shift as it faces increased pressure to limit overcrowding in various national parks. Increased visitation has resulted in park resources becoming strained, leading to trail deterioration, reduced safety, maintenance backlogs, etc. To address this issue, the NPS has begun experimenting with different methods of dealing with overcrowding. A proposed solution is to increase park entrance fees with the intended effect of reducing demand, i.e., overcrowding. There has been significant debate regarding whether such a strategy would work, as well as if the potential pricing-out effect goes against the NPS mission of providing access for all citizens. Utilizing data from 30 US National Parks over the period 1993-2023, an economic analysis of national park visitation trends was conducted in this study to answer the question, "How do park entrance fees and various socioeconomic factors affect national park visitation rates?" with the purpose of evaluating the viability of an increased entrance fee strategy. Examined factors include entrance fees per vehicle, fuel prices per gallon, and median household income. Utilizing statistical software and various econometric/statistical techniques, we constructed a regression model that demonstrates the relationship between the socioeconomic factors and changes in national park visitor rates. The model found that entrance fee increases that occurred in the research period had no effect on visitation on average (a small, statistically significant negative effect occurred in less visited parks), meaning that while increased entrance fees could potentially be used to address budgetary issues, alternative methods such as timed-entries and permitting systems should be explored to address overcrowding. This project will help policymakers make informed decisions on park management strategies, including pricing, as park overcrowding becomes increasingly prevalent.

Jacob Copple

OK - University of Central Oklahoma

Discipline: Nursing and Public Health

Authors:

Abstract Name: Clinical Alarm Fatigue in the Acute Care Setting

Nurses are overexposed to a variety of alarms in the clinical setting. IV pumps and telemetry equipment all produce auditory and visual alarms. These alarms are crucial for patient safety; however, many are deemed false or “non-actionable” leading to a phenomenon called alarm fatigue, or when nurses are desensitized to the alarms. This dangerous problem can put patient safety at risk. It is shown that nurses who received education on alarm fatigue and supplemental information on their telemetry equipment lowered reported rates of alarm fatigue all together. If nursing students are given education on the topic and how to combat the issue, patient safety could improve. Using a pre-test/post-test to measure learning, students in their final semester of the nursing program will be provided with education about the danger of alarm fatigue and how to combat the issue. With acuity levels in the hospital increasing, there is a need for equipment that will alert the nurse when a problem arises. Unfortunately, this can also lead to alarm fatigue for the nurse and could put other patients at risk. It is hoped that being proactive and addressing the issue will improve patient safety outcomes.

Jessica Cornelius

OK - University of Central Oklahoma

Discipline: Art History

Authors:

#1 Jessica Cornelius

Abstract Name: Poverty in Japan and the United States

This paper discusses the problem of poverty in two of the most economically developed countries –Japan and the United States. Even in this wealth, it is clear that poverty is systemic and that the process continues to favor one group over another. In the United States, poverty is racially and sexually segregated, and in Japan, educational inequality and child poverty are aggravated by cultural prejudices and insufficient social protection. Social costs of poverty are evident in both countries – suicides bear signs pointing to economic factors as well as social pressure. The paper also analyses cultural representations of poverty based on Andres Serrano and Tetsuya Ishida. Serrano's pictures depict the social reality of people experiencing homelessness in the US, while Ishida's surrealist paintings portray the different aspects of Japanese society's aloofness. By examining these problems and how they are depicted in culture, this research advances the understanding of how poverty can be eradicated only through significant system changes and social efforts.

Jessica Cornelius

OK - University of Central Oklahoma

Discipline: Art History

Authors:

#1 Jessica Cornelius

Abstract Name: The Concept of Loss and Trauma in Children’s Books in Japan and the United States

The subject of this paper concerns the concept of loss and trauma in children's books in Japan and America. The study contended that there are significant differences in the way trauma and loss are represented and handled in books for children, largely because of societal and cultural differences in the approaches each country takes toward these emotions. First, the socio-emotional differences between the United States and Japan is discussed. Understanding these differences is important, for they provide the narratives and

emotional tone in children's books about how each society influences readers to process and cope with adversity. Second, the investigation of each country and details of specific styles and themes of illustration within children's books are presented. The sections will demonstrate how cultural norms of visual and narrative storytelling construct and frame themes of loss, separation, and survival. Particular attention will be given to illustration in children's books to enlighten when images support or subvert text to carry deeper emotional resonance. The comparative conclusion will highlight the cross-cultural dynamics of representing loss and trauma for children in the implications of emotional development. Understanding these differences helps to ascertain new insights into how children's literature reflects broader values and societal attitudes. This research is supported by academic sources and primary material, including artwork in children's literature and writings from the period.

Germano Correa Silva de Carvalho

FL - University of West Florida

Discipline: Computer Science

Authors:

#1 Brittany Lane

#2 Sikha Bagui

#3 Asmi Mishra

#4 Stephanie Eager

#5 Dustin Mink

#6 Subhash Bagui

Asmi Mishra

Abstract Name: Unsupervised Detection of Cyber Threats Using K-means Clustering on the UWF-ZeekDataFall22 Dataset

In the rapidly evolving landscape of network security, the detection of advanced persistent threats (APTs) and zero-day attacks has become increasingly critical. Traditional intrusion detection systems (IDS), which rely on signature-based methods, struggle to recognize new or emerging threats, as they depend on predefined attack patterns. To address these limitations, this research applies unsupervised machine learning techniques, specifically K-means clustering, to enhance the detection capabilities of IDS. The study utilizes the UWF-ZeekDataFall22 dataset, a comprehensive collection of Zeek network traffic logs labeled with the MITRE ATT&CK framework, which categorizes various tactics and techniques used in real-world cyber-attacks. The primary goal of this research is to accurately distinguish between normal and malicious network traffic without the use of labeled training data. By experimenting with different cluster labeling strategies, the study finds that labeling clusters containing more than 50% attack data yields the highest precision and recall for identifying cyber threats. This unsupervised approach not only significantly improves IDS but also enables the detection of previously unknown and evolving attack patterns. Furthermore, the results demonstrate the adaptability of clustering techniques to identify and respond to cyber threats in real-time scenarios, where new, unknown attack behaviors may arise. The findings of this research underscore the potential for using unsupervised learning methods like K-means clustering to provide robust, automated monitoring of network security. With its capability to detect both known and novel attack patterns, K-means clustering offers a valuable and scalable tool for improving the efficiency and effectiveness of IDS in today's increasingly complex and dynamic cybersecurity environments.

Maia Correia-Fill

WI - University of Wisconsin-Milwaukee

Discipline: Dance

Authors:

#1 Maia Rose Correia-Fill

#2 Sonya Martin

#3 Mair Culbreth

Abstract Name: Creative Composition and the Correlation to the 21st Century American Contemporary-Dance Field

As the American contemporary dance field transitions into its next “era” due to evolving technological integrations, the patrons across the dance community desire new approaches to engage with original choreographic compositions. Within this adaptation, there is a call to investigate how dance artists can apply the tools within their artistic “toolbelt” to adapt to the unique needs, and future trends which define and shape the contemporary dance field. The following study investigates how creative compositional tools correlate to the unique mediums of the field, specifically within the post-covid-19 era, where dance artist practice their choreographic engagement within the physical and metaphysical world. This research contributes to the body of knowledge through the investigation of choreographic structures applicable in the 21st century. In addition to the study of compositional tools, this research aims to address trends in consumer behavior by investigating impactful ways to present one's artwork within a technologically autonomous environment. The research methodology is structured to use a qualitative descriptive model that employs auto-ethnography as the primary method of data collection. Over the course of 8 weeks, eight to ten participants will engage in seminar-style studio practice courses, where participants will be exposed to different compositional tools, then asked to reflect upon the perceived effectiveness for composing original work within technologically integrated mediums. This methodology is built upon Skains 2018 methodology for practice-based research in the fine arts, which culminates to a final creative artefact. My research and composition of this new dance has allowed me to continue to deepen my knowledge of composition tools codified within the era of post-modern dance, and how to wield them into the new and unique mediums of the 21st century.

Diego Cortes

FL - Miami Dade College

Discipline: Computer Science

Authors:

#1 Diego Cortes

Abstract Name: Enhancing Security with Combined RSA and AES Encryption Layers

This study presents a novel multilayer cryptographic security scheme that integrates RSA (Rivest-Shamir-Adleman) and AES (Advanced Encryption Standard) encryption techniques into a unified security system. RSA, a public-key encryption method, relies on the computational difficulty of factoring large integers, while AES, a symmetric-key encryption scheme, excels in securing large datasets with speed and efficiency. By combining these methods, the proposed hybrid system leverages the strengths of both algorithms: RSA for securely exchanging symmetric keys or handling smaller data sets, and AES for efficiently encrypting large volumes of data. Layering RSA encryption with AES enhances security by diversifying cryptographic primitives, making attacks significantly more challenging by requiring adversaries to compromise both public-key and symmetric-key algorithms. The study evaluates the security, computational performance, and practicality of this approach by testing it against well-known threats, including Man-in-the-Middle (MitM) and Side-Channel attacks. Findings demonstrate that the layered combination of RSA and AES creates a robust and resilient security model, offering practical solutions for modern cryptographic challenges.

Douglas Cortez Recinos

NC - Wingate University

Discipline: Biology

Authors:

#1 J. Alison Brown

Abstract Name: Does exposure to a male or female sibling in the womb affect reproduction in sheep? A preliminary study of the impact of sex of littermate on fetal loss in ewes

In litter bearing species, such as rodents and pigs, exposure to a male littermate in-utero may negatively affect the reproductive potential of female co-littermates as adults. In sheep, little is known about the effect of sex of littermate on the pregnancy rate and a ewe's ability to carry offspring to term. Based on previous studies, ewes born with a male co-twin (FM) or two males as triplets (FMM) had greater embryonic loss from ovulation to lambing, but the analysis did not include fertilization failure or fetal loss. Fetal mortality is often underestimated in domestic livestock and contributes to economic loss in the sheep industry. This study aims to determine if in-utero exposure to a female or male co-twin or triplet affects pregnancy rate and fetal loss in the adult ewe. Pregnancy diagnosis using ultrasonography was conducted on approximately days 35 to 50 of gestation in 1,189 ewes (927 as twins and 262 as triplets) at the U.S. Sheep Experiment Station from 2015-2017 and 2023 ranging from 1 to 6 years in age. Breeds included Polypay, Suffolk, Targhee and Rambouillet. Pregnancy and lambing rate, average number of fetuses and lambs born per ewe will be determined. Fetal counts at ultrasonography will be compared to corresponding lambing records to determine the percentage of total (complete pregnancy loss) and partial (reduction of litter size only) loss occurring in ewes born with a male or female littermate (co-twin or triplet). Statistical analysis will be determined by ANOVA using the PROC MIXED and procedure of SAS. We hope that examining this effect on pregnancy rate and fetal loss will provide greater insight into how interactions with male offspring in-utero may potentially affect reproduction in the adult ewe.

Thomas Cosenza

MA - Bridgewater State University

Discipline: Anthropology and Archaeology

Authors:

#1 Thomas Cosenza

Abstract Name: Understanding Juvenile and Adolescent Gorillas: Revisiting Gorilla gorilla gorilla (Western Lowland Gorilla): Supporting Conservation Efforts

Primatology has many applications relating to species conservation, population growth efforts, and understanding evolution. Non-human Primates in captivity deserve the best care available; understanding social development at a young age is critical in providing this. Western Lowland Gorillas were observed from the fall of 2022 through the summer of 2023 at Franklin Park Zoo. This group included 5 related individuals and one unrelated silverback male. The two youngest individuals, Aziza, age 7, and Pablo, age 3, were the focus of this research. Timed 1-minute intervals were used for focal observations approximately 3 times a week. Out of 22 behaviors, Pablo's highest active behavior was social play, at 7.52%. Eighty-six percent of this behavior was with his sister Aziza, with 24% spread among the other gorillas. Aziza was beginning to engage in more adult behaviors over the observation period, with increased time spent self-grooming. Overall, these two individuals showed typical age-appropriate behaviors for young gorillas, in a socially well adapted group. This shows the importance of maintaining a family-like group for gorillas to provide opportunities for species-specific social development in captivity.

lauren coshun

WI - Carthage College

Discipline: Communications

Authors:

#1 Lauren Coshun

Abstract Name: Social Media and Reputation Management

The rapid pace of social media has completely changed how companies respond to crises, making readiness and swift action critical to preserving reputation and trust. This thesis proves the importance of crisis management and image repair tactics through content analysis and by dialing into a real-world case study of a small business in Kenosha, WI: Rustic Road Brewing Company. Through an analysis of how small businesses might handle crises such as customer complaints, internal conflicts, and social media backlash, this study reveals practical ways to minimize crises despite fewer resources. It underlines the necessity of clear communication, proactive planning, and transparency to prevent minor problems from escalating. Ultimately, this study offers practical advice on how businesses can successfully handle crises while preserving their brand and encouraging customer loyalty.

Jenna Coss

WI - Alverno College

Discipline:

Authors:

#1 Alex Blom

#2 Mikelene Ray

#3 Megan Krueger

#4 Rebekah Klingler

#5 Lauralee Guilbault

#6 Susan Pustejovsky

Heather Mernitz

Abstract Name: The Powers Program: A Summer Research Experience Designed for Early Undergraduate Students

Alverno College is a women's college and the first Hispanic serving institution in Wisconsin, with programs aimed at expanding access to STEM education to women from historically underrepresented groups. Our Powers research program is unique in its emphasis on providing students with research experiences as early as their first summer (early researchers), while also offering opportunities customized for advanced students (advanced researchers). Our early researcher track aims to increase STEM identity, build skill and confidence in laboratory settings, and create competitive student researchers ready for subsequent off-campus research and internship experiences. We have designed our program around known best practices for first generation and underrepresented students, including an emphasis on community-based research. Student researchers conduct meaningful water analysis projects, sampling water from local waterways and sharing their results with community partners. During our six-week program, early student researchers attend weekly laboratory meetings and professional development sessions aimed at exploring STEM opportunities and providing academic advising assistance. Select advanced student researchers serve as peer mentors for the early

researchers, assisting faculty in supporting field and laboratory skill development. All student researchers are required to present their work at an on-campus research symposium, and we have developed a cohort model of travel that has been highly successful in supporting student research fellows to attend and present their work at regional and national professional conferences. Since 2018, we have supported 89 total student research fellows (63 unique student fellows) and participants have a 95% persistence rate in the college, with program evaluation suggesting gains in our student researchers in measures of persistence, self-efficacy in STEM, and personal identity as scientists.

Angelina Costa

OK - University of Oklahoma

Discipline: Nursing and Public Health

Authors:

Abstract Name: Barriers to Collegiate Education: Nursing School for Single Parents

AbstractThis study looks at the challenges that are faced by single-parent nursing students and what they encounter at UCO. Nursing School comes with challenges such as program costs, varying clinical schedules, software fees, liability insurance, and heavy cognitive load. Stress and anxiety are heightened during Nursing school. Parent students already experience stress and anxiety due to juggling and trying to balance everything and attend school. The review of the literature provides information on significant stressors such as financial constraints, lack of support systems, time constraints, parenting guilt, and lower graduation rates than peers without children. The literature reveals a gap in knowledge and research among this population of students, specifically single-parent nursing students. Many research articles are about parent students and the barriers faced by obtaining post-secondary education. The study proposes interventions to improve their educational experience. Using the Social Determinants of Health framework shows the correlation between SDOH and single-parent and parent students. This project proposes an on-campus childcare facility by showing a need through qualitative and quantitative research. The study discussed ethical considerations and outlined the research design for the proposal. The project aims to improve the educational environment for single-parent nursing students, enhancing their academic success and well-being.

Ashley Cota

OK - University of Central Oklahoma

Discipline: Nursing and Public Health

Authors:

#1 Ashley Cota

Abstract Name: Enhancing Rheumatoid Arthritis Care: The Promise of Natural Supplements

AbstractBackground: Rheumatoid arthritis (RA) is a chronic autoimmune disease characterized by persistent joint inflammation, causing debilitating pain, stiffness, and progressive disability. While conventional treatments like disease-modifying antirheumatic drugs (DMARDs) and biologics have significantly improved outcomes, many individuals still experience inadequate symptom control or adverse side effects. This highlights the need to explore complementary therapies that may enhance RA management and improve quality of life. Purpose: This proposal aims to explore the efficacy of natural supplements as adjuncts to conventional RA treatment. The focus will be on four commonly used supplements—omega-3 fatty acids, curcumin (derived from turmeric), ginger, and vitamin D—which have gained attention for their potential

anti-inflammatory and immunomodulatory properties that may contribute to symptom relief and improved disease outcomes. Method: A synthesis and critical evaluation of the current evidence-based practices and policies regarding the use of these natural supplements in RA management will be conducted. This evaluation aims to provide evidence-based recommendations for healthcare providers and patients considering the integration of these supplements into a comprehensive RA treatment plan. Conclusion: The existing literature supports the use of omega-3 fatty acids and curcumin as promising adjunctive therapies for RA, with ginger and vitamin D also showing potential in alleviating symptoms. These findings suggest that natural supplements may offer valuable complementary options for RA patients, enhancing treatment efficacy and improving quality of life. Keywords: rheumatoid arthritis, natural supplements, omega-3 fatty acids, curcumin, ginger, vitamin D

Cora Cotson

PA - Commonwealth University - Bloomsburg

Discipline: Education

Authors:

#1 Evelyn Spayd

#2 Carolyn Reid-Brown

Abstract Name: Byte Sized Attention: Exploring the Link Between Social Media Consumption and AI Usage in Academic Settings

Research Question: Is there a relationship between the duration of time spent engaging with the short-form social media content and the likelihood of employing Artificial Intelligence to aid in or complete class assignments? Artificial intelligence (AI) has been on the rise amongst students as a quick and simple way to complete assignments. The use of AI in the classroom has skyrocketed as new technology is developed and distributed at an unprecedented rate. At the same time, short-form content, such as videos on popular social media apps, are published and consumed by students at an even faster rate. Teaching professionals are claiming that it is becoming increasingly difficult to hold the attention of students, as well as encouraging students to produce original work. This has created a lack of student engagement with content material and overall attachment to classes and courses. Literature primarily focuses on the poor use of AI in the classroom, though research rarely focuses on why this may be. To address this gap, a mixed-method study using an explanatory sequential design will be used to analyze the relationship between the duration of time spent engaging with the short-form social media content and the likelihood of employing AI to aid in or complete class assignments. The study will be conducted at a state university in central Pennsylvania. A college wide survey will be administered focused on duration of screen time on social media apps and the frequency at which students use AI to complete assignments throughout a week. Focus groups will be conducted with randomly selected students to further understand the relationship between social media and AI use amongst peers. The anticipated conclusion is that the longer a student engages with short form content it will positively affect the likelihood of utilizing AI to complete/aid in class assignments.

Kathleen Cotterill

MI - University of Michigan - Ann Arbor

Discipline: Physics and Astronomy

Authors:

#1 Kathleen Cotterill

#2 Niko Speck

#3 Drew Vecchio

#4 Gabrielle Grey
#5 Mark Hammig

Abstract Name: Evidence of Low Energy Nuclear Reactions in Palladium Nanoparticles Exposed to Deuterium

The existence of “cold fusion”—potential nuclear reactions in a condensed matter, room-temperature environment—has been controversial since the 1990s when possible evidence of low energy nuclear reactions (LENR) emerged. Previous LENR experiments focused on heat generation in electrolytic cells, but heat-based experiments failed to demonstrate direct nuclear origin because they didn’t marry a nuclear active environment (NAE) with in situ, high-resolution radiation detectors. This study aims to discover evidence of LENR via measuring radiation by-products with solid-state detectors coupled to isotopic changes in the palladium nanoscale composite, as measured via energy dispersive spectroscopy (EDS). The study is experimental with the aim of developing a model of LENR. Palladium nanoparticles are solution-grown via a potassium tetrachloropalladate solution that is mixed with trisodium citrate dihydrate and tannic acid, centrifuged, and grafted upon an aramid nanofiber porous hydrogel. The dried composite is exposed to deuterium gas while adjacent silicon detectors survey the charged particle and photonic environment. The experiment is predicated on previous observations that the NAE resides in nanoscale potential wells which motivates the utilization of nanoparticles interconnected into a percolating network. The results indicate that after some period of deuterium loading, photons consistent with gamma-rays were produced as well as internal conversion electrons. Specifically, depending on the particular preparation conditions, gamma-rays and internal conversion electrons with energy of 477, 94, and 37 keV were spectroscopically detected. In some cases, these prompt reactions were accompanied by isotopic changes as measured via EDS. The appearance of gamma-rays suggests that nuclear reactions are occurring within the nano-composite. Next steps focus on reproducing the various measurements and localizing the NAE via transmission electron microscopic studies. Through discovering evidence of LENR, this research will allow for a greater understanding of nuclear reactions and the development of higher efficiency energy generation.

Grace Courter

IL - Loyola University of Chicago

Discipline: Anthropology and Archaeology

Authors:

#1 Grace Courter

#2 Paula Tallman

Abstract Name: Food Insecurity and Gender Based Violence on a Global Scale: A Scoping Review

In this study, we present the findings of our literature review investigating the association between food insecurity and gender-based violence on a global scale. It is well-documented that food insecurity, or the inability to access and benefit from affordable, adequate, reliable, safe, and healthy food, has many adverse repercussions for social wellbeing, nutrition, and overall health. However, the connections between food insecurity and gender-based violence (GBV) are just beginning to be documented. GBV is defined as any act of violence that results in, or is likely to result in physical, sexual or psychological harm or suffering, predominantly toward women. This includes sexual, physical, mental, and economic harm, as well as threats of violence, coercion, and manipulation. In this study, we conducted a literature review using databases including Research Gate, Google Scholar, and PubMed, as well as NGO websites, using the search terms (“gender-based violence” OR “intimate partner violence” OR “domestic violence”) AND (“food insecurity” OR “nutrition”). The inclusion criteria for scoping the reviewed studies were a) published in English, b) focused on studies that focus or mention the association between food insecurity and GBV, and c) published within the past 10 years (2014 to 2024). In total, 13 studies met our inclusion criteria. Reviewing these studies revealed that being food insecure is associated with higher rates of experiencing GBV. In this poster,

the authors present the main mechanisms connecting these phenomena and identify potential pathways to developing interventions that tackle these linked phenomena.

Simone Coucher

VA - Norfolk State University

Discipline: Visual Arts

Authors:

Abstract Name: From Ruin to Radiance: Harnessing the Power of Art for Social Change

From Ruin to Radiance is a triptych that addresses ruinous flooding issues in marginalized communities within Norfolk, VA. These works capture natural efforts to enhance our environment through a timeless renewal of an urban environment. We invite you to engage with this exploration of flood-threatened shelters that can be uplifted to ensure a more sustainable and equitable present. As a mixed media artist, I explore the relationship between humanity and the environment, particularly in the context of climate change. For this project it was my vision to show the vitality created in environments through green infrastructure. My works depict the beauty and radiance that can arise from destruction through our ability to adapt and know that we all can coexist and benefit from natural habitats. My inspiration for these works comes from Nina Jordan's art, which explores themes of safety and security in the places we call home. I am also influenced by Xavier Cortada, who uses his art projects to raise awareness about climate change, rising sea levels, and threats to biodiversity. My research included: Peer-reviewed articles. Attending conferences to learn more about the subject. Collaborating with my community to explore ways to reduce global warming effects. Encouraging viewers to install rain barrels can reduce stormwater runoff pollution and enhance groundwater filtration, ultimately helping to conserve our water bodies.

Kyla Covato

PA - Duquesne University

Discipline: Engineering

Authors:

#1 Taylor Stovall

#2 John Viator

Abstract Name: Discovering the Effect of Red Blood Cell Lysis Buffer on the ESKAPE Pathogens

Healthcare associated infections caused by antimicrobial-resistant ESKAPE pathogens are currently a leading cause of mortality and morbidity worldwide. ESKAPE stands for *Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, and *Enterobacter* spp. Photoacoustic flow cytometry (PAFC) transforms light waves into sound waves and is used to detect optical tags which attach to analytes such as cells. The tagged analyte is flowed through a 3D printed flow chamber and interacts with a pulsed laser light at 532nm, via optical fiber. It produces ultrasonic sound waves that are amplified by a transducer and stored in an oscilloscope. We use bacteriophage as an optical tag for bacteria by removing the capsid containing the bacteriophage DNA and replacing it with a larger, dyed microsphere which increases the optical absorption of the bacterium. Red Blood Cell Lysis Buffer (RBCLB) is used to lyse red blood cells from whole blood samples. Combining this knowledge, we aim to develop a novel method to rapidly identify the ESKAPE pathogens in whole blood samples, using PAFC analysis, to improve the diagnosis timeline for healthcare associated infections. Extracting bacteria from whole blood adds a new

level of complexity and requires a lysis step prior to PAFC analysis. It was hypothesized that growing each of the ESKAPE pathogens in PBS versus RBCLB would indicate if the lysis buffer posed a threat to the survival of bacteria during the lysis process. The following procedure was executed for each type of bacteria: culturing, diluting, plating, data collection, and statistical analysis via Mann-Whitney U test. We found that RBCLB had a strong effect on the gram-negative strains and some effect on the gram-positive strains. Future research includes collecting more data, infusing whole blood samples with bacteria, lysing the sample, and detecting the bacteria using photoacoustic methods.

Ann Crabtree

LA - Louisiana State University, Baton Rouge

Discipline: History

Authors:

#1 Meredith Veldman

Abstract Name: Experimental Ethics: Twentieth-Century British Chemical and Biological Warfare Trials

Twentieth-century British science may be characterized by significant wartime influence, empirical frameworks, and civilian scientists paving the path for twenty-first century bioethical standards in experimentation. These factors, in conjunction with popular debates surrounding the use of chemical and biological weapons, manifested in a larger discussion, lead in many cases by scientists, of the ethics of experimenting on humans and animals, particularly in such chemical and biological weapons trials. These experiments built upon the Listerian age of experimental medicine and pushed the ill-established bounds of bioethical experimentation such that a new, radical form of patriotic exceptionalism in scientific experimentation was born out of the chemical age, and coterminously, civilian scientists carved a convoluted path to each of the tenets of bioethics as part of a broader reaction to wartime science. This dichotomy significantly impacted the trajectory of western physiological trials, medical practice, and medical education well into the twenty-first century, resulting directly in widespread recognition of autonomy, non-maleficence, beneficence and justice. Via analysis of records of researchers and trial participants, existing literature, archival materials, and legal documents, this project examines the extent to which the establishment at Porton Down and its colonial counterparts established a new framework for bioethics, how civilian scientists functioned and communicated within a military framework, and whether bioethical malfeasance—in terms of non-consensual experimentation, animal testing, and lethal experiments as a means to an end—can be justified by the law, popular opinion, or otherwise, through an intellectual and material historical framework. This study further establishes the intersectional nature of material history, intellectual history, and historiography necessary for a comprehensive contextualization of twentieth-century approaches to physiological experimentation in the British chemical and biological weapons development programs.

Joseph Crachiola

MI - Wayne State University

Discipline: Mathematics

Authors:

#1 Fernando Charro

#2 Arijit Ghosh

#3 Brielle Komosinski

Abstract Name: A Discrete Pizzetti Formula and Applications to Digital Image Reconstruction

Pizzetti's "mean-value formula" expresses the average of a function over a ball or sphere as a power series involving its iterated Laplacians. We show a discrete formula that approximates mean values of functions of two real variables based on Pizzetti's formula. Similar to the five-point stencil for the Laplacian, we approximate iterated Laplacians by taking the value of the function on equally spaced points on a circle. Through Taylor expansion, we get the derivatives necessary to obtain the iterated Laplacians in Pizzetti's formula for two dimensions. As the number of points in the discrete approximation goes to infinity, the coefficients obtained by this method approach the coefficients in Pizzetti's formula. We also explore when the coefficients obtained are equal to those of Pizzetti's formula. Our discrete Pizzetti formula has applications in digital image reconstruction, or inpainting, the process of recovering lost or damaged information in images, which in many cases, involves taking the average of a function in some set near a specific point.

Nancy Craig

FL - The University of Tampa

Discipline: Psychology

Authors:

#1 Nancy Craig

#2 Meredith Elzy

Abstract Name: Gradual Reduction of Self-Injurious Behavior: An Investigation into Clinicians' Perspectives Through the Theory of Planned Behavior

Self-harm is increasing at alarming rates. The DSM-5-TR defines non-suicidal self-injury (NSSI) as deliberate bodily harm without the conscious intention of causing death. Although several evidence-based NSSI treatments exist, these significant increases suggest a need for additional approaches. Most NSSI interventions require immediate cessation of the behavior leading clients to feel unsupported and frustrated with their autonomy, often resulting in the discontinuation of services. Recent literature suggests that harm-reduction techniques used for substance use disorders may be effective for NSSI. When abrupt cessation is not practical, harm-reduction aims to reduce the dangerous consequences of the behavior. This approach enhances client autonomy, leading to improved therapeutic relationships and treatment outcomes. This study will examine mental health practitioners' attitudes toward harm-reduction and gradual reduction approaches to treat NSSI. This involves the gradual decrease in frequency, intensity, and/or life-threatening nature of self-harming behavior by breaking it into smaller, more manageable goals. The Theory of Planned Behavior (TPB) will serve as the theoretical framework to measure how practitioners' attitudes, subjective norms, and perceived behavioral control influence their willingness to adopt gradual reduction approaches for NSSI. A mixed-methods survey approach will be used, with approximately 50 participants recruited from mental health facilities and doctoral-level training clinics in Tampa, Florida. Data will be collected anonymously through Qualtrics surveys. We anticipate that practitioners with more years of experience will have more positive attitudes towards a gradual reduction approach to NSSI in inpatient and outpatient settings. Additionally, we hypothesize that there will be a difference in overall TPB constructs among all practitioners depending on setting, with those in inpatient settings indicating more support for these interventions. This research aims to expand the current understanding of NSSI treatment by exploring the feasibility and acceptability of gradual reduction, which can result in complete abstinence, improving chronic self-injury recovery successes.

John Crain

NC - Western Carolina University

Discipline: Engineering

Authors:
#1 Matt Clontz

Abstract Name: Method for Assessing Obstacle Height in Mountain Bike Trails Using a Distance Sensor Array

Advanced development techniques for mountain bike systems are becoming increasingly prevalent as both recreational and professional athlete interest in mountain biking has grown. Some advanced development techniques can utilize trail profile data for specific trails in order to create new specialized components or fine tune parameters of existing components. However, information regarding the measurement and modeling of such surface profiles is severely limited. One possible method to measure trail profiles is to use a set of distance sensor arrays. The present work is an investigation of a configuration which consists of two arrays of three sensors each, one set mounted on the front wheel hub and another set on the rear hub of a standard mountain bike. By utilizing measured values from the arrays, a geometry-based algorithm and case structure have been developed to determine obstacle heights for several scenarios. The scenarios which were investigated in the current work include a single obstacle at each wheel and obstacles of different heights at both wheels simultaneously. The developed algorithm was able to successfully determine obstacle heights for each of the aforementioned scenarios. One limitation of the present work arises with the transition to experimental application. For modelling purposes, the distance sensor field of view (FoV) was treated as single line, while the actual FoV of most distance sensors is typically conical in shape, which could lead to errors in the current algorithm and inaccurate data. Future stages of this work will investigate mathematical modelling with these conical measurement scopes and experimental validation.

Gwendolyn Crain

TX - Lone Star College

Discipline: History

Authors:

Abstract Name: Doll Liberation: Barbie's Evolution in the Second Wave of Feminism

The release of the Barbie movie in the summer of 2023 reignited debates about feminism and representation surrounding the iconic doll. This paper investigates the conjunction of feminism and intersectionality through the lens of Barbie, tracing her evolution throughout the Second Wave of Feminism. By contextualizing Barbie's history within the broader framework of feminist movements, this research argues that the franchise was more forward-thinking in addressing intersectional issues than critics and historians typically acknowledge. Through a unique historiographical approach to analyzing primary sources, media, and biographical materials, this paper traces Barbie's journey as she evolves into a more inclusive franchise, influenced by powerful feminists and civil rights activists. By highlighting the complex relationships between gender, intersectionality, and women's rights, this paper concludes that Barbie serves as a powerful emblem of womanhood, inspiring women to not only pursue diverse careers but also actively engage in feminist movements.

Kirstyn Crane

KS - Benedictine College

Discipline: Biology

Authors:
#1 Virginia Huddleston
Juliette Lange

Abstract Name: Expediting Diapause in *Osmia lignaria* Through Temperature Manipulation

Temperature has been thought to play a key role in diapausal emergence for insects and tested in several species; however, its relative importance compared to other factors is still widely disputed. We analyzed the effects of expediting diapause in the hymenopteran species *Osmia lignaria*, a popular pollinator used in commercial and amateur agriculture or gardening. Our previous study (the first of its kind) found that mimicking seasonal temperatures in a shortened period resulted in early emergence from diapause. We specifically looked at the effects of expedited diapause on longevity, emergence synchronization, and emergence rates using three different treatment groups: a control, following standard overwintering processes, a natural treatment group undergoing expedited seasonal temperatures with daily fluctuations, and a treatment group undergoing stable expedited seasonal temperatures. Each group contained around 40 bees. The controls were kept at 1.1°C throughout November-April, then taken out to begin the emergence process. For the stable treatment group, we decreased the temperature by 12°C every five days to 1.1°C and left them for a month, increased the temperature to 3.9 °C, and left them for another month. Following this, we increased the temperature every 3 days by 12°C until we reached 21°C. The day/night fluctuating group followed the same schedule listed above; however, for each day, a high and low temperature was predetermined using a random number generator. Analysis is ongoing. If our results show it is possible to get *O. lignaria* out four to five months early with minimal impacts on efficiency, longevity, and synchronization, this could change the solitary bee and agricultural industry completely. *O. lignaria* could pollinate and improve the crop quality of crops previously inaccessible to them, allow for staggered generations, and more control on when and what *O. lignaria* emerges and pollinates.

Kirstyn Crane

KS - Benedictine College

Discipline: Biology

Authors:
#1 Virginia Huddleston
#2 Terry Malloy

Abstract Name: Non-Target Effects of S-Methoprene on Solitary Hymenopterans

One of the most problematic threats facing pollinators today is the extensive usage of pesticides. The non-target effects of pesticides have come under intense scrutiny in the last two decades, yet S-Methoprene has remained understudied. S-Methoprene is a larvicide found in over 500 different products and is a competitive inhibitor of the Juvenile Growth Hormone (JGH), a key factor in several developmental processes. Due to its mirrored hormonal structure, S-Methoprene can be absorbed through the larval skin and sit on JGH active sites preventing successful development in most insects. S-Methoprene's low specificity and placement in water sources used by many insect species could lead to many non-target effects in pollinators. I tested the non-target effects of this larvicide by collecting hymenopteran larvae from the Mullen's Pollinator Meadow from May-July 2024, and dosing treated larvae with two drops of 0.00245 g/L concentrated S-methoprene from Amdro brand mosquito dunks. Following this, I tracked their development daily, noting instar changes, cocoon formation, pre-pupal transitions, and living status. I then used chi-squared contingency tests and two-sample t-tests to analyze differences in mortality, time survived, and developmental advancement rates between the treatment and control larvae. Overall, I collected 98 larvae from *Isodontia Mexicana* (35) and *Ancistrocerus adiabatus* (63) with 47 control larvae and 51 treated larvae. My results showed treated larvae were 3.5 times more likely to die, had a significantly lower mean time alive, and are 3 times less likely to

advance to the next instar following treatment than control larvae. These results show that S-Methoprene could have serious non-target effects for hymenopterans and pollinators in general. More studies need to be done to understand the true ecological impact that this chemical has, as well as other effects it may have on pollinators.

Mita Crane

PA - Lafayette College

Discipline: Economics

Authors:

#1 Christopher Ruebeck

Abstract Name: Debugging Virtual Corporate Reality: a Gamified Market Simulation of Salop's Circular City Model

Virtual Corporate Reality (VCR) is an interactive model of market simulation, based on Salop's circular city model, a variant of Hotelling's linear city model. The model consists of a circular market structure, where product differentiation is captured by spatial positioning around the circle. In this web exercise, students are assigned to teams of "firms" with an initial endowment of cash and a single differentiated good equidistantly located from other teams. These student firms then set prices, announce new products, and relocate old products with the objective of generating profit to achieve a higher grade in a class context. Our analysis focuses on class gameplay data from 11 industries, each containing three student firms. The challenge in this project was to identify the source of the Perl code's incorrect demand calculations. We ran experiments on the VCR system under various conditions to isolate the effects of factors including product placement, industry number and composition, and pricing strategy. We conducted analysis of diverse presentations of the bug by comparing displayed demand calculations with results from the formula for demand and expected estimations from the system. We identified product collocation, identical pricing, and the relative number of products in neighboring industries as the features that created the incorrect demand calculations. These findings allowed us to correct code that improperly indexed arrays in the neighboring industry, interfering with indexing in the industry where the bug occurs. This research contributes to the improvement of educational tools used in industrial organization and game theory market simulations.

Morgan Crase

KY - Morehead State University

Discipline: Education

Authors:

#1 Timothy Simpson

Abstract Name: The Secret Garden: How Classic Children's Literature Tends Virtue

This research highlights the importance of reading classic children's literature by establishing the genre's transformative influence on an individual's development, a unique impact that has a lifelong effect on its reader. By exploring the scholarship of education philosophers such as William Kilpatrick and Vigen Guroian, as well as the essays of classic children's storytellers such as J.R.R. Tolkien and C. S. Lewis, this research examines the role of classic children's literature within the development of a child's healthy imagination, moral code, personal identity, and sense of cultural literacy. The findings of this research conclude that it is classic children's literature's ability to cultivate a child's moral imagination, a term

popularized by political philosopher Russell Kirk, that bestows its lifelong, transformative impact on its reader. The process in which one develops their scope of imagination, morality, and identity through exposure to classic children's literature will be metaphorically illustrated through the events of Frances Hodgson Burnett's classic tale, *The Secret Garden*. Mary Lennox's experiences tending the secret garden will be explored on the levels of the soil, seeds, flowers, and the garden itself to symbolize a child's imagination, moral formation, personal identity, and cultural literacy.

Noah Crawford

MI - Wayne State University

Discipline: Sociology

Authors:

#1 David Merolla

Abstract Name: Navigating Parental Involvement: How Demographics and COVID-19 Have Reshaped Educational Engagement

Research consistently links parental involvement to improved academic outcomes, yet defining and measuring it remains complex due to its multifaceted nature. Using data from the National Household Education Survey's (NHES) Parent and Family Involvement in Education (PFI) surveys conducted in 2019, 2023, this paper examines how parental involvement in education has evolved before and after the COVID-19 pandemic, focusing on disparities across race, income, educational attainment, and household structure. Descriptive and bi-variate analyses will establish baseline associations between demographic factors and parental involvement indicators. Regression analyses will isolate confounding factors, and comparison t-tests will identify significant shifts in patterns of involvement between 2019 and 2023. The expected findings aim to give insight into how the pandemic influenced parental engagement, with a focus on whether it exacerbated educational disparities or fostered new attitudes and practices, particularly among minority groups. By contextualizing these changes, this research seeks to inform strategies and practices that foster educational equity as schools and families navigate the post-pandemic era.

Amy Creamer

MD - Bowie State University

Discipline: Chemistry

Authors:

#1 Kylie Harris

#2 Greg Walters

#3 Oluwabusayo Salau

Brianna Reader

Romello Brown

Abstract Name: Vitamin C Content Lost in Cooking Yellow Bell Peppers

This study thoroughly investigates the determination of ascorbic acid (vitamin C) content in commercially available products and food items using titration techniques. Ascorbic acid is a water soluble nutrient found in some fruits and vegetables and has many benefits including immune system support. It can also help stave off cardiovascular disease and cancer and helps with the absorption of other nutrients such as iron. The main goal is to establish a reliable and efficient method for determining the ultimate storage conditions that result in the

highest concentration of vitamin C, a crucial antioxidant that plays a vital role in human health. The experimental approach involves titrating the samples, employing 2,6-dichloroindophenol (DCIP) as the titrant, chosen for its ability to exclusively oxidize ascorbic acid without affecting other potential substances. Additionally, DCIP serves as a self-indicator in the titration process. For a substance to function as a self-indicator, it should exhibit one color when in the presence of excess analyte (i.e., ascorbic acid) and a different color when the analyte has completely reacted, which allows for the calculation of the amount of ascorbic acid present in the sample. The study explores the optimization of storage conditions, to enhance the amount of vitamin C concentration. The purpose of this project is to show that consuming raw yellow bell peppers will provide the highest Vitamin C content and also to show that by cooking yellow bell peppers, a significant amount of Vitamin C is lost not only in the cooking process, but in the water strained from the peppers after cooking.

Hannah Creely

PA - Carlow University

Discipline: Psychology

Authors:

#1 Jennifer Roth

#2 Clara Cheng

Abstract Name: Sound Tracking and Localization in Blind Athletics

Blind and Visually Impaired (BVI) tennis is played with foam balls containing a mechanical rattle that makes a sound only while changing its momentum. The present study examined the effects of head placement and age on sound localization and tracking in blindfolded participants. The findings can benefit blind athletics as we can learn how to both optimize players' sound localization ability, leading to more efficient coaching techniques that can increase success and enjoyment of the sport, as well as retention of new players. In this study, sighted and blind participants aged 18-60 were blindfolded as BVI tennis balls were tossed at them by a researcher standing 20 feet in front of them. The balls were thrown at five different target points at -15° , -7° , 0° , 7° , 15° from where the researcher was standing. In 3 blocks of trials, participants had both ears, left ear, or right ear towards the researcher tossing the balls. The ball bounced three times before reaching the target point. Participants stood in the "ready" position with a standard tennis racket, assuming a high squat so that the head of the racket touched the ground, and shuffled laterally to make contact with the BVI tennis ball. Another researcher sat behind the participant giving hand signals to communicate which target the first researcher should be tossing to, and logging the participants' performance. Participants were significantly more successful at contacting the ball when both ears faced the ball rather than just one. There was not enough data collected to confirm the effect age has on the general population's sound localization and tracking abilities. As blind tennis grows worldwide, coaches of sighted athletes who typically have players turn to hit a ball, will know to coach blind athletes to keep both ears pointed toward the ball.

Michael Crenshaw

FL - Florida International University

Discipline: Art History

Authors:

#1 Daniel Guernsey

Abstract Name: Dissecting Heterocosmic Fictions Through William Blake's Laocoön (c. 1826-7)

To understand and interpret William Burke's Laocoön, I intend to analyze the Romantic's way of narration and creativity, the expression of 'things as they might be and ought to be'. M.H Abrams provides a crucial concept of the Romantic movement – the "Heterocosmic" model of Romantic fiction – which emphasizes the imagination when interpreting the natural world. Contemporary thinkers from the Sturm und Drang movement would react to the post-Kantian theories of beauty, and give not only beauty its autonomy, but also the work of art. By using the imagery of the Vatican's Laocoön Group, Blake's etching offers insight on the heterocosmic reality that exists within each and every piece of art. Blake's etching evokes three layers of visual storytelling – The mythic account of Laocoön, Blake's reinterpretation of Apollo as the 'Angel of the Divine Presence', and the visual rhetoric of the engraving itself, appearing as a manifesto of Blake's theology. Embellished with allegorical proverbs, Blake attempts to syncretize the Greek and Hebrew divine within Laocoön through a chaotic visual approach, protest against the Greek classic, and work of the imaginative and contemplative viewer. In this paper, I will consider philosophy behind Romanticism, the heterocosmic fictions of literature, contemporary Romantic artwork, and the role Gnosticism played in Blake's radicalism against the Enlightenment and Neoclassicism in Laocoön.

Morgan Cromwell

MN - College of Saint Benedict/ Saint John's University

Discipline: Biology

Authors:

#1 Morgan Cromwell

#2 Maddy Fuller

#3 Emilia Edel

#4 Preston McGraw

Maddy Fuller

Emilia Edel

Abstract Name: Is There a Difference in Bird Diversity Among Prairie and Lake Habitats in Central Minnesota?

Biodiversity plays an essential role in ecosystem stability. Habitat changes from human activities also threaten this role. Our study examined how habitat type and urbanization affect the number of birds and bird diversity across two campuses in central Minnesota. The first campus is rural Saint John's University (SJU), and the second is suburban College of Saint Benedict (CSB). We predicted that there would be more bird species in habitats with water as compared to habitats without water bodies. We also predicted that bird species numbers would be greater on SJU, which has a large natural area, which CSB lacks. Observations were conducted weekly in prairie (non-water adjacent) and water-adjacent areas, at four locations over two months. Data was analyzed with chi-square goodness of fit. We did not find a significant difference in bird numbers between habitat types ($\chi^2=1.080$, $df=1$, $p=0.299$). We did find a significant difference in type of bird group found in the habitats (songbirds, corvids and waterfowl). Based on the data results, songbirds and corvids preferred prairie habitats, while waterfowl preferred water-adjacent areas (songbirds: $\chi^2=6.231$, $df=1$, $p=0.012$) (corvids: $\chi^2=341.822$, $df=1$, $p<0.0001$) (waterfowl: $\chi^2=455.008$, $df=1$, $p<0.0001$). Additionally, due to data limitations, we could not draw a clear conclusion about the differences in bird diversity between the two campuses. Our findings highlight the importance of conserving habitats to support bird populations and maintain ecosystem balance. Further research is needed to better understand biodiversity patterns in both urban and rural environments.

Elyse Cronic

OK - Oklahoma State University

Discipline: Biology

Authors:

#1 Karen Wozniak

#2 Toby Nelson

#3 Brittney Conn

Abstract Name: Identification of the Antifungal Mechanism of EIPE-1 against *Cryptococcus neoformans*

Cryptococcus neoformans is a fungal pathogen found in soil and bird droppings that causes severe infections in immunocompromised and immunocompetent individuals. Cryptococcal meningitis, a serious manifestation, affects approximately 152,000 HIV/AIDS patients annually, resulting in 112,000 deaths worldwide. Current antifungal treatments are limited by toxicity and increasing resistance, underscoring the need for novel therapeutic options. Our lab identified a eumelanin-inspired compound, EIPE-1, with significant antifungal activity against *C. neoformans*. EIPE-1 treatment results in abnormal fungal cell morphology and alters the regulation of genes responsible for cell wall synthesis, membrane assembly, and cell stress responses. Based on these findings, we hypothesize that mutations in these pathways confer resistance to EIPE-1. To test this, we screened mutants from the *C. neoformans* mutant library, focusing on transcription factors, kinases, and phosphatases. Mutants were co-cultured with an m-cherry fluorescent cryptococcal strain and treated with the minimum inhibitory concentration (MIC) of EIPE-1 or left untreated as controls. Flow cytometry analysis after 24 hours showed that most mutants were more susceptible to EIPE-1 than wild-type strains, suggesting EIPE-1's efficacy in targeting key pathways. Future experiments will validate these findings by exposing mutant strains to increasing EIPE-1 concentrations to confirm resistance patterns. Additionally, Western blot analyses will examine protein phosphorylation in relevant pathways, providing insight into the mechanism of action of EIPE-1. These studies aim to pinpoint how EIPE-1 interacts with critical fungal signaling pathways, offering a foundation for its potential development as a novel antifungal therapy. By addressing the rising resistance to current treatments, EIPE-1 may represent a significant advancement in combating life-threatening fungal infections such as cryptococcal meningitis.

Kiara Cronin

NC - Elon University

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

#1 Kiara Cronin

#2 Amy Allocco

Abstract Name: Traditional Faith, Contemporary Doubts: Is Christianity Adapting to Generation Z?

This study analyzes how members of Generation Z interact with the Christian church and considers whether these interactions are different from how members of Generation X engage with religion. The focus is on the generations' differences in socialization to see if they account for divergences in their faith identities. The researchers paid special attention to social media to see if its use impacts participants' faith practices or lack thereof. Drawing on several focus groups and individual interviews with eight members of Generation X and ten members of Generation Z, the team sought to identify environmental factors that may have contributed to participants' generational differences vis-a-vis faith. The researchers used thematic coding with Dedoose software to analyze participants' experiences with religion and the Christian church and to better understand intergenerational trends in faith formation. The researchers' findings indicate that Generation Z is open to human difference, community is important and may impact people's faith life, and the Christian church is slowly evolving to reflect the needs of the current era.

Ethan Crosby

PA - University of Pittsburgh

Discipline: Computer Science

Authors:

#1 Ethan Crosby

#2 Hurt Griffin

#3 Shovan Bhatia

#4 Michael Kann

#5 Regan Shanahan

#6 Jacob Biehl

#7 Edward Andrews

Hurt Griffin

Abstract Name: Mixed Reality's Utility for Segmenting Large Displays in Medical Settings

Background: Presenting information via holographic windows during endovascular surgery may decrease cognitive load by mitigating the split-attention effect, and allow intraoperative adjustment, overcoming limitations of conventional large monitors, thereby potentially revolutionizing surgical interfaces and improving patient outcomes. Endovascular surgeries, including cerebral angiographies, and stroke rescue therapies are common medical procedures during which a catheter is inserted into an artery and passed through a patient's vasculature. During these procedures, the surgeon is required to consume many different information streams at once including preoperative scans, and intraoperative X-ray feeds. Currently, many angiography systems provide this information on a single large monitor. This solution comes with significant drawbacks from a usability standpoint. During the procedure, surgeons must maintain a sterile surgical field, which prevents their physical interaction with the monitor. Methods: We are currently working on a study to determine the difference in behaviors when referencing information on a large monitor compared to mixed reality. After developing an understanding of how virtual monitors are utilized during fine motor tasks, we hope to explore new approaches for hands-free interaction. Concurrently, we are investigating its benefits for surgical ergonomics. Additionally, we plan to run a study regarding occlusion resolution strategies. Results: In a study designed to investigate the benefits of mixed reality systems in information-mediated tasks, we found no significant difference in performance. However, in interviews, almost every participant noted the task-dependent nature of information display replacements. Conclusion: Augmented reality presents opportunities for users to interact with information without limitations of the physical world, and the requirements of endovascular procedures create an important use case for these techniques. By developing a better understanding of user behavior when presented with holographic monitors in the operating room, we can begin to work toward designing better surgical interfaces in mixed reality to decrease task load, and save lives.

Key Crosley

OK - University of Central Oklahoma

Discipline: Mathematics

Authors:

#1 Brittany Bannish

Abstract Name: Agent-Based Modeling of Fibrin Fiber Network Formation

Blood clots are held together by a network of fibrin fibers. It is widely accepted that fibrin networks form through lateral aggregation (forming parallel, chain-like networks of fibrin) and branching. However, new imaging is showing a potentially different formation mechanism, one that involves existing fibrin fibers forming a “criss-cross” structure when one fiber comes into contact with another. Our agent-based model aims to render accurate fibrin interactions to better understand how fibrin networks form. We model individual fibers that rotate and move randomly each timestep. The fibers are represented by a single line with a radius around the midpoint to indicate the interaction region. To start, 60 fibers are randomly oriented and placed inside the “world.” As time progresses and fibers move, any portion of the fiber may enter the radius of another. When this occurs, they stick together and stop in place. We adjust different variables to coincide with different physiological conditions to see which produce results most like experimental output. Early results of our random-motion model suggest that biologically accurate interactions are only possible if the fibers have first reached a critical length. Future models may measure interaction angles, allow for fibers of different lengths, and include details of fiber polymerization.

Ashley Crowl

MN - Bemidji State University

Discipline: Environmental Science and Sustainability

Authors:

#1 Miriam Rios-Sanchez

Mikenna Pattrin

Jordyn Harvey

Abstract Name: Mapping Aquifer Layers and Determining Hydraulic Properties of Glacial Aquifers to Assess Surface-Groundwater Connectivity in the Shingobee River Watershed, Minnesota

Groundwater in Minnesota is an important topic for a variety of water resource uses. The abundance of these water resources allows for large quantities to be used for the purposes of agriculture, industry, human consumption, and generation of power. Understanding the relationship of groundwater and surface water in Minnesota is also important for water resource management. Excessive use of pumping causes stress on aquifers around the state. Mapping the aquifer layers and determining their properties and the degree of confinement is valuable for management. This study was conducted at the Shingobee experimental site, which was originally run by the USGS before being transferred to the University of Minnesota and Bemidji State University in 2022, to study the 28 square kilometer watershed in physical, chemical, and biological aspects. The primary objective was to identify the layers that store and transmit groundwater, and map their spatial distribution. The secondary objective was to analyze pumping test data to determine hydraulic properties such as hydraulic conductivity, transmissivity, and storage coefficient, and to understand the flow regime and connectivity within the layers. The data was collected from observation wells along with information from the Minnesota County Well Index. Cross-sections based on well logs were created for layer mapping. Pumping tests data was analyzed qualitatively to understand flow regimes and quantitatively to determine hydraulic properties. Three aquifer layers were identified and mapped. Pumping test data indicates that these layers are hydraulically connected.

Mary Crowley

PA - University of Pittsburgh School of Nursing

Discipline: Nursing and Public Health

Authors:

Abstract Name: Bridging the Gap: Developing an LGBTQIA+ Resource Toolbox to Enhance Nursing Education and Culturally Competent Healthcare

Background: Despite AACN efforts to promote diversity, equity, and inclusion, significant gaps persist in nursing education concerning LGBTQIA+ healthcare. Research indicates 80% of nurses receive little/no formal education on LGBTQIA+ health. LGBTQIA+ individuals face inequitable health outcomes due to provider biases and lack of clinical training. A scoping review of nursing LGBTQIA+ health education emphasizes the need for comprehensive resources to improve provider education and reduce disparities. Purpose: An LGBTQIA+ Resource Toolbox was created to educate nursing students, nurses, and healthcare providers on delivering informed, culturally competent care to address gaps in nursing curricula. Methods: An LGBTQIA+ Resource Toolbox was developed to provide current information on LGBTQIA+ care for educators, students, and healthcare providers. The toolbox contains resources specific to LGBTQIA+ health. First-time and return-users are invited to complete a survey assessing their knowledge and current practices toward LGBTQIA+ care. Data is collected on demographics, knowledge, and healthcare practices. Returning users are asked about practice changes after using resources. Results: Most users (126) are female, white, and heterosexual; 4 identified as non-binary. Most users are 20-29 and 50-59 years old. The toolbox reached nurses and providers in 29/50 states with 40.8% practicing in the Northeast. Self-reported practices of inclusive care by first-time users included: 17.11% ask pronoun/name, 9.21% ask about sexual orientation/identity/expression; 18.42% intake/medical forms include pronouns/name, 11.4% use inclusive posters/resources on LGBTQIA+ health; sexual orientation and gender identity is included in employment's nondiscrimination policies (14.04%) and single-stall restrooms (10.09%) are reported by users. Return-users reported improved knowledge and attitudes after using the toolbox. Conclusion: Based on survey results, there is strong engagement among users of the LGBTQIA+ Resource Toolbox. Results of the survey demonstrate interest in implementing changes in clinical practice to better support LGBTQIA+ patients.

Tyler Crupe

PA - Susquehanna University

Discipline: History

Authors:

Abstract Name: "The Hanging Place: America's First Civil War in Monmouth County, New Jersey"

Many contemporary historians see the American Revolutionary War as localized civil wars fought within different military frontiers, each being waged along different lines but containing similar events. Monmouth County, New Jersey is one of these frontiers that saw heavy fighting due to reasons such as property rights and vengeful militia units. The county's story has been analyzed as a civil war before, but not compared with other fighting areas or how the area and fighting changed over time. This project aims to determine the factors and causes of a civil war within revolutionary Monmouth County and how they relate to the larger scope of the war and tell a unique and separate story within the county. Monmouth County had significant involvement in a military frontier and in the American Revolution as a whole. This project aims to build on previous theories by other historians to prove that Monmouth County experienced significant fighting and change during the war and can fall under the theory of being a civil war. The violence seen within its borders is significant to the story of the Revolutionary War but also holds a unique space within its story. I have analyzed multiple primary sources, including letters from Monmouth's citizens, legislation to ban loyalists from the county, and writings by George Washington and Thomas Paine to help write my paper. Other scholarly works have contributed to my argument, including local historians Michael Alderberg, Mark Lender, and Gary Stone. Monmouth County directly represents a trend in fighting that other military frontiers experienced during the American Revolutionary War. Other frontiers saw significant fighting, but the actions seen within Monmouth County can help explain why the conflict was important and why the county's story directly relates to the causes of the American Revolutionary War.

Mialexa Mariae Cruz

TX - Lone Star College

Discipline: Interdisciplinary

Authors:

#1 Mialexa Mariae Cruz

Abstract Name: Evaluating Statewide Fentanyl Policies: A Comparative Analysis of Texas and Colorado

Incorporating four primary interviews with high-level policymakers, this research evaluates statewide solutions in Texas and Colorado to the fentanyl epidemic, a pressing public health crisis, to identify appropriate responses to this critical policy challenge. Reflecting their particular institutions and politics as well as contrasting drug laws and fatality rates, the two states have adopted distinctive approaches, rendering them useful cases for comparative analysis. The existing research recognizes the effectiveness of specific remediations, specifically medication availability, telemedicine consultation, penalty enhancements, and harm reduction, as well as highlighting pre- and post-COVID-19 challenges. However, little in-depth case study analysis has been conducted to unpack the contextualized effectiveness of key solutions across states. To this end, four semi-structured interviews were conducted with Michael Davidson, Communications Professional at the Colorado Consortium for Prescription Drug Abuse Prevention, Mike McDaniel, Director of Houston High-Intensity Drug Trafficking Area, Wendell Campbell, Drug Intelligence Officer at HHIDTA, and Texas House of Representatives Member Gene Wu, sponsor of fentanyl-related bills. The results suggest that a universal solution to the fentanyl epidemic is highly improbable. Essentially, policymakers must embrace multifaceted approaches with varying degrees of focus on healthcare, education, harm reduction, and law enforcement. These strategies include expanding access to medication-assisted treatment, implementing school-based prevention programs, establishing harm reduction facilities, and enhancing law enforcement operations to dismantle fentanyl trafficking networks. The research is clear that enabling drug users to seek aid and treatment through the healthcare system is more effective than prioritizing penalty enhancements. While this research offers a window into different statewide approaches, further research is needed to evaluate the long-term impacts of Texas' recently enacted fentanyl laws and Colorado's existing policies.

Orestes Cubas

FL - Miami Dade College

Discipline:

Authors:

#1 Orestes Cubas

Abstract Name: Interdisciplinary Mentorship: Strategies for Designing and Powering Cameras for Wildlife Research

The Wildlife Research Project exemplifies the power of mentor-student collaboration in addressing environmental challenges, particularly those impacting endangered species. Led by a team of faculty at Miami Dade College, this initiative spans multiple disciplines—engineering, renewable energy, physics, and biology—leveraging Raspberry Pi-based video cameras to monitor wildlife in their natural habitats. The project involves coding Raspberry Pi devices, designing engineering solutions, performing power calculations for solar energy systems, and observing ecological interactions, all of which require substantial mentorship to guide students through advanced concepts. Undergraduate students, often at the beginning of

their academic journeys, rely on instructor guidance to master these interdisciplinary tasks. Through the project, students develop technical and scientific expertise, gaining hands-on experience in both camera design and video analysis. Their efforts provide valuable insights for scientists and park managers, enhancing our understanding of species behavior, ecological dynamics, and urban wildlife interactions—especially within Miami's unique environment. Mentorship plays a pivotal role in this initiative, fostering curiosity and equipping students with the tools to navigate cutting-edge research. By collaborating with mentors, students not only learn but also transition into leadership roles, mentoring peers and engaging with field experts. This cyclical model of collaboration cultivates innovation, drives meaningful research, and prepares students for careers as researchers, educators, and leaders.

Sofia Cuello

FL - The University of Tampa

Discipline: Biology

Authors:

#1 Sofia Cuello

#2 Kimberly Dobrinski

Abstract Name: Investigating Mechanisms of Antioxidant Treatment on Drug Resistant Breast Cancer

Understanding mechanisms underlying cellular drug resistance is essential for addressing the rise of drug-resistant breast cancer (BC). The Warburg effect facilitates aggressive cancer cell proliferation by promoting metabolic shifts that favor glycolysis. While antioxidants demonstrate potential as cancer treatment, their effects on BC is complex. A transition to aerobic respiration (OXPHOS) in BC induces oxidative stress and leads to accumulation of reactive oxygen species (ROS), as these cells lack the compensatory mechanisms to adapt to such changes. Shikonin (SHK) is an antioxidant that induces mitochondrial dysfunction and apoptosis in cancer cells, potentially linked to this metabolic shift. This study will elucidate that SHK modulates the metabolic function of drug resistant BC by facilitating a transition from Warburg to OXPHOS. To evaluate these effects, we employed an experimental protocol involving MCF7 (non-drug-resistant), MDA-MB-231 (drug-resistant), and MCF10A (non-cancerous epithelial) breast cells. We assessed cell viability, metastatic potential, oxidative stress, oxygen consumption, and gene expression. Results demonstrate that SHK significantly induces cell death in MCF7 and MDA-MB-231 cells at concentrations of 16, 20, and 24 μ M over 24 hours, compared to untreated and DMSO-treated controls ($p < 0.01$). Furthermore, cancer cells exhibited significant differences in oxygen consumption in relation to SHK concentrations and cell type ($p < 0.01$). However, ROS production in MCF7 cells did not show significant variation over time ($p < 0.55$), as MCF7 cells grow via OXPHOS. These findings support our hypothesis, with ongoing analysis.

Finnley Culhane

MI - Wayne State University

Discipline: History

Authors:

#1 Finnley Culhane

Abstract Name: A Genocide in North America: Investigating Modern Indigenous Reconciliation Efforts

My project examined and compared the operations and effects of the Residential School System in Canada

and the American Indian Boarding School System in the United States. It responded to the question of how North American governments participated in the maltreatment of Indigenous populations and have differed in their approaches to Indigenous recognition and reconciliation efforts historically and currently while assessing Indigenous self-determination and the long-lasting effects of intergenerational trauma. One of my motivations for researching this history was the sheer lack of scholarly work on these assimilative institutions, notably on the American end. Scholars who have worked to examine the Residential and Boarding Schools concur that the settler-colonialist practices used align with Indigenous claims of abuse, trafficking, kidnapping, and extermination despite governmental denialism. The purpose of my project was to shine a light on Indigenous-led movements and discoveries about the atrocities committed in these institutions and to educate the masses on this vastly under-covered and dark portion of North American history. My project utilized a historical research methodology by identifying the question, evaluating relevant primary and secondary sources, interpreting findings to better understand the past, and applying the information to the present. The conclusion of my project validated the findings of biological remains on former sites, which align with the historically ignored claims of Indigenous populations. By using a plethora of credible articles and official government statements, I was able to close the gap between said declarations and their factual existence. My project also affirmed the stark difference in governmental action and representation between Canada and the United States regarding their role in the parallel systems, the U.S. being decades behind and millions of dollars short. The overall consensus of my project urged North American governments to take legitimate action toward reconciling the horrors of their past actions.

Mikkel Cullen

GA - Kennesaw State University

Discipline: Music

Authors:

#1 Peter Fielding

Abstract Name: Analysis of Visayan/Bisayan/Cebuano Philippine Traditional Vocal Repertoire

The traditional vocal repertoire of Central Visayas in the Philippines is a rich tapestry that encompasses diverse linguistic traditions and subdialects, including Visayan, Bisayan, and Cebuano. This oral heritage provides a unique opportunity for comparative analysis. This research focuses on a portion of the repertoire collected by Priscilla Magdamo; materials collected under the auspices of Silliman and Indiana University. Magdamo transcribed traditional folk songs of the Philippines into six volumes, four of which are used in this study. The overall purpose of this research is to present a preliminary baseline of the repertoire. In addition, preliminary pedagogical merits of the songs will be identified for potential use in Aural Skills curriculum as examples used in classrooms are primarily taken from the Western classical tradition, limiting students' experience with different types of music. Drawing from the music pedagogy of Zoltan Kodály's pitch maps and post-tonal quantitative methodologies, scholars can discern normative patterns and outlier variations in pitch collections as well as scalar patterns across different song repertoires. By employing techniques such as tonic-centered successive-interval arrays and composite pitch collection mappings, researchers can delve deeper into the structural nuances and tonalities inherent in the Central Visayan vocal traditions. Analysis showed that there are patterns within the song collections used, such as almost every song containing pitch classes two and five. This means that most songs contain a supertonic and subdominant, implying that there may also be some form of predominant function within them. Having form that can be viewed through this lens also implies that the songs contain material that aligns with concepts taught in Aural Skills classes. As such, it is expected that the repertoire contains other normative patterns, and that students will be able to understand and find use in the addition of Philippine folk songs to their curriculum.

McKenna Culp

TX - San Jacinto College

Discipline: History

Authors:

Abstract Name: Wingstop: From Dream to Reality

Wingstop, the nationally acclaimed wing-focused restaurant chain, has had a long, rich history of success. However, before becoming famous, it remained a simple dream and ambition of its founders, Bernadette Fiaschetti and Antonio Swad. This research essay reflects Wingstop's chronological history, from its first opening in Garland, Texas in 1994, to its franchising in 1997, and to its recognition as the 'official wings of the Dallas Cowboys' in 2009, to its nationwide impact today. As one of the first restaurants in America to concentrate on wings, Wingstop has been a leader in developing this market. For my research, I utilized several magazine and newspaper articles to get the beginnings of the concept itself, such as the Fort-Worth Star-Telegram. In addition, the paper also utilizes other primary sources such as interviews of the founders and other employees and franchisees. I used other documents to complete the story, in particular the loyal support of customers throughout its expansion.

Morgan Cumberland

NC - North Carolina State University

Discipline: Biology

Authors:

#1 Elsa Youngsteadt

#2 Laura Taylor

Abstract Name: Does Nectar Availability Drive the Abundance and Movement of a Rare Butterfly Species?

Nectar is a vital resource for the survival and proliferation of many species, including a variety of bats, flies, bees, and butterflies. Variations in the abundance, distribution, and diversity of nectar resources can limit the populations of these species. For the Crystal skipper butterfly (*Atrytonopsis quinteri*), life in their native, range-limited coastal dune habitat consists of a low diversity of floral species compared to other habitats (e.g., forest, prairie) and their access to these nectar resources may be affected by urbanization. Our goal is to understand how the distribution of nectar sources correlates with the distribution of the Crystal skipper. To study this, we analyzed floral abundance and Crystal skipper mark-recapture data from 6 transects across 3 sites (i.e., urban, protected land, and dredge spoil land) to determine whether nectar availability correlates with butterfly abundance and recapture probability across these study sites. From this data, I expect that the more diverse and abundant nectar sources within a habitat will indicate a higher concentration of Crystal skippers within that area. In addition, for the urban areas, I expect them to contain fewer Crystal skippers because of a lower abundance and diversity of nectar sources. In identifying the correlation between the Crystal skipper and the nectar sources needed for its survival, we can develop a better understanding of the impact of the diversity and distribution of nectar sources as well as the necessary steps to conserve and protect the Crystal skipper species. In turn, the Crystal skipper can act as a model species as we can use the information from this research to assist in the creation and development of conservation plans for other range-limited species'.

Melika Cummings

NV - University of Nevada - Las Vegas

Discipline: Biology

Authors:

#1 Melika Cummings

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#3 Davis Cammann

#4 Jingchun Chen

Abstract Name: Genetic correlation between Dental Disorders and Alzheimer's Disease: A Polygenic Risk Score and Mendelian Randomization Study

Background: Despite prevalence and rising rates of Alzheimer's disease (AD), the inherited associations with comorbidities, such as oral health are poorly understood. This study aims to identify possible the genetic and causal relationships between several dental conditions and AD. Methods: Genome-wide association study (GWAS) of sixteen dental conditions to create polygenic risk scores (PRSs) in independent AD discovery with adjustments for the top principal components (PC1, PC2). Nominally associated conditions were reevaluated in a replication analysis to confirm directionally of correlation. Further analysis of correlation evaluated with additional covariates (sex, age, and APOE ε4 count). PRS associations with AD in the discovery and replication samples were then meta-analyzed. Potential causal relationships between AD and dental conditions was evaluated by a bidirectional two-sample Mendelian randomization (MR) analysis, focusing on the significant dental conditions from PRS analysis. Results: The PRS meta-analysis identified two risks associated dental disease PRSs (Dentures, DMFS/Dentures combined), and two that were protective (Nteeth, excluding or including HCHS/SOL) ($p < 0.0125$). In the MR analysis, periodontitis combined with loose teeth inferred a positive causal relationship with AD as the outcome (Wald Ratio p-val: 0.036). In the reverse MR analysis, there were no notable relationships. Conclusions: Our results suggest a genetic connection between dental disease conditions (Nteeth, dentures, and DMFS/dentures) and AD. Periodontitis combined with loose teeth showed a causal relationship unidirectionally with AD. This highlights the consequence of oral health in the prevention of AD from a genetic perspective. Further studies on the clinical observations are warranted to better understand applications.

Zechariah Cummings

WI - University of Wisconsin-Milwaukee

Discipline: Exercise Science and Nutrition

Authors:

#1 Zechariah Cummings

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#7 Whitney Morelli

Abstract Name: Focus on POWER: Mixed Methods Insights for the Preservation of Physical Function in Soft Tissue Sarcoma patients.

Introduction: Soft tissue sarcomas (STS) are rare, malignant tumors found in the trunk and extremities of the

body. They are treated with surgery, chemotherapy, and/or radiation. Despite treatment advances, patients experience side effects like functional decline, fatigue, and reduced quality of life. Prehabilitation (preoperative exercise and diet interventions) improves postoperative outcomes in other cancers, but remains understudied in STS. This study assessed STS patients' needs and preferences for a lifestyle prehabilitation program. Methods: STS patients completed an online questionnaire including demographics, cancer and treatment characteristics, and current physical/dietary activity. Participants also completed a semi-structured interview addressing their treatment experiences, symptoms, lifestyle behaviors, feedback on prehabilitation, and nutritional programming. Data from the interviews were analyzed by 5 research team members using an inductive approach through thematic text analysis. Results: Participants (N = 20) were 50% female, ages 22 to 77 years. Patients who received chemotherapy before surgery (83%) felt fatigue and loss of appetite. Patients who received radiation (63%) felt fatigue and loss of physical function. Five themes emerged from the interviews for patients' needs and preferences: (1) Prehabilitation lifestyle resources allow ownership over recovery; (2) Consistent reinforcement and feedback; (3) Tracking external factors that influence lifestyle habits; (4) Social support from other STS survivors; and (5) Remote access to support and resources. Discussion: Participants emphasized the need for prehabilitation resources like physical activity and nutrition recommendations before surgery, as early access would empower them to take ownership of their recovery. They expressed interest in regular reinforcement and using behavioral tools. Participants suggested future lifestyle interventions should consider factors like mental health, symptoms, side effects, and family stressors when designing programs. Lastly, support from other STS survivors was seen as valuable for accountability and encouragement. Overall, participants viewed a prehabilitation program positively to improve postoperative outcomes and quality of life.

Julia Cunningham

NC - Elon University

Discipline: Environmental Science and Sustainability

Authors:

Abstract Name: Estimate of Biomass and Carbon Storage in Cane Creek Mountains Natural Area

Photosynthesis removes carbon dioxide (CO₂) from the air and in woody plants, the carbon is stored for long periods of time. Forests with long-lived and large trees should store significant amounts of CO₂. The purpose of this study was to document the composition and structure of the forest and to estimate biomass and carbon storage in Cane Creek Mountains Natural Area (CCMNA), a local park with a Piedmont monadnock forest type. Data were collected from 46 non-permanent plots in which prism cruising was used to select trees for inclusion in the study. Diameter at breast height (DBH), as well as the species for each tree was recorded. Our results indicate that the size and species of trees in CCMNA are consistent with that of old-growth forests. Oak species are dominant, with 50% of trees being chestnut oak (*Quercus montana*), and 12.6% being white oak (*Quercus alba*). Furthermore, we found that the forest stores between 193.2-214.7 Mg/C/ha (45-50% of biomass), which is significantly higher than that stored in younger Piedmont forests. We examined the relationships between carbon storage and the following values: number of trees (N), species richness (S), Shannon's diversity (H'), % oak, and tree size (DBH). The only significant correlation with carbon storage was tree size. Our results indicate that local parks such as CCMNA are significant carbon sinks so long as they are managed to maintain healthy forests.

Alexandria Currier

GA - Kennesaw State University

Discipline: History

Authors:
#1 Lauren Thompson

Abstract Name: Indeterminate Politics: U.S. Interventionism within Nicaragua

This research accumulates various historical viewpoints, ranging from 1986 to 2023, and constructs a greater holistic work detailing justifications and complexities surrounding U.S. foreign policy towards Central America during the 1980s. It highlights the initiatives and goals of the Reagan administration which dictated U.S. interaction with the nation of Nicaragua and seeks to clarify ongoing historiographical debate surrounding the justification for these projects. This study utilizes documents, testimonies, and speeches from the United States Congress and former President Ronald Reagan to contextualize official statements relating to the role of the United States within Nicaragua. It then places them in comparison with later interpretations of 1980s U.S. foreign policy from authors such as Jeff Bass, Robert Kagen, Roy Gutman, Thomas Carthers, William Schmidli, and several others. In addition to this, notable publications from The Heritage Foundation, The Permanent People's Tribunal, and The Washington Post are used to observe larger media interpretations of U.S. intervention during the time period. Individual publications of political authors such as Andrew Kimmens, William Leogrande, Peter Kornbluh, and Christopher Dickey are also included for the role of observing political opinion of foreign policy initiatives within the time period.

Gerrell Dabbs

TN - University of Memphis

Discipline: Engineering

Authors:

Abstract Name: Investigating the impact of Noise on Hyperspectral Unmixing

A hyperspectral image is a photo created by collecting information from the electromagnetic spectrum and has three axes: x , y , λ . " λ " represents a wavelength value allowing images to be created at different wavelengths and then combined into 3-dimensional data. By analyzing the reflectance values over different wavelengths, distinct spectral signatures called endmembers can be extracted. These endmembers can be used to identify different material in a scene allowing hyperspectral imaging to be used in object detection and classification. However, if a pixel contains multiple endmembers, there is a need to unmix those endmembers to find out the amount of each material in that pixel. Hyperspectral unmixing is the process of determining the weight or amount of a material that is in each pixel of the data. Linear Unmixing is done by recovering a linear combination of the endmembers in an image along with their weights for each pixel. These can then be used to create abundance maps, images that use a color scale to indicate the weight of a material in a pixel, creating a map for each endmember. Hyperspectral processing techniques are used in many fields, with one of note being anomaly detection. This study had the goal of analyzing one of many computational pipelines used in enhancing anomaly detection. The analysis was focused on the pipeline's ability to handle noise in cases of unmixing. It was found that part of the pipeline, edge enhancement, had an undesirable effect on noisy images, while other parts helped mitigate the noise. Another part of the study was to attempt to provide a solution if the pipeline could not handle noise well. Attempted solutions, such as sharpening, saw improvements to unmixing accuracy for some endmembers at the expense of the accuracy of others, indicating a need for a general solution.

Armita Dadvar

VA - George Mason University

Discipline: Psychology

Authors:

Abstract Name: Is Executive Function Similarly Related to Behavioral Outcomes in Typically Developing and Neurodiverse Children?

Executive functions (EF) are a set of neurocognitive processes that help us engage control over our actions, manage the information in our brains, and prioritize ideas that are aligned with our personal objectives. Evidence has shown that EF is essential to child development, especially in its concurrent and longitudinal relation to both academic achievement and school readiness. Research suggests that children diagnosed with neurodevelopmental conditions show greater impairment in EF compared to their neurotypical peers. While the overall relationship between EF development and behavioral outcomes is well established, it is not yet known whether this relationship is moderated by neurodiversity status. The project will investigate the relation between EF in young children and behavioral outcomes by conducting a mixed-effects meta-analysis. It will explore whether the relation between child EF and behavioral outcomes varies depending on whether children are typically developing or have clinical, learning, or behavioral diagnosis. Through this meta-analysis, we hypothesize: There will be stronger, more consistent EF-behavioral outcome relations in neurodiverse vs neurotypical samples. Inclusion criteria involve children between the mean age of 3.0-5.99 years when assessed for EF, primary studies, and studies that used performance-based tasks to measure EF. We conduct a thorough literature search on four databases, complete abstract and full-text screening, and analyze multiple effect sizes from multiple studies. This project addresses the knowledge gap that no meta-analysis has included and compared neurodiverse and neurotypical populations, which could lead to important insights about the nature of EF skills. It is important to know this in order to enhance our understanding of the best ways to foster EF skills in all children.

Charlotte Dagli

NC - Elon University

Discipline: Biology

Authors:

#1 Charlotte Dagli

Abstract Name: Oncolytic virotherapy and chemotherapeutic approaches against malignant fibrosarcoma

Fibrosarcoma is a type of rare and poorly studied cancer associated with a ~40% survival rate at five years after diagnosis. Oncolytic virotherapy, which relies on the use of viruses to kill cancer cells, is being explored as a therapeutic agent against common cancers that show resistance to chemotherapy. One oncolytic virus, Reovirus, has been shown in clinical trials to effectively kill various types of cancer cells while having minimal side effects in patients. However, the oncolytic potential of Reovirus against rare cancers remains largely understudied. Here, we explored the oncolytic potential of genetically-different Reovirus strains in human HT-1080 fibrosarcoma cells. Our research shows that HT-1080 cells are permissive to Reovirus infection and that the infection rate is strain-specific. We quantified the ability of the different viral strains to kill fibrosarcoma cells and assessed their therapeutic effects of combining Reovirus with chemotherapeutics. Our data demonstrates that infection of HT-1080 cells with selected Reovirus strains followed by treatment with chemotherapy results in a significant decrease in cell viability compared to individual treatments. Altogether, we identified two viral strains with strong oncolytic potential in fibrosarcoma cells and demonstrated their enhanced effectiveness when used in combination with common chemotherapeutic agents.

Audrey Dahlen

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Geir Sajdak

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Kimberly Watson

Abstract Name: Examining a Potential Therapeutic approach for Parkinson's Disease Using Overexpression of ATP6VoA1

Parkinson's disease (PD) is the most common neurodegenerative movement disorder and is characterized by the loss of dopaminergic neurons in the substantia nigra pars compacta and aggregation of the α -synuclein protein. Emerging evidence suggests that lysosomal function plays a vital role in removal of α -synuclein aggregates through autophagy. Interestingly, we determined that ATP6V0A1, a subunit of the v-ATPase transmembrane pump that is integral in maintaining lysosomal pH homeostasis and autophagy clearance, is a risk factor for PD. However, we do not know the relationship between ATP6V0A1 function and the development of synuclein pathology. It is possible that, by enhancing autophagy and the clearance of protein aggregates, ATP6V0A1 could slow disease progression and could serve as a potential therapeutic target for treating Parkinson's disease. Here, we show data implicating ATP6V0A1 in PD etiology and validate a number of tools to overexpress ATP6V0A1 in mouse models of synucleinopathy. Future work will determine whether overexpression is capable of reducing synuclein load and preventing cell loss in the pre-formed fibril model of synucleinopathy. Together this study aims to determine whether ATP6V0A1 overexpression is capable of promoting synuclein clearance, potentially mediated by increased activity of the ATP6 proton pump and lysosomal acidification; if so, therapeutic approaches could involve the use of vATPase activators for neuroprotection in PD.

James Dalrymple

NC - Elon University

Discipline: Political Science

Authors:

#1 Dr. Jason Kirk

Abstract Name: China-Pakistan Relations: Assessing the All-weather Friendship in a Changing Political Climate

The People's Republic of China (PRC) is an emerging power within the international system and has risen in status in recent decades following significant economic and foreign policy changes. Consequently, the PRC has engaged in what has become an increasingly multipolar world, challenging the United States (U.S.) in areas including economic, technological and militaristic superiority. Since Xi Jinping's ascension to become the paramount leader in 2013, China has deployed a more ambitious foreign policy. The PRC has utilized militarism in regions of strategic importance, while concurrently promoting major investment programs abroad. One of the critical junctures of the PRC's foreign policy apparatus is Pakistan, a longstanding ally of the country that offers significant strategic benefits both in South Asia, as well as the larger global system. It is the intention of this research project to critically examine the China-Pakistan alliance in order to understand the primary motivations that sustain this special relationship. Specifically, this work will scrutinize the

evolution of the Gwadar Port project, from its recognition of geostrategic importance in 1958, to its inclusion in the China-Pakistan Economic Corridor beginning in 2013. As one of the flagship projects of the PRC's Belt and Road Initiative, Gwadar Port is a particularly compelling narrative of bilateral relations and regional geopolitics. Considering both historical trends and contemporary developments, this work will yield an analysis of Chinese foreign policy under the leadership of Xi Jinping, as well as how investment and cooperation between China and its premier South Asian partner will impact the global order amidst a developing Sino-American rivalry.

Akshay Dalvi

IL - University of Illinois at Chicago

Discipline: Sociology

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- #9 Robin Ortiz
- #10 Ana Sahagun
- #11 Ana Sahagun
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Abstract Name: Trends of Diagnosis Disclosure Among Individuals with Plasma Cell Disorders

Multiple myeloma, along with precancerous conditions such as monoclonal gammopathy of undetermined significance (MGUS) and smoldering myeloma, represent the most common plasma cell disorders (PCDs) around the world. Coping with such disorders is often a challenging prospect for patients, and the disclosure or withholding of information pertaining to the patient's diagnosis or prognosis may have a significant impact on the patient's perception of their care. We hypothesize that patient perceptions of diagnosis disclosure will be largely positive due to the various psychosocial benefits conferred by the sharing of information with friends and family. In order to investigate these diagnosis disclosure patterns among individuals with PCDs and determine areas for interventions that utilize social support strategies to help patients navigate their diagnosis, we invited participants with PCDs through the HealthTree Cure Hub to complete a 34-question online survey regarding their disclosure trends (n= 510). Participants generally reported sharing their diagnosis with at least one person (98%), with the most common responses being a spouse, domestic partner or significant other (60%) and friend(s) (10%). Most participants that chose to disclose their diagnosis experienced a positive impact in their coping (79%) and became closer with others (55%), whereas patients who chose not to disclose their diagnosis generally reported feeling more isolated in their relationships (56%). Despite some reports of certain negative experiences associated with sharing a PCD diagnosis, the majority of participants expressed no regrets over sharing their diagnosis (87%). Based on these findings, patients generally perceive sharing their diagnosis among their primary social networks to be beneficial to their coping. Oncologists may be advised to promote the utilization of social support to navigate a PCD diagnosis.

Jonah Damian

CA - University of California - Riverside

Discipline: Engineering

Authors:

#1 Kevin Dalsania

#2 Iman Noshadi

Varun Vemuri

Abstract Name: FRESH-Enabled 3D Bioprinting of Emulsion Materials for Tissue Engineering Applications

One of the primary goals of tissue engineering is the development of functional scaffolds that replicate the structural and physiological behavior of native tissues/extracellular matrix (ECM). Recent literature has highlighted that two critical features of ECM are multiphasic structures and porosity, both facilitating valuable functions such as cell migration and infiltration. The challenge is that traditional scaffold fabrication methods struggle to create multiphasic microscale porous architecture. One class of materials that inherently possesses these characteristics are emulsions. However, most current emulsion manufacturing techniques are limited and do not possess the macroscale complexity required for advanced tissue engineering applications, highlighting the need for a platform that can generate more complex shapes. This research addresses these limitations by combining emulsion material fabrication with the Freeform Reversible Embedding of Suspended Hydrogels (FRESH) 3D bioprinting system. The goal of this work lies in developing a system capable of 3D bioprinting complex macroscale geometries with microscale porosity and multiphasic architecture, enabling precise control over scaffold design at both the macro- and microscale. The methodology involves three stages: optimizing a baseline FRESH bath to generate optimized microarchitecture, enhancing the macroscale printability, and evaluating the cytocompatibility of the printed constructs through cell viability assays. Preliminary results have successfully generated the macroscale printability of our emulsion material. Additionally, microscale morphology from scanning electron microscopy (SEM) demonstrates promising potential for optimizing multiphasic microarchitecture. Further refinements are underway to achieve the desired structural and functional properties, laying the foundation for scalable, physiologically relevant scaffolds.

Sindhuja Damodaran

NC - University of North Carolina at Chapel Hill

Discipline: Biology

Authors:

#1 Sindhuja Damodaran

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#10 Kenichi Okuda

#11 Kenichi Okuda

Abstract Name: Dissecting the Impact of SARS-CoV-2 Variants on Olfactory Signaling Pathways and Inflammation in Mice

The Omicron variants of SARS-CoV-2 have posed significant challenges to public health due to their acute and chronic disease burden. Anosmia is a hallmark of SARS-CoV-2 infection, yet the molecular processes

linking inflammation to olfactory dysfunction remain poorly understood, particularly across different viral strains. To address this, we developed a sublethal but pathogenic mouse-adapted SARS-CoV-2 Omicron BA.1 virus (BA.1 MA), comparable to the original mouse-adapted SARS-CoV-2 strain (MA10). This study integrates spatial transcriptomics and histological analysis to provide a detailed and localized perspective of the nasal epithelium's response to infection, enhancing our ability to model and predict human olfactory pathology. Using the GeoMx Digital Spatial Profiling platform, we analyze nasal tissues at 2, 4, and 7 days post-infection with SARS-CoV-2 variants MA10, BA1, and BA5. Gene expression analyses revealed strain-dependent changes in inflammatory mediators (e.g., Il6, Ccl2, Ccl5) and olfactory signaling genes (e.g., Olfr, Gnal, Adcy3). Spatial resolution of transcriptional changes showed infection-induced inflammation correlating with disruptions in olfactory pathways, providing critical insight into localized tissue damage. Our findings highlight upregulated interferon-stimulated genes and IL-1 inflammatory pathways in SARS-CoV-2 infected olfactory epithelial and submucosal regions. IL-1 pathway activation was more pronounced in MA10-infected mice, correlating with greater submucosal damage compared to BA1. MA. Additionally, Ugt1a1 and Ugt2a2, genes implicated in post-infection anosmia in humans, were significantly downregulated in both MA10- and BA.1 MA-infected mice, supporting the relevance of these models to human olfactory pathology. These data underscore the importance of early interventions targeting inflammation to mitigate anosmia. Our study identifies strain-specific transcriptional pathways disrupted in the olfactory epithelium during SARS-CoV-2 infection, advancing our understanding of the molecular basis of anosmia and inflammation across different viral strains.

Pranav Danasekar

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Matthew Goldberg

Abstract Name: Role of Parkinson's Disease-Linked PINK1 in Histone Modifications

Parkinson's disease (PD) is a neurodegenerative disorder characterized by a loss of dopaminergic neurons needed for normal movement. Deletion mutations in the PINK1 gene cause an inherited form of PD with early onset of symptoms, usually under age 45. Recent findings suggest that the mutations in PINK1 decrease removal of dysfunctional mitochondria, but we are exploring alternative functions of PINK1. The purpose of this project is to determine if the protein PINK1 can regulate gene transcription. PINK1 is known to phosphorylate ubiquitin at serine 65 (pS65-Ub), and the Goldberg lab has recently identified the nuclear protein histone H2A to be conjugated to pS65-Ub in wild-type (WT) astrocytes, while being absent in PINK1 knockout (KO) astrocytes. This project aims to determine if PINK1 regulates gene transcription by increasing pS65-Ub conjugation to histone H2A. We hypothesized that the phosphorylated form of ubiquitin conjugated to histone H2A is more stable compared to the non-phosphorylated form. Histone H2A ubiquitination promotes methylation of histone H3, which represses transcription of inflammatory cytokines including interleukin-6 (IL-6), found at higher levels in humans with PINK1 mutations. We used chromatin immunoprecipitation (ChIP) with rabbit anti-pS65-Ub antibody to investigate if we could detect pS65-Ub conjugated to histone H2A in mouse brain chromatin. Quantitative PCR and DNA fragment size analysis showed significant signal using our positive control antibody against histone H3 in both WT and KO samples. We tested various methods of immunoprecipitation using different amounts of nucleosomes with and without purifying the nucleosomes with hydroxyapatite.

Joseph D'Andrea

NY - Adelphi University

Discipline: History

Authors:

#1 Joseph D'Andrea

Abstract Name: Frontier Fathers in Crisis: Bob Dylan's "Ballad of Hollis Brown" and the Legacy of Familial Struggle in Rural America

This paper examines Bob Dylan's "Ballad of Hollis Brown" within the context of late 19th- and early 20th-century rural America. In a period marked by economic and social transformations—industrialization, job migration—there was a disruption of traditional frontier life, particularly the divide between rural and urban families which led to widespread poverty and shifting family roles. As fathers struggled to maintain their identities and provide for their families, many women and children assumed nontraditional roles, leading to unfamiliar, sometimes-frustrating family dynamics. Patriarchs often felt emasculated and lost, contributing to an increase in violence, which Dylan captures in his haunting portrayal of Hollis Brown, a father who, overwhelmed by his inability to provide, resorts to a tragic murder-suicide. Incorporating historians Linda Gordon's and Steven Ruggles' analyses of the history of family and Elliott West's look at children on the frontier, among others, this paper connects Dylan's song to historical trends, focusing on the challenges of familial anxiety faced by pioneers on the frontier. As the frontier expanded, families often experienced separation and loss, which, combined with economic hardship, led to psychological distress and social breakdown. This pattern of paternal frustration and loss of identity is reflected in Dylan's narrative, where Hollis Brown's act of violence can be seen not just as madness but as an anguished response to overwhelming external pressures. The song serves as a window into the emotional and social realities of rural America, offering a deeper understanding of the personal toll of economic and familial disruption. Dylan's song, through its powerful narrative and evolving performances, remains a significant reflection of the complexities of domestic life and the struggles of those left behind by an industrializing nation.

Joseph D'Andrea

NY - Adelphi University

Discipline: History

Authors:

#1 Joseph D'Andrea

Abstract Name: Frank Capra, the Great Depression, and the Fallacy of the American Dream

This paper analyzes the depiction of the American Dream in the films of immigrant filmmaker Frank Capra, particularly "Mr. Smith Goes to Washington" (1939) and "It's a Wonderful Life" (1946). Capra depicts a nation in crisis in contrast to the idealized vision of the "American Dream" by contrasting it with the harsh realities faced by ordinary citizens, as seen through his protagonists, Jefferson Smith and George Bailey. Building upon the work of historian Charles R. Hearn, who initially foregrounded the ways that the Great Depression stifled this promise of prosperity, this paper shows how Capra's not-so-sunny vision of American life reflected 20th-century realities. Further, I elaborate upon historian Peter Feuerherd's assertion that Capra subverted the idealized narrative of this dream, among others, by demonstrating precisely how this was so by examining the economic struggles of the protagonist Bailey, a small bank manager. Central to the presented argument is that Capra uses the outsider perspective to highlight the contradictions within American politics and society. Through this lens of the Great Depression and its aftermath, I consider how both films offer a commentary of the political and economic systems that promised prosperity in the early 20th century but often failed to deliver. In "Mr. Smith," Capra critiques the corruption of political institutions and breakdown of democratic ideals, portraying the struggle of the everyman. This theme resonates with modern distrust in government. Similarly, in "It's a Wonderful Life," Capra presents a more personal reflection on the American Dream, exploring the economic struggles of the collapse of the traditional family business in the face of

corporate greed. These films paint nuanced scenarios of American capitalism and politics while providing messages of perseverance and community.

Khoa Dang

CA - Cuesta College

Discipline: Interdisciplinary

Authors:

#1 Khoa Dang

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#3 Kerry Lam

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Kerry Lam

Youngji Kim

Abstract Name: Analyzing Vaccination Equity: Factors Influencing Uptake for Reemerging and Ongoing Infectious Diseases (COVID-19, Influenza, Pertussis, Measles) Using Data Science and Machine Learning

The MAVEN (Multidisciplinary Analysis of Vaccination Games for Equity) project addresses the global health threat of vaccine inequity in the fight against emerging infectious diseases. Vaccination is essential for controlling and preventing infectious diseases, especially routinely recommended vaccinations for ongoing diseases of high transmissibility. In the study presented here, we utilize publicly available datasets from the U.S. Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC), the United States Census Bureau, and the Mayo Clinic. Our research found a significant association between population heterogeneity and vaccination behavior for historically marginalized communities within California counties during the COVID-19 pandemic. To explore changes in future vaccination uptake trends, we apply predictive modeling using machine learning techniques such as Long-Short Term Memory (LSTM) neural networks to conduct time-series forecasting, using objective optimization techniques such as multi-objective evolutionary ensemble learning to enhance predictive performance. Analogous to the COVID-19 pandemic, we provide insight into how structural, social, and individual factors impact vaccination uptake rates for other reemerging diseases. Our approach focuses on regional factors correlated to the uptake of various pediatric vaccines, using statistical parametric analyses through Python software to then identify the relationship between regional variation and type of vaccine for Diphtheria, Pertussis, and Tetanus (DTaP) and Measles, Mumps, and Rubella (MMR). Understanding these disparities in childhood vaccines recommended during early developmental stages can help guide targeted strategies to improve vaccination coverage and reduce barriers to vaccination access. Extending our analysis, we explore individual factors correlated to influenza vaccination uptakes in the United States. Preliminary findings revealed a strong association between economic, social, and housing factors for vaccination uptakes. Understanding these various factors can help uncover patterns contributing to disease resurgence and provide insight into how to strengthen public health intervention for future infectious threats.

Sarah D'Angelo

PA - Duquesne University

Discipline: Biology

Authors:

#1 Rosemary Westcott

#2 Sarah Woodley

Abstract Name: Validating a Method to Confirm Sex in *Xenopus laevis* Tadpoles

Larval amphibians are important models for understanding vertebrate development. However, it is difficult to discriminate males from females because gonads are not easily distinguished until after metamorphosis. Similar to humans, *X. laevis* tadpoles have chromosomal sex determination. *X. laevis* uses ZZ/ZW-type sex determination, with ZZ chromosomes for males and ZW for females. While human males contain the unique Y chromosome, female *X. laevis* contain the unique W chromosome. In this study, we aimed to validate a method to determine the sex of *X. laevis* tadpoles. I achieved this goal using DNA extracted from the guts of 14 *X. laevis* tadpoles and two *X. laevis* metamorphs. A W-linked (*dm-w*) and Z-linked (*dmrt-1*) gene were amplified using PCR and visualized on a 2% agarose gel. We expected that genetic males would have one band at the expected product length for the Z-linked gene and the females would have bands at both the expected product lengths for the Z-linked and W-linked genes. To further validate the method, I plan to examine adults where I can compare gonadal sex with genetic sex. Future studies can utilize this validated method to reveal possible sex differences in tadpole gene expression, hormone levels, or behavior.

Lauren Daniels

PA - Lafayette College

Discipline: Psychology

Authors:

#1 Lauren Myers

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#3 Olivia Mackey

Abstract Name: Food Insecurity in Children's Media: Lived Experiences' Impact on Upper Elementary Students' Perceptions of Similarity to Characters in Picture Books, Liking of Story, and Perceptions of Food Insecure Children

One in five children identifies as food insecure in the USA, and the issue continues to grow. Stigmas about food-insecure individuals remain rampant and misinformed through news and media framing. Yet, depictions of characters facing food insecurity and leading storylines surrounding this topic are limited within children's media—both books and television shows—giving children fewer outlets to learn and understand food insecurity. However, there is prominent research on the benefits of social-emotional learning in children's media content—including authentic, non-stigmatized representations of race, gender, and culture—and its use to lessen stereotype beliefs. Studies show children who perceive themselves as similar or have similar experiences to diverse kid characters can improve their confidence and achievement. While likely applicable, little to no research exists on food-insecure characters and children's lived experience of food [in]security and its impact on perceptions of others and the self. It is important to explore this gap to increase positive representations of food insecurity in children's media. In this study, over 500 upper elementary students (third and fifth graders) in a Pennsylvania school district are anticipated to participate in a classroom-based study involving a read-aloud of picture books. Parental pre-screening questionnaires identify the food security status of involved participants. Classes are randomly assigned to engage with two food insecure-centered books or two control books and answer pre-exposure questions about experiences with food insecurity, and adjective associations with food insecure kids. After exposure, questions are asked about story liking, perceived similarity with character, and the pre-test question about adjective association is repeated. Data will be analyzed using ANOVA tests and coding open-ended responses to assess the relationships between how book conditions and lived experiences of food insecurity impact kids' perceived similarity to characters and their positive attributes towards food-insecure children before and after book exposure.

Lucas Dantas Leite

MA - Boston University

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

#1 Lucas Dantas Leite

#2 Maggie Ma

Maggie Ma

Abstract Name: Divinity and the Dead: Pantheism in Northeastern Protestant Elegy

Historically, New England elegists have found comfort in Protestantism. It is this very Protestantism, however, that assigns ontological priority to an afterlife, heaven, and in doing so occludes diverse experiences of grief. Nonetheless, within this same elegiac tradition, we find an evolution toward pantheism, which embraces ontological parity, and, in turn, embraces rather than stifles grief. By deconstructing established religious hierarchies, we question whether a singular God, as espoused in traditional Christian theology, can be the only cause of signified meaning in the world. This collaborative research project begins with Anne Bradstreet's Puritan poetics and traces the development of an implicit pantheism in Lydia Sigourney's early 19th-century works. We compare these foundational Protestant poems to elegies by Walt Whitman and Edna St. Vincent Millay, relative exemplars of the pantheistic mode of grief and disruptors of protestant hierarchies. Through an analysis of Whitman and Millay, we argue for a grief which allows for the dead to be celebrated not only as a departed other, but as God. As a framework for our argument, prompted by a reading of John Hunt's 1884 *Pantheism and Christianity*, we analyze the Hellenistic theology of Philo Judaeus through the lens of Jacques Derrida's theory of the trace, positing that Philo's non-ontological God is correspondent to Derrida's ultimate other, an entity existing outside of ontology, yet one the written word reveals and conceals. By engaging with Philo and Derrida as a means to interpret the undeniable presence of religious multiplicity in the American elegiac tradition, this project uncovers a hidden history of longstanding intersection between two seemingly oppositional doctrines, honoring diverse experiences of grief. Our project also evokes further discussion of the nature of grief and the cultural necessity for acknowledging the religious diffusion inherent to poetic expressions of death.

Madison Daraklis

PA - Westminster College

Discipline: Mathematics

Authors:

#1 Heather Muchowski

Abstract Name: A Numerical and Differential Analysis of Smoking Habits in Young Adults Following an SEIS Model of Disease Spread

Nicotine dependence is one of the most widespread and costly health disorders in the United States to date. The vaping-to-smoking pipeline is a growing point of contention in youth health regarding nicotine consumption with both evidence supporting and refuting its existence. To help increase understanding of this potential trend, we propose an adaptation of a commonly used differential-equations based compartmental model of disease spread that captures the unique interactions between non-users, e-cigarette users, and combustible cigarette users. We determine the basic reproduction number and analyze the stability of equilibria in the no-smoking case, vaping-only case, and endemic case. We propose possible numerical trajectories of the youth smoking endemic given current usage rates and trends.

Madison Daraklis

PA - Westminster College

Discipline: Psychology

Authors:

#1 Jessica Rhodes

Abstract Name: Mind the Gap: Exploring Proposed Mediating Factors Between Sleep Quality and Dissociation

Minor dissociation (feeling a disconnect between one's mind and body/environment) is a near universal experience. Dissociation as a pathology is associated with poorer outcomes for a myriad of mental health disorders. Key to providing better treatment for these disorder subtypes is understanding the causes of dissociation. We use multiple linear regression to analyze the relationship between dissociation and sleep disturbances as mediated by executive dysfunction/cognitive failures, alexithymia (the inability to understand emotions), and post-traumatic stress (PTS) symptoms (excessive nervousness, daytime flashbacks, etc.). Dissociation is significantly positively correlated with poorer sleep, as well as PTS symptoms, alexithymia, and executive dysfunction/cognitive failures. PTS symptoms and cognitive failures seem to significantly mediate the relationship between sleep and dissociation ($R^2 = .67$, $F(4,71)=38.76$, $p < .001$), while alexithymia does not reach significance, suggesting that future research and interventions for dissociative subtypes of mental health disorders should focus on cognitive skills.

Sanjana Das

PA - University of Pittsburgh

Discipline: Psychology

Authors:

#1 Frances Wang

Abstract Name: Examining racial and sex differences in novel measures of subjective response to alcohol

Subjective response to alcohol (SR) refers to individual differences in neurophysiological effects during alcohol consumption. Previous research highlights SR as a potential etiological risk factor for alcohol use disorder (AUD) and related problems; therefore, developing a deeper insight into this facet of alcohol use can diminish harms associated with this condition. Research shows significant variance in SR across demographic groups, with evidence from survey measures suggesting males experience lower levels of response to alcohol compared to females and Black individuals need fewer drinks to feel "drunk" compared to White individuals. However, SR survey measures do not capture how intensely people experience alcohol effects within their items. Thus, the current study aims to examine the extent to which racial (i.e., individuals identifying as Black vs. White) and sex (i.e., assigned male vs. female at birth) differences affect SR as defined by both intensity of alcohol effects and number of drinks required to experience effects. Participants ($N=246$) were heavily drinking adults (18-50 years) who endorsed impaired control over drinking and completed a 30-minute online survey. Participants reported the number of drinks to experience alcohol effects using the Alcohol Sensitivity Questionnaire (O'Neill et al., 2002), as well as how intensely they experienced relevant effects. Factor analyses revealed that two factors underlay items assessing alcohol effect intensity (i.e., stimulating vs. sedating effects) and the number of drinks (i.e., lighter vs. heavier effects of alcohol). Linear regression revealed that Black individuals reported higher intensity of stimulating alcohol effects ($\beta=0.14$,

$p=0.03$) and needing more drinks to feel lighter alcohol effects ($\beta=0.21$, $p<0.001$) relative to White individuals. Moreover, males reported needing more drinks to feel heavier alcohol effects ($\beta=0.19$, $p<0.001$) relative to females. These findings highlight the assessment of alcohol effect intensity as important in illuminating important demographic differences in SR.

Vishmi Dasanayake Aluthge

CA - University of California - Merced

Discipline: History

Authors:

Abstract Name: Chile Within Mesoamerican Culture

Prior to the Spanish invasion of the Americas, the fruit of the chile or chili plant was used in a variety of ways. These included use within food preparation, and in consumed medicinal remedies. Studying the significance of chile or other foods within the Mesoamerican culture creates opportunities for researchers to better understand the role in which different types of foods impact the Nahua people. This study aims to closely analyze how chile was discussed and used within the Mesoamerican culture, specifically among the Nahua people. Based on analysis of multiple sections within the Florentine Codex, this research aims to understand how the chile was used as an additive within cultural dishes, a component within remedies, and other influential ways; also addressing why they were used. Implementing an approach of literary analysis through compare and contrast of two different translations. The primary source material used within the research is the Florentine Codex, a 12-volume, Indigenous-authored text that is available in the original Nahuatl, with a Spanish translation (and an English translation of both the Nahuatl and Spanish). Analysis within the Codex suggests that chiles had broad culinary, medicinal, and other social significance. The study of the impact of chile shows a narrow look within the culture and practices of the Nahua people, informing how much is still unknown about the Mesoamerican people.

Amuktha Dasari

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Amuktha Dasari

#2 Jean Sun

#3 Sydney Lin

#4 Mary Anne Garner

#5 Alecia Gross

Abstract Name: Heterozygous knockdown of cofilin 1 in rod photoreceptors exacerbates effects of degeneration in a mouse model of retinitis pigmentosa.

Cofilin 1 (CFL1) is an effector of actin cytoskeletal dynamics and contributes to toxic protein aggregation and disease exacerbation across multiple neurodegenerative diseases. In animal models of neurodegenerative disease such as Parkinson's and Alzheimer's, decreasing the endogenous amount of CFL1 is neuroprotective. Our lab has recently discovered CFL1 is expressed in the neural retina and is critical for photoreceptor viability, but the effect of CFL1 in retinal degenerations remains unexplored. Retinitis pigmentosa (RP) is a retinal degenerative disease that can be caused by mutations in the gene for rhodopsin (RHO), including the

P23H mutation. RP results from a loss of rod photoreceptors, leading to vision loss. We investigated the potential neuroprotective effect of rod-specific heterozygous loss of CFL1 (rCfl+/-) in a heterozygous RHO P23H mouse model of RP (rCfl+/-;P23H/+) using electroretinography to measure retinal function in vivo and immunohistochemistry to evaluate rod viability and retinal inflammatory responses ex vivo. We found that these mice displayed diminished retinal function alongside greater rod photoreceptor degeneration, together with increased glial reactivity compared to RHOP23H mice at 6 weeks of age. These results indicate that the heterozygous loss of Cfl1 exacerbates the degenerative effect of the RHO P23H/+ mutation, leading to a more rapid loss of rod photoreceptors, in contrast to other neurodegenerations found in the brain.

Cyrille Date

MN - Minnesota State University - Mankato

Discipline: Biology

Authors:

#1 Cyrille Date

#2 Cecilia Noecker

#3 Peter Turnbaugh

Abstract Name: Comparing Gut Bacterial Strains' Responses to Nitric Oxide Stress

Nitric oxide (NO) is a host-produced molecule that disrupts bacterial respiration and acts as a potent antibacterial agent in the mammalian gut, especially in inflammation. *Escherichia coli* is a common human gut bacterium with significant strain variability, including some strains with beneficial functions and others that have been linked to inflammatory bowel disease (IBD). Preliminary data suggest that *E. coli* strains with the nitroreductase (NR) gene family 3VPSM are more abundant in the microbiome of individuals with IBD. This finding suggests a potential link between these NR genes, *E. coli*'s tolerance of nitric oxide, and its influence on autoimmune conditions. However, it remains unclear whether *E. coli* strains differ in their tolerance of NO stress and whether these differences could be mediated by the NR gene family. This research is investigating whether *E. coli* strains vary in their response to NO and whether the NR gene family 3VPSM may contribute to this variation. Using genomic data, I have selected eight *E. coli* strains for this study, including four with the NR gene family and four without. We are culturing these strains in anaerobic conditions with varying exposure to NO, produced from the NO donor DEA NONOate. In a preliminary experiment, an *E. coli* strain with the NR gene family had only an 8% growth inhibition in a 100uM concentration of NO. On the other hand, the type strain, which lacks this gene, was inhibited by 48%. We are further optimizing growth conditions to test differences in growth rates, nitrogen-related compounds using the Griess assay, and gene expression using qRT-PCR). By elucidating the roles of strain variation and nitroreductase genes in NO resistance, this research will enhance our understanding of *E. coli*'s survival strategies and its dual role in health and disease.

Isabella Dattilio

GA - Georgia College and State University

Discipline: Chemistry

Authors:

#1 Peter Rosado Flores

#2 Logan Hall

Abstract Name: Development and Stability of Mesalamine-Capped Silver Nanoparticles for Targeted

Silver nanoparticles (AgNPs) are innovative materials with broad applications in antiseptics and drug delivery systems. Inflammatory Bowel Disease (IBD) refers to chronic disorders characterized by inflammation of the intestinal lining, primarily including Ulcerative Colitis (UC) and Crohn's Disease (CD). These conditions require localized treatments to manage flare-ups and induce remission. Mesalamine, a 5-aminosalicylic acid (5-ASA) derivative, is a commonly used therapeutic agent for IBD. This study focuses on the synthesis and stability of mesalamine-capped silver nanoparticles (MSA-AgNPs) as a potential drug delivery system for IBD therapy. The nanoparticles were synthesized via chemical reduction using silver nitrate (AgNO_3) as the precursor and sodium borohydride (NaBH_4) as the reducing agent. Unlike the commonly used stabilizer, mercaptosuccinic acid (MSA), mesalamine was employed as a capping agent in this research. Three synthesis methods were evaluated: rough addition of NaBH_4 , steady drop-by-drop addition, and controlled burette dispensing. UV-Vis spectroscopy confirmed the formation of AgNPs with characteristic absorption peaks between 350-400 nm. To assess long-term stability, nanoparticles were tested in two solvents: water and phosphate-buffered saline (PBS). PBS demonstrated superior stability, minimizing aggregation and enhancing suitability for drug delivery applications. Environmental factors, such as pH, were systematically varied to optimize nanoparticle stability and delivery efficiency. For these tests, 10 mL of nanoparticle solution was mixed with 8 mL of buffer adjusted to different pH levels. The results indicate that mesalamine-capped silver nanoparticles, synthesized under controlled conditions, offer promise as a stable and efficient drug delivery system for targeted IBD treatment. This study highlights the potential of MSA-AgNPs to improve therapeutic outcomes for patients with UC and CD.

Amelia Davidson

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Mackenzie Love

#2 Anna Cook

#3 Andrew Arrant

Abstract Name: Brain Injury Increases Progranulin Expression in Microglia and Astrocytes

Loss-of-function mutations in the gene encoding progranulin (GRN) are a major genetic cause of frontotemporal dementia (FTD). Progranulin is a secreted protein found abundantly in the central nervous system. It has multiple functions in the body, including enhancing lysosomal activity, anti-inflammatory effects, and neurotrophic effects. Progranulin-deficient mice ($\text{Grn}^{-/-}$) have hyper inflammatory responses of both microglia and astrocytes to inflammatory stimuli and injury compared to responses in wild-type mice. Previous literature has shown that levels of progranulin in microglia increase over time after injury, but progranulin in astrocytes has not been well studied. The aim of this study was to document the change in progranulin after injury, focusing on astrocytic levels of progranulin. We subjected mice to unilateral cortical stab wound injury to examine changes in microglial and astrocytic progranulin expression at 1, 4, 7, 10, and 14 days after injury. The uninjured hemisphere was used as a control. Immunofluorescent staining for progranulin and markers of microglia, astrocytes, and neurons were used to assess the change in progranulin levels over time. Astrocytes and microglia exhibited elevated progranulin immunoreactivity beginning at 4 days post injury, which then decreased in astrocytes through the final time point of 14 days, while microglia showed only a downwards trend through the final time point. Neurons showed slightly elevated progranulin immunoreactivity by day 10. These findings suggest that progranulin plays an important role in injury recovery. Future directions will measure Grn RNA to confirm progranulin expression in each cell type, and will determine if progranulin's lysosomal functions are sufficient to reduce reactivity in activated microglia and astrocytes.

Abigail Davidson

PA - Susquehanna University

Discipline: Political Science

Authors:

#1 Abigail Davidson

Abstract Name: Violence as a Predictor of Migration

Migration patterns are influenced by an intricate mix of push and pull factors that may encourage populations to leave their homes and move elsewhere. This paper investigates how various forms of violence, and fear of violence, influence migration decisions in Mexican states. By analyzing data from 2015–2020, this study evaluates trends in immigration, emigration, and net migration by focusing on indicators such as violent crime, organized crime, firearm crime, and fear of violence, while controlling for poverty levels. Findings reveal that fear of violence significantly deters immigration into states, acting as a strong anti-pull factor. Overall, fear of violence had a negative correlation with net migration, suggesting it is more influential in deterring new arrivals than motivating departures. Violent crime showed a surprising positive relationship with immigration and net migration, which indicated other pull factors, such as economic opportunity, outweigh the potential danger of the violent crime rates. The other indicators of violence did not show a significant impact on the migration rates, except for a negative relationship between net migration and weapon crime on its own. These findings highlight the importance of addressing both perceived and actual violence to mitigate migration pressures and predict patterns, calling attention to the nuanced role fear of violence plays in shaping regional migration dynamics.

Starr Davis

TX - Texas Woman's University

Discipline: Biology

Authors:

#1 Starr Davis

#2 Megan Park

#3 Sushmita Sinha

Abstract Name: Role of BATF3 in Human Central Memory CD8 T Cells

Basic Leucine Zipper ATF-Like Transcription Factor 3 (BATF3) belongs to the family of AP-1 transcription factors. In the murine model, BATF3 played an intrinsic role in the formation of memory CD8 T cells and induction of robust recall responses. Additionally, in a study on chronic myeloid leukemia (CML) cells, BATF3 regulated apoptosis and survival related genes in the cells through key components: Caspase 3, BAX and BCL-2. Although BATF3 was initially discovered in human T cells, there is limited research on the mechanism of BATF3 regulation of T cell function in healthy human donor cells. We have found that BATF3 is upregulated in activated T cells. Further analysis of differentiated T cells revealed that BATF3 was predominantly upregulated in central memory (CM)-CD8 T cells, suggesting a functional role of BATF3 in CM T cells. We have developed a system to induce central memory T cells from naive T cells that, on analysis, upregulated BATF3. Building on this, we aim to knockdown BATF3 in CD8 T cells to determine its role in regulating proliferation and survival of CM CD8 T cells. We will also use inhibitors of the key pathways involved in the activation, proliferation, and function of T cells with the goal of determining the key

molecules involved in the upregulation of BATF3 in CM CD8 T cells. It is expected that the results from these experiments may narrow down the role of BATF3 in human CM-CD8 T cells.

Claire Davis

WV - West Virginia University

Discipline: Art History

Authors:

#1 Prashnna Gyawali

Kelsey Clodfelter

Abstract Name: Artful Algorithms: Annotating Ancient Maya Vases for a new AI Detection Model

This project utilizes an interdisciplinary approach to developing an artificial intelligence (AI) model capable of recognizing and segmenting hieroglyphic blocks from scanned images of Maya vessels. The objective is to train the AI model to identify and isolate regions of interest within these images, specifically focusing on individual text blocks, integral components of Maya writing. To improve the accuracy and precision of the model, the project employs a combination of manual annotation and rigorous examination. WVU undergraduate researchers in Technical Art History manually annotate the images by marking the boundaries of each hieroglyphic block. This produces a high-quality dataset serving as a “gold-standard,” which allows the model to learn the distinct characteristics of each hieroglyphic block, enhancing its segmentation capabilities. The performance of the model is rigorously evaluated using an Intersectional Reunion metric, which compares the results of the model’s segmentation against the manually annotated data, ensuring the model’s output is accurate and consistent with human expertise, helping identify areas for improvement. The model is refined based on these evaluations, with the goal of maximizing its ability to segment blocks accurately while minimizing errors. This project employs experts in Maya art history and linguistic anthropology with computer scientists in a collaborative, holistic approach to the complex task of Maya hieroglyph recognition and segmentation. This will advance the field of epigraphy and improve the tools available for the analysis of ancient texts. The project anticipates future study in not only identification of entire hieroglyphic blocks but eventually, translation.

Megan Davis

CO - University of Colorado at Boulder

Discipline: Engineering

Authors:

#1 Michael Toney

#2 Thomas Chaney

Abstract Name: Impact of Solvent Choice on PM6 Solution Conformation for Organic Photovoltaics Devices

The increasing demand for renewable energy sources has accelerated advancements in organic photovoltaics (OPVs), which have the potential to provide a low-cost, flexible, and environmentally sustainable alternative to traditional silicon solar cells. However, OPVs currently exhibit a lower power conversion efficiency (PCE) of 19%, compared to the 26% efficiency of silicon cells. This inefficiency limits their broader adoption in the solar energy market. The morphology of the conjugated polymer films within OPVs largely determines the PCE, as it directly influences both light absorption and charge transport. One key factor in shaping this morphology is the aggregation of polymer chains during fabrication. The choice of solvent used in the

deposition process plays a crucial role in controlling polymer aggregation, as well as the crystallinity and overall film structure. These solvent-driven changes in morphology ultimately impact the PCE of the OPVs. The objective of this research is to explore how different solvents affect the morphology of PM6-based OPVs. To achieve this, PM6 solutions were prepared with varying solvents at different concentrations, followed by spin-coating onto glass substrates to form thin films. Ultraviolet-visible (UV-Vis) spectroscopy was used to measure the absorption spectra of both the solutions and the films, revealing information on polymer aggregation, crystallinity, and the degree of order within the films. Changes in the absorption peak position, width, and intensity are analyzed to reveal the impact of solvent choice on the polymer structure. Data from these measurements help correlate solvent-induced changes in polymer aggregation with improvements in OPV performance. By investigating the relationship between solvent selection and OPV morphology, this research provides valuable insights that contribute to the development of more efficient and cost-effective OPVs.

Sydney Davis

KS - University of Kansas

Discipline: Interdisciplinary

Authors:

Abstract Name: Between Policy and Peril: How Italy's Reception System Fails Women

Within the past decade, the refugee crisis in Europe has led to an influx of refugees in Italy, many of them being women who experience SGBV in reception facilities. The project investigates how Italian migration policies from the past 10 years affect Italian reception facilities perpetuating sexual and gender-based violence (SGBV) for women refugees. Previous researchers examined how the lack of adequate reception facilities puts refugees' human rights at risk. Moreover, scholars used qualitative methods, in the form of interviews, adding various frameworks for effective analysis. For primary data, I will employ a direct semi-structured interview methodology to gather in-depth qualitative data from female refugees currently residing in or have previously experienced Italian refugee reception facilities. Furthermore, a thematic analysis of the interviews will evaluate trends between migration policies and the perpetuation of SGBV in Italian reception facilities for women refugees. The results will likely show the correlation between Italian migration policies and the perpetuation of SGBV in Italian reception facilities. Bringing to light the previously stated correlations will push for policy reform to improve the reception facilities conditions, thus ensuring future refugees do not have to endure the same human rights violations, allowing for a safer environment for a better chance of starting a new life.

Kaitlynn Davis

WI - University of Wisconsin-Whitewater

Discipline: Chemistry

Authors:

#1 Kaitlynn Davis

#2 Paul House

Abstract Name: Developing a method for detection of volatile organics in dog urine

Studies have shown dogs use urine to mark 'property lines' and assert dominance. Part of this communication is thought to take place through volatile organic compounds in urine. These compounds have not been

extensively studied in dogs and this work aims to develop a reliable method using liquid-liquid extraction to extract volatile organic compounds and then separate the mixture with gas chromatography. Previous work with the urine of dogs and of other animals have found a variety of organic compounds but particularly carboxylic acids, ketones and sulfides of approximately 5-12 carbons. This work utilized aqueous solutions with small amounts of these compounds to develop the method. Previous work had used solid phase microextraction but had problems with reproducible results. This work utilized diethyl ether extraction of typical volatile organics from aqueous solution. A small amount of the extract is injected to a gas chromatography instrument for separation. Detection was with flame ionization where the sample is exposed to a hydrogen flame, and loses electrons, ionizing the organic compounds. Charges from the sample are attracted to an electrode, producing a current which is read. The height and area below the curve is proportional to the presence of the analyte in the sample. Ultimately, we aim to draw connections between the presence and quantity of volatile organic compounds in a sample with the social behaviors of domestic dogs. By studying sample analytes which are similar in character, and can assist in developing a well rehearsed method that will benefit future exploration on this topic.

Ferrufino Dayana

MD - Bowie State University

Discipline: Chemistry

Authors:

#1 Giselle Nunez

#2 Kameron Banks

#3 Saniyah Dyches

#4 Adriana Florence

Chenilyn Espineda

Abstract Name: Effect of Food Preparation on Vitamin C Concentration in Fruit

This study thoroughly investigates the determination of ascorbic acid (vitamin C) content in commercially available products and food items using titration techniques. The main goal is to establish a reliable and efficient method for determining the ultimate storage conditions that result in the highest concentration of vitamin C, a crucial antioxidant that plays a vital role in human health. The experimental approach involves titrating the samples, employing 2,6-dichloroindophenol (DCIP) as the titrant, chosen for its ability to exclusively oxidize ascorbic acid without affecting other potential substances. Additionally, DCIP serves as a self-indicator in the titration process. For a substance to function as a self-indicator, it should exhibit one color when in the presence of excess analyte (i.e., ascorbic acid) and a different color when the analyte has completely reacted, which allows for the calculation of the amount of ascorbic acid present in the sample. The study explores the optimization of storage conditions, to enhance the amount of vitamin C concentration. The goal of this team's project to find out how different food preparation affects Vitamin C concentrations in fruits. We will be testing this on three different fruits; pineapple, orange and lemons. The preparation techniques include boiling, freezing and dehydration. Samples of juice from the fresh fruits were tested in both the as obtained and processed condition. The analysis technique consisted of titration using a 2,6-dichloroindophenol sodium salt solution.

Joao Pedro de Favari Engel

CA - University of the Pacific

Discipline: Computer Science

Authors:

#1 Brian Ngo
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Abstract Name: Rethinking Onboarding for High Turnover Development Groups

Software onboarding is a process where new developers familiarize themselves with an existing code base. Researchers have reported the difficulty that new employees have with onboarding (Rollag et al, 2005) and the high learning curve that adjusting to a new project can face (Williams, 2003). In student-led research, the process and problems related to onboarding are exacerbated. This is due to the constant turnover rate of student developers, the lack of experience some students have maintaining legacy software, and the desire by students to focus on features instead of documentation. This creates a situation where new developers often struggle with productivity during the onboarding process. In this case study, we seek to explore the difficulties we faced while onboarding a research project and the potential solutions. When onboarding onto our research project, a full-stack telemetry application, we found it difficult to onboard with the current documentation. The documentation was scarce and had not been updated for a month, which led to us abandoning the current codebase. Karimzadeh & Hoffman also reported a similar finding, where poorly documented projects lead to software abandonment (2018). We propose an assessment-centric approach to the onboarding process. Building on Onwuatigwu and Islam's findings that inviting an external contributor improves documentation, we took their approach one step further. Not only did we include external participants, we also included a final evaluation step to assess the effectiveness of the documentation. After completing the improved onboarding materials, new developers are asked to re-implement an already existing feature, further assisting us to validate whether the documentation adequately prepared them for real contributions and assess their readiness to join the project. We believe this assessment-centric approach can reduce the cognitive overload and productivity gap for new developers. Future studies will evaluate the long-term impact of this approach's effectiveness.

Leslie De Haro

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: Arrowhead Pathways - Transitional Housing for Former Foster Care Youth

The design of "Arrowhead Pathways" focuses on creating a facility for young adults transitioning from foster care to independence. Central to this is the integration of trauma-informed design principles to address the psychological challenges commonly faced by those aging out of foster care. The design process was informed by research, including interviews with a Oklahoma foster care professional, case studies, and a review of literature and articles, which highlighted the specific needs and challenges of this population. This research guided strategies to enhance social sustainability, safety, mental and physical health, and overall comfort for residents. To support positive outcomes, the facility incorporates inclusive design elements for accessibility and prioritizes the aesthetic appeal of the space. The layout includes flexible living areas, private spaces for reflection, and communal areas for socialization, fostering a sense of community and belonging. Social interaction was a major focus, with spaces like shared dining areas, lounges, and activity areas to encourage engagement and reduce isolation. By creating opportunities for connection, the design supports the mental and emotional well-being of residents, enhancing their ability to thrive in a semi-independent environment. The design also prioritizes staff well-being, addressing the challenges of employee retention in social work-related roles, where burnout and stress are common. Staff areas designed for respite and relaxation provide a supportive work environment, helping to mitigate stress and improve retention. This, in turn, enhances the quality of care provided to residents. Ultimately, "Arrowhead Pathways" combines intentional social spaces for residents, staff-focused areas for employee well-being, and trauma-informed

principles. The result is a balanced environment that promotes both the success of residents transitioning to independence and the long-term sustainability of the staff supporting them.

Omar De Jesus-Gomez

NC - Western Carolina University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Language and Culture Struggles of the Latinx Community in the U.S.A.

In the United States, roughly six in ten Latinx people ages 18 to 29 (62%) and 30 to 49 (57%) face at least one sort of discrimination (Pew Research Center, 2021). Many Latinx individuals in this scenario say they have experienced discrimination from Latinx and non-Latinx people. Their customs and beliefs differ from the traditional American beliefs, making the Latinx community face serious challenges. One of them is language, which creates these barriers in healthcare, education, and other essential services. In recent years, the situation of the Latinx community in the United States has taken a toll; however, recent changes in the community have remained unspoken in the academic side of the world. Recent news articles have highlighted the significance of speaking up and its outcomes, which will be discussed in the presentation. This presentation shares preliminary findings that Latinx people in the United States experience negative mental health decline along with negative impacts on identity. Despite the limited resources that the Latinx community is given, the findings of this study provide different methods of how the Latinx community can unite and speak up, allowing their voices to be heard to make a difference.

Jesus De La Mora Herrera

CA - University of California - Merced

Discipline: Engineering

Authors:

#1 Jesus De La Mora

#2 Jose Morales

#3 Ashlie Martini

Abstract Name: The Phenomena of Tribology: Varnish Removal from Metal Surfaces in Mechanical Components.

Varnish formation in lubricating oil is a significant challenge in industries such as power generation and transportation, where reliability and efficiency are critical. Varnish forms when oil degrades due to exposure to water, dust, and elevated temperatures, accelerating oxidation and deteriorating its properties. These deposits adhere to metal surfaces, obstructing oil flow and causing functionality issues in mechanical systems. Addressing this issue is crucial for maintaining optimal performance and extending the lifespan of mechanical components. Our research explores innovative methods for varnish removal by evaluating chemical cleaners under controlled conditions. Using a custom-designed testing ring, I expose artificially degraded varnish to varying flow rates, temperatures, and chemicals to test their effectiveness. This approach allows us to simulate real-world operational environments and measure varnish removal through visual and mass analysis. The visual analysis is conducted using MATLAB to process the collected visual data and compare its findings with the mass analysis, which quantifies varnish mass removed by the chemical cleaner. This lets us assess the performance of chemical cleaners and our testing apparatus. Additionally, we evaluate

the impact of chemical cleaners on elastomeric seals to ensure compatibility and reliability in long-term applications. This study offers an innovative contribution to the field of tribology by addressing varnish-related challenges with a systematic and quantifiable approach to varnish removal. Varnish removal findings advance the reliability of mechanical systems across essential industries by reducing maintenance costs and downtime while promoting efficient operation. Advancing varnish removal techniques contributes to the development of practical solutions to a persistent tribological problem by maintaining components at optimal performance for longer periods.

Jordyn De La Torre

CO - Regis University

Discipline: Biology

Authors:

#1 Karin Streifel

Abstract Name: Decoding Post-Chemotherapeutic Cognitive Impairment with a C. Elegans Model

Approximately 1.1 million people a year receive chemotherapeutic treatments after being presented with a cancer diagnosis and as much as half of these patients experience cognitive impairment after treatment. Symptoms can include lower processing speeds, short term memory inhibition, a short attention span, and much more. This is often referred to as Post-Chemotherapeutic Cognitive Impairment (PCCI) and there is a notable lack of investigation on the cause behind it. This research utilizes *Caenorhabditis Elegans* as a model to determine the potential cause of PCCI due to their human-like neurons. To do this, three C. Elegans mutants were exposed to chemotherapies Methotrexate and Mechlorethamine as well as a water control. Of the three variations of C. Elegans that will be used, GLP-1 C. Elegans can form tumors, Clec-47 C. Elegans don't have an immune system, and N2 C. Elegans are the wild-type to be used as a control. Once each of these mutants were introduced to the experimental treatments, we performed a nose touch assay to measure each of their learning ability. Differences in nose touch response and learning ability could indicate that PCCI could potentially be due to the chemotherapy, the immune system response, or the cancer itself. This method can be used as a compass to show where to direct future research on PCCI to further investigate its underlying cause. This is in an effort to redirect cancer research to not only include treatment of physical ailments but also the overall wellbeing of affected patients.

Hannah-Betty De Moica

CA - University of California - Merced

Discipline: Health and Human Development

Authors:

#1 Jennifer Manilay

Alexandra Biternas

Abstract Name: The Impact of VHL Deletion on Bone Marrow Microenvironments: Insights into B-Cell Development and Hematological Changes

his research aims to identify how bone marrow niches influence immune cell and blood cell development. We are investigating the role of the Von Hippel-Lindau (VHL) gene, a hypoxia response gene, in the regulation of B-cell development and erythropoiesis in the bone marrow. Longitudinal analysis of tamoxifen-inducible VHL gene knockout reporter (iVhlcKO, Tagln-ERT2-Cre;Ai213;Vhlfl/fl) mice was performed. Complete

blood count (CBC) data was analyzed to identify if there were alterations in red blood cell (RBC) counts and hemoglobin (Hb) concentration, providing preliminary insights into the potential hematological effects of VHL deficiency. Future studies will investigate its effects on bone marrow microenvironments and B-cell development, addressing critical gaps in the understanding of hematopoietic regulation under hypoxic stress. One challenge in our study is the validation of the VHL knockout in the iVhlcKO mice. We developed an assay to confirm Vhl deletion in Tagln⁺ cells. We first tested our assay in single-cell suspensions of enzymatically-digested duodenum tissue (which are known to express high levels of Tagln). Cells were analyzed for the GFP reporter using flow cytometry (FACS). Initial testing of the assay showed GFP detection was low, at 0.014%. Optimization of the timing of the enzyme digestion improved GFP detection to 0.14%. Additional testing is in progress. This research has broader implications for understanding the effects of irradiation, myeloablative conditions, and bone-targeting therapies on hematopoiesis, and could inform strategies to enhance B-cell development and maintenance throughout the lifespan.

Sayumi De Silva

NC - Western Carolina University

Discipline: Biology

Authors:

#1 Britannia Bintz

Abstract Name: Optimization and Validation of an mRNA Multiplex Panel for Identification of Human Biological Fluids

Body fluid identification is an important tool in the field of forensic science as it can provide context in a criminal investigation. Historically, biological fluid identification has been performed using a series of serological tests that result in destructive consumption of precious evidence. Recently, many laboratories have started investigating the utility of mRNA profiling for identification of biological fluids on evidentiary materials. This approach is advantageous because both mRNA profiling and DNA analysis can be performed on a single extract allowing the analyst to retain more of the stain for repeated analyses. Additionally, mRNA based-methods are suitable for mixed stains and are highly sensitive. The purpose of this project is to optimize a multiplex panel for identification of biological fluid specific mRNA transcripts. The process includes co-extraction of RNA and DNA, reverse transcription of the RNA into complementary DNA strands (cDNA), subsequent cDNA amplification and finally multiplex amplification of cDNA using targeted primers specifically designed for mRNA markers that have been associated with forensically relevant biological fluids including peripheral blood, menstrual blood, seminal fluid, vaginal secretions, and saliva. This project draws ideas and procedures from previous studies performed using mRNA for biological fluid identification. Initially studies have focused on perfecting the workflow and assessing performance of primers in singleplex reactions for peripheral blood and seminal fluid samples. We have shown that cDNA can be successfully synthesized after extraction of DNA and RNA from dried biological fluids on swabs using the PrepFiler® and PrepFiler® BTA Forensic DNA Extraction Kits and NEBNext® Single Cell/Low Input cDNA Synthesis & Amplification Kit. Future experiments will include assessing success of PCR amplification using marker-specific primers on single-source fluids. Ultimately, a multiplex panel will be developed that enables forensic analysts to test for several biological fluids using a single, streamlined workflow for each evidentiary stain.

Matthew Deacon

PA - Lafayette College

Discipline: Computer Science

Authors:
#1 Christian Lopez
Miles Morrison

Abstract Name: Integrating Large Language Models into Educational Gamification Programming Application

This study explores the integration of Large Language Models (LLMs), specifically the ChatGPT API, into a gamified educational application designed to teach Python programming for Spanish speaking users. With Python being one of the most in-demand skills in today's job market, this project aims to enhance programming education by automatically generating questions of varying difficulty levels through ChatGPT. The app adapts to users' individual learning needs and offers personalized content based on their progress. By employing interactive and individualized content, the app aims to foster deeper learning and mastery of Python. Moreover, a key component of the application is its use of gamification to increase user engagement and motivation. However, recognizing that game element preferences vary widely among individuals, the project integrates Recommendation Systems to personalize the gamified aspects of the app. This customization maximizes motivation by aligning game features with each user's unique preferences. While the development and integration processes are still underway, this study highlights the potential impact of combining LLMs, Machine Learning, and personalized gamification to revolutionize programming education. More specifically, the work focused on formulating a prompt that generated Python coding questions of varying difficulty. Additionally, the team implemented a pipeline that generates question sets, validates their JSON format, extracts one and translates it for use. Future work will focus on testing the prototype, incorporating other programming languages, and exploring more complex programming concepts. The project envisions creating a highly adaptive learning tool that enhances engagement, motivation, and learning outcomes for users across diverse skill levels.

Zoey Dean

OK - Cameron University

Discipline: Chemistry

Authors:
#1 Jacob Thorne
#2 Leilani Hunter
#3 Kandalama Priyasantha

Abstract Name: Method development and LC-MS troubleshooting for discovering bioactive compounds in herbal plants

Unlocking the therapeutic potential of herbal plants requires precise and reliable analytical techniques to identify and quantify bioactive compounds. This research focuses on developing and troubleshooting methods for separating and detecting bioactive compounds using Liquid Chromatography-Mass Spectrometry (LC-MS) combined with the Quick, Easy, Cheap, Effective, Rugged, and Safe (QuEChERS) extraction method. This approach separates chemical compounds based on polarity, facilitating their identification with LC-MS. Nine different phenolic acids were selected for the study, and 0.1M solutions were prepared. All samples were filtered and analyzed using a C18 LC column with a mobile phase consisting of methanol and 0.1% formic acid. The QuEChERS method was applied to both boiled tea samples and tea leaves. During LC-MS analysis, several challenges were encountered, including tubing clogs, salt deposition within the photodiode array (PDA) chamber, leaks due to excessive backpressure, and loss of optimal pressure in the MS vacuum. These issues were addressed by upgrading to larger bore tubing, optimizing flow rates, thoroughly cleaning the PDA chamber, and ensuring gasket integrity. Implementing these solutions resulted in enhanced separation efficiency and more precise identification of phenolic compounds. The systematic approach to troubleshooting and method optimization minimized instrument downtime and improved the reproducibility

of analytical results. This study offers a solution for herbal plant analysis, aiding in the discovery and utilization of bioactive compounds for potential therapeutic applications using the QuEChERS separation method. The QuEChERS method demonstrated excellent reliability in analyte separation prior to LC-MS analysis. The developed methods and troubleshooting strategies ensure reliable and efficient LC-MS analysis, establishing a framework for future research in this field.

Riddhi Deb

GBR - Cambridge Centre for International Research

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Gender Differences in Trust Levels Toward Law Enforcement Among High School Students

This research project investigates potential differences in trust levels toward law enforcement between male and female high school students. Understanding how gender influences perceptions of law enforcement during crucial developmental stages of a person's life can provide insights into future community relations and policing strategies and may help identify any potential political or treatment-based gaps regarding gender. Existing research has examined trust and confidence in law enforcement across different demographics and contexts but not much so around gender specific areas in regards to the differences in attitudes towards law enforcement or policies between men and women, or around teenagers and highschoolers. The studies that do exist have been focused heavily on undergraduates and have little focus on specific gender perceptions. Utilizing a mixed-methods approach, this study collected quantitative data through surveys and qualitative insights via focus groups. Results indicated that while overall views on law enforcement varied between genders, significant differences emerged in perceptions of law enforcement's societal role and their effectiveness within school settings. Specifically, male and female students held similar surface-level opinions; however, deeper analysis revealed contrasting ethical and logical reasoning behind their views. Their contrasting perspectives included women revolving their conversations around social justice and community based concerns, while men prioritized authority and societal order. Although the focus was on gender-based differences in trust, the findings offer valuable perspectives on the broader opinions of future generations and highlight potential gaps in overall current law enforcement practices and performance.

Dhanushi Dedakia

NC - East Carolina University

Discipline: Physics and Astronomy

Authors:

#1 Yara Maayah

#2 Samuel Minier

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Abstract Name: Magneto Mechanical Actuation to Treat Brain Cancer

Glioblastoma, a highly aggressive and lethal brain cancer, remains resistant to conventional therapies due to its invasive growth and complex tumor environment. In 2023, there was an estimated number of ~2 million new cases of brain cancer in the world with over 25,000 new cases of malignant brain tumors in the United States alone. Current treatment options, such as ionizing radiation therapy, are associated with high costs—~\$82k per course—and detrimental side effects, including cognitive impairments, which limit their

therapeutic efficacy. This study draws on a unique, completely non-invasive therapeutic modality that relies on magneto-mechanical actuation to enhance the potency of chemotherapy medications, such as paclitaxel and doxorubicin, for targeting glioblastoma cells. This modality is based on the remote actuation of magnetic nanoparticles by non-heating alternating magnetic fields. One critical component is to maximize the conversion of magnetic energy into mechanical agitation of intracellular nanoparticles. Our initial studies are centered on optimizing drug parameters, including exposure times (0-72 hours) and concentrations (0-100 μM), using two colorimetric assays CCK-8 and PrestoBlue to assess cell death. Preliminary data indicate that at desired drug exposure, an increase cytotoxic response against human glioblastoma cells (U87) can be induced. U87 cells will be subsequently exposed to magnetic nanoparticles, which will be stimulated by alternating magnetic fields. This will allow us to study the synergistic effect of chemotherapy and magneto-mechanical actuation. Future studies will attempt to determine the molecular mechanism through which magneto-mechanical actuation induced apoptotic pathways. This modality has the potential to advance the field of cancer nanotechnology and magnetic therapy.

Caroline DeDecker

VA - Virginia Tech

Discipline: Psychology

Authors:

#1 Kilee Pearson

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Helina Abraham

Abstract Name: Perceptions of Misogynistic Culture in Digital Environments: Key Influencing Factors

Misogyny online has become an alarming and pervasive issue in the current age of digital communication. The normalization of social media consumption has led to impressionable audiences becoming more casually exposed to misogyny. Additionally, the prevalence of misogynistic content online has caused hatred, prejudice, and discrimination against women both online and offline, emerging as a pressing societal concern. This study applied TikTok videos to investigate discrepancies in the perception of misogyny in online spaces as a function of gender, and other personal and sociocultural dynamics. Specifically, this research has investigated the impact of the following human dynamics on one's perception of misogyny: a) religious affiliation, b) level of devotion to an organized religion, c) political affiliation, d) level of agreement with major political figures (i.e., Kamala Harris vs. Donald Trump), and e) the cultural background of one's parents/caregivers. A total of 124 participants reported demographic information and rated 20 TikTok videos on a 5-point Likert Scale based on the perceived misogyny and perceived humor of the content. To date, our results have revealed that people who are assigned male at birth have lower perceptions of misogyny ($p < 0.001$) and higher perceptions of humor ($p < 0.001$). People who participate regularly in an organized religion have lower perceptions of misogyny ($p = 0.031$), and those who are more devout to an organized religion have lower perceptions of misogyny ($p < 0.001$) and higher perceptions of humor ($p = 0.014$). More conservative individuals have lower perceptions of misogyny ($p < 0.001$) and higher perceptions of humor ($p < 0.001$). Participants who more closely agreed with Donald Trump had lower perceptions of misogyny ($p < 0.001$) and higher perceptions of humor ($p < 0.001$). These findings highlight the complex interplay between personal beliefs and attitudes toward gender-based discrimination online and suggest a need for interventions targeting the sociocultural contributors to misogyny online.

Jacob Deere

IN - Franklin College

Discipline: History

Authors:
#1 Jacob Deere

Abstract Name: Journalism and Desegregation: The Indianapolis Recorder's Coverage of House Bill No. 242

In 1949, the 86th General Assembly of Indiana passed House Bill No. 242, which prohibited schools that segregated students based on race, color, or creed. This research argues that the Indianapolis Recorder, a Black-owned newspaper, built public awareness for House Bill No. 242 in central Indiana. This scholarship examines newspaper publications from the Indianapolis Recorder in 1949, specifically focusing on the day of the bill's adoption on March 10th and its implementation on September 3rd. The Indianapolis Recorder, spoke to and for the African-American community as their publications contained detailed reporting of the bill, including expert analysis from lawyers and civil rights activists. The Indianapolis Recorder also revealed the NAACP efforts to support the bill as well as highlight the politicians who voted for and against the bill. The Indianapolis Recorder's instrumental efforts through their publications throughout 1949 empowered the African-American community of Indianapolis to understand changes in their community. This research builds on existing scholarship of racial history in the state of Indiana and the history of the media in the United States. It fills a gap in the historical narrative by recounting the African American voice in the media, providing greater diversity of perspective on the process of desegregation.

Marissa Defino

PA - Susquehanna University

Discipline: Biology

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#3 David Sandell
#4 Steven Reid

Abstract Name: The effects of spotted lanternfly host plant diet on palatability among spider predator species

The spotted lanternfly (*Lycorma delicatula*) is an invasive planthopper introduced into the US from Asia. Its native host plant, the Tree-of-Heaven (*Ailanthus altissima*), is also an invasive Asian species. The insect's diet is broadening to include commercially important orchard and horticultural plant species. In their native range, lanternflies are putatively chemically protected while feeding on Tree-of-Heaven, but it remains unknown if they are chemically protected while feeding on other non-native host plants. North American spiders may be important predators of lanternflies, but the range of species that feed on them and the inter- and intraspecific range of palatability based on the host plant of the lanternfly remains unknown. We tested lanternfly palatability among lycosid, pisaurid and oxyopid spiders and compared consumption of those actively feeding on the Tree-of-Heaven versus a native species, Staghorn Sumac (*Rhus typhina*). We field-collected spiders, fed them crickets and standardized hunger level prior to offering each spider one of three prey types: a lanternfly nymph collected from a Tree-of-Heaven, a Staghorn Sumac, or a cricket (control). During a 30-min trial, we measured spider attack and predation latencies of prey. We also recorded prey consumption within 24 hours of spider exposure. We hypothesized that Tree-of-Heaven nymphs would be less palatable compared to Sumac nymphs and that these differences would result in variation in palatability across spider species. Preliminary results indicate that palatability varies significantly by host plant and spider species. Tree-of-Heaven nymphs are significantly less palatable than Staghorn Sumac nymphs. We found a trend toward higher predation among larger spider species with smaller spider species feeding on smaller instars. Our results suggest that as lanternfly diet broadens, they could become more palatable to spider predators. This may dampen lanternfly range expansion and allow more opportunities to use spiders as biocontrol agents against this invasive pest species.

Sonoka Deguchi

AL - University of Alabama at Birmingham

Discipline: Biology

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#3 Heng Huang

Abstract Name: Receptor-Mediated Endocytosis as a Pathway for Cellular Uptake of Nanoplastics

The global rise in single-use plastic products and waste has raised concerns about microplastic and nanoplastic pollution in the environment. Microplastics are particles less than 5 mm in diameter, while nanoplastics are even smaller. Both pose potential risks to human health. Emerging research suggests that nanoplastics accumulate in carotid artery plaques, which may increase the risk of cardiovascular events, such as heart attacks and strokes. However, the pathways by which nanoplastics enter the human bloodstream remain poorly understood. In our study, we investigated how nanoplastics enter mammalian cells and circulate in the body using both ex vivo cellular models and in vivo mouse models. Our results indicate that nanoplastics can enter the bloodstream of mice through oral ingestion. At the cellular level, gut epithelial cell lines efficiently internalize nanoplastics via receptor-mediated endocytosis. Using mass spectrometry, we identified potential receptors that interact with nanoplastics. Moving forward, our research will focus on characterizing these receptors and understanding the pathways that nanoplastics use to enter human gut epithelial cells.

Shawnlyn Deitz

OK - University of Central Oklahoma

Discipline: Education

Authors:

#1 Shawnlyn Deitz

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Jessie Cornelius

Abstract Name: The 3 I's, Insight, Inquire, Imagination

The "see, think, and wonder" approach, offers a tool for developing critical thinking skills in art education. This poster examines the impact of these routines in fostering students' observational skills, interpretative abilities, and analytical thinking. Through a mixed-methods study combining observational data, structured art activities, and reflective practices, we investigated how students engage with visual media and develop critical thinking capabilities across multiple learning contexts. The research emphasizes the importance of slowing down the observation process to encourage deeper engagement with visual materials, ranging from traditional artwork to political cartoons and multimedia content. Our poster incorporated diverse strategies, particularly emphasizing an art critique game where students evaluated and discussed peer artwork. This collaborative approach and structured peer teaching opportunities created a learning environment that encouraged students to articulate their perspectives and creative choices. Key findings demonstrate that when students observe, and question artwork through guided routines, they show an improved ability to make insightful observations, provide thoughtful peer critique, and engage in deeper analytical thinking. The

research reveals that art education inherently cultivates critical thinking by engaging students in activities requiring analysis, interpretation, and reflective judgment. Particularly significant was the development of "strong thinking" - students' capacity to critically assess their processes, adapt to creative challenges, and persist through difficulties. The study's results indicate that structured visual thinking routines not only enhance art appreciation skills but also develop transferable critical thinking abilities applicable across academic disciplines. This transformation was evidenced by students' increased capacity for self-criticism, deliberate revision, and resilience in facing creative challenges. These findings have significant implications for art education and the broader development of critical thinking skills in educational settings. Our research suggests that implementing see-think-wonder routines creates a foundation for deeper learning experiences.

Andrea Del Castillo

MN - University of Minnesota - Rochester

Discipline: Psychology

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#1 Robert Dunbar

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#3 Christian Ballam

Abstract Name: Free Speech or Safe Spaces: Students Reluctant to Speak on Controversial Topics Prefer Open Learning Environments

Universities are traditionally viewed as a place where students can learn and practice expression of diverse ideas and perspectives. When talking about campus expression, there are different types of spaces that encourage the sharing of ideas, such as open learning environments, or positive learning environments. Open learning environments are defined as a space in which you can share your ideas without any restriction, while positive learning environments are spaces in which there are restrictions put in place to prevent offensive viewpoints against groups of people. To better understand student expression at the University of Minnesota Rochester, the Campus Expression Heterodox Academy survey was conducted to explore campus expression and students' reluctance levels when discussing topics in the classroom. This research focused on the relationship between students' reluctance to talk about race and politics, and their preference over an open or a positive learning environment. The results showed that University of Minnesota Rochester students who are reluctant to talk about race and politics prefer an open learning environment to a positive environment. This suggests that students who are hesitant to talk about certain topics value free expression. Future research will be focused on understanding the reasoning behind this preference, with the support of qualitative interviews, and further survey analysis.

Cristian Del Gobbo

AR - Lyon College

Discipline: Computer Science

Authors:

#1 Cristian Del Gobbo

Abstract Name: Mapping the use of GAI in a higher educational context

The body of scholarly literature on Generative Artificial Intelligence (GAI) is rapidly expanding, exploring various potential applications for these technologies. However, few studies have examined the extent of students' use of GAI and how often they use it. Even fewer have focused on small colleges. This study, conducted between August and November of 2024 at Lyon College, a small liberal arts institution in Arkansas, systematically investigated the utilization of GAI by students within the university context. The primary objectives of this study were to identify the prevalence, extent, and nature of GAI usage among students. For data collection, we developed an anonymous survey composed of seven questions on the use of AI in student's academic lives. This survey included a mix of closed-ended and Likert-scale questions, administered in classes across various departments to maximize response rates and achieve a diverse and representative sample (n = 171). The findings revealed the proportion of students using GAI tools in their academic work, how frequently they use these tools, the specific purposes for which they are used, and which GAI tools are most favored by students. Additionally, the study highlighted differences in GAI usage between native and non-native English speakers, supported by a significant sample of international students (n = 52).

Finally, we compared GAI usage across different fields of study, uncovering notable variations between academic disciplines. This research provides insights into student's use of GAI tools in academia. As AI continues to grow in popularity, it is crucial to understand the spread of these technologies in higher education, both to develop new and effective ways of incorporating AI to benefit students and to promote mindful and responsible use of tools.

Iván Del Toro

PA - Duquesne University

Discipline: Health and Human Development

Authors:

Emma Bernardi

Catherine Startup

Abstract Name: "Describing persons' post-stroke and caregivers' perceptions of music therapy and dyadic treatment during rehabilitation"

Music therapy is an effective treatment for post-stroke individuals, providing client-oriented care with an emphasis on the interactions between neurologic, personal, and cultural factors which influence daily function (Ben-Yishay & Diller, 2011; Magee, 2010). Music therapy can improve individuals' emotional, physical, and communication outcomes (Magee, 2010), as well as motivation toward rehabilitation and participation in activity (Hitchen et al., 2010). The involvement of a caregiver has been identified as an important factor in recovery post-stroke (Kitter & Sharman, 2015; Norup et al., 2013), but the engagement of caregivers as part of music therapy treatment is limited. To optimize dyadic treatment within music therapy, it is critical to first understand dyads' perceptions about music therapy and the use of dyadic intervention. Their first-hand perceptions about these treatments may help to identify potential needs and inform health professionals in providing care (Ekstam et al., 2015). This project aims to explore individuals post-stroke and their caregivers' perceptions of music therapy and potential use of dyadic treatment. Using a phenomenological qualitative research methodology, the research team will recruit dyads: persons post-stroke and their caregivers. Participants will engage in a semi-structured interview to discuss their perceptions of music therapy and dyadic treatment. The interview will be conducted either via phone or in person. The data analysis will occur during the data collection process using MAXQDA software and consensual coding. Through this project, we expect to gain a deeper understanding of stroke survivors' and caregivers' understandings and attitudes toward music therapy and the feasibility of dyadic treatment. The findings for the study will be used to guide future music therapy programs and the use of dyadic treatment.

madalynn delauter

CA - Medanos College

Discipline: Environmental Science and Sustainability

Authors:

Abstract Name: Owl pellets as bio-indicators for heavy metals

Contra Costa County is home to many diverse ecosystems in which owls play a vital role as predators. Owls help manage rodent and insect populations, preventing crop damage and the spread of diseases, and maintain high biodiversity in their habitats. The purpose of this study is to use owls, specifically their pellets, as indicators of heavy metals in the environment. Owl pellets serve as an excellent bioindicator of toxic metal

contaminants due to owls' wide hunting ranges and diverse diets. Owl pellets were collected from two distinct ecoregions and analyzed for toxic metals using ICP-MS (Inductively Coupled Plasma Mass Spectrometry). We found that both Black Diamond Mines and Big Break Regional Shoreline samples had only trace amounts of copper, iron and zinc, and there was so significant difference between the two sites. The other metals were not detected during ICP-MS analysis. my teammates are Jose Chaves, Yilin Chen, Mariana Maravilla, Gizelle Tirado

Ruby Delgado

IN - Indiana University Purdue University Indianapolis

Discipline: Biology

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#13 Abigail Walton
#14 James Marrs
Shreya Chopra
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Abstract Name: Developmental and Morphological Effects of Lead Acetate Exposure in Embryonic Zebrafish

Lead toxicity and exposure is presented as a major threat to organisms, which may cause morphological changes. This investigation uses the zebrafish (*Danio rerio*) AB strain as the model organism to assess the impact of lead acetate (PbAc) exposure on the development of zebrafish embryos. Previous studies have noted that there are prevalent changes to the gut microbiome and body malformations, including other physical changes. We hypothesize that lead will specifically affect the intestinal structure of zebrafish and increase physical defects in spinal curvatures. Using indirect immunofluorescence, we examined morphology of the digestive tract with the use of an epithelial marker, E-cadherin. Histology was also implemented in the experiment and presented clear differences in the intestinal tract of the gut and intestinal villi for lead treated embryos compared to the control group. Microscope imaging of zebrafish also presents visible spinal malformations, kinks, reduction in eye size and facial-cranial structures that can be used for further analysis. These findings suggest that lead exposure during critical developmental stages induces phenotypic malformations, warranting further investigation into its effects on eye size, body size, and craniofacial development. Our goal is to explore whether the intestinal morphology changes correlate to a change in the microbiome when in the presence of lead. Future experiments will identify vulnerable windows for developmental exposure, morphological consequences, and structural effects on brain development.

Mirnesa Delic

MN - Hamline University

Discipline: Chemistry

Authors:

Abstract Name: Green Synthesis of Antibacterial Silver Nanoparticle Dispersed Hydrogels via Cold Atmospheric Pressure Plasma

Hydrogels are three-dimensional polymer network structures that can imbibe large amounts of water, resembling the function of biological tissues. Currently, most hydrogels are synthesized using hazardous initiators such as peroxides or cross-linking agents that are unpleasant for the environment. The purpose of this research is to synthesize antibacterial silver nanoparticle dispersed hydrogels of poly(acrylamide-co-acrylic-acid) (PAAm-co-AAc) in a sustainable way by using cold atmospheric pressure plasma (CAP plasma). By utilizing CAP plasma, chemical species including the hydrated electrons, hydrogen radicals, and hydroxide radicals are generated which lead to chemical reaction pathways such as polymerization. In this study, free radical polymerization of an acrylic acid and acrylamide monomer solution was performed by a CAP plasma. PAAm-co-AAc hydrogels were formed with a high percentage conversion, and a polymerization time of less than nine minutes when 40 milliliters of a 20% monomer solution was mixed and subject to CAP plasma. Silver nanoparticle dispersed hydrogels were synthesized when 2.5mM of silver nitrate or 1.25mM of silver sulfate were added to the monomer solutions. A catalytic effect with both silver sulfate and silver nitrate was observed. Several characterization tests were then conducted on the hydrogels. Crystalline silver nanoparticles (spherical and rectangular) were confirmed via TEM-EDS in hydrogels that contained silver nitrate or sulfate. Nuclear magnetic resonance spectroscopy confirmed the formation of a copolymer and the ratio of acrylamide-to-acrylic acid in our hydrogel samples. Water swelling, gel fraction, and antibacterial tests were conducted to further characterize the synthesized hydrogels. From our chemicals mentioned above, a metal and polymer hydrogel has applications in wound healing/dressing, tissue adhesion, catalysts, conductive material on skin, etc. By harnessing plasma technology to create hydrogels, we are advancing the field of science while exploring sustainable solutions to reduce environmental impact.

Kieran DeLoatch

PA - Duquesne University

Discipline: Biology

Authors:

#1 Tarun Bhatia

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#3 Rehana Leak

Abstract Name: MAP2 Expression in Astrocytes in Vitro and in Vivo

Microtubule-associated protein 2 (MAP2) plays a role in microtubule assembly in neuronal processes. Although MAP2 expression was reported in injured astrocytes more than thirty years ago (PMID: 1692628), this protein is widely used today as a neuron-specific marker in studies of the central nervous system. Here we report in vitro MAP2 expression in rat primary astrocyte cultures, using immunostaining with two independent antibodies. We also confirmed prior reports of in vivo MAP2 expression in GFAP+ astrocytes surrounding the needle track following stereotaxic infusions of the mouse brain. In primary astrocyte cultures evaluated by immunocytochemistry and immunoblotting, astrocytes expressed a low-molecular mass isoform of MAP2 (~75 kDa) but not the neuron marker NeuN. Control primary cultures containing neurons displayed two isoforms of MAP2 (~75 and >250 kDa) as well as abundant NeuN expression. Treating astrocyte cultures with the oxidative toxicants paraquat and hydrogen peroxide or increasing the passages of the astrocytes did not raise MAP2 expression levels by immunoblotting. Increasing the cell plating densities in primary astrocyte cultures or applying the proteasome inhibitor MG132 also did not affect MAP2 or GFAP expression in primary astrocyte cultures by immunocytochemistry. Thus, additional MAP2 expression may

not be observed in cultured GFAP+ astrocytes, as they have already undergone intense gliosis. These findings have significant implications for the common use of MAP2 as a marker of neurons.

Gianna DelRosso

MA - Boston University

Discipline: History

Authors:

#1 Christopher Rhodes

Abstract Name: The history of the Crusades and the significance it holds on both medieval and modern societies

The Crusades were a time of political, economic, cultural, and religious impact, and were the origin of the various complex relationships between the Europeans and the Muslims. From the 11th to 13th centuries, it was initiated by European Christians to reclaim the Holy land from Muslim control. The period of the Crusades also has a profound impact on Christian and Islamic medieval and modern societies. There are a great number of articles that mention the long-lasting affects the actions of the Europeans have on Muslim people, or people in the Islamic community, today. One important question to consider during this time period is, "Were Muslims converted to Christianity through the Crusades?" When researching, many historical writers in particular have mixed opinions about the topic of assimilating cultures, traditions, and religions. While there are some works that emphasize assimilation of the Muslims, most discuss other factors and motives from the Europeans that were more significant to them than forceful religious conversion. When delving deeper and coming to the realization that the majority of authors believe that the Europeans did not have any ulterior motives religiously, more questions and concerns can be raised about why the interactions between the Europeans and the Muslims were often so hostile and pugnacious. Since the European Christians, or the "Crusaders," violated Muslim territory to reclaim a religious site, there were other elements that came into play that could have sparked tension and conflict between the two groups of people. Key themes like Muslim resistance, the role of women, certain military strategies conducted by the Europeans, and intervention of the nobility, political, and religious leaders are all common in most works when discussing European-Muslim relations during the Crusades. Even though there are some misconceptions when interpreting this event, there are also many different perspectives of it.

Shree Delwadia

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:

#1 Steven Howard

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Abstract Name: Various Factors of Hospital Performance Assessment

In today's society, assessment of hospital performance is significant in terms of evaluating healthcare system

management. Understanding the factors that influence hospital performance is crucial for improving variables such as patient outcomes and operational efficiency. This project conducts a systematic review of existing literature to explore various factors that impact hospital performance such as financial management, market attributes, quality and safety, and advanced technologies. Furthermore, this project will also analyze comparable and potentially interrelated variables in hospital datasets through the review of data dictionaries and codebooks. By reviewing previous studies and analyzing data from the American Hospital Association (AHA), we aim to quantitatively operationalize the diverse hospital attributes within the context of the Counte-Howard Healthcare Performance Conceptual Framework as well as examine the relationships between them. This review not only aims to further clarify how different hospital performance factors interact but also identify gaps in the current understanding of this topic. By determining the relationships between the framework, the goal of this project is to develop an expanded framework which assesses hospital performance more objectively and comprehensively. This hospital performance assessment (HPA) framework will allow for improved decision-making for important stakeholders, such as healthcare management officials and policymakers, ultimately leading to enhanced strategies for improving hospital operations and patient care.

Kate DeMann

MI - Hope College

Discipline: Biology

Authors:

#1 Skylar DeWitt

#2 Erika Calvo-Ochoa

Abstract Name: Effects of acute hypoxic exposure in the olfactory system of adult zebrafish

Hypoxia, the lack of sufficient oxygen in tissues to sustain bodily functions, has a deleterious effect on brain health. Zebrafish offer an excellent model to study hypoxia due to extensive neuroplasticity and injury-induced cell proliferation in their central nervous system (CNS), particularly their olfactory system. In this study, we establish a paradigm of acute hypoxic exposure in zebrafish to uncover the effects on the olfactory system's structure and function. To induce hypoxia, zebrafish were placed in a tank with hypoxic levels of 0.6-0.8 mg/mL dissolved O₂ (DO) for 15 minutes and then recovered for 1-day post hypoxia (1 dph). We hypothesized that hypoxia is associated with a loss of smell due to abnormalities in the olfactory epithelium (OE). To study this, we assessed olfactory-mediated responses to cadaverine, an odorant that elicits alarm responses in zebrafish, characterized by freezing, sinking, and decreased exploration of the tank. To assess olfactory epithelium integrity we stained for active mitochondrial dehydrogenase activity to study mitochondrial function and performed immunohistochemistry assays to assess structural degeneration and neuroinflammation in the olfactory system. We measured olfactory sensory neuron (OSN) activity by labeling with c-Fos, a marker of neural activity. In addition, we utilized Alcian Blue stainings of the olfactory epithelium to visualize the mucus layer and the structure of mucus-producing Bowman Glands. We observed reduced responses to cadaverine in the hypoxic group, indicative of olfactory loss. We also found mitochondrial activity reduction, increased astrocyte activation, and apoptosis markers in the olfactory bulb. Interestingly, we found changes in the mucus layer in the OE as well as epithelial swelling along with changes in OSN activation. Collectively, our results characterize olfactory loss associated with degeneration of the olfactory system caused by hypoxia. This work provides insights into hypoxia's impact on olfaction, specifically olfactory morphology and function.

Amanda DeMars

AZ - Northern Arizona University

Discipline: Nursing and Public Health

Authors:

#1 Dolavee Tumthong

Ryley Manahan

Marcela Marcial Fragozo

Abstract Name: Reducing Stigma through Mindfulness: An Intervention for HIV-Positive Patients and Healthcare Employees

Project Purpose: Our intervention aimed to reduce the stigma associated with HIV/AIDS among patients by fostering a supportive and understanding environment. Additionally, our intervention promoted gender-affirming care for employees at North Country HealthCare, ensuring that all staff and patients feel respected in their identities. Overall, the initiative aimed to create a more inclusive and compassionate healthcare setting for both patients and staff. **Background:** Stigma can affect both patients and healthcare employees and remains a barrier to accessing adequate health care. This particularly affects patients who are living with HIV since patients who perceive high levels of HIV-related stigma are 2.4 times more likely to delay enrollment in care. Addressing this issue and focusing on gender-affirming care can help improve health outcomes and create a safe environment. **Methods:** Two interventions were used for this project. The first targeted North Country HealthCare employees through a health education lesson focusing on preventing stigma and supporting gender-affirming care. The lesson included role-play scenarios to help employees understand and address stigma and gender-affirming care in the workplace. The second intervention supported Ryan White patients through the creation of a website focusing on mindfulness techniques and stigma-reduction tools. Additionally, we assembled and distributed mindfulness goodie bags containing items such as journals and massagers to promote mindfulness practices and support patient wellbeing. **Conclusions:** During the educational presentation to North Country Healthcare employees, a pre and post-test was conducted. Knowledge about how to reduce stigma among North Country HealthCare employees increased by 13%. Additionally, the comfort of working with HIV patients increased by 13%. Commonly written feedback from our participants included gratitude and an improved understanding of gender-affirming care and stigma. Looking ahead, the Ryan White Part B program will be equipped with digital platforms and interactive activities to better support patients living with HIV.

Kylie Dempsey

WV - West Virginia University

Discipline: Dance

Authors:

Abstract Name: "Fragments of Us"

The story behind my dance has such a sentimental meaning to the growth and lessons I have learned in my life, and I wanted to create something so vital, that it showcased the importance of knowledge in community. I created this dance with a co-ed cast of 11 dancers who all portray their own experiences under the umbrella of my theme. The purpose of this dance is to invoke the acknowledgement of knowing that you are not alone. Specifically, in the experience of conflicting emotions of love and hate one faces when they lose someone who essentially became a part of you. It is also a lesson of how someone, no matter how long they have been in your life can have a long lasting effect on you. The aspects explored in this piece are the moments of expressing one's anger musically and the remembrance of a once tender love, but now whimsical fleeting memory that is only a daydream you are being pulled out of. This dance demonstrates its uniqueness of letting others know that it is not wrong to experience a vast range of emotions when dealing with a loss of someone you loved, no matter the reason for their now non-existence in your life. While this is a well-known topic, what makes this dance so different is it truly brings to life the embarrassing actions of sniffing a loved

ones shirt, trying to hold on to the memory of them in the form of clothing their loved one once wore. This is showcased in the community of all of them wearing the same outfits with a prop shirt being drawn back to a cream white shirt that represents how we all are grappling with the loss and sentimental tie to a variety of relationships.

Yuntian (Louis) Deng

PA - University of Pittsburgh

Discipline: Psychology

Authors:

Abstract Name: Recalibrating the Self: Affirmation, Rumination, and the Complex Nature of Psychological Integrity

Self-affirmation, a widely studied psychological intervention, aims to bolster self-integrity and promote adaptive cognitive and emotional outcomes. However, its efficacy remains context-dependent and influenced by individual and situational factors. This study investigates how self-affirmation interacts with different types of rumination—positive, negative, and neutral—to affect construal levels, affirmativeness, and dampening of positive emotions. A sample of 275 U.S. adults participated in a mixed factorial design study, where they completed pre-task assessment, rumination induction and affirmation intervention tasks, followed by a series of post-task assessments. Results revealed no significant main effect of self-affirmation on construal levels, although trends suggested potential interactions with rumination. Affirmation increased construal levels under negative and neutral rumination but appeared to reduce abstraction under positive rumination for participants with lower baseline construal levels. Affirmation significantly enhanced engagement with affirming content, as evidenced by higher Affirmation Index scores across conditions. Exploratory analyses showed that affirmation interacted with rumination to influence dampening, with affirmation tempering heightened positive states in positive rumination and reducing overly negative states in negative rumination. Racial differences further moderated these effects, particularly in the dampening subscale, highlighting the importance of cultural and identity-related factors in self-affirmation processes. These findings highlight the context-sensitive nature of self-affirmation, suggesting its effects depend on baseline cognitive states and the reflective context and exploring affirmation's role as a regulatory mechanism that stabilizes cognitive and emotional states.

Logan Denney

FL - Jacksonville University

Discipline: Psychology

Authors:

#1 Logan Denney

#2 Amanda McGraw

Abstract Name: The Cognitive Abilities of College Students and their Relationship to a Personal Sense of Uniqueness

PosterTITLEThe Cognitive Abilities of College Students and their Relationship to a Personal Sense of UniquenessData collection is in progress. This study examines the relationship between cognitive abilities and personal uniqueness in college students. While prior research highlights the importance of uniqueness in individual identity, its connection to specific cognitive abilities remains underexplored. Young adults

represent a population where developing a sense of uniqueness is particularly complex due to significant cognitive and social development. Here, we hypothesize that processing speed, academic achievement, working memory, and social cognition will each predict a greater sense of personal uniqueness. Participants will complete assessments measuring their processing speed, working memory capacity, academic achievement, and social cognitive abilities. Self-reported measures of personal uniqueness will be collected to evaluate the relation between cognitive abilities contribute and personal uniqueness. To address Research Question 1: Does processing speed predict a greater sense of personal uniqueness in adolescents? we will conduct regression analyses with processing speed as the predictor. To address Research Question 2: Does academic achievement predict earlier uniqueness development? we will use academic performance as the predictor. Similar analyses will explore the effects of working memory (Research Question 3) and social cognition (Research Question 4) on personal uniqueness. Age and gender will serve as covariates in all analyses. This study is significant because understanding how cognitive abilities contribute to uniqueness can help individuals recognize and embrace their individual differences. These insights may enhance self-efficacy, foster healthier relationships, and improve mental health outcomes, ultimately creating opportunities for personal and social development.

Logan Denney

FL - Jacksonville University

Discipline: Psychology

Authors:

#1 Logan Denney

#2 Amanda McGraw

Abstract Name: The Sleep Quality of College Students and its Relationship to Academic Anxiety and Performance

This study examines the relationships between sleep quality, academic stress, and academic performance in college students. We aim to build on existing research by exploring how these factors interact and influence student outcomes. Sleep quality refers to the degree of restfulness and uninterrupted sleep, academic stress involves feelings of worry or nervousness about educational responsibilities, and academic performance is measured by grade point average (GPA) and students' satisfaction with their grades. Participants will complete self-report measures assessing sleep quality, academic stress, and satisfaction with academic performance. GPA will be collected as an objective indicator of academic performance. To address Research Question 1: Is poor sleep quality associated with greater academic stress? we will conduct regression analyses with sleep quality as the predictor and academic stress as the outcome. Here, we hypothesize that poor sleep quality will be associated with higher levels of academic stress. To address Research Question 2: Does poor sleep quality predict reduced academic performance? We predict that poor sleep quality will correlate with decreased academic performance. We will run a similar analysis, using academic performance as the outcome. Age and gender will be included as covariates in both analyses. Both poor sleep quality and elevated academic stress are also expected to contribute to reduced self-efficacy, difficulties in maintaining relationships, and increased risk for poor mental health outcomes. This study is significant because understanding how sleep quality and academic stress affect performance can help students identify strategies to enhance their academic success while reducing stress and anxiety, ultimately fostering improved mental health and well-being.

Logan Denney

FL - Jacksonville University

Discipline: Psychology

Authors:

#1 Logan Denney

#2 Amanda McGraw

Abstract Name: Positive versus Critical Self-Talk and their Relationship with Creativity

Oral Presentation
TITLE Positive Self-Talk versus Brooding and their Relationship with Creativity
Data collection is in progress. Many studies have established a relationship between depressive symptoms and creative thought. However, the relationship is not robust and can be found in both directions. Here, researchers wish to further investigate why this occurs. It is likely because studies have examined multiple symptoms of depression, some being related to creativity and others unrelated. We hypothesize that different types of self-talk will be correlated with creativity. Specifically, we predict a positive relationship between positive self-talk and creative thinking, and a negative relation between brooding and creative thinking. Participants from a college sample will be instructed to respond to self-report measures of self-talk and brooding. Additionally, the ability of the participants to produce creative thinking will be measured using an alternative use task. To assess research question 1: Does positive self-talk predict creativity, we will run a regression analysis where positive self-talk is the predictor and creativity is the outcome. Covariates include gender and age. To assess research question 2: Does brooding predict creativity, we will run a regression analysis where brooding is the predictor and creativity is the outcome. Covariates include gender and age. This study can help us better understand the connection between creativity and depression potentially providing an individual with an outlet to better understand one's emotions. This could lead to increased ability to problem solve and make decisions.

Luke Denney

WI - University of Wisconsin-Stout

Discipline: Computer Science

Authors:

#1 Michael Tetzlaff

Abstract Name: Kintsugi 3D Builder: User Experience Design & Implementation

Photogrammetry is the process of using 2D photographs to generate a 3D model of a real object. Developed by researchers at UW-Stout, Kintsugi 3D is a new software suite that allows users to import and process data from photogrammetry software to generate a more accurate digital representation of a 3D object. Using information derived from source photographs, Kintsugi 3D captures texture, color, material, and shininess more accurately than standard photogrammetry software. The suite's processing tool, Kintsugi 3D Builder, relies upon intuitive UI design and implementation to service both new and existing users. Notable UI contributions include direct import from photogrammetry software, a detailed progress bar, and a modal to select an image from a list of cameras.

Logan Denney

FL - Jacksonville University

Discipline: Psychology

Authors:

#1 Logan Denney
#2 Nicole Iannone

Abstract Name: How Jealousy Relates to Relationship Quality and Personality

This study examines how different types of jealousy—emotional, cognitive, and behavioral—relate to relationship quality and personality traits. Building on Attridge’s (2013) findings that emotional jealousy is “good,” cognitive jealousy is “bad,” and behavioral jealousy has minimal associations, the current study expands these relationships by incorporating additional relationship components (investments, alternatives, commitment) and personality factors (attachment styles, self-esteem, Big Five traits, and implicit relationship beliefs). Participants included 140 adults (102 females, males = 25) in romantic relationships. They completed measures assessing jealousy types, relationship quality, and personality. Results showed emotional jealousy positively correlated with satisfaction, commitment, and investments ($r = .31$, $p < .001$), and negatively with quality of alternatives ($r = -.24$, $p = .001$), aligning with prior findings. However, unlike Attridge, cognitive jealousy also positively correlated with satisfaction, commitment, and investments ($r = .15$, $p < .05$). Behavioral jealousy correlated positively with quality of alternatives ($r = .26$, $p < .001$). Personality analyses revealed no significant links between emotional jealousy and personality traits. Cognitive jealousy correlated positively with growth and destiny beliefs, and neuroticism ($r = .15$, $p < .05$). Behavioral jealousy showed mixed correlations: positively with destiny beliefs, neuroticism, and anxious attachment ($r = .20$, $p < .01$), but negatively with agreeableness, conscientiousness, and self-esteem ($r = -.21$, $p < .01$). These findings suggest emotional jealousy aligns with higher relationship quality, reinforcing its “good” label. Cognitive jealousy previously deemed “bad,” also showed positive associations with relationship quality. In contrast, behavioral jealousy, linked to lower self-esteem and alternative quality, supports its “bad” categorization. This research deepens our understanding of jealousy’s complex relationship with relationship dynamics and personality traits.

Aaron Dent

WI - University of Wisconsin-Madison

Discipline: Engineering

Authors:

#1 Aaron Dent
#2 Seth Anderson
#3 Sam Johnstone
#4 Matthew Gebbie

Abstract Name: Anion Influence on the Hydrogen Evolution Reaction

As we progress toward a renewable energy infrastructure, we must address the intermittent nature of these energy sources by storing energy for use during non peak production hours. One way we can combat this is by leveraging the electrochemical hydrogen evolution reaction to produce energy dense hydrogen molecules that can be used to support the electrical grid. Hydrogen evolution reaction is difficult, however, because it requires expensive catalysts, produces low yields, and has sluggish kinetics. To improve hydrogen evolution we must engineer the interface which is composed of the electrode and electrolyte. Historically, much of the research has been dedicated to enhancing the electrode, however, the electrolyte is now understood to have an equally important impact. Current models on electrolyte effects rely on the assumptions of dilute electrolyte theory where only hydrated cations can influence electrochemical reactions. However, recent research shows the anion can also have an impact on reactivity in certain electrolyte concentrations. We hypothesize then that at higher concentrations of electrolyte the anion will play an important role in how the reaction proceeds and we test this with Cl, F, BF₄, ClO₄, and TFSI anions. By performing cyclic voltammetry we were able to conclude that BF₄ performed the best while ClO₄ performed the worst in terms of current density and these factors were likely due to mass transfer limitations as performing linear sweep voltammetry showed that

CIO4 is most limited by it. Moreover, Raman Spectroscopy points toward a unique mechanism that CIO4 follows which also may explain its poor performance. These findings advance understanding of anion effects in HER, offering new strategies to optimize hydrogen production for renewable energy systems.

Alexis Denton

KS - University of Kansas

Discipline: Political Science

Authors:

#1 Brian Lagotte

Abstract Name: Just Kicking It: Football and Nationalism in Spain during Francisco Franco's Regime

This research project investigates football's role during Francisco Franco's pursuit of a unified Spanish nationalism. While Spain consists of seventeen autonomous communities, Francisco Franco's political goal was to create a Spain with no cultural or linguistic divisions, and football was a tool to achieve this goal. Previous scholars have questioned how politicians use football events for political support. Moreover, the existing research posited a theory called football nationalism to explain football's ability to unify a nation toward a collective goal. This research project will define Franco's Spanish nationalism and use news media sources from Spain's National Library. Analyzing the news media will reveal football's role in Franco's Spanish state. Likely, the research results will indicate Franco endorsed football teams with ties to the Spanish crown while repressing other cultures during his pursuit of a collective Spanish nationalism. Examining football's role during Franco's regime will disclose how leaders around the world are using football and nationalism as a tool to achieve political goals.

Sam Derby

NY - SUNY Buffalo State College

Discipline: Interdisciplinary

Authors:

#1 Sam Derby

Abstract Name: Effects of sound exposure on the growth and intracellular macromolecular synthesis of *E. coli*.

Abstract This study investigates the effects of sound wave exposure on the growth, morphology, and metabolic activity of *Escherichia coli* (*E. coli*). Sound waves, often overlooked as a physical stimulus, have shown potential in influencing biological systems through mechanical and vibrational energy. The research aims to explore whether specific frequencies and amplitudes of sound waves impact *E. coli* growth rates, biofilm formation, and gene expression related to stress responses. Initial experiments involve culturing *E. coli* under controlled conditions while subjecting samples to sound waves of varying frequencies (e.g., 100 Hz to 20 kHz) and intensities. Measurements include growth kinetics (optical density monitoring), metabolic activity (respirometry and ATP quantification), and structural changes (scanning electron microscopy). The study also aims to incorporate transcriptomic analysis to identify changes in gene expression profiles associated with stress, metabolism, and motility. Preliminary results could provide insights into non-invasive methods to influence microbial behavior and may have applications in microbial biotechnology, infection control, and environmental microbiology.

Axli Deritzia Alvarez

TX - San Jacinto College

Discipline: Law and Legal Studies

Authors:

Abstract Name: Can Democracy Survive? A Philosophical Investigation into Tocqueville and Mill's Theories of Cultural Cohesion Considering Rapid Change Due to Immigration

Democratic regimes are often based on shared history and cultural cohesion, while immigration brings diversity in values and practices. Can democracy adapt to this complexity without compromising its principles? Through a comparative thematic analysis of Alexis de Tocqueville and John Stuart Mill's works, this study examines the interplay between cultural integration and democratic resilience. Tocqueville emphasizes the importance of civic associations and a shared democratic ethos, warning that fragmented norms could weaken societal unity. Mill advocates for liberty and individuality, while also acknowledging that cohesion and mutual respect are essential in effective governance. Their philosophies taken together offer a lens to analyze how democracies may find a way to integrate different populations. This research seeks a linkage between 19th-century philosophical frameworks and modern debates on immigration with ethical and structural tensions found within democratic systems. By linking historical thought to contemporary challenges, this study will provide actionable insights for policymakers grappling with global migration's impact on democratic values. Ultimately, it demonstrates that resilience and adaptability are essential for democracies facing the complexities of immigration.

Dhairya Desai

NC - University of North Carolina at Charlotte

Discipline: Nursing and Public Health

Authors:

#1 Dhairya Desai

Abstract Name: The Effect of the Great East Japan Earthquake and Tsunami on the Care of Noncommunicable Diseases

Noncommunicable diseases (NCDs) put a significant burden on communities, especially on communities with a substantial elderly population, due to the constant demand for care and medication. This burden is increased during natural disasters such as the Great East Japan Earthquake and Tsunami (GEJET), which disrupted healthcare systems, interrupted medication supplies, and placed additional physical and emotional stress on individuals. These challenges are often severe for elderly populations that are managing chronic diseases, as symptoms typically worsen with elevated stress and reduced healthcare access. This study focuses on understanding the disruptions faced in care for chronic disease patients through a series of literature reviews. Key findings show that typical symptoms of chronic diseases were exacerbated during disasters due to care interruptions and increased psychological stress. Patients typically experience delays in receiving medication, while healthcare providers face challenges in delivering care due to the damaged infrastructure and limited resources. This study also examines the need for comprehensive improvements within the healthcare system for patients with chronic diseases during future disasters. Specific recommendations include improving current infrastructure, increasing disaster preparedness education, maintaining stockpiles of necessary medications, and developing support teams that can provide medical and

psychological support. Addressing these gaps, can ensure that future healthcare systems are more resilient and responsive to natural disasters like the GEJET, which would also reduce the effects seen on patient populations with NCDs.

Dhairya Desai

NC - University of North Carolina at Charlotte

Discipline: Chemistry

Authors:

#1 Dhairya Desai

Abstract Name: Synthesis of Antimicrobial Peptide Analogs for DNA Conjugation

Antimicrobial resistance (AMR) is a global health crisis projected to cause over 10 million deaths annually by 2050. Many current antibiotics which target bacterial proteins are increasingly ineffective due to resistance mechanisms arising from genetic mutations and horizontal gene transfer. This study investigates the use of peptide-DNA conjugates as a novel strategy to combat AMR, leveraging the modularity and versatility of nucleic acids to assemble into nanostructures with the broad-spectrum activity of antimicrobial peptides (AMPs). LL-37 is a well-characterized human AMP that acts by disrupting bacterial membranes, reducing the chance of developing resistance. In this study, we use LL-37 as a proof of concept to assemble into peptide-DNA conjugates. LL-37 is synthesized using Fmoc-based Solid Phase Peptide Synthesis (SPPS) with a propargyl glycine residue at the C-terminus for click-chemistry conjugation with DNA. Liquid Chromatography-Mass Spectrometry (LC-MS) data shows we were able to obtain our desired product. Current efforts focus on improving peptide purity, providing a basis for exploring diverse AMPs to enhance therapeutic options with peptide-DNA conjugates.

Palak Desai

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Cheng Jack Song

#2 Trang Nguyen

Abstract Name: Inducible Lentiviral Re-Expression of PKD1/PKD2 Genes Restores PC1/PC2 in Human Kidney Organoid-Derived Cystic Cells

Autosomal dominant polycystic kidney disease (ADPKD) is a genetic disease caused by mutations in the PKD1 and PKD2 genes, resulting in disrupted polycystin-1 (PC1) and polycystin-2 (PC2) protein function. This leads to cyst formation, followed by inflammation and fibrosis. We hypothesize that re-expressing wild-type PKD1 and PKD2 in mutant cells can reverse cystic structures back to normal tubular cells. Reversal of cyst formation through re-expression of wild-type PKD1/PKD2 genes has been successful in a mouse model. We wanted to assess if this result could be successfully achieved in human kidney organoid-derived cystic cells. To test this, we construct a lentivirus utilizing plasmid vectors to insert PKD1 and PKD2 genes through transfection. This lentivirus transduces human embryonic kidney (HEK) cells by encoding for PKD1/PKD2. Successful transduction is expected to result in the re-expression of PC1/PC2 proteins in HEK cells, observed by the proliferation and intensity of the mCherry reporter signal under microscopy. In conclusion, we aim to discern whether PC1/PC2 function can be restored through re-expression of wild-type PKD1/PKD2 in human

cells. This research will aid in furthering our understanding of ADPKD. Future work will attempt to replicate these results in cystic human embryonic kidney organoids, which will be more applicable as a proof-of-concept to future in vivo research. The re-expression of PC1/PC2 in human cells provides foundational knowledge for applying these results to cystic human embryonic kidney organoids.

Sarang Deshpande

NC - University of North Carolina at Charlotte

Discipline: Computer Science

Authors:

Abstract Name: Personalized Portfolio Construction: Leveraging Modern Portfolio Theory for Investor-Specific Portfolios

Many investors have varying degrees of risk appetite, causing the optimal portfolio to vary based on personal preferences. This research seeks to address the question: How can an automated framework optimize equity portfolios for individuals with varying risk appetites using company financial data? I aim to develop a framework that can take either a pre-existing portfolio or an empty portfolio and recommend equities based on company financial information and user preferences, optimizing for high long-term returns. Data will be collected from the US Equities market through filings made to the US Securities and Exchange Commission, as well as financial data provided through Yahoo Finance. The data will be filtered to remove stocks with low risk-to-reward ratios. I plan to use the Efficient Frontier, as first presented in the Modern Portfolio Theory by Harry Markowitz, to provide optimal allocations for each security. The framework will adjust for industry overexposure by recommending the liquidation of specific positions to maintain appropriate diversification. The expected outcome is a framework that balances risk and reward while tailoring recommendations to individual investors, bridging theoretical portfolio optimization and practical application. This framework aims to empower individuals to make better-informed investment decisions, alleviating anxiety about market volatility by providing personalized, data-driven recommendations. Additionally, it can serve as a valuable complement to financial advisors, enhancing their ability to guide clients in optimizing portfolios for long-term growth.

Lauren Dethridge

WI - University of Wisconsin-Whitewater

Discipline: Biology

Authors:

#1 Kirsten Crossgrove

Abstract Name: Functional analysis of the Insulin/IGF-1 signaling gene Bma-pptr-1 in the parasitic nematode *Brugia Malayi*

Lymphatic filariasis (LF) is a human disease caused by a parasitic nematode, *Brugia malayi*, as well as other related parasites. This mosquito-transmitted disease can be highly debilitating and is the second leading cause of permanent deformity and disability worldwide, following leprosy. The free-living nematode *Caenorhabditis elegans* is a widely used model organism for parasitic nematodes. *C. elegans* progress through four different larval stages during their development where each stage lasts between seven and eleven hours. However, under certain environmental conditions the nematode can enter a dauer larval stage and stay in this stage for up to four months. *C. elegans* dauer stage is hypothesized to be similar to the parasite infective stage. Dauer

stage is known to be regulated by the insulin/insulin-like growth factor signaling pathway in *C. elegans*. DAF-2 is the insulin receptor, and it is activated when insulin-like peptides bind to it. DAF-2 then sends a signal into the cell that activates a kinase cascade which includes PDK-1 phosphorylating and activating AKT-1. Activated AKT-1 can phosphorylate the DAF-16/FoxO transcription factor which deactivates DAF-16 and turns off genes important for dauer formation. However, a phosphatase, PPTR-1, can dephosphorylate AKT-1, and therefore activate DAF-16 gene function, turning on genes responsible for dauer formation. We are studying the pptr-1 gene in *B. malayi*. We have successfully cloned and sequenced a Bma-pptr-1 expression construct. We will be testing its function by expressing it in cultured cells. We will then use a reporter gene assay to determine if overexpression of Bma-PPTR-1 will activate Bma-DAF-16, as shown by an increase in reporter gene activity. This could lead to more research on how larval development is affected by Bma-PPTR-1 and will hopefully help drive further ideas for medicine used in the mitigation of lymphatic filariasis.

Shanmayee Devarapalli

PA - University of Pittsburgh

Discipline: Biology

Authors:

Abstract Name: Protective Role of GDAP1 in Maintaining Mitochondrial Calcium Homeostasis Under Oxidative Stress

Calcium signaling is essential for cellular function, with mitochondria playing a critical role in energy regulation and calcium homeostasis by absorbing and releasing calcium to maintain mitochondrial health. This process involves calcium uptake through the outer membrane protein VDAC1 and the inner membrane protein MCU, driven by mitochondrial membrane potential. Oxidative stress, induced by lipid peroxidation products like 4-Hydroxynonenal (4HNE), disrupts this calcium exchange, leading to mitochondrial dysfunction. Oxidative stress damages mitochondrial proteins, lipids, and DNA, impairing their ability to regulate calcium and produce energy efficiently. 4HNE modifies and inhibits VDAC1 and MCU, affecting calcium regulation. This study investigates whether GDAP1, a protein hypothesized to protect mitochondria by removing 4HNE modifications from VDAC1, can maintain mitochondrial calcium homeostasis under oxidative stress. We used flow cytometry and the calcium-sensitive dye Rhod 2 to monitor calcium levels in GDAP1-overexpressing HEK cells exposed to tert-butyl Hydroperoxide (tBHP) and Uridine Triphosphate (UTP). These compounds were used to induce oxidative stress and calcium signaling, respectively, to assess mitochondrial calcium dynamics under physiological and stress conditions. Additionally, ionomycin was applied to release intracellular calcium, allowing further observation of calcium dynamics. The data revealed that GDAP1 overexpression modulates calcium signaling under oxidative stress. In GDAP1-overexpressing cells, tBHP treatment significantly increased calcium levels, indicating elevated calcium under stress. The addition of UTP did not further increase calcium, suggesting GDAP1 helps stabilize calcium homeostasis during prolonged stress. Resting calcium levels increased with higher tBHP concentrations and then plateaued, highlighting the impact of oxidative stress on calcium dynamics. These findings suggest that GDAP1 plays a protective role in maintaining mitochondrial calcium balance and mitigating oxidative stress, potentially by preventing 4HNE modification of VDAC1. This protective mechanism may have broader implications for diseases characterized by oxidative stress and mitochondrial dysfunction, such as neurodegenerative disorders (Parkinson's and Alzheimer's diseases) and cardiovascular conditions.

Natilyn Devolgado

VA - Virginia Commonwealth University

Discipline: Sociology

Authors:

Abstract Name: Parental Transmission, Italian Society, and Agency on Religious Identity of Individuals from Muslim-Catholic Families in Italy

With immigration increasing significantly in Italy, intercultural and interreligious family dynamics are crucial to understanding identity development in adolescents from these families. Adolescents from interfaith families may benefit from increased cultural capital due to exposure to diverse value, but also face potential internal turmoil in reconciling religious, national, and ethnic identities. This study explored whether interfaith and same-faith families differ in the strategies they use for religious transmission and the effectiveness of such strategies in facilitating a minority religious identity in a Catholic-dominated cultural context. Through a review of literature, the study examined key themes such as the variability of religious transmission strategies (active, passive, or absent) in interfaith families, the role of external societal pressures on second-generation Muslim immigrants' religiosity, and the increasing individualization of Islamic practices within Catholic-majority settings. Interfaith families that attempt to transmit both parent's religion may opt to choose passive transmission, allowing their children to be exposed to cultural references related to either religion and experience religious practices with extended family or peers. However, due to the dominance of Catholicism in Italian society, Islam may not be as effectively transmitted to children who are only passively exposed to Islamic teachings. The findings aimed to illuminate how Italian-Catholic cultural influences shape pluralistic identities and potentially weaken connections to minority religious identities, offering new insights into the intersection of intercultural relations, religious identity, and adolescent development.

Dhruv Dhawan

IN - Purdue University Main Campus

Discipline: Computer Science

Authors:

#1 Cai Chao

Abstract Name: Dedupr: Streamlining Citation Deduplication in Evidence Synthesis

In evidence synthesis projects, removing duplicated citations from multiple databases is a critical but often time-consuming task. To streamline this process, we developed Dedupr, a user-friendly R package and Shiny web app. This tool automates the reliable Bramer's method for citation deduplication, significantly reducing the effort required in systematic reviews. By simplifying the removal of duplicates, Dedupr improves the accuracy and efficiency of research, ensuring compliance with PRISMA2020 guidelines. Dedupr is particularly valuable as it removes the need for users to know R coding, offering an accessible solution through a straightforward interface. Researchers can upload their citation files, deduplicate them, and export results quickly and easily. The tool's broader impact includes enhancing the accessibility of systematic reviews for professionals in fields like healthcare, public health, and academia. By providing a cost-effective and efficient solution, Dedupr empowers researchers, especially in resource-limited environments, to conduct high-quality evidence synthesis without extensive technical expertise.

Tosha Diamond-Huey

EGY - Alexandria University

Discipline: Biology

Authors:
#1 Rilquer Mascarenhas
Ian Kenny

Abstract Name: Genetic Diversity of Bird Species in Fragmented Forest Habitats

Understanding genetic diversity in isolated ecological communities sheds light on species abundance, evolutionary history, and community assembly processes. Isolated communities reveal how species respond to fragmentation and provide predictions for biodiversity under anthropogenic pressures. This study examines species abundance, genetic, and functional diversity in high-elevation forest fragments in Brazil, remnants of ancient rainforests isolated 13–15 thousand years ago due to climate-driven changes. These "forest islands," sustained by a rain shadow effect, offer a natural laboratory to explore biodiversity dynamics in fragmented ecosystems. Focusing on forest fragments in Areia, Ubajara, Araripe, and Baturité, the research targets birds and arthropods, analyzing four biodiversity dimensions: species abundance, genetic diversity, functional diversity, and phylogenetic diversity. Species abundance measures individual counts, genetic diversity assesses genetic variation, functional diversity examines ecological traits like diet and morphology, and phylogenetic diversity explores evolutionary relationships among species. Data integration addresses key questions on community assembly, such as whether environmental filters or competitive interactions shape species coexistence. Molecular techniques like DNA extraction and sequencing evaluate genetic diversity, while computational analyses leverage databases to assess abundance, traits, and evolutionary relationships. Results reveal that genetic diversity and species abundance are not positively correlated, with habitat size and isolation influencing abundance distribution. Genetic diversity appears shaped by historical isolation, while abundance reflects contemporary landscape configurations. Future efforts will expand genetic analyses and incorporate body size distributions to better understand functional diversity. Insights from this research enhance understanding of biodiversity dynamics in fragmented habitats, informing conservation strategies to preserve genetic reservoirs and ecosystem functionality. These findings underscore the significance of habitat characteristics in shaping biodiversity, offering valuable perspectives for managing isolated ecosystems worldwide.

Ansel Dias

WI - University of Wisconsin-Madison

Discipline: Physics and Astronomy

Authors:
#1 Sanjay Limaye
#2 Keith Kessens

Abstract Name: Space Exploration Through Orbital Data Analysis and Computational Techniques

How can the AKATSUKI orbiter provide key information on Venus's cloud cover and atmosphere? This research seeks to refine positional data from AKATSUKI's imaging using the NAIF-SPICE toolkit developed at the Jet Propulsion Laboratory. It is critical to have accurate knowledge of the planetary coordinates corresponding to the individual pixels in every image from the Akatsuki orbiter for better analysis of the Venus cloud cover properties. Using SPICE tools on the positional data from the spacecraft and Venus at the time the image was captured, I leveraged the pointing kernels provided by the Akatsuki project to develop a "forward" function in Python. This function translates each pixel coordinate in a Venusian image into its corresponding latitude and longitude on Venus. Typically the predicted location of the planet in the image and its actual position in the image do not coincide perfectly. By calculating the planet center location from the image data, I found the offset between the predicted center and the actual center in image coordinates. I then implemented that offset into my "forward" function to obtain accurate planetary coordinates for the image pixels on the planet. The forward function allowed me to convert to and from certain positions of Venus and

more accurately align the SPICE values of Venus with the corrected values for each pixel coordinate in every infrared and ultraviolet image captured by the AKATSUKI orbiter. This enables more accurate future investigations of cloud properties as well as atmospheric dynamics through measurement of cloud motions on Venus.

Danelia Diaz

FL - Miami Dade College

Discipline: Architecture, Construction Management, and Interior Design

Authors:

#1 Danelia Diaz

Abstract Name: Hostile Architecture: Ethics in the Urban Environment

This research investigates the impact of hostile architecture on user experience and public perception of urban environments, emphasizing its ethical implications in urban design. Hostile architecture refers to design elements that discourage specific behaviors, often marginalizing vulnerable groups such as the homeless. The study explores the societal consequences of these designs and their alignment with the principles of inclusivity and equity in public spaces. Hostile architecture raises significant ethical concerns as it often operates unnoticed, yet its effects on marginalized groups and the mental well-being of urban residents are profound. While some proponents argue that these designs address urban challenges pragmatically, they often perpetuate exclusion and societal divisions. This research is particularly relevant in today's context of growing urban populations, technological advancements, and heightened awareness of social justice, calling for a critical reevaluation of urban design practices. The study employs a qualitative and inductive methodology, combining case studies, comparative analyses, literature reviews, and stakeholder perspectives. Case studies of urban spaces where hostile architecture is prevalent will shed light on its design intent and social outcomes, while comparative analyses will highlight the differences in user engagement between inclusive and exclusionary designs. Insights from literature and stakeholders will provide a holistic understanding of the issue. Preliminary findings suggest that hostile architecture negatively impacts social cohesion, public trust, and mental health while reinforcing systemic inequalities. This research anticipates offering design alternatives that prioritize inclusivity and fairness, challenging the status quo and inspiring urban planners, architects, and policymakers to create more compassionate and equitable cities. By highlighting the broader societal implications of design decisions, this study aims to foster ethical urban design practices that serve all members of society, particularly marginalized communities.

Wendy Diaz

OK - Southern Nazarene University

Discipline: Psychology

Authors:

#1 Wendy Diaz

Abstract Name: Elements of Belonging

This research sought to develop a model of student belonging at small private liberal arts universities. Using the lens of Bronfenbrenner's Ecological Model we hypothesized that the past research predicting student belonging from academic achievement and relationships with faculty and staff was insufficient as it left out important variables related to the individual student and the relationships with peers. Using archival data set

of over 90 students gathered in conjunction with the National Survey of Student Engagement (NSSE) we were able to refine the model of student belonging. By adding student mental health status and relationships with peers a linear regression model accounted for over 50% of the variability in students' self-reported belonging. The implications for college support services are discussed. Future research should refine the model by exploring the role of other factors such as cultural background and extracurricular involvement and examining the relationship between belonging and degree persistence and completion using larger and more diverse longitudinal samples.

Liam Diaz-Williamson

GA - Georgia State University

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

Abstract Name: Candomblé, Capoeira, and Catholicism: Hybridity in Afro-Brazilian Religious and Cultural Practices

This summer, I had the opportunity to travel to Salvador, Bahia in Brazil for three and a half weeks through a Fulbright-Hays grant. While there, I engaged in participant observation of various Afro-Brazilian cultural and religious practices. I had the chance to attend a Terreiro De Candomblé and a Roman Catholic Mass, and I heard an Afro-Brazilian drumming rhythm called Ijexa in both spaces. I immediately recognized the rhythm because I had heard it and played it before during my previous ethnography of a Capoeira group in Atlanta, Georgia. I was immediately curious about why Ijexa appeared in these three practices, especially in the Roman Catholic Mass. This paper aims to share descriptions from my initial ethnographic encounters in Brazil combined with descriptions and research from my previous ethnography in Atlanta, Georgia to describe how I witnessed Ijexa function in a Candomblé Ceremony, a Capoeira Roda, and a Catholic mass. I am guided by my research questions: How does Ijexa function in a Terreiro De Candomblé, a Roman Catholic Mass, and a Capoeira Roda? What are the similarities within differences and differences within similarities of how Ijexa functions in these three spaces? What is the significance of hearing Ijexa, an Afro-Brazilian drumming rhythm in these three spaces?

Brandon Dick

PA - Saint Francis University

Discipline: Biology

Authors:

#1 Gjendine Voss

#2 Joshua Rosenthal

#3 Matthew Birk

Abstract Name: Squid RNA Editing in Hypoxic Environments

RNA editing is a phenomenon when adenosines on RNA molecules are edited into inosines, which are interpreted by ribosomes as guanosines. Depending on where in an mRNA transcript this edit occurs, it can result in the protein produced having variations in its amino acid sequence, that may be adaptive for their function under certain environmental conditions. All animals are capable of RNA editing, but coleoid cephalopods can edit their RNA to change their proteins orders of magnitude more than other organisms. It was recently found that cephalopods alter their RNA editing in different environmental conditions such as

temperature. We wanted to assess whether varying environmental oxygen levels also produce changes in RNA editing. During the summer of 2024, we conducted experiments at the Marine Biological Laboratory in Woods Hole, MA that investigated RNA editing in the squid *Euprymna berryi* that were exposed to hypoxic environmental conditions. First, we conducted experiments to determine the hypoxia tolerance of *E. berryi*. These experiments suggested they can tolerate ~33% air saturation without depression of aerobic metabolism. In our second set of experiments, the squids were kept either at air saturation or near their hypoxia threshold for seven days by regulating dissolved oxygen levels with a microcontroller. At the end of the experiments, we dissected optic lobes from the brain for RNA sequencing to quantify the abundance of RNA editing. To help determine a potential mechanism of hypoxia-induced RNA editing, we also examined in situ oxygen levels within the optic lobes of squids exposed to varying oxygen conditions. Our preliminary data showed that their brain oxygen levels change with the environmental oxygen conditions. We also observed that when squids exhibited jetting behavior there may potentially be a decrease in brain oxygenation. This study broadens our understanding of the acclimatory responses of cephalopods to environmental changes.

Sara Dickens

KY - University of Kentucky

Discipline: Health and Human Development

Authors:

#1 Elizabeth Riley

Abstract Name: NPCS mission to make safety culture in the child welfare system

Public child welfare system workers dedicate their time and hard work to improve the outcomes for children and their families. As a high-stake organization, there are possibilities for individuals to make mistakes that could range from minor missed case opportunities to critical incidents cases that push policy change. The National Partnership for Child Safety (NPCS) is a peer-to-peer learning and data sharing collaborative of over 35 child welfare jurisdictions in the United States, and members are focused on systems improvements. One goal the NPCS wants to achieve is to develop an efficient model of a safety culture to be followed for overall psychological safety. With a focus of critical incidents, the NPCS developed a safe systems improvement tool aimed to understand possible influences in case errors. The main objective of this study is to find a correlation between stress and work outcomes using employees within the NPCS jurisdiction as a sample. The methods of this study include surveys of child welfare workers reflecting on their critical incidents. Ultimately, the goal is to understand the different types of external stressors that impact child welfare workers and their target families. Currently, this study is through data analyzation; thus, conclusions are being developed. A full description of the database, study goals, and preliminary data will be presented at the showcase.

Cassidy Dickerson

OK - University of Central Oklahoma

Discipline: Art History

Authors:

Abstract Name: A cultural analysis of Japanese and French Impressionist art through Hiroshige and Monet

The topic of this study is the cross-cultural comparison between Japanese-style ukiyo-e prints and French Impressionism, with a specific focus on thematic elements including bridges and the natural world. The study will compare the print *In the Kameido Tenjin Shrine Compound* by Utagawa Hiroshige and the painting

Water Lilies and Japanese Bridge by Claude Monet. Contrary to the myth, ukiyo-e prints were considered to be more than just wrapping paper for goods traded between Japan and France. Ukiyo-e prints were deeply admired by not only Japan but many other countries, especially France. With the introduction of the ukiyo-e prints to the rest of the world, France began to draw inspiration from these prints as seen in Monet's painting Water Lilies and Japanese Bridge. One example of this can be found in the imagery of bridges in the two compositions. The depiction of bridges held local importance to Japan and France but also had a shared cultural significance. While bridges held a more mythological and spiritual meaning in Japan, both Japan and France depict bridges to help convey human connection to the natural world. This is not the only relevant cultural overlap to be found within the two artworks. This comparison will highlight the similarities between Hiroshige's and Monet's respective works, in particular the use conceptual elements such as light and airiness, while expanding on specific differences such as the presence and lack of human subjects within these pieces. The information from this study was gathered from various printed academic sources. Knowing the inspirations and similarities in artworks such as these allows us to understand the cultural and global competence that is foundational for positive cross-cultural relations.

Hannah Dickinson

UT - Weber State University

Discipline: Health and Human Development

Authors:

#1 Valerie Herzog

Abstract Name: The Efficacy of Differing Cryotherapy Modalities

Healthcare has become expensive so we endeavored to see if the increased expense was worth the results, where cryotherapy and compression treatments are in question. We tested three devices the GameReady 2.1 Pro (~\$4000), the NICE1 system (~\$4500), and an elastic bandage (FEB) with a non-stick coating on one side, soaked in water and frozen, (~\$4). Each was applied to cover 30.5-33cm of the lower leg, left on for 30 minutes of treatment, and removed for 25 minutes of rewarming. We used a pico-press on the lateral side of the calf to ensure consistent pressure throughout each treatment. We inserted a thermocouple into the greatest girth of the calf (1 ± 0.3 cm) deep to the subcutaneous fat. After each trial, we gave a survey to assess their satisfaction with the treatment. 24 subjects volunteered to participate (12 males, 12 females, age= 24.21 ± 2.87 yr, ht= 170.18 ± 7.45 cm, mass= 77.05 ± 18.79 kg.) There were statistically significant differences in intramuscular temperature between the three treatments over time ($F=10.75$, $p=.001$, observed power-0.987), there was a statistically significant difference ($p=.043$) in intramuscular temperature between the GameReady 2.1 Pro ($24.78 \pm 4.90^{\circ}\text{C}$) and the FEB ($28.07 \pm 2.82^{\circ}\text{C}$) at 25 minutes treatment. The surveys indicated a statistical significance ($\chi^2(2)=6.727$, $p=0.035$) in satisfaction with the treatment's ability to cool the leg, being more satisfied with the ability of the GameReady 2.1 Pro to cool compared to the FEB. These results indicate that the GameReady 2.1 Pro and the NICE1 system were the more effective treatments, with the GameReady 2.1 Pro having higher satisfaction with cooling. Future research should evaluate the cost-effectiveness and satisfaction results of other cryotherapy/compression modalities.

Christian Diederich

MN - University of Minnesota - Morris

Discipline: History

Authors:

Abstract Name: African Orality as Ignored History

In this presentation I aim to explain how the structuralist movement in history created stigma and ignorance towards African Orality and Historiography calling them pseudo-history. The structuralist movement then attacks culture because of how important history, specifically oral history, is to the west african culture. In doing this they invalidated African Culture which has Orality and Family history deeply embedded within cultural values. I use two accounts of the epic of Sundiata, Sundiata: an epic of old Mali and La Maître de la Parôle to show how these historical stories told by griots have ties of culture and family history within them. These stories being exactly what structuralists found non-historical. Within this boasts a story of persistence and resilience, that with these invalidations, African Orality and Culture is still thriving in West Africa.

Celine Diep

CA - California State University - Fullerton

Discipline: Chemistry

Authors:

#1 Andrew Petit

Abstract Name: Exploring the Mechanism of the Electronic Quenching of NO ($A2\Sigma^+$) With Acetylene and Benzene

NO is an important by-product of combustion and a prototypical free radical. NO is commonly quantified using laser-induced fluorescence (LIF) along its $A2\Sigma^+ \leftarrow X2\Pi$ transition band. Electronic quenching of NO ($A2\Sigma^+$) through interactions with other molecules provides alternative photochemical pathways that fluorescence must compete with. Previous experiments have demonstrated that acetylene and benzene are highly effective at quenching NO ($A2\Sigma^+$). Specifically, the room temperature electronic quenching cross sections for NO ($A2\Sigma^+$)+C₂H₂ and NO ($A2\Sigma^+$)+C₆H₆ are 62 Å² and 147 Å², respectively. The underlying photochemical pathways responsible for these large electronic quenching pathways remain unknown. In this poster, we describe our efforts to characterize the photochemistry of both NO ($A2\Sigma^+$)+C₂H₂ and NO ($A2\Sigma^+$)+C₆H₆ through the development of high-quality potential energy surfaces (PESs). The PESs are primarily calculated using the EOM-EA-CCSD/d-aug-cc-pVTZ//EOM-EA-CCSD/aug-cc-pVDZ and CASSCF/d-aug-cc-pVTZ//NEVPT2/d-aug-cc-pVTZ level of theory. These methods provide a balanced treatment of the valence and Rydberg electronic states while cleanly capturing the open-shell character of these systems. We additionally performed multireference electronic structure calculations to evaluate the role of electronic energy transfer from NO ($A2\Sigma^+$) to the low-lying electronic states of C₂H₂ or C₆H₆. Our work suggests that the harpoon mechanism, in which electron density shifts from NO ($A2\Sigma^+$) to the molecular partner, primarily drives the electronic quenching. While C₂H₂ and C₆H₆ have highly unfavorable electron affinities, attractive Coulombic interactions within the transient ion pair generated by the electron transfer allow the harpoon mechanism to be energetically favorable. Applying these computational methods helped us to compare the differences between the low-lying electronic states of C₂H₂ and C₆H₆. Overall, our work sheds new insights into bimolecular, open-shell photochemistry and will hopefully inspire new experimental studies on these interesting systems.

Ellie Dietrich

WI - University of Wisconsin-La Crosse

Discipline: Sociology

Authors:

Abstract Name: An Examination of Degree Attainment on Reported Physical and Mental Health over Three Decades

Previous empirical studies have examined the relationship between education and health, notably finding that education leads to better health outcomes; however, it is not clear how education leads to improved health outcomes. This study seeks to examine the pathways through which obtaining a college degree mediates physical and mental health outcomes. Further, this study seeks to examine how degree attainment has mediated physical and mental health outcomes across time by using three different years (1998, 2008, 2018) of the General Social Survey. Multiple structural path models were examined, and results indicate that education has a positive impact across time. While the direct effects examined largely confirm findings from the existing literature, indirect effects indicate that these relationships are more complex. The findings from this study can be used to better understand the changing effect education has on health. Conclusively, the research offers support for the pursuit of higher education. Policy implications will be discussed.

Marcus Dillard

FL - Miami Dade College

Discipline: Biology

Authors:

Abstract Name: Survival Strategies in Monarch Butterflies: Cannibalism Increases When Resources Are Scarce

Butterfly enthusiasts often plant milkweed to support monarch butterflies (*Danaus plexippus*), but in South Florida, the nonnative tropical milkweed (*Asclepias curassavica*) is the predominant option available at nurseries, with limited exceptions. Tropical milkweed has smaller leaves compared to the native common milkweed (*Asclepias syriaca*), and monarch caterpillars may resort to cannibalism when food resources are depleted. While such behavior has been observed anecdotally, video documentation offers an opportunity to provide empirical evidence of these interactions. In this study, tropical milkweed was arranged in both low-density and high-density patches, with an equal number of caterpillars placed in each patch. Two experiments were conducted: one that allowed caterpillars to interact with natural predators, and another that excluded predators using netting. Video footage revealed that monarch caterpillars in low-density patches exhibited heavy cannibalism, whereas cannibalism was minimal in high-density patches. These findings suggest that monarch caterpillars experience a Malthusian trap, where cannibalism increases when resources are scarce. While predation by natural predators was relatively rare, caterpillars in low-density patches suffered significantly more losses compared to those in high-density patches. Plant density appears to influence both the likelihood of cannibalism and exposure to predators. This study demonstrates the utility of video cameras as a tool for remotely documenting monarch caterpillar behavior. Future research should explore the integration of artificial intelligence to streamline video analysis and reduce time spent reviewing footage.

Holy Din

WI - University of Wisconsin-Madison

Discipline: Social Work and Human Services

Authors:

#1 LB Klein

Abstract Name: Bringing in The Bystander Program for prevention of sexual violence for LGBTQ+ community on Campus

LGBTQ+ (lesbian, gay, bisexual, transgender, nonbinary, queer) people face disproportionately high rates of sexual and relationship violence (SRV) and often lack access to inclusive prevention education on college campuses. To address this, our research focuses on implementing an LGBTQ+-specific adaptation of the Bringing In The Bystander (BITB) program, which promotes positive bystander intervention that is tailored to LGBTQ+ communities (BITB-LGBTQ+). BITB is the campus SRV bystander intervention with the most empirically replicated support and is used on college and university campuses across the United States and Canada. This project focuses on pilot testing BITB-LGBTQ+, a 100-minute in-person interactive small group educational program for LGBTQ+ college students. Throughout the program, participants will have a chance to elevate and equip themselves with skills that can result in effective and positive action when encountering and witnessing sexual violence and SRV situations. We evaluate the adapted intervention through outcome measures, measures of acceptability and feasibility, and semi-structured interviews. After evaluation through these interviews, we hope to adjust and make improvements to better facilitate the BITB program for future use. This study measure not only highlights the importance of prevention education but also contributes to efforts to reduce disparities in SRV prevention and provide equity and inclusion in educational settings. By adapting and testing the BITB program to address the unique experiences of LGBTQ+ participants, we hope to shift bystander attitudes, knowledge, beliefs, and behavior to create a more safe and supportive campus environment and, in addition, contribute to more inclusive SRV prevention strategies that are evidence-based and inclusive of everyone.

Claudia Disbrow

VA - Roanoke College

Discipline: Exercise Science and Nutrition

Authors:

#1 Sean Cochran

Abstract Name: The Effects of Aerobic Fitness on Bilateral Transfer in Younger and Older Adults

Bilateral transfer is the change of motor performance in one limb following opposite limb practice. Transfer between limbs in younger adults is typically asymmetrical, meaning a greater change is observed in one limb following practice with the other limb than vice versa. Asymmetrical transfer is associated with lateralized hemispheric control of movement parameters according to the dynamic dominance model. Older adults exhibit more symmetrical transfer caused by additional ipsilateral activation as a compensatory mechanism for de-lateralization. Aerobic fitness helps maintain lateralized hemispheric activation in older adults, suggesting asymmetric transfer could be retained. Previous research has shown high levels of reported physical activity influenced bilateral transfer performance in both young and older adults, with older adults maintaining asymmetric bilateral transfer. However, the effects of aerobic fitness on bilateral transfer have not been assessed. The purpose of this study is to examine the effects of aerobic fitness on bilateral transfer in younger and older adults. 50 young right-handed adults aged 18-35 and right-handed older adults aged 65-81 will be recruited. Prior to training, the Edinburgh Handedness Inventory will determine hand dominance. Individuals will then perform a 30° visual rotation drawing task assessing movement parameters. Pre-test of two trials with each limb will establish baseline performance, followed by 40 practice trials on the assigned limb. Post-tests mirror pre-tests assessing the transfer of motor planning parameters including movement time, normalized jerk, trajectory length, and initial direction error. Following the drawing task, aerobic fitness will be assessed through a 2-minute walk test to estimate VO2 max performance. Higher aerobic fitness is hypothesized to preserve lateralized hemispheric activation compared to those with low aerobic fitness. For

younger adults, higher aerobic fitness may positively influence bilateral transfer of movement parameters. For older adults, higher aerobic fitness could help retain lateralized hemispheric control.

Rebecca DiScipio

OH - Baldwin Wallace University

Discipline: Biology

Authors:

#1 Cydney Hudson

#2 Clare Mathes

Caitlyn Jilek

Abstract Name: The Impact of Exercise on Sucrose Preference in Sprague-Dawley Rats

A prior study showed that 8 weeks of treadmill exercise blunts sucrose preference in Long-Evans rats. We seek to replicate those findings in Sprague-Dawley rats with the goal of using exercise to prevent changes in 'sweet' taste behavior and physiology resulting from early-life ingestion of low-calorie sweeteners. To that end, we subjected male and female Sprague-Dawley rats to moderate treadmill exercise (35-min sessions) 5 days per week for 6 weeks (n=7) or allowed them to remain sedentary (n=8) but exposed to the testing environment. The females ran 519m per day, and the males ran 365m per day. To assess taste-behavior changes, a 2-bottle preference test was employed, where 1 bottle of water and 1 bottle of 0.1 M sucrose solution were placed on each cage. Following exercise, fluid intake was measured at 15,30,60,120&240 min and at 24&48h after placements. At 24h, the bottles switched sides. Preference was calculated as the proportion of sucrose intake that made up total fluid intake. No significant differences in preference were seen between the exercise and sedentary groups in the mixed-sex cohort in a 2-way repeated measures ANOVA. However, the female rats, which were maintained on the more intense exercise regimen, showed lower levels of sucrose preference relative to those of their sedentary sisters at 30 and 240 min when the data were analyzed separately via t-test. We seek to extend this work by increasing sample size to further explore sex differences and increasing the duration of the exercise regimen to that used in the prior publication. Since exercise has the potential to change taste preferences, it may be a useful therapy to prevent changes resulting from early-life ingestion of low-calorie sweeteners.

Wimeth Dissanayake

NY - University of Rochester

Discipline: Biology

Authors:

Abstract Name: Serglycin Regulates Azurophilic Granule Formation in Neutrophils

Neutrophil granules are membrane-bound compartments that release their contents upon a stimulus in a process known as regulated secretion. Neutrophils contain three prevalent granule types, characterized by different protein compositions and capacities to fuse with the cell membrane: primary (azurophilic), secondary (specific), and tertiary (gelatinase) granules. The proper secretion and formation of Neutrophil granule proteins are important in protecting the body against infections, inflammation, and malignancies. However, the underlying molecular mechanisms of granule formation in neutrophils are poorly understood, limiting the treatment of neutropenic disorders. The process by which granule-destined proteins are sorted and subsequently packaged into nascent secretory granules has remained a scientific enigma. Primary granules are

the first granules formed during neutrophil differentiation and contain serine proteases, neutrophil elastase (Elane), and myeloperoxidases (Mpo). Previous studies suggested that serglycin, CD63, and Rab27a are required for the trafficking and function of primary granules. Our work confirmed the increased production of serglycin during the initial stages of neutrophil differentiation, corresponding with expression of Elane, indicating that serglycin is present during primary granule formation. Furthermore, imaging of differentiating neutrophils showed increased expression and colocalization of serglycin, Elane, Cd63, and Mpo during primary granule formation. To test if serglycin is a granule-forming protein, we ectopically expressed serglycin in U2OS cells, which lack native secretory granules. Serglycin was shown to induce the expression of Elane, Rab27a, and Cd63. In contrast, ectopic expression of Elane showed no impact on the expression. Our findings support the theory that serglycin regulates primary granule biogenesis by promoting the upregulation of cargo proteins (Elane) and trafficking machinery, including CD63 and Rab27a. With this work, we have provided a first mechanistic insight into the biogenesis of primary granules, setting the base for future investigations.

Tyler Distenfeld

OH - Denison University

Discipline: Biology

Authors:

#1 Tyler Distenfeld

#2 Solomon Chak

Abstract Name: Identifying Sex-Related SNPs in Eusocial Synalpheus Shrimps

Eusociality is a rare phenomenon that is characterized by a queen-worker relationship in which a single queen is responsible for breeding for the entire colony, while the workers defend the juveniles and the rest of the colony from predators. Synalpheus shrimps provide a unique opportunity to study the evolution of eusociality because both eusocial and non-eusocial species coexist in the same areas, and their multiple origins of eusociality occurred more recently than many eusocial insects. While the evolution of eusociality in shrimps has been explored to some extent, the mechanisms of sex determination in eusocial Synalpheus shrimps are still unclear. This study aims to use double-digest restriction site-associated DNA sequencing (ddRADseq) to identify the presence of sex-linked single nucleotide polymorphisms (SNPs) in Synalpheus shrimps. Genomic data was obtained from 384 individuals across 33 species of Synalpheus, including eusocial and non-eusocial representatives. We used reference samples (two species with 28 females and 19 males) to obtain (1) SNPs shared by both males and females and (2) SNPs that are unique to one sex. Then we tested these SNPs in the test samples (31 species with 334 females and 3 males) 746 and 49 SNPs were identified among the female and male reference samples, respectively. Among these SNPs, 205 and 19 SNPs had a major allele frequency close to 1 in the reference and the test samples for females and males, respectively. Furthermore, > 10,000 sex-specific SNPs were found in the reference samples but only a small proportion were found in the test samples (3.9% and 0.3% in females and males, respectively). These findings suggest the potential for localized genomic regions associated with sex-determination. Future work on this project would involve mapping identified SNPs back to reference genomes to identify sex-linked loci, which could provide insight into the evolutionary sex dynamics of eusociality.

Keara Jo Divoky

GA - Georgia Southern University

Discipline: Nursing and Public Health

Authors:

#1 Dorothy Seybold
#2 Atin Adhikari

Abstract Name: Connection Between Microbial Activity on Grocery Stores Shopping Cart Handles and Short-term Exposures to Ambient Temperature, Relative Humidity, Ultraviolet Radiation, and Wind Speed

Research question, purpose, and context: Shopping carts can harbor microorganisms, but limited research has been done on the microbial activity on cart handles when stored outdoors under varying conditions of ambient temperature (T), relative humidity (RH), ultraviolet radiation (UV), and wind speed (WS). We propose that certain outdoor factors, particularly UV exposure and T, may contribute to the natural decontamination of the carts if they are left outside for an adequate duration. This study aims to investigate this hypothesis. Methodology: Surface ATP levels were measured to assess microbial activity on shopping cart handles (n = 10 per test). When the luminescent enzymes are present, ATP released from microorganisms generates light. The intensity of this light was measured using a luminometer and expressed in Relative Light Units (RLUs). T, RH, WS, and UV were measured using a handheld environmental multimeter, and a handheld UV-AB light meter. Results: Preliminary results indicated the microbial loads on shopping cart handles after a 10-minute outdoor exposure to UV light, temperature, and wind speed significantly dropped ($p < 0.05$ in paired t-test). When analyzing half of the handles, the microbial loads were measured as 318.25 ± 234.74 RLU before exposure and 255.74 ± 202.75 RLU after exposure. The environmental conditions during the experiments were: UV intensity was 1.18 ± 0.95 mW/cm², temperature was $69.20 \pm 2.787^\circ\text{F}$, relative humidity was $51.33 \pm 20.40\%$, and wind speed was 2.75 ± 1.58 m/sec. The differences in microbial activity on low-UV days compared to high-UV days were noticeable. Conclusion: Based on preliminary data, we conclude that short-term outdoor exposure to ambient T, RH, WS, and natural sunlight UV can significantly reduce the microbial activity on shopping cart handles. This cost-effective decontamination method should be widely considered by business managers of grocery stores.

Vaishnavi Dixit

NY - Adelphi University

Discipline: Computer Science

Authors:

#1 Vaishnavi Dixit

Abstract Name: Evaluating the Efficacy and Limitations of K-Nearest Neighbors in Imbalanced Datasets

The K-nearest neighbor (kNN) algorithm is a powerful and simple technique in machine learning. Its common purpose is to classify a query point into a class based on the classes of the K number of nearest neighbors. Due to the simplicity and effectiveness, it is used in a wide variety of applications such as data preprocessing, recommendation engines, finance, healthcare, and pattern recognition. Recommendation systems used in Netflix and Amazon, Climate forecasting, Stock price prediction, and prediction of a second heart attack are some of the real-world examples. However, it has drawbacks which makes kNN algorithm not applicable in certain scenarios. These disadvantages include large datasets which can potentially slow the system, large number of dimensions as it can increase errors and choosing the right value of K or number of nearest neighbors in order to proceed with the algorithm. As per previous knowledge, lower values of K can overfit the query points whereas higher K values can underfit the data. This research aims to display the limitations of kNN algorithm specifically with unbalanced datasets. It will examine the effect of number of neighbors or K on theoretical and experimental kNN algorithm's performance. At last, a better algorithm will be proposed to display the noise or pattern in imbalanced datasets, it will be compatible with large dimensions and is friendly with all K values.

Stephanie Dixon

OK - University of Central Oklahoma

Discipline: Art History

Authors:

Abstract Name: Symbology of the Feminine New World as Explored Through Art

The subject of this study is visual media emphasizing creation myths about female symbolism within the Americas, a place allegorically feminized in order to justify control and expansion by European colonists. The symbolism of a female figure has emerged out of colonized places time and time again for nation-building and mythologizing stories to justify later nation-states. As established in scholarship, the loving and forgiving woman of the New World accepts and unites this “New World” for the colonizers, but comparative studies on the topic are limited. This comparative study focuses on Pocahontas and La Malinche, and their mythologizing stories created by Europeans for colonial means. In addition, this study concerns the image of The Virgin of Guadalupe, one created through Spanish-Catholic and indigenous contact in Central America in the 1500s. The study further demonstrates key differences in the artistic representations of these three cultural symbols in the “post-colonial” world of what was once North America and Central America via a formal and symbolic study of each visual representation. Art as a visual medium, paired with cultural contexts will provide a unique dialogue in the national myth of The United States and Mexico. The importance of this study lay in the context of colonization; the US remains a colonized state, continuously reinforced by Pocahontas’s myth, whereas Mexico created a nation state out of independence from Spanish control where La Malinche is villainized, and exists alongside la Virgen de Guadalupe.

Erica Dobies

VA - James Madison University

Discipline: Engineering

Authors:

Abstract Name: Setup, Calibration and Implementation of a Pendulum Impact Machine Following ASTM Standards

This undergraduate research focuses on the setup, calibration, and implementation of a pendulum impact machine according to ASTM guidelines. Pendulum impact testing is a method used for evaluating the toughness and fracture resistance of materials which provides insights into their performance under sudden loading conditions. The project aims to ensure accurate and consistent impact test results by following the standardized procedures outlined in ASTM D256 and D6110, which specifies the requirements for Izod and Charpy impact testing. The calibration process, as detailed by ASTM, involves verifying the machine's alignment, pendulum release, and striking edge, as well as ensuring the accurate positioning of the specimen. The process also entails adjusting the pendulum's height and measuring any frictional losses that could influence the energy readings. Calibration plays a crucial role in minimizing measurement error, thereby increasing the repeatability and reproducibility of test results. Calibration results are then verified by testing a 3D printed polypropylene specimen with a known impact strength, allowing verification that the machine's energy readings align with expected values. This research contributes to understanding how careful setup and calibration of impact testing equipment can influence the reliability of material property data, helping ensure that engineering materials meet safety and performance standards in practical applications. After careful calibration is completed, the goal is to perform impact tests on 3D printed materials that have been infused with hemp fibers to assess how the addition of natural fibers affects the impact strength of the

material. The findings are intended to support future material testing initiatives by providing a framework for accurate impact testing.

Olivia Dobiesz

OH - University of Dayton

Discipline: Psychology

Authors:

#1 Dr. Tracy Griggs

Abstract Name: The Effects of Acute Psychosocial Stress on Alcohol Craving, Motivation to Consume Alcohol, and Physiological Correlates

Stress has been identified as an important risk factor for the onset and maintenance of Alcohol Use Disorder (AUD). Accordingly, the present study seeks to explore the link between stress and alcohol-related measures, specifically by analyzing how fluctuations in subjective and biological measures of stress affect craving and choice for alcohol. The present study utilizes a variation of the Trier Social Stress Test (TSST) to acutely induce stress in participants. Participants will be randomly assigned to complete either the TSST or a non-stress equivalent procedure which will serve as the control. Saliva samples will be collected in order to assess fluctuations in the stress biomarker alpha amylase in response to the TSST. Heart rate and heart rate variation will also be measured throughout the experimental session as an additional measure of the physiological stress response. Participants will be asked to fill out a series of questionnaires pertaining to perceived levels of stress, anxiety, and affect before and after completing the TSST. Upon completion of the TSST, participants will complete a series of alcohol-related questionnaires that measure: frequency of alcohol use, magnitude of alcohol craving, risk for developing AUD, anticipated effects of alcohol use, hypothetical alcohol choice behavior, occurrence of negative alcohol-related consequences, and level of engagement in non-drug related activities. We expect to see an increase in subjective and physiological markers of stress post-TSST, correlated with an increase in alcohol craving in those who are at-risk for developing AUD. The aforementioned measures will allow us to identify factors that may influence the decision to consume alcohol or engage in non-alcohol related activities. In turn, this would allow us to develop a more complete understanding of the relationship between stress and alcohol-related behaviors which may relate to the development of AUD.

Catherine Dobler

CAN - University of Alberta

Discipline: Education

Authors:

#1 Hilyatuz Zahroh

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#3 Fatima Mraiche

Abstract Name: The Impact of Undergraduate Research Experiences on Student Communication Skills, Understanding of the Research Process, and Academic Achievement: a Cross-Disciplinary Scoping Review

Undergraduate Research Experiences (UREs) are increasingly recognized as an important component of higher education. They provide students with opportunities to apply theoretical knowledge to real-world problems, develop an array of academic and professional skills, and foster student interest in research-

oriented careers and graduate studies. Despite the recognized value of UREs, it is challenging to assess the extent of their benefits due to the diversity of research experiences and corresponding variety of assessment tools. To understand the impact of UREs across disciplines and formats, we systematically identified URE skills, outcomes, assessment tools employed, and their validation status. Systematic searches in MEDLINE, SCOPUS, and ERIC were performed and results were limited to English-language studies from Canada and the United States, published between 2019-2023. Inductive thematic analysis was conducted on the primary sources to categorize the skills and outcomes of UREs. Subgroup analysis was performed to explore themes associated with different characteristics of UREs including year of URE intervention, duration, format, discipline, and inclusion of historically underrepresented groups. Thirty-eight studies met the inclusion criteria and from these, four overarching themes for outcomes were identified—Academic Performance and Achievement, Research Achievement, Advanced Degree Enrollment, and Employment Outcomes—along with eleven subthemes. For skills, six themes were identified—Scientific Process Skills and Knowledge, Personal Gains and Development, Communication and Collaboration, Attitudes and Behaviors Towards Research, Career Preparation and Job Readiness, and Social and Cultural Competency—with twenty-five skill subthemes. The assessment methods used to evaluate skills and outcomes were separated into direct and indirect methods, each with their own advantages and disadvantages. Twenty studies used tools previously validated, fifteen used self-validation techniques, and eleven did not report validation. The identified skills and outcomes can guide creation of assessment tools and programs that capture the full range of skills developed through UREs, while ensuring accessibility and inclusivity for all students.

Meghana Dodda

PA - University of Pittsburgh

Discipline: Health and Human Development

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Abstract Name: Racial Equity Collaborative Database (RECD): Leveraging Solution-Based Resources to Advance Racial Equity and Address Systemic Racism on a Global Scale

The Racial Equity Consciousness Database (RECD) is a comprehensive platform designed to serve as a centralized repository for resources addressing systemic racism. Developed in collaboration with the United Nations Permanent Forum on People of African Descent (UNPFAD) and other partners, RECD is a database for individuals and organizations seeking racial equity solutions aligned with the United Nations Sustainable Development Goals (SDGs). Accessing resources to address systemic racism is notoriously difficult due to their fragmentation across multiple platforms, disciplines, and formats, which hinders collaboration and progress. A centralized database like RECD eliminates this challenge by unifying these resources into a single, easily accessible hub, enabling users to efficiently find the tools and information needed to drive meaningful action toward racial equity. In building this global database, we used a structured survey as a primary method of collecting and organizing research data from our student team. The team actively sought

out siloed data from professionals across various disciplines within the Pittsburgh region with the purpose of centralizing information for greater use. As such, we started within the University of Pittsburgh and created a novel pathway for students and universities to leverage RECD and our structured research methodology as the initial steps of an intervention mapping process in addressing racial issues. By organizing these resources under the SDGs, RECD bridges gaps in accessibility, provides actionable insights to tackle racial disparities across various sectors, and empowers users to engage with research, initiatives, and innovative solutions that promote equity and sustainability. Through our presentation at NCUR 2025, we aim to showcase the impact of RECD as a transformative tool for advancing racial equity, fostering collaboration, and driving meaningful social change.

George Doherty

PA - University of Pittsburgh

Discipline: Computer Science

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Abstract Name: Real-time Seizure Detection from Intraoperative Files Using a Variational Autoencoder, Transformer, and Multi-Layer Perception

In neurosurgery, seizure detection is essential to patient safety during open brain surgery. The current standard of care relies upon continuous interpretations of EEG monitoring by clinical staff, a process made difficult due to the multiplicity of information that must be understood in real time. This study investigates the capability of machine-learning algorithms to evaluate intraoperative neuromonitoring data for real-time seizure detection to increase detection accuracy and reduce human error. This study uses a machine-learning technique using a variational autoencoder (VAE), transformer, and multi-layer perceptron (MLP) to interpret neurophysiological data from intraoperative monitoring files. The simultaneous recording of electrical activity across multiple electrodes placed on the scalp is known as “multi-lead data,” which provides complex data about brain activity. The VAE is utilized to extract latent representations of this data, identifying underlying signals in neurophysiological data. The transformer enables sequence analysis, revealing temporal relationships that are essential for the early diagnosis of seizures. The MLP then categorizes seizure-like activity based on these processed features. By automating the examination of multi-lead data, this integrated pipeline helps the surgical team receive real-time alerts while overcoming the problem of subjective detection delays. We anticipate an AI-powered seizure detection system leveraging a VAE, transformer, and MLP will perform better than traditional EEG interpretation techniques performed by clinical staff regarding detection speed and accuracy. Even with the variability of multi-lead data, preliminary research indicates improved sensitivity and specificity. This approach minimizes subjective interpretation and provides rapid alerts during critical events. Integrating AI into real-time seizure detection has great potential to enhance patient safety during surgical procedures by improving reaction times through better seizure detection. This technology will increase intraoperative safety by extending the window of action when a seizure is about to occur.

J Dombroski

MN - St. Catherine University

Discipline: Political Science

Authors:

#1 Megan Baumler

Julia Schmitt-Mischke

Helen Sands

Abstract Name: Exploring the Perceived Impact of Farmers' Markets on Food Access: Insights from the Twin Cities Metro Area

Within the Twin Cities metro area in Minnesota, an estimated 12.5% of residents are food insecure, although some census tracts report food insecurity as high as 24%. Oftentimes these tracts are classified as food deserts, where significant portions of residents are low-income and are located more than ½ a mile from a supermarket. These factors impede access to affordable, healthy, and adequate food. We expanded on the literature around the Twin Cities' food environment. Our project assessed how shopping at farmers' markets may improve perceived food access. We investigated how perceived food access differs based on whether an individual is food insecure and/or utilizing food assistance programs including Supplemental Nutrition Assistance Program (SNAP), Electronic Benefits Transfer (EBT), Farmers' Market Nutrition Program (FMNP) and a "Market Bucks" program at farmers' markets that matches up to \$10 of SNAP-EBT spending. We developed a survey with questions about demographics, accessibility of the farmers' markets, food insecurity, use of food assistance programs, and perceptions of food access, and administered it at 17 farmers' markets across the Twin Cities metro area during June and July of 2024. Of the 239 respondents, 46 (19%) used food assistance programs at the farmers' market, 57 (24%) met the criteria for food insecurity, and 24 (10%) were food insecure and utilizing a food assistance program. Use of food assistance programs and food insecurity were each associated with statistically significant increases in agreement that farmers' markets increased respondents' food access in general and their consumption of healthy foods ($p < 0.05$). The data suggests those who use benefits felt they were able to access a greater variety of local nutritious foods and these markets and their use of food benefits increased the quantity of food food-insecure attendees were able to purchase.

Davielys Domenech Garcia

PRI - Universidad Ana G. Méndez - Recinto de Carolina

Discipline: Chemistry

Authors:

#1 Davielys Domenech Garcia

#2 Maria del Carmen Cotto Maldonado

Abstract Name: Optimization of Reaction Conditions for Green Synthesized ZnO Nanoparticles Using Microwave-Assisted Heating: Effects of Different Heating Times

Nanoparticles synthesized through green methods have garnered significant attention for their eco-friendly approach and potential applications in environmental remediation. Zinc oxide (ZnO) nanoparticles are known for their photocatalytic properties, making them suitable for the degradation of organic pollutants. The use of natural reducing agents like red mangrove (*Rhizophora mangle*) extracts offers a sustainable alternative for producing ZnO nanoparticles via microwave-assisted methods. Traditional methods of synthesizing photocatalytic nanoparticles often involve harmful chemicals, raising concerns about environmental impact. Optimizing green synthesis methods, such as using plant extracts and microwave-assisted processes, is critical for improving nanoparticle yield, reducing particle size, and ensuring scalability for environmental applications. Understanding the relationship between synthesis parameters and nanoparticle efficiency in degrading pollutants remains a key challenge. This study focuses on optimizing the reaction conditions for

the green synthesis of zinc oxide (ZnO) nanoparticles using microwave-assisted heating. Red mangrove leaf extract was employed as a sustainable reducing agent. A CEM 2.0 Discover microwave was used at a fixed power of 250 W, with heating times ranging from 5 to 25 minutes to evaluate their effects on nanoparticle yield and morphology. Characterization of the synthesized ZnO nanoparticles is being conducted to assess their structural, optical, and thermal properties, including efforts to optimize the synthesis process further. This research aims to investigate how microwave heating times influence nanoparticle formation, with a focus on reducing particle size and enhancing the yield of ZnO nanoparticles. The findings will provide insights into the potential of microwave-assisted green synthesis to improve the efficiency and scalability of ZnO nanoparticle production for environmental applications, particularly in the degradation of organic pollutants.

Javier Dominugez

IL - Eastern Illinois University

Discipline: Psychology

Authors:

#1 Jeffrey Stowell

Abstract Name: Understanding Misinformation Susceptibility in Relation to Social Media Use and Media Literacy

As misinformation proliferation continues within social media environments, understanding how individuals engage with erroneous information has become an increasingly important area of focus in psychology and social sciences. However, media literacy may also influence susceptibility to misinformation. The purpose of this study aims to understand how social media use relates to misinformation susceptibility depending on an individual's media literacy level. This study mainly hypothesizes that greater social media use will be more strongly associated with susceptibility to misinformation when media literacy is low, while the relationship will be weaker among individuals with high media literacy. Up to 200 adult college students will be recruited to complete an online Qualtrics survey. Participants will provide consent and answer demographic questions before the assessment starts. Next, participants will begin the assessment by selecting social media platforms that are applicable to them and report their weekly average social media use. Then, complete a 26-item media literacy scale (covering need for cognition, locus of control over media, and knowledge of media structures), and finish with a 20-item Misinformation Susceptibility Test analyzing true or false news headlines. Data collection will occur from December 2024 to March 2025. Data will be exported from Qualtrics and analyzed using SPSS through a multiple regression model to assess the relationship between social media use and misinformation susceptibility based on media literacy levels. This study aims to understand the relationship between social media use and misinformation susceptibility depending on media literacy. This particular relationship has not yet been observed empirically. The results of this study will contribute to a further understanding of how misinformation and social media use are related to one another. Not only that, but this study would also make use of a fairly novel instrument that measures susceptibility to misinformation, which could further validate its use.

Veronica Domyslawski

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Discipline: Health and Human Development

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Abstract Name: Positive outcomes of $\alpha 7$ nicotinic acetylcholine receptor modulation and environmental enrichment on sustained attention and cholinergic neurotransmission after controlled cortical impact injury

Traumatic brain injury (TBI) is a leading cause of cognitive disability. Enhancing acetylcholine (ACh) transmission may ameliorate post-injury cognitive deficits, especially when combined with noninvasive rehabilitation. We predicted that NS-1738, an $\alpha 7$ nicotinic ACh receptor ($\alpha 7$ -NACHR) positive allosteric modulator (PAM), will improve sustained attention post-TBI, alone and with environmental enrichment (EE) housing, and improve brain markers of cholinergic transmission post-TBI in male and female adult rats. Blocking $\alpha 7$ -NACHRs with methylycaconitine (MLA) will attenuate the effects of NS-1738, confirming its mechanism of action. Additionally, we compared effects of 4BP-TQS, an $\alpha 7$ -NACHR allosteric agonist (ago-PAM), on attention post-injury. Rats trained in the 3-choice serial reaction time task (3-CSRT) prior to right parietal controlled cortical impact (CCI) or sham injury. Rats were randomized to NS-1738 (5 mg/kg, i.p.) or vehicle (saline), as well as daily EE (6h) or standard housing starting post-injury day (PID) 1. Male subgroups also received daily $\alpha 7$ -NACHRs blockade via MLA (3 mg/kg) injections. 3-CSRT retrials occurred on PID 14-24, when 4BP-TQS (1 mg/kg) was administered daily in one male cohort. Choline acetyltransferase (ChAT) immunostaining was performed in the basal forebrain. Statistical analysis utilized ANOVAs with repeated measures and Newman-Keuls post hoc tests. TBI rats of both sexes exhibited impaired sustained attention and increased distractibility versus shams ($p < 0.05$), with chronic NS-1738 improving accuracy in females and omissions in both sexes ($p < 0.05$). Daily EE was beneficial on 3-CSRT measures in male rats ($p < 0.05$), while NS-1738+EE rendered an additive effect on lowering omissions and reducing cortical cavitation ($p < 0.05$). All TBI rats reflected ChAT disruptions in the basal forebrain, improved by chronic NS-1738+EE housing in male rats ($p < 0.05$). Chronic 4BP-TQS was promising at restoring accuracy and premature responding. Our findings support benefits of $\alpha 7$ -NACHR PAM and ago-PAM compounds and/or EE treatment after TBI.

Madison Donahoe

TX - Texas Woman's University

Discipline: Nursing and Public Health

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#1 Madison Donahoe
#2 Jennifer Wilson

Abstract Name: The Impact of Oral Histories on Long-Term Care Staff's Perceptions of Patient-Centered Care

Background: The growing aging population, nursing shortage, and current landscape of understaffed long-term care (LTC) facilities collectively threaten quality patient care. Patient-centered care (PCC) is known to improve patient and staff outcomes by approaching care holistically through shared active patient/staff engagement in patient care and decision-making. When LTC staff engage with residents through stimulating and positive interactions, residents' mental and physical quality of life increase. Benefits to staff include increased job satisfaction and improved work performance through meaningful engagement and learning more about the residents' preferences. The literature describes the impact of conducting oral histories on LTC as a strategy to promote PCC with a focus on patient outcomes. However, there is a gap regarding the impact

of oral histories on PCC from the staff's perspective. A nursing student created a LTC initiative in which the findings of LTC residents' oral histories were summarized in posters and shadow boxes placed in the patient's rooms to promote patient/staff engagement. Purpose: to explore the perceptions and experiences of LTC staff regarding the impact of a LTC oral history initiative on PCC. Methodology: phenomenological qualitative methodology, utilizing thematic analysis of transcripts from semi-structured interviews conducted with LTC staff. Interview questions were created using the PeoPLe framework to address all six aspects of PCC. Results: Pending. Study has obtained IRB approval. Data collection is on track for completion in December 2024; thematic analysis will be completed January 2025. Expected Conclusion/Clinical Implications: Preliminary findings indicate oral histories show promise as an effective strategy to promote PCC in LTC, with meaningful mutually beneficial outcomes for patients, staff, and LTC facilities. Findings will be disseminated to the LTC facility and corporate stakeholders and disseminated in a peer-reviewed journal.

Qingwen Dong

CA - University of the Pacific

Discipline:

Authors:

#1 Qingwen Dong

Abstract Name: Empowering Undergraduate Research: A Mentor's Guide to Practical Application and Success

Empowering Undergraduate Research: A Mentor's Guide to Practical Application and Success For over thirty years, my pedagogical philosophy has been deeply intertwined with the practical application of academic research. A central tenet of my teaching strategy is not only to equip students with foundational research concepts and practices but also to inspire them to translate these elements into actionable projects. This approach requires students to design a research study, collect and analyze data using SPSS, and disseminate their findings in public forums. Annually, I select 3-5 exemplary students to present their research at national or regional conferences. A notable instance from my recent intercultural communication class highlights this process. Several students excelled in their research designs and arguments, prompting me to recommend their work for our university's Diversity, Equity, and Inclusion Retreat. These three students adapted their class paper into a compelling presentation that resonated well with the audience, illustrating the dynamic and persuasive potential of well-guided undergraduate research. This engagement led to the university endorsing their participation in the Council on Undergraduate Research's Advocacy Program: Scholars Transforming Through Research (STR). Such opportunities exemplify the numerous instances throughout my career where student-initiated research projects have transitioned into significant learning and professional development experiences. Through my presentation, I aim to reflect on these experiences and distill essential principles that can enhance undergraduate research initiatives. By fostering an environment where research is seen not only as accessible but also as an enjoyable and beneficial pursuit, we can significantly influence students' academic and career trajectories. This session will explore strategies to cultivate a vibrant research culture that empowers students to thrive and succeed in their higher education journeys and beyond.

Precious Donkor

NC - North Carolina State University

Discipline: Computer Science

Authors:

#1 Noah Donkor

Abstract Name: Exploring and Mitigating Implicit Bias in Large Language Models: A Cross-Domain Evaluation Framework

Implicit bias in Large Language Models (LLMs) remains a significant challenge, particularly in high-stakes applications like healthcare, education, and hiring. Despite advancements in reducing explicit biases, subtle and unintentional biases rooted in societal stereotypes persist, influencing LLM-generated outputs even when demographic attributes such as race, gender, or age are not directly referenced. These biases can result in discriminatory outcomes, with potentially harmful consequences if left unaddressed. A comprehensive framework for evaluating and mitigating these biases is essential to ensure that LLMs produce equitable and contextually sensitive responses. The evaluation framework developed here assesses the influence of language associations and contextual cues on model outputs, focusing on how certain words and phrases can trigger biased responses. By comparing prompts with varying levels of context, from context-neutral to context-rich, the impact of prompt design on bias manifestation is examined. The framework further explores different mitigation strategies to determine their effectiveness across diverse domains and tasks, ensuring that solutions are adaptable without compromising the accuracy or fluency of generated text. Ethical concerns surrounding fairness, cultural sensitivity, and the potential reinforcement of harmful stereotypes are also addressed. Findings highlight the necessity of scrutinizing model outputs for implicit bias, especially in decision-making applications where fairness is critical. The proposed framework offers a scalable approach to identifying and mitigating bias in LLMs, with broader implications for improving AI systems' fairness and inclusivity in real-world applications. The insights gained aim to inform best practices in AI development, ensuring that LLMs contribute to more equitable outcomes and reduce the risk of perpetuating societal biases.

Claire Donnelly

PA - Villanova University

Discipline: Psychology

Authors:

Abstract Name: Classification of Bilingualism and Performance on Cognitive Control Tasks

The bilingual advantage hypothesis claims that bilinguals' management of multiple linguistic systems provides additional cognitive flexibility relative to monolinguals. However, what is considered bilingual has varied markedly across studies, limiting the generalizability of results. There are two common approaches to grouping participants: categorical and continuous. With categorical grouping, participants are divided into groups (e.g., bilinguals, monolinguals) based on predetermined criterion. With continuous grouping, bilingualism is a continuous metric ranging along a spectrum. This study aims to close this gap by investigating how experimenter's choice of participant grouping influences the results of cognitive control tasks in a linguistically diverse group. Participants (N=54) completed a language history questionnaire (LHQ-3) asking about language usage patterns, family language backgrounds, and self-ratings of proficiency. The participants performed two tasks measuring cognitive control: the AX-CPT and the n-back task with lures. We used an aggregate L2-to-L1 dominance ratio score from participants' response data to either create a continuous index of bilingualism (continuous approach) or to split participants into monolingual and bilingual groups (categorical approach). For the continuous classification, individuals with no L2-to-L1 dominance scores were assigned a value of zero. For categorical classification, those with L2 experience, and thus L2-to-L1 dominance scores, were classed as bilingual (n=30) while other participants were classed as monolingual (n=24). We conducted a linear regression analysis on cognitive control measures from behavioral tasks to explore the influence of language experience on cognitive performance. No significant difference between bilinguals and monolinguals in cognitive control under categorical classification was found. Likewise, there was no significant relationship between cognitive control and the continuous language experience metric. While we note that the absence of a significant difference is not evidence of a significant absence, we believe

that these results call for more systematic standards of practice for investigation of the cognitive consequences of bilingualism.

Sara Dooley

MN - Hamline University

Discipline: Chemistry

Authors:

Abstract Name: Cathodic Contact Glow Discharge Electrolysis: Characterization and Exploration of Applications for PFOA Degradation

Plasma technology has increased in popularity in recent decades due to its unique ability to produce chemically diverse species within a solution. Despite its increasing popularity, plasma is a niche area of research with wide knowledge gaps. The characteristics of different plasma types are broadly theorized but haven't been prominently studied. To bridge large deficits in knowledge surrounding plasma technology, this project focuses on characterizing the first-ever cathodic contact glow discharge electrolysis (CGDE) plasma jet to be built and operated in the United States. CGDE is a special type of plasma that's generated within the solution directly instead of being introduced to the sample afterward. This technology is spurred by the breakdown of normal electrolysis, causing deviations from Faraday and Ohm's laws to synthesize excess yields of valuable gases such as hydrogen and oxygen. To properly characterize the plasma, trials implementing different conductive salts were analyzed to identify the lowest breakdown voltage, indicating the generation of plasma at energy-efficient costs. Results indicated that 0.006M potassium sulfate, increasing the conductivity of the solution to 3000-3500uS, coupled with a small cylindrical cell (~35mm in diameter), produces plasma the quickest with minimal energy input. Once characterized, CGDE was used to degrade PFOA, an emerging carcinogenic water contaminant. In degradation trials using the standard conditions determined above, PFOA was treated in 25 mL, 20uM aliquots from zero to fifteen minutes. A Liquid Chromatography Mass Spectrometer was utilized to quantify PFOA degradation for each trial. Fifteen minutes of plasma exposure degraded PFOA by 75%. Preliminarily, 82% to 88% of PFOA is degraded when other reagents are implemented into the solution. Results highlight enhanced PFOA degradation compared to the current literature. This project has many probative avenues with the potential to further combat water contamination and create interdisciplinary solutions to previously unsolvable issues.

Emily Dooley

IL - Eastern Illinois University

Discipline: Education

Authors:

#1 Emily Dooley

Abstract Name: The Impact of Jazz Education on Students' Musicianship: A Survey Study

It is undeniable the impact jazz has on culture both in the United States and around the world. However, there exists a need for further research on the importance of jazz education. By understanding the impact participating in jazz ensembles has on our collegiate and K-12 students, teachers can better prepare their music students for life beyond their classroom. Research regarding jazz pedagogy has informed us that jazz can benefit students' development of artistic identities (Robertson, 2023) and can help students' improvisation skills (Perlmutter, 2010). Further research is needed on how students' fundamental musicianship skills can

improve through participating in jazz band. The purpose of this study is to investigate the importance of participating in a jazz ensemble and to track the growth students have made by participating in such ensembles. A survey was created using the Qualtrics electronic program and was distributed via the ILMEA membership list, social media, and to colleagues. The survey was designed with branches so that each student received personalized questions based on their current level of schooling. The branch designed for teachers included questions they answered about their students. Current K-12 students, high school graduates, current college students, college graduates, and current K-12 teachers were invited to respond. The data will be used to analyze how participating in a jazz ensemble has affected students' rhythm counting skills, knowledge of scales and chords, playing technique, ability to improvise, confidence and ability to play their instrument in front of an audience, overall musicianship, and knowledge of the history and origins of jazz. Identifying the impact that playing in a jazz ensemble has on K-12 students will add to the body of research informing us of the effects that jazz education can have on students.

Mary Dorsey

MI - University of Michigan - Ann Arbor

Discipline: Biology

Authors:

#1 Ann Marie Lawson

#2 Jacob Mueller

Abstract Name: Selfish Transmission of the Homogeneously Staining Region in Mice

Most animals have pairs of chromosomes harboring genes, one chromosome inherited from the female and the other from the male. Gene inheritance is largely considered random, consistent with Mendel's Law of Independent Assortment. However, some genes/chromosomes are "selfish," and their inheritance frequency is greater than 50%. Selfish gene inheritance can happen on the female's side, during oogenesis, or on the male's side, during spermatogenesis. One gene believed to be "selfish" during oogenesis is HSR, the homogeneously staining region, which maps to the first chromosome in house mice (*Mus musculus*). I will determine if the HSR chromosomal region is selfish and how it promotes its own inheritance. I will use heterozygous female mice for an HSR deletion (deletion/wild-type) and determine the frequency of inheritance of the deletion versus the wild-type chromosome by genotyping offspring. To determine the genotype of each offspring, I will use PCR (polymerase chain reaction) to detect chromosomes carrying the HSR deletion versus wild-type chromosomes. The PCR amplified DNA will be resolved via gel electrophoresis to detect PCR product presence or absence and product sizes. The study will determine if HSR is "selfish" by observing the frequency of inheritance of the HSR deletion.

Leah Dorsey

AL - University of Alabama

Discipline: Nursing and Public Health

Authors:

#1 Evans F. Kyei

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#3 Mercy Mumba

Abstract Name: A Cross-Sectional Analysis of Financial Stress and Smoking Behavior: The Influence of Housing Costs, Mental Health, and Sociodemographic Factors Among US Adults.

The primary aim of the study was to assess the association between financial stress, specifically stress about paying rent, mortgage, or utility bills, and smoking tobacco, while accounting for mental health and sociodemographic variables. While there has been much study of the correlation between financial stress and smoking or smoking and mental health, a gap remains in the literature regarding the combined intersectional effect these variables have upon one another. This study utilized data from the 2023 National Health Interview Survey (NHIS). The weighted sample included 76,423,291 participants, and the data analyzed included sociodemographic variables such as age, race, ethnicity, marital status, educational level, financial stress, smoking behavior (every day or some days), and mental health as measured by the PHQ-2 and GAD-2. Findings indicate significant associations between financial stress, mental health, and smoking behavior. Participants experiencing financial stress had 53% higher odds of smoking (OR = 1.53, $p < 0.001$) compared to those without financial stress. Additionally, anxiety (OR = 1.38, $p < 0.01$) and depression (OR = 1.23, $p < 0.05$) were significantly associated with smoking behavior. Race, education level, and marital status also demonstrated intersecting influences on the likelihood of smoking. Non-Hispanic Black participants were more likely to smoke than Non-Hispanic White participants (OR = 1.40, $p < 0.05$), while higher educational attainment and being married were inversely associated with smoking. Interaction analyses revealed that Non-Hispanic Black participants with depression had lower odds of smoking than Non-Hispanic White participants (OR = 0.46, $p < 0.01$). These findings highlight the importance of considering intersectional factors, such as race and mental health, when designing smoking cessation programs, as well as addressing mental health alongside smoking cessation.

Jessica Doss

AR - University of Arkansas

Discipline: Chemistry

Authors:

#1 Suresh Thallapuranam

#2 Zeina Alraawi

Abstract Name: Creating a Heparin-Binding, Hyper-Stable FGF1: Effects of a Targeted Two Mutation on the N-Terminus of a Hyper-Stable FGF1

Approximately 4% of Americans experience poor-healing foot ulcers due to diabetes, often leading to severe complications and amputations and costing millions in healthcare resources for intensive wound care. Fibroblast Growth Factors (FGFs), cell-signaling proteins critical for cell proliferation, metabolism, differentiation, and tissue repair, are key drivers of wound-healing processes. Recently, researchers have developed a hyper-stable FGF1 (hsFGF1) mutant that retains its diverse bioactivity while increasing its stability in isolation, eliminating repulsive electrostatic forces by mutating the amino acid sequence in the protein's C-terminus. While hsFGF1 represents a significant advancement in the protein's stability, no current modifications in literature exhibit complete loss of heparin-binding affinity. This leaves room for increasing the efficacy of wound-healing applications, completely eliminating anticoagulatory activity due to heparin's inhibition of thrombin, a biological coagulant. This project aims to investigate the heparin-binding functionality of the hyper-stable FGF1 by introducing two amino acid mutations in the N-terminus of hsFGF1. Prior research found five amino acids on the N-Terminal of FGF10, which has the highest heparin-binding affinity out of all of the FGF protein family, that are also found on FGF1 near its heparin-binding site. This project focuses on incorporating two of these five amino acids of FGF10 on hsFGF1 to investigate their effect on heparin-binding affinity. Investigation of this two-mutation recombinant hsFGF1 involves overexpression and purification techniques. The protein's structure and stability will be characterized using circular dichroism spectroscopy, fluorescence spectroscopy, and thermal assays. Biological activity will be compared to original hsFGF1 and wild-type FGF1 through isothermal titration calorimetry and bioactivity assays. After initial testing and analysis, it is anticipated that the two-mutation recombinant hsFGF1 will exhibit enhanced heparin-binding functionality and comparable biological activity to wild-type FGF1, while

retaining the stability of the hyper-stable FGF1. Implications include improved understanding on the development of optimal wound-healing treatments through chemically-engineered solutions.

Ken Dostalek

CA - Cuesta College

Discipline: Physics and Astronomy

Authors:

#1 Ken Dostalek

#2 James Eickemeyer

Abstract Name: New Measurements for WDS 11329-4342 HJ 4448AB

The purpose of the project was to conduct astronomical research of double star (binary) systems. The research was conducted by student led teams using a network of small telescopes remotely controlled with locations all over the world. The goal was to provide insight into how scientific research may be completed and published in a timely manner within a community of practice that includes students, educators, and both amateur and professional astronomers. The research began with an overview of the essential astronomy relationships necessary to analyze and understand the binary star data. We then selected a suitable double star system from an existing database using specific criteria we learned at the beginning of the course. We utilized remote small telescopes stationed worldwide to capture images. We then analyzed these images, measuring angular distances and angles between stars. By comparing our findings with historical observations, sometimes spanning a century or more, we contributed a new data point to their orbital plots. This collaborative effort was finally synthesized into a research report using a simple yet professionally correct structure suitable for publication in a scientific journal. This seminar had a great deal of educational value: It enriched our understanding of fundamental astrophysical concepts; it fostered critical thinking skills; and, it will no doubt inspire future generations of astrophysicists. Specific to our research, we were hoping to find evidence that the double star system we selected was a true binary. Its nature was listed as "uncertain," so we assumed that more data was needed to make this determination. Unfortunately, the additional data we collected was inconclusive. But the true goal of the research seminar was achieved in October of 2024 when our report titled "New Measurements for WDS 11329-4342 HJ 4448AB," was published in the Journal of Double Star Observations.

Brianna Dotson

AL - University of Alabama at Birmingham

Discipline: Psychology

Authors:

#1 Brianna Dotson

#2 Catheryn Orihuela

#3 Sylvie Mrug

Abstract Name: Breaking the Cycle of Abuse: The Role of Supportive Emotion Socialization in the Relationship Between Childhood Abuse and Later Parenting Behaviors

In 2022, there were 558,899 incidents and 1,990 deaths from child abuse/neglect. Childhood physical abuse survivors have the greatest risk of perpetuating child abuse through abusive/neglectful parenting, and childhood emotional abuse predicts unsupportive parenting behaviors. Both forms of abuse are associated

with poor emotion regulation, a key risk factor for abusive behaviors. Supportive emotion socialization promotes emotion regulation, especially for negative emotions, yet few studies have investigated its role in the relationship between childhood abuse and parenting behaviors. This study investigated whether supportive emotion socialization moderated the relationship between childhood emotional and physical abuse and adults' parenting behaviors towards their offspring. The sample included participants from Waves 4 and 5 of the Healthy Passages Study, conducted in Birmingham, Alabama. Wave 4 consisted of 1,273 participants (mean age = 19.7 years; 51.3% female) who reported physical and emotional childhood abuse and supportive parental emotion socialization of fear, sadness, and anger. Wave 5 included 317 participants with children (mean age = 28.7 years; 62.8% female) who reported their parenting behaviors (nurturance, inconsistent discipline, and harsh discipline). Multiple linear regressions demonstrated that supportive anger socialization moderated the effects of physical abuse ($\beta = -0.07$, $p < 0.05$) and emotional abuse ($\beta = 0.09$, $p < 0.01$) on inconsistent discipline. Simple slope analyses showed that greater physical abuse predicted more inconsistent discipline at low supportive anger socialization ($\beta = 0.26$, $p < 0.01$) but not at high supportive anger socialization ($\beta = -0.12$, $p = 0.27$). Emotional abuse predicted lower inconsistent discipline at low supportive anger socialization ($\beta = -0.22$, $p < 0.05$) and high inconsistent discipline at high supportive anger socialization ($\beta = 0.24$, $p < 0.05$). These results suggest that supportive anger socialization may lessen the negative impact of childhood physical abuse on later parenting but aggravate the effects of emotional abuse.

Ashlee Douglass

PA - Westminster College

Discipline: Psychology

Authors:

#1 Eric C. Fields

Abstract Name: Understanding Decision-making: Can Individual Differences Predict Dominant Decision-making Styles?

One question that remains ambiguous in decision-making research is whether it is possible to predict decision making styles. Previous research suggests that one element of that prediction may involve individual differences to measure an individual's tendency toward certain decision-making styles. This study explores whether it is possible to predict dominant decision-making styles based on the following individual differences: risk attitudes, personality traits, and cognitive styles. Also, this study investigates which variables may be stronger predictors for decision-making styles in an attempt to work toward an accurate and reliable model for predicting dominant decision-making styles. Data was collected via an online self-report survey and then analyzed using multiple regression statistical analysis. This study hypothesizes a correlation between the predictor variables of risk attitude, cognitive style, and personality traits and the dependent variable of decision-making style. Risk attitude is expected to be one of the strongest predictor variables due to the well-established connection between risk and the decision-making process. Results are expected to suggest that individuals with attitudes oriented more towards risk aversion are more likely to demonstrate either dependent or avoidant decision-making styles. The personality traits and cognitive differences predictors are expected to be statistically significant, but they are expected to be weaker predictors for decision-making style than risk attitude. The demographic factors are not expected to be correlated with decision-making style and are not expected to have a significant impact on the overall regression model. The results of this study may add to the psychological understanding of how individuals tend to make decisions and whether it is possible to predict those tendencies based on individual differences. If psychologists can make these predictions, they may be able to better understand the overall decision-making process as it relates to specific individuals and also why people make decisions in drastically different ways.

Alexis Draai

PA - Grove City College

Discipline: Linguistics and World Languages

Authors:

Abstract Name: Ideology and Social Classes in Francophone Theater

Shakespeare's Hamlet famously claimed that theater holds a mirror up to nature and in the 20th century Sartre called for an "engaged" theater that transforms its society. Does theater reflect pre-existing societal realities, or does it aim to profoundly reshape its society through its influence? This project explores the interactions between theater and society at large by showcasing the representation of social classes in francophone theater. Through an analysis of three works across francophone theater, this paper argues that playwrights consistently use theater to advocate and promulgate their own worldviews, with an emphasis on how they portray social class and defend their class interests. This paper examines *Le Jeu de l'amour et du hasard* (1730) by Marivaux, *Le Mariage de Figaro* (1778) by Beaumarchais, and *Les Belles-sœurs* (1965) by Michel Tremblay and analyses how they portray social classes and the ideological intent behind these portrayals. *Le Jeu de l'amour et du hasard* defends the place of the aristocracy in the Ancien Régime while also arguing for certain advancements within that class. *Le Mariage de Figaro* critiques the moral corruption of the aristocratic class and defends the ascendant bourgeoisie against both the aristocrats and the tiers état. *Les Belles-sœurs*'s portrayal of working-class women in Quebec during the Quiet Revolution shows the economic and moral disillusionment experienced by Québécois workers, and how it interacts with concurrent societal evolutions. All three plays demonstrate the fact that theater not only reflects but also, sometimes very directly, shapes the societal debates of their time. By engaging with the sociocultural issues of their day, each playwright affirms their own perspective and often attempts to influence their audience's values and perceptions through this engagement.

Aidan Draxinger

PA - Mercyhurst University

Discipline: Psychology

Authors:

#1 Aidan Draxinger

#2 Lindsey Markiewicz

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#4 Kevin Tanner

#5 Esra Akcay

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Halle Graham

Isabella Cappellano Sarver

Abstract Name: From Isolation to Integration: Cross-Cultural Adaptation of International Students in a Northwestern Liberal Arts Setting

Here's a revised version of your abstract, condensed to 300 words while preserving the key elements: This study explores the cross-cultural adaptation experiences of international undergraduate students at a small liberal arts college in the northwestern USA. As globalization increases international student enrollment worldwide, understanding their unique challenges becomes crucial. The research aims to identify factors influencing adaptation and contribute qualitative data to inform institutional support mechanisms. Building on existing research, including Luo and Zhang's (2021) predictors of cross-cultural adaptation, Zhang and Li's (2022) exploration of initial transition effects, and Schwartz et al.'s (2010) call for expanded acculturation

operationalization, this study employs semi-structured interviews with 17 randomly selected international students. The research question guiding the study is: How do international students perceive their cross-cultural adaptation experiences? Grounded theory analysis of the interviews revealed a range of perceptions categorized as positive, negative, and mixed experiences. Positive aspects included participation in campus activities and personal resilience development. Negative perceptions highlighted the need for better support systems to address isolation and homesickness. Mixed experiences indicated that cultural adaptation is a complex, individualized process influenced by various factors. The findings underscore the importance of tailored institutional support to meet diverse student needs. Practical implications for small liberal arts colleges include implementing targeted support mechanisms such as orientation programs, mentoring, and increased opportunities for social integration. This study contributes to the broader understanding of international student experiences, offering valuable insights for educators and administrators. By providing a supportive and inclusive environment, colleges can help international students navigate cross-cultural adaptation more effectively, leading to a more positive and enriching educational experience. The research emphasizes the need for an expanded and nuanced approach to acculturation and cross-cultural adaptation within the context of higher education.

Jada Drees

OH - University of Findlay

Discipline: English and Literature

Authors:

#1 Jada Drees

Abstract Name: "Stay Sexy and Don't Get Murdered": A Rhetorical Analysis of the True Crime Podcast My Favorite Murder

As the true crime genre grows in popularity, questions arise about how difficult cases are presented. The literature on true crime addresses concerns of insensitivity and commercialization of the genre. While the literature addresses problems of docuseries such as Netflix's *Monster: The Jeffrey Dahmer Story*, it does not consider the same concerns with true crime podcasts, including *My Favorite Murder*. There has also yet to be research that analyzes specific true crime podcast episodes. Adding to the conversation on the moral ambiguities of the genre, this project uses rhetorical analysis to analyze the Jon Benet Ramsey episode of *My Favorite Murder* titled "A Small Foreign Faction." The analysis of this episode reveals the two hosts purposefully use a lighthearted tone and gossip-like conversation to disconnect the audience from the severity of the crime that has been committed. The analysis also examines how the tone and language of the episode push ethical boundaries in hopes to draw in listeners. In addition to filling the gap in the literature, this project argues additional research should be completed over other true crime podcasts that further demonstrates the genre using sensitive stories for their own purposes.

Giselle Drewett

CA - University of California - Berkeley

Discipline: Biology

Authors:

Abstract Name: Quantitative Analysis of Epigenetic Influences by Gut Microbiota-Derived Short Chain Fatty Acids on RPI-1 Gene Expression in *C. elegans*: A Novel Investigation into Dyslexia and ADHD Related Pathways

Background: Nearly one in five individuals is diagnosed with dyslexia, while ADHD affects approximately 10% of the population. Both disorders however, lack effective, side-effect-free treatments. Recent research highlights the gut-brain axis's role in neurodevelopmental disorders, with SCFAs—gut bacteria metabolites—potentially modulating gene expression. However, no studies have yet explored the impact of SCFAs on dyslexia-related genes. This study addresses this gap by exploring the effects of SCFAs on the expression of the dyslexia-related gene DCDC2 and its ortholog, RPI-1, in *C. elegans*. **Procedure:** The experiment involved preparing Nematode Growth Media (NGM) agar plates seeded with *E. coli* OP50, treated with SCFA concentrations of 10 μ L, 20 μ L, and 40 μ L, while untreated plates served as negative controls. *C. elegans* were cultured on the plates followed by RNA extraction for cDNA synthesis. Gene expression levels were quantified using qPCR analysis, with ACT-1, which served as an internal control to normalize expression levels and by accounting for variations in RNA quantity and quality. **Results:** Statistical analyses, including ANOVA ($p < 0.05$) and Tukey HSD, confirmed significant reductions in RPI-1 expression at SCFA concentrations of 20 μ L and higher. Data simulations in Python 3.12.3 validated these results, ensuring reproducibility and robustness. Notably, no significant changes were observed in the expression of ACT-1, ensuring that the effects on RPI-1 were specific to SCFA treatment and not due to procedural inconsistencies or technical errors. Shapiro-Wilk tests confirmed a normally distributed dataset, further ensuring reliability of the findings. **Conclusion:** The results demonstrate that higher SCFA concentrations significantly reduce RPI-1 expression, suggesting a potential epigenetic mechanism by which SCFAs influence dyslexia-related gene expression. These findings provide preliminary evidence for the role of diet and gut health in managing dyslexia, with implications for developing scalable, non-invasive, and personalized lifestyle-based strategies for addressing neurodevelopmental disorders. **Keywords:** Dyslexia, ADHD, SCFAs, Epigenetics, Gut-Brain Axis, *C. elegans*

Kaiyuan Du

MD - Johns Hopkins University

Discipline: Biology

Authors:

Abstract Name: Cell Selection of A Fully Modified Aptamer Against Human Transferrin Receptor

aimed to address limitations in traditional chemotherapy by using fully modified RNA aptamers as targeted cancer therapeutics. The primary step is to push the selection to select for an aptamer against human transferrin receptor (TfR) that does not compete with the human transferrin receptor ligand using the GL1 library. TfR contains a positively charge portion that produces a high affinity binding site for most aptamers since aptamers are negatively charged due to the structure of their backbone. Fully modified RNA sequence consists of modifications to the 2' position of the carbon ring. Cytosines are modified by adding a Fluro, while Guanine, Adenine, and Uracil are modified by adding O-Methyl groups. Cell internalization Systematic Evolution of Ligands by EXponential Enrichment (SELEX) is used to identify high-affinity nucleic acid sequences, such as aptamers, through multiple rounds of binding, selection and amplification. Cycle-course Polymerase Chain Reaction (PCR) is performed to determine the optimal amplification round number, at which the expected DNA product is clearly visible in gel electrophoresis without the significant presence of other non-specific products at various sizes. Past experiments showed that at cycle 16 and upwards, the significant presence of a large, non-specific DNA artifact was observed. Flow binding is used to test if a significant increase of aptamers that bind the TfR in the presence of competitive and non-competitive ligands is present. Currently, cell SELEX is performed for additional rounds on Jurkat cells to amplify the desired aptamers. The next step will be conducting an additional 1 to 2 rounds of selection and testing for binding to Jurkat cells. Additional steps involves sequencing the selected aptamers to identify which ones are binding, and then to optimize them via truncation and additional chemical modifications.

Guodong Du

ND - University of North Dakota

Discipline:

Authors:

Abstract Name: Interdisciplinary Renewable and Environmental Collaborative REU Program at University of North Dakota

The Interdisciplinary Renewable and Environmental Collaborative (IREC) Research Experience for Undergraduates (REU) Program at University of North Dakota has been running for a couple of cycles. This NSF-supported program is jointly hosted by the departments of chemistry, chemical engineering and atmosphere science, and provides summer research experiences for undergraduates with priority to first generation college students, underrepresented minority students, and students from tribal colleges and other primarily undergraduate institutions. We emphasize the interdisciplinary and collaborative nature of renewable and environmental research by assembling a team of faculty mentors from various disciplines and working closely with graduate students. Typical research projects include cathode materials from lignite for battery applications, synthesis of degradable polymers, catalytic hydrogenation of CO₂, chemical characterization of pollen, hydrogen production from biogas, and carbon quantum dots from lignin. The professional training is centered around science communication with three main components: an initial 3-minute elevator pitch on research goals, a mid-term oral presentation of research progress and a final poster presentation. Faculty mentors lead the training sessions and experienced graduate students provide live examples, feedbacks, and help sessions. Students can apply these skills in two outreach activities targeting K-8 kids in the community. These activities are interspersed with tours to the local research facilities such as Energy and Environmental Research Center and UND Artificial Intelligence and Virtual Reality Lab. Overall the program provides an inspiring and enjoyable summer experience and continues to empower the next generation of researchers and scientists in the field of renewable and environmental studies.

Aricel Du Bois

NY - The New School: A University

Discipline: Psychology

Authors:

Abstract Name: Ambition, Motivation, and Achievement among first generation college students in urban settings: An Analysis of the Factors that Contribute to Subjective Success

Within a city, how does the background of being a first generation student inform one's ambition and attitude towards college, desired income, and potential career? This paper aims to assess and explore how much of ambition is intrinsic, taught, and how much can be attributed to the individual. The currently existing research offers little consideration to an approach analyzing the perspectives of individuals themselves regarding higher education. Another previously lacking aspect is the application of an academic motivation scale to this specific group of students. This factor within the data sets of similar experiments prior presented a gap in the literature the study aimed to fill. In social psychology, the widely discussed topic of motivation has not yet focused on this group of underrepresented people. This research used the pre-existing AMS-C 28 validated scale that measured internal and external motivations in academia. It was a cross sectional design, controlling for 42 participant survey responses from demographic of first generation students. Responses were collected beginning on March 31st, 2024 through April 16, 2024. The results of the experiment revealed that their desires for academic achievement were often highly aligned with the utilized scale, and their motivations were indeed influenced by external factors. A potential direction for future research could be a more

expansive scale regarding how their communities and home lives impacted their perspectives on higher education and career choices in general. While the current research successfully yields responses regarding attitudes towards overall life achievement, it is evident that there is some career specific research to be conducted.

Michael Dub

AL - Auburn University

Discipline: Biology

Authors:

#1 Michael Dub

#2 Dylan Brown

#3 Nannan Liu

Abstract Name: Insecticide Resistance of the Mosquito, *Aedes aegypti* to Different Classes of Insecticides

Aedes aegypti is a key vector for diseases affecting millions globally. In the U.S., these mosquitoes are concentrated in southern and southwestern regions, increasing the risk of disease transmission. Mosquito management relies heavily on integrated pest management (IPM), which includes environmental, biological, and chemical control. However, the development of insecticide resistance, particularly in *Aedes aegypti*, poses significant challenges to these efforts. Insecticides such as pyrethroids and organophosphates (OPs) are commonly used for mosquito control, with pyrethroids being particularly effective. Unfortunately, resistance to these chemicals, often due to mutations in the voltage-gated sodium channel gene, has emerged. To investigate the evolution of resistance, researchers compared AeStA, a field strain, with insecticide-selected strains. Results showed that resistance to permethrin developed rapidly in *Aedes aegypti*, increasing resistance by 120-, 400-, and 650-fold after three generations. In contrast, resistance to malathion developed more slowly, with no cross-resistance observed between permethrin and malathion. Additionally, the F1534C mutation, caused by a T-to-G polymorphism in the sodium channel gene, was confirmed in resistant strains, indicating its role in pyrethroid resistance. These findings highlight the importance of alternating insecticides from different classes to delay resistance development, a strategy that can enhance the effectiveness of IPM programs for mosquito control.

Summer Duba

VA - Christopher Newport University

Discipline: Biology

Authors:

#1 David Collar

Abstract Name: Eel-volution: Many Roads to a Slippery Shape

Vertebrates span a huge array of body shapes, and their degree of elongation is a major component of this diversity. Some animals are long and skinny, like snakes and eels, while others are stout or round, such as toads and pufferfish. Fishes are an excellent model system for studying this diversity because their wide-ranging body shapes can inform upon the unique adaptive advantages of differing morphologies. In this study, we examined Zoarcoidei, a suborder of fishes derived from a shared eel-shaped ancestor. While these fishes share an elongate history, the group includes several highly elongated species as well as one non-elongate species, making them an ideal model for the study of changes in morphology. We collected measurements of

anatomical features such as body length, depth, and vertebrae from x-rays of 71 zoarcoid species. Using these data, we then identified clusters of related species that have been drawn to distinct adaptive peaks. We found that extreme body elongation arose multiple times but through different sets of skeletal characteristics, such as an increased number of caudal vertebrae in the wolf eel versus increased numbers of vertebrae in both caudal and precaudal regions in the quillfish. These alternative shifts may indicate different adaptations for swimming efficiency in the challenging habitats that these species often inhabit. Interestingly, we also found evidence of adaptive peak shifts in skeletal form that were not associated with an overall shift in body shape; in these cases, subtle changes in the skeleton allow for adaptation to different environmental demands while retaining a similar moderately elongated body shape. These findings support the hypothesis that varying selective pressures—arising from different habitats, feeding strategies, and behaviors—drive not only body shape diversity but an even greater variety of underlying skeletal forms across fishes.

Lindsay Dubé

SC - Coastal Carolina University

Discipline: Environmental Science and Sustainability

Authors:

#1 Lindsay Dubé

#2 Angelos Hannides

Abstract Name: Estuarine Eutrophication Risk and Urbanization

Anthropogenic eutrophication is a process by which the overapplication of nutrients by humans in a waterbody leads to algal blooms, hypoxia or anoxia, and the accompanying damage to living populations, water quality, and ecosystems in general. The objective of this study is to determine if there is a higher risk of eutrophication in more urbanized areas compared to less-developed locations and how eutrophication risk is affected by seasonality. We conduct monthly monitoring at three sites in Long Bay, South Carolina: the urbanized tidal creeks of White Point Swash and Singleton Swash, and the restricted-access Waties Island's estuarine Dunn Sound and open-ocean-facing beach. We collect salinity, temperature and oxygen data using a handheld meter-sensor ensemble in situ. We collect samples for the analysis of the nutrients nitrate, nitrite, phosphate, and ammonium, as well as chlorophyll by spectrophotometry and fluorometry. We evaluate eutrophication risk by comparing our data with the National Eutrophication Estuarine Assessment thresholds. We hypothesize that the urbanized locations will show higher eutrophication risk, as previous research concludes that urbanized areas tend to be exposed to more fertilizers than secluded areas. We also expect that risk will be higher in warmer months, since higher temperatures increase photosynthesis and respiration rates, leading to increased organic matter production but also oxygen depletion due to lower oxygen saturation concentrations. Our results will inform the degree to which urban development compromises coastal water quality as compared to undeveloped or protected coastal environments

Catherine Dublinske

IA - Iowa State University

Discipline: Criminology/Criminal Justice

Authors:

#1 Aimee Zarling

Abstract Name: Developing a program to rehabilitate sex offenders

Sex offenses are among the most serious crimes in our society, causing profound harm to individuals and communities. Up to 24% of those convicted of a sex offense reoffend, according to the Center for Sex Offender Management (2007), though this figure may be an underestimate due to the underreporting of sex crimes. Individuals who commit sex offenses are often stigmatized and marginalized, yet there is limited research on effective interventions and systems to prevent these crimes and reduce recidivism. The purpose of this research is to adapt and develop a rehabilitation program specifically for individuals who have committed sex offenses. Currently, the ACTV (Achieving Change Through Values-Based Behavior) program, created by Dr. Amie Zarling, has demonstrated success in addressing intimate partner violence. This project seeks to revise and tailor the ACTV program to meet the unique needs of individuals convicted of sex offenses. To guide these revisions, I first reviewed existing rehabilitation models and programs to identify best practices and evidence-based approaches for this population. These insights will inform the development of a sex offender-specific adaptation of ACTV. The revised program will be piloted at the Civil Commitment Unit for Sexual Offenders (CCUSO) in Cherokee, Iowa, with the goal of creating a framework that can also be implemented at other treatment facilities. While sex offenses remain a societal challenge, this initiative seeks to provide a path toward rehabilitation, aiming to reduce recidivism and contribute to a safer society. By addressing this critical issue, we can support those committed to change and help prevent future harm.

Cameryn DuBose

MD - Bowie State University

Discipline: Biology

Authors:

#1 Cameryn LeAnn DuBose

Abstract Name: Agar Plate Methods for Assessing the Antibacterial Activity of *Zingiber officinale* (Ginger) and *Curcuma longa* (Turmeric) against *Bacillus cereus* and *Escherichia coli*

The proliferation and dissemination of antibiotic resistance among pathogenic microorganisms represent a critical global health concern. The excessive and inappropriate use of antibiotics has facilitated the development of resistance mechanisms, rendering many established antimicrobial agents ineffective against bacterial pathogens. Consequently, there is an urgent imperative to investigate alternative antimicrobial compounds, particularly those derived from natural sources, to effectively address the challenge of antibiotic-resistant bacteria. This study aims to assess the antimicrobial potency of *Curcuma longa* (turmeric) and *Zingiber officinale* (ginger) extracts, liquid and powder, against two prevalent bacterial pathogens, *Bacillus cereus* [BC] and *Escherichia coli* [EC] after 24 hours. The extracts, both in liquid and powdered forms, were prepared using 95% ethanol (EtOH) as the solvent, with appropriate dilution factors applied to facilitate accurate colony enumeration and ensure experimental reproducibility. Tetracycline, penicillin, and untreated control plates with [BC] and [EC] will serve as reference controls to benchmark the antimicrobial efficacy of the natural extracts.

Vianey Duchene

TX - The University of Texas at El Paso

Discipline: Health and Human Development

Authors:

#1 Yun-Pai Lee

Madeline Ontiveros

Jetzhel Loya

Abstract Name: The Association between Mental Health and Self-Care Among People with Multiple Sclerosis

The intrusiveness and uncertainty related to multiple sclerosis (MS) can lead to the development of mental health symptoms. Prior research has suggested that fatigue and physical functioning were predictors of self-care among people with MS. However, less research has examined the role of psychological factors in predicting self-care behaviors in the MS population. The purpose of the study was to examine the extent to which depression and anxiety explain the variance in self-care when controlling for demographic and MS characteristics. 369 participants with MS were recruited from the National MS Society. Self-care was measured with two items of the 12-item World Health Organization Disability Assessment Schedule 2.0. Depression and anxiety were measured with the Patient Health Questionnaire-4. A three-step hierarchical regression analysis was carried out to examine the extent to which depression and anxiety explain the unique variance in self-care when demographic and MS-related covariates were controlled. Our results showed that in step 1, the amount of variance in self-care scores accounted by the demographic variables was not significant. In step 2, MS duration and subtype accounted for a significant amount of variance in self-care even after controlling for age, gender, and race. In step 3, depression and anxiety accounted for a significant amount of variance beyond that explained by the demographic variables, MS duration and subtype. The model explained 28% of the variance in self-care. Overall, our findings suggested that depression and anxiety were associated with self-care when controlling demographic and MS-related covariates. Findings provided implications for practitioners to incorporate mental health and self-care strategies that are relevant to client's needs and priorities during the rehabilitation process. When clients with MS can better manage their mental health symptoms, this can also facilitate the improvement of self-care behaviors.

Joelle DuFault

NJ - The College of New Jersey

Discipline: English and Literature

Authors:

#1 Joelle DuFault

Abstract Name: The Haunting of Female Gender and Sexuality in Gothic Literature

This research will analyze Gothic literature through the lens of Queer and Feminist Theory, explicitly focusing on gender performance/roles, gender identity, and homosexuality. Some of the novels analyzed will include, but are not limited to: *Dracula* by Bram Stoker, *Rebecca* by Daphne du Maurier, *Beloved* by Toni Morrison, *Mexican Gothic* by Silvia Moreno-Garcia, *Carmilla* by Sheridan Le Fanu, *Wuthering Heights* by Emily Brontë, *The Mysteries of Udolpho* by Ann Radcliffe, and *The Haunting of Hill House* by Shirley Jackson. These novels range from 1794 to 2020 and include five female authors, two authors of color, and a mix of American, English, and Irish authors. The list also consists of a blend of traditionally canonized and non-canonized Gothic texts. The selected novels embody characteristics of the Female Gothic, a subcategory of Gothic literature that predominantly focuses on female protagonists and their struggles against a patriarchal society, in addition to the haunting. As such the Female Gothic, represented by selected texts, is the perfect site to explore gender performance/roles, gender identity, and homosexuality. This analysis will focus on female gender expectations specifically, and how the selected Gothic narratives use ghosts or other sources of haunting, to challenge gender and sexual binaries. Ultimately it will be determined that the hauntings in these novels disrupt cis-heteronormativity, allowing female characters to explore homosexuality and differing gender identities and behaviors from what is typically allowed under patriarchal heterosexual cisgender conventions. While queerness has been discussed within Gothic studies, the emphasis on how the haunting generates queerness has not been fully discussed. Ultimately, it will be determined that the haunting in Gothic literature repressed heteronormative behavior while encouraging homonormative behavior.

Chukwudalu Dumebi-Kachikwu

PA - University of Pittsburgh

Discipline: Computer Science

Authors:

#1 Chukwudalu Dumebi-Kachikwu

Abstract Name: Exploring AI's Potential in Predictive Analysis for Student Essay Scoring and Real-Time Feedback

This research seeks to answer the question: To what extent can Artificial Intelligence (AI) be used for predictive analysis in student essay scoring and real-time feedback, and what are the implications for fairness, accuracy, and educational outcomes? AI has shown transformative potential in education, particularly through automated essay scoring (AES) systems and large language models (LLMs), which analyze patterns in prior essays to forecast scores and provide immediate, iterative feedback. To address this question, the study employs state-of-the-art (SOTA) models and rationale-based scoring approaches that align with human grading practices by generating rubric-based rationales. These methods are evaluated against traditional assessment systems to determine their effectiveness in assessing nuanced traits like creativity, argument coherence, and originality. The research also explores a hybrid human-AI framework to mitigate limitations such as bias, fairness, and privacy concerns. Preliminary findings indicate that while AI systems excel in evaluating surface-level features like grammar and organization, they face challenges with higher-order traits requiring subjective interpretation. The proposed hybrid approach combines AI's efficiency with human oversight, resulting in more reliable and equitable assessments. Additionally, the study highlights the critical role of diverse training datasets and advanced prompt engineering in improving model accuracy and inclusivity. This research contributes to the integration of AI in education by addressing its strengths and limitations, offering practical solutions for enhancing student outcomes, and reducing educator workloads. These findings aim to guide the development of equitable, effective AI systems for real-time essay feedback and predictive scoring.

Tammi Duncan-Teller

NM - University of New Mexico - Valencia Campus

Discipline:

Authors:

Piotr Filipczak

Abstract Name: Course Based Undergraduate Research Experiences (CUREs) Strategies for Cultivating Undergraduate Research at the University of New Mexico-Valencia Campus, a rural 2-year Hispanic-serving Institution

Course-based Undergraduate Research Experiences (CUREs) can provide more students access to research, including those from rural areas, who might not typically have the chance to participate in novel research. CUREs at the University of New Mexico-Valencia Campus, a rural, Hispanic-serving 2-year institution, were developed and taught in two courses: Microbiology for Health Sciences Lab (Biol 2305) and Biotechnology I (Biol 2710). The end goal for each course was presentation of students' original research at the semester end campus-wide Research Day. Two strategies were used to cultivate vibrant research CURE experiences. In Microbiology lab CURE, students started with an overall research question, Is the overall health of an individual affected by their oral microbial diversity? Through the semester students completed a i. preparation phase to understand the background of human oral microbes, ii. a hands-on application phase in completing and analyzing experiments, and iii. presentation phase of presenting their findings to their peers and campus

community. In Biotechnology I CURE, students reached state-mandated course learning objectives focused on DNA manipulations by performing a novel research project in the field of cancer biology. They designed DNA oligos which code for shRNA (short hairpin RNA) targeting expression of TET1, a novel oncogene candidate that promotes malignancy of p53-mutated lung cancers. After synthesis, students cloned these oligos into pENTR expression vector via ligation, transformed recombinant constructs into competent bacteria, and obtained high yield of each vector via plasmid isolation. Sequencing data confirmed the correct structure of cloned constructs. These vectors will be used in functional studies on the effect of TET1 knock-down on lung cancer cell growth as a part of Biotechnology II class scheduled for the Spring of 2025. Research for both CUREs provides undergraduates with early opportunities to engage in high-quality science, enhancing their commitment to STEM and health sciences careers.

Ava Dunekack

KS - University of Kansas

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: I said alcohol not methanol: Italian alcohol policy and consumption habits regarding the 1986 wine methanol scandal

This project asks how Italian food and beverage policies had evolved after the 1986 methanol scandal to further protect the Italian wine consumer from wine adulteration. The 1986 methanol scandal was a case of wine adulteration in Italy where wine bottles were tainted with methanol as a means to raise the alcohol content, hospitalizing 90 people, and leading to the death of 23. Previous researchers explained the significance of wine adulteration on the wine industry in France, signifying adulteration as a worldwide problem affecting the global wine consumer. Additionally, past researchers explored German alcohol policies against wine adulteration, however, this project will investigate Italian alcohol policies in relation to the methanol scandal. I will conduct a historical case study analysis on the public opinion of Italian wine consumers in the years following the methanol scandal, as seen in Italian newspaper articles. I will then connect the public opinion with raw alcohol policy data in Italy both before and after the methanol scandal, detailing if and how the policies shifted after the methanol scandal, and the impact the policies had on the Italian wine consumer. The results will likely show a distrust between the Italian wine consumer and the Italian wine industry following the methanol scandal, leading to amendments in alcohol policies which prioritize the safety of the consumer. Understanding the results will explain how Italian consumer habits and wine culture have changed into what they are today and will also pinpoint how Italian policymakers prioritize the safety of Italian consumers.

Brooke Dunkley

NC - North Carolina State University

Discipline: Engineering

Authors:

#1 Kyla Bosh

#2 Katherine Saul

#3 Jacqueline Cole

Abstract Name: Development of excess extracellular collagen in biceps, subscapularis, and supraspinatus muscles following brachial plexus birth injury

Brachial plexus birth injury (BPBI) occurs when the nerve bundle innervating the shoulder is damaged due to excessive stretching of an infant's neck during childbirth. It occurs in about 0.9 of every 1,000 births, with 30-40% of those resulting in lifelong shoulder impairment, including musculoskeletal deformities, reduced range of motion, and muscle paralysis. These deficits vary by injury location (preganglionic vs. postganglionic), but the effect on underlying muscle composition is unknown. We hypothesize diminished muscle growth from BPBI is related to increased collagen content (fibrosis), impairing muscle function. We will examine the effects of altered passive muscle loading and active functional loading on collagen buildup between muscle fibers using four groups. Sprague Dawley rats underwent surgery on one forelimb at postnatal day 3-6: preganglionic or postganglionic neurectomy, forelimb disarticulation (n=8/group/timepoint), or sham surgery (n=6/timepoint). Contralateral limbs served as added controls. Biceps, subscapularis, and supraspinatus muscles were dissected at 2, 3, 4, 8, or 16 weeks post-injury, snap-frozen, cryosectioned longitudinally, and stained using Masson's trichrome. Muscle sections were imaged and analyzed as a ratio of collagen to muscle tissue. Fibrosis was compared across groups and timepoints using repeated measures ANOVA and Tukey's tests for multiple comparisons (GraphPad Prism 10, $\alpha=0.05$). Comparisons between injured and uninjured limbs in each group were assessed using paired t-tests. Preliminary data indicate greater fibrosis in postganglionic injuries than preganglionic. Collagen content peaked at 4 weeks in all muscles for postganglionic injured limbs and in the subscapularis and supraspinatus for disarticulation injured limbs. No significant differences have been found across timepoints in sham or preganglionic injured limbs. This is the first study characterizing fibrosis development and progression in glenohumeral muscles following BPBI. Understanding the progression of altered muscle composition throughout development following BPBI may inform treatment planning.

Molly Dunne

NY - Pace University

Discipline: History

Authors:

#1 Molly Dunne

Abstract Name: Forced Marriage, Exhibition, and Prostitution: Uncovering the History of Trafficked Women in Lower Manhattan

This study has been conducted in the approach to and aftermath of the 2024 US Presidential election. It has formed concurrently with a political climate in which female autonomy is being relitigated. This study has also been conducted as a new slogan echoes among men – your body, my choice. By distorting the popular phrase, “my body, my choice,” that has served to empower women, this slogan suggests that a modern society is not removed from the female oppression that it posits as a feature of the distant past. This work therefore seeks to uncover the theft of women's autonomy, focusing on untold histories of early New York. It considers the evolving sociopolitical ideas on the purposes a woman's body should serve and her right to ownership of it. Since the beginning of the 21st century, attention to criminalizing human trafficking has spiked, but before progress was made, certain instances of this crime, especially involving women, have not been recognised as such. In this study, I will trace the history of women who were brought to this city in the 17th century, when the first enslaved women arrived in the Dutch colony, through the 19th century when the interest in human exhibitions reached its peak, until the early 20th century when forced prostitution became a widespread issue. Using archival research, this study asserts that unexamined forms of human trafficking, including forced marriage, exhibition, and prostitution, have compromised women's autonomy in ways not yet fully realised. This exploration ultimately seeks to discover why women could be trafficked without consequence, and how normalising female objectification in the past has informed ideas about women's bodily rights in our present.

Khang Duong

WI - University of Wisconsin-La Crosse

Discipline: Economics

Authors:

#1 Khang Duong

#2 Aditya Anil

Aditya Anil

Abstract Name: Breaking Barriers - Gender Law and Female Entrepreneurship

Our research aims to examine how laws can impact female entrepreneurship across different contexts. We use a new measurement from the World Bank's Women, Business, and the Law (WBL) index 2.0, focusing on legal systems in place to help female entrepreneurs. Specifically, we explore how gendered differences in legal access in the context of accessing credit, registering businesses, opening bank accounts, and laws relating to inheritance influence female entrepreneurship outcomes relative to males. We also want to distinguish between opportunity driven and necessity driven entrepreneurship across genders and whether differences in legal access can explain some of the gaps. The research will provide insights into how policymakers can enhance female entrepreneurship by improving legal frameworks, particularly in developing economies where women face significant financial and institutional barriers. We will also investigate potential moderating factors such as economic institutions and culture, which have been shown to affect female entrepreneurship outcomes. Empirical models like OLS, fixed effect, marginal effect plots, and matching models will be used to test our analysis. We will also present ideas for future related research, as the WBL index is fairly new and thus understudied. The contribution of our work is twofold: 1) we will examine the effectiveness of legal/policy frameworks as they relate to female entrepreneurship, and 2) we will examine how these systems interact with formal economic institutions and informal institutions such as culture. The latter will help to understand what frameworks must be in place for a nation to foster successful female entrepreneurs and promote an equitable entrepreneurial landscape.

Jean Duperon

KS - University of Kansas

Discipline: Interdisciplinary

Authors:

#1 Brian Lagotte

Abstract Name: Voice of a Nation: Interviews of Nationalistic Terms in Japan

Nationalism in East Asia has been a recurring theme in Western research, particularly concerning Japan. This proposed study will conduct interviews with Japanese citizens to explore individual perceptions of nationalism and connect Japanese nationalism to the extant literature on the deconstruction of East Asian identity. While previous studies have deconstructed East Asian national identity and its connection to nationalism, much of the data used focuses either on the linguistic aspects of nationalistic terms or the direct analysis of identity construction and its influence on nationalistic tendencies. Therefore, this study will conduct interviews to explore how Japanese citizens perceive nationalistic terms. The results will show how certain demographics use the terms. This research aims to explore perceptions of nationalism and the connection between national identity and nationalist sentiment in East Asia, particularly in the context of Japan, by emphasizing the perspectives of Japanese citizens.

Paris Dupre

LA - University of Louisiana at Lafayette

Discipline: Psychology

Authors:

#1 Paris Dupre

#2 Brooke Breaux

Abstract Name: Unpacking Microaggressions: Evaluating Word Meaning Through Public Perception

What do everyday people think the term “microaggression” means? Are people equally willing to use the term to describe different types of microaggressions (e.g., microassaults, microinsults, and microinvalidations)? While researchers, such as Sue et al. (2007), define the term “microaggression” in their published work, it is not clear whether the ways in which everyday people define this term align with such definitions. We seek to explore these questions by recruiting 200 adults within the United States and asking the extent to which they are familiar with the term “microaggression”: Those who indicate familiarity will be asked to characterize the meaning of the term using a semantic differential scale, and those unfamiliar with the term will be presented with a definition followed by the same semantic differential scale. Participants will then be shown six scenarios, three involving microaggressions and three involving pleasant interactions, and asked how sure they are that what the person in power said to the minority member was a microaggression on a scale of 1 (very sure it was not a microaggression) to 7 (very sure it was a microaggression). After each rating, participants will be asked an open-ended, follow-up question about their reasoning. We are interested to see the extent to which our participants are familiar with the term “microaggression” and whether the semantic differential scale ratings are different based on whether participants were provided a definition. We anticipate differences in ratings across the different types of microaggressions with participants being more confident that microassaults are microaggressions as compared to microinsults and microinvalidations. Finally, participants’ responses will be used to determine which factors are most important for everyday people when considering the term “microaggression.” These findings can be used to develop more effective strategies for reducing the frequency of microaggressions in everyday life.

Allison Durand

NC - Elon University

Discipline: Political Science

Authors:

#1 Allison Durand

Abstract Name: Politics of the Performance: Who Attends Theater, Why, and How Does It Matter for Politics?

Live theatrical performance, though used as political commentary across many cultures for millennia, has been less researched by social scientists in its potential impact on voting and civic life. Many often view theatre and its participants as leaning to the left of the American political spectrum. However, this assumption does not account for the wide array of theatrical performances in the United States. This study asks what are the demographic, social, and political factors associated with attending live performances. In turn, the research asks how live theatrical performance may influence the tendencies of theatergoers to be civically engaged or engaged with a particular political ideology or party. Using theoretical frameworks of media and politics research as well as the social capital literature, the research design employs surveys of United States residents from Pew Research Center (2018) and the General Social Survey (2016). Findings reveal that audiences in the United States are politically diverse with both Democrats and Republicans appearing

regularly in audiences. Theatergoers tend to be higher socioeconomic status and are more likely to be involved in their community than non-attenders. While the types of productions attended by Democrats and Republicans may differ in context, Democrats and Republicans alike attend theatrical performances to engage in political commentary and other social capital building. Overall, results are suggestive that theater attendance is one of many important contributors to civic involvement and socioeconomic class, rather than politics, is the primary differentiator in who attends theater.

Elizabeth Durr

PA - Carnegie Mellon University

Discipline: Interdisciplinary

Authors:

#1 Ellie Durr

Abstract Name: Childhood Rhythms: Perspectives on Music in Early Childhood Education

This project explores how music exposure influences the development and well-being of preschool-aged children, inspired by Dalcroze pedagogy. This capstone aims to address three key questions: (1) What is the comfort level of early childhood teachers in implementing music in their classrooms? (2) How does music exposure affect six core areas of preschool development — self-esteem and independence, interaction and cooperation, communication, discovery and exploration, physical capabilities, and artistic expression? (3) Which features of activities have the most positive valence for children? The project will use multiple methods of inquiry, beginning with teacher carousel brainstorming sessions and interviews to gauge their confidence in using music as a classroom tool. Small group music activities, inspired by Dalcroze techniques, will be introduced alongside regular classroom rhythms. At the end of the project, teachers will revisit the initial questions to reflect on changes in both their own comfort levels and in their classrooms, and teachers' impressions of the activities. The project not only highlights the developmental benefits of music exposure, but also emphasizes its role in fostering classroom wellness, promoting cognitive growth and physical development, and provides discussion of opportunities for teachers to include music in their classrooms.

Brooke Dustman

OK - University of Central Oklahoma

Discipline: Art History

Authors:

#1 Brooke Dustman

Abstract Name: Deception, Fear, and Moral Value: Portrayal of Women in Horror in 19th Century America and Contemporary Japan

This study compares 19th-century American and Japanese supernatural stories, examines the connections between the two and how they relate, and explores the prominent role women play in horror. By analyzing myths, stories, and films from the past and present, I demonstrate how human psychology, fear, and cultural norms inspire the horror genre. Within this study, I look at *The Bell Witch* and *Kuchisake-Onna* as selections from American and Japanese horror literature. I analyze their shared themes of perverse womanhood and how they present this concept in different ways. By comparing and contrasting each story and connecting their ideas to modern horror literature and films, I find much to be learned about human psychology, internalized fears, and cultural and religious reflections within the genre. By observing the history of horror through these

stories and their relation to human psychology and societal differences, we can understand how modern forms capitalize on these ideals and further emphasize the intrinsically human aspects of the genre.

Tawananyasha Dzenga

UT - Salt Lake Community College

Discipline: Interdisciplinary

Authors:

Abstract Name: Immigration in the United States – Displacement, Refugees, Border Crises, Healthcare, Economic Impact, and Education.

This research paper explores the complex socio-economic impacts of immigration in the United States, focusing on key issues such as displacement, healthcare, economic contributions, education, refugee challenges, and border crises. Immigration is both a catalyst for economic growth and a point of social and political contention, affecting diverse facets of American life. Drawing from an immersive experience on a Spring Alternative Break in Los Angeles that highlighted the intersection of immigration and homelessness, this study examines how immigrant populations shape urban landscapes and confront multifaceted challenges. Through fieldwork, community engagement, and comprehensive research, we delve into how immigrants, particularly refugees and those displaced by crises, navigate access to healthcare, education, and economic opportunities. The paper also assesses the border crises that further complicate immigration policy and advocates for policies that acknowledge and integrate immigrant contributions while addressing systemic barriers. My findings underscore the urgent need for reforms that support immigrant resilience, enhance their contributions to society, and address challenges through equitable solutions.

Stefania Dzhaman

PA - Lehigh University

Discipline: Computer Science

Authors:

#1 Matthew Maisonave

#2 Jian Wu

Abstract Name: Toward Open Domain Scientific Claim Verification: Baseline Results Using GPT-3.5

Online scientific disinformation misrepresents the findings of scientific papers and disseminates misleading or malicious information to internet users. Although fact-checking sites such as Snopes.com exist, manually verifying scientific claims is time-consuming and usually requires domain knowledge, and therefore does not scale to the massive number of claims spread on the internet. This leaves a pressing need for tools that can automatically verify scientific claims by labeling their credibility and providing a rationale for the labels. In this work, we investigate the capabilities of large language models in verifying scientific claims. As a pilot study, we explore baseline prompting methods including zero-shot, one-shot, and Chain-of-Thought (CoT) on GPT-3.5. Recent research on prompt engineering has shown significant improvements in accuracy when using CoT compared to few-shot or zero-shot prompting, and we aim to compare the three prompting methods within the context of two subtasks, namely, stance labeling and rationale annotation. To this end, we developed a new dataset by carefully selecting legitimate scientific claims from an existing dataset MSVEC. The new dataset consists of 138 scientific claims in 10 scientific domains. We performed extensive experiments by varying the prompts and domains and evaluated performances using the F1-score. We find

that zero-shot prompting performs the best on average in the stance labeling task. For the rationale annotation task, CoT outperforms zero-shot and one-shot and the performance improves in general with the number of examples. Surprisingly, the CoT performs better when out-of-domain examples are provided than when in-domain examples are provided. Our work sheds light on the potential of developing a fact-checking browser extension to assist internet users in identifying credible science news.

Caroline Eagen

NY - Marist College

Discipline: Computer Science

Authors:

#1 Caroline Eagen

#2 Elsa Blease

Elsa Blease

Abstract Name: Predicting Median Housing Price in New York State: Integrating Economic Indicators with Time Series Forecasting

This study presents a data mining model for predicting median housing prices in New York State, combining economic indicators and multiple forecasting models. Housing prices are critical for many including buyers, sellers, investors, and policy as they influence critical decisions across the real estate market and affect the overall economy. We created a dataset including the Federal Funds Rate, New York Unemployment Rate, 30-Year Mortgage rates, Gross Domestic Product (GDP), Consumer Price Index (CPI), New Construction Permits for New York, New York Population, New York Real Income, and a binary Pandemic Indicator. Additionally, lagged features and rolling statistics were created to capture the temporal dependencies as well as patterns and trends in the time series data. The initial forecasting method was a naive model which served as a benchmark for comparing the accuracy of more advanced models. Subsequently, Exponential Smoothing (ETS), ARIMAX (Autoregressive Integrated Moving Average with Exogenous Variable), and linear regression forecasting models were employed. Each model being chosen because of their different strengths in handling seasonality, trends and external economic factors. These models were evaluated using the key performance metric Root Mean Squared Error (RMSE). The results indicated that ETS and ARIMAX performed significantly better than the naive model because it was able to account for historical patterns and external influence, while the linear regression models offered a more interpretable model with competitive accuracy. This study demonstrates the value of using multiple forecasting techniques, feature selection, and the integration of lagged and rolling features to enhance predictive power of housing price models, providing valuable insights for anyone in the housing market and policy makers looking to anticipate future trends in the market and make informed decisions about the real estate market.

Elizabeth Eason

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Shelby Lauzon

#2 HaoSheng Sun

#3 Prince Mosley

Abstract Name: Drugging *C. elegans* Worms to Study Cocaine Use Disorder

Cocaine Use Disorder (CUD) is known to cause molecular, cellular, and behavioral changes in neuronal plasticity, yet the underlying mechanisms remain largely unexplored. Most CUD research relies on model organisms with long developmental periods, limiting large-scale analysis. *Caenorhabditis elegans* (*C. elegans*), a model organism with rapid growth, a well-characterized nervous system, and established drug responses, offers a promising alternative. In this study, we investigated cocaine-induced behavioral changes in *C. elegans* mutant strains (CB112, RM2702, MT14984, DA509, ZR1, ZR2) by exposing each to acute and chronic cocaine treatments. Worms in the chronic exposure group received daily doses of cocaine until adulthood. At adulthood, both groups were placed onto plates with and without cocaine before behavioral tracking. Locomotion-based characteristics were quantified and compared to an established control baseline. All cocaine-exposed mutants exhibited decreases in speed and other locomotion parameters. These results suggest conserved pathways in cocaine response that may be linked to neural plasticity. We hope to use this pilot data as a framework for future CUD studies that explore *C. elegans* DEGs with human orthologs to further explore the potential mechanisms behind CUD-induced neural plasticity.

Ethan Ebarvia

IL - North Central College

Discipline: Computer Science

Authors:

#1 Piotr Szczurek

Abstract Name: A Network Analysis Approach for Improving Stock Market Predictions

Abstract—This work proposes the use of network analysis to improve stock market price prediction. Historical, daily adjusted closing prices are collected before being shifted daily and grouped weekly. Then, are used to calculate lagged, weekly correlation matrices between every pair of stocks. Weekly graphs are then generated with nodes as stocks, and edges as the correlation between the stocks. Furthermore, centrality measures are determined from the graphs and were utilized in the form of individual neural network models for each stock with and without exogenous variables (centrality measures). The results indicate that models without exogenous variables provide better and statistically significant results compared to those with exogenous variables. However, the significance can be debated based on the chosen p-value threshold. Of the centrality measures, PageRank and hubness score of Hyperlink-Induced Topic Search (HITS) were the most predictive of future prices. Although findings show that centrality measures are not beneficial features for predicting stock market prices, the nuance in optimization methods, like the use of genetic algorithm, opens the possibility for them to be more helpful than observed.

Tristan Eberbach

SC - The Citadel

Discipline: Physics and Astronomy

Authors:

Sarah Fink

William Boyd

Abstract Name: Application of Quantum Dots in Layer-by-Layer Films as Pressure Sensors

Quantum dots are zero-dimensional nanocrystals with unique fluorescence capabilities, where the wavelength of light produced is dependent on its size. In previous studies, quantum dots have been proven to show altered light intensities when in proximity to metal nanoparticles (MNPs) compared to their fluorescence without the MNPs. Using the layer-by-layer self-assembly method, thin films with varying amounts of layers between the quantum dots and metal nanoparticles were used to produce fluorescence. The purpose was to measure the emittance wavelength as a function of separation. This research investigates the applicability of layer-by-layer (LbL) assembly and quantum-dot technology to be used in quantifiable visual analysis of pressure gradients across wings. This LbL film was designed to produce changes in fluorescence based on the air pressure present on the wing. Computational Fluid Dynamics (CFD) software was used to model a wind tunnel and simulate the flow parameters within the test section. The relative pressures on the surface were 76% of the total pressure of the tunnel through comparison of the inlet pressure and the pressure on the slide with an inlet velocity of 45 mph. In the future, the films will be tested in a physical wind-tunnel at velocities up to 250 mph and MATLAB software will be used to process the light intensity of the fluorescence of the films.

Colin Echeverri

PA - Carnegie Mellon University

Discipline: Psychology

Authors:

#1 Kasey Creswell

#2 Aidan Wright

Abstract Name: Drinking Motives and Alcohol's Acute Effects in a Social Laboratory Setting

Background: Motivational models of alcohol use emphasize drinking motives—enhancement, coping, social, and conformity—as drivers of drinking behavior. Few studies have explored whether these motives influence acute alcohol responses, with prior research neglecting social motives, expectancy effects, and ecological validity. This pre-registered study addresses these gaps by examining how drinking motives relate to alcohol's effects on emotions and social facilitation using multi-modal assessments in a multi-participant alcohol administration study with placebo control. Methods: Heavy-drinking young adults (N=393; 50% female) completed the Drinking Motives Questionnaire-Revised and were assembled into 131 three-person groups of strangers. Groups consumed either alcohol (males: 0.82 g/kg; females: 0.74 g/kg) or placebo over 36-min. Social interactions were video-recorded, with facial expressions, speech, and laughter coded using Ekman's Facial Action Coding System. Participants also reported subjective responses to alcohol (e.g., affect, stimulation) and perceived social bonding after drinking. Results: Using multilevel structural equation modeling, results showed higher enhancement motives were associated with increases in positive affect and stimulation in both the alcohol and placebo conditions, and greater relief of negative affect and social bonding in the alcohol condition. Higher coping motives were associated with greater relief in both conditions with a significantly stronger effect in the alcohol condition, and was associated with increases in positive affect and stimulation in both conditions. Higher social motives were associated with increases in stimulation in both conditions, and increases in positive affect and greater relief in the alcohol condition. Finally, higher

conformity motives were associated with longer durations of social smiles in the placebo condition throughout the drinking session, and were associated with increases in positive affect, stimulation, and greater relief in the alcohol condition. Conclusion: These results highlight the importance of considering expectancy effects and more ecologically-valid laboratory drinking contexts in understanding how drinking motives may shape acute alcohol responses.

Finn Eckes

WI - University of Wisconsin-Madison

Discipline: Health and Human Development

Authors:

#1 Emma Mohr

#2 Anika Shah

Abstract Name: Defining the Timing of Cytomegalovirus Acquisition in Infants with Prenatal Zika Virus Exposure: Insights into Fetal Immune Modulation

This study investigates the timing of Cytomegalovirus (CMV) acquisition in rhesus macaque infants, exploring whether prenatal exposure to Zika virus (ZIKV) alters the fetal immune system and influences functional immune responses, like the timing of CMV infection during childhood. CMV is a ubiquitous virus in human and macaque populations with nearly 100% seroprevalence by adulthood, with most individuals acquiring CMV in early childhood. Previous research indicates that exposure to other prenatal infections, such as HIV, leads to earlier acquisition of CMV infection in childhood. We hypothesized that prenatal exposure to ZIKV might have a similar effect. We tested banked blood samples from ZIKV-exposed and control infant macaques at 12, 18, and 24 months and corresponding dam samples at the time of infant birth for rhesus CMV DNA and antibodies. Our final sample size was 32 infants and 23 dams. We found a similar acquisition timing of CMV IgG antibodies across ZIKV-exposed and control infants, with ~20% having CMV IgG at 12 months, 60% at 18 months, and 100% at 24 months. CMV viremia was identified in 3 infants before 12 months of age. All the dams presented positive with rhCMV IgG, indicating this is a ubiquitous virus infection in macaque colonies. Our findings suggest that prenatal ZIKV exposure does not alter the timing of CMV acquisition and that prenatal ZIKV exposure may not significantly alter the development of the fetal immune response.

Kaiya Edwards

GA - Clark Atlanta University

Discipline: Psychology

Authors:

#1 Kaiya Edwards

#2 Medha Talpade

Abstract Name: Roots of Resilience: How Maternal Trauma Shapes Generational Identities in Black Communities

The purpose of this exploratory study was to understand the protective and risk factors for transmission of trauma across generations for Black women and their daughters. At this stage in the research, intergenerational trauma will be generally defined as the passing of the psychological effects of traumatic and/or racist experiences from one generation to the next. Specifically, this study seeks to answer the following

research question: What are the protective and risk factors of intergenerational trauma among Black women and their children? Research shows that trauma experienced by African Americans due to systemic oppression is transmitted across generations, particularly through maternal influence. Many Black Americans exhibit behaviors, such as hyper-vigilance and distrust, which become normalized and are often passed down as survival mechanisms. Identifying protective factors may inform interventions to strengthen resilience within affected communities. Preliminary data collection includes participants who were pairs of Black women and their daughters. Recruitment included purposive sampling, and to date 4 mother-daughter pairs have been interviewed. The data collection method included a semi-structured interview, approximately 35 minute in duration, one for the daughter and a separate one for the mother of each pair. Data collection will continue to saturation. Preliminary results indicate that daughters whose mother had coping mechanisms were more likely to pass on similar behaviors to their daughters. Validation strategies include rich thick descriptions and reflexive journaling. Implications of the results for future studies include designing interventions to enhance coping among mothers so that they can be socialized to the daughter/child, based on the findings of this study. The results of this study can contribute to the field of psychology and help initiate positive change for culturally relevant interventions for people of color.

Boluwatife Efunkoya

IL - Northern Illinois University

Discipline: Engineering

Authors:

#1 Javiera Tiggelaar

#2 Soka Suliman

#3 John Shelton

#4 Alisha Diggs

Abstract Name: 3D-Printed Microneedle Device Design Optimization for Pain Reduction and Drug Delivery Efficiency

In comparison to traditional drug-delivery applications, microneedles have shown fewer adverse effects and reduced patient discomfort during transdermal drug delivery. Medical applications of these devices include vaccination, insulin delivery, and cancer therapy. Studies show that longer needles can increase pain by activating deeper skin receptors; yet it is often necessary to penetrate deeper layers to increase bioavailability and likelihood of reaching the target site. However, it is a challenge to balance drug delivery efficiency with low pain response. Literature lacks explicit reports that provide parameters for a microneedle array design that minimizes pain while efficiently administering the therapeutic agent. We seek to optimize a 3D printed microneedle design to address the need to reduce pain while maximizing drug delivery efficiency through the variation of design parameters. Cone-shaped, solid microneedles with various heights, diameters, and array sizes are designed using SolidWorks and fabricated by 3D printing. We assign the value of pain based on needle dimensions as reported in literature. A simulated drug is used to assess the impact of surface area on coating efficiency and drug release. The acquired data is examined to determine the needle design that effectively delivers drug with minimal pain. We strive to highlight the dependency of pain and delivery efficiency on the surface area. We aim to identify the optimal height, width, and array size to minimize pain and maximize drug delivery efficiency. The use of microneedles for transdermal drug delivery would greatly improve patient compliance, thereby reducing needle phobia. This research is expected to provide a guide for the design of next-generation microneedles by providing a deeper understanding of how microneedle designs can be optimized to cause the least amount of pain while delivering drugs efficiently.

Catherine Egan

MD - Salisbury University

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: Storytelling for Success: The Effects of Preserving Campus Lore on Salisbury University's Admission and Retention Rates

Admission and retention rates at a university depend on the institution's reputation, which is then dependent on the university's image from the students' and community's perspective. Previous research has shown that when a university has a positive reputation, students are more willing to stay enrolled in their chosen institution through graduation and remain involved as alumni, while donors are more likely to make financial contributions to the university. To increase admission and retention rates at a given university, this paper focuses on how to improve reputation and make connections through the telling of campus legends and the preservation of the institution's history. Storytelling allows people to connect and provides a feeling of familiarity that can be applied to relationships between the students and the university, as well as between the university and its donors. To improve Salisbury University's admission and retention rates, this research recommends the incorporation of campus legends in Salisbury University's tours for students and donors on the physical campus through story signs. Doing so may spark a personal connection between the university and the audience, leading to increased feelings of loyalty and willingness to support the institution.

Colin Ehrhardt

FL - Embry - Riddle Aeronautical University

Discipline: Engineering

Authors:

#1 Colin Ehrhardt

Abstract Name: Design and Development of Components for a Jumping-Type Dynamic Climbing Robot

Climbing robots have great potential to be used in various applications such as the inspection of vertical structures and the exploration of microgravity environments. There are, however, a few challenges facing climbing robots that limit their general utility. Most existing climbing robot designs can be described as quasi-static, as they climb by slowly taking one step at a time. These robots tend to climb at speeds unacceptable for time-sensitive applications and struggle to overcome discontinuous climbing terrain. Dynamic climbing robots, a relatively new sub-category of climbing robots, utilize momentum to propel themselves up vertical surfaces and have great potential to address these issues. The purpose of this research is to begin the development of a dynamic climbing system that can overcome discontinuous climbing terrain and traverse quickly by jumping between climbing holds. Two components were developed that may be used in a jumping-type dynamic climbing robot: a locust-inspired robotic limb theoretically capable of propelling a 4 kg total payload to a height of 1 meter, and a compliant micro-spine gripper. A simplified model of the power-amplification mechanism found in locusts was analyzed and used to design the robotic limb. The micro-spine gripper's design was largely inspired by the design of existing grippers for quasi-static climbing robots. Initial tests confirmed the functionality of the limb's power amplification system and demonstrated the gripper's ability to adhere to the climbing surface when dropped from a height of 1 cm. Further improvements in energy density of the power amplification mechanism, actuator speed, and gripper reliability are discussed as steps toward realizing a dynamic climbing robot.

Maeleigh Eichenlaub

PA - Point Park University

Discipline: English and Literature

Authors:

#1 Kirstin Hanley

Abstract Name: Capitalism, Consumerism, and the Contemporary Classroom

“MEDIA LITERACY IS DEAD!!!” has been the battle cry of many individuals across social media platforms in recent years. The response to this claim has been overwhelmingly one of agreement, looking at how there has been a decline of education in the United States of America, and how that has affected the understanding and consumption of every piece of media in our lives. Social media has also made many individuals more cognizant of America’s economy, with the realization that we are functioning under capitalism’s latest stages. In my research presentation, I want to explore how these two things are inextricably interlinked. Through personal primary research, compiled with research done by others, I will be able to demonstrate how capitalism has “killed” education in America. I will look especially at capitalism’s inherently racist upbringing that has led to the underfunding and defunding of English programs, which forces educators to not have the resources to make kids feel represented in literature. This movement has led to an increase in book bans of representational literature, primarily in red states like Florida. Because kids are not feeling represented, they are not caring about English classes and are not learning important contextualization and empathizing skills. I will take these conclusions and look at what educators and others can do to address these issues. By turning to the work of Adrienne Rich's groundbreaking essay, “When We Dead Awaken: Writing as Re-Vision”, I will suggest a framework for combating the damage capitalism has done to our education system. I will also interview current and future educators about what they see in real time, how capitalism – and its child, consumerism – has affected students and classrooms. Through these processes, I will develop a plan that educators can put into place to help potentially save education in America.

Roma Eisel

PA - Duquesne University

Discipline: Mathematics

Authors:

#1 Roma Eisel

#2 Valerie McMullen

Valerie McMullen

Abstract Name: Identifying Hidden Ideals in Partially Ordered Sets

We study the problem of identifying hidden ideals in partially ordered sets (or posets). In this problem, we query members of the poset one at a time for membership in the hidden ideal with a given limited number of positive queries allowed. We provide an efficient search strategy for this problem and prove that this strategy finds the hidden ideal in a number of queries bounded by an explicit function of the height and degree of the poset. Moreover, we show that for the case of complete n -ary trees, this strategy is of the same order as a hypothetical optimal strategy. This result has applications in various situations, such as the famous ‘marble drop problem,’ identifying sources of pollution in water systems, and searching for corrupt data in computer science.

Tasneem Ekhtiar

PA - Penn State Greater Allegheny

Discipline: Biology

Authors:

#1 Eva Wilstermann-Luna

Eva Wilstermann-Luna

Abstract Name: Significance of Telomeres on Aging

This research project looks at the process of aging at a cellular level. The shortening of telomeres is what causes aging. Telomeres are repeating DNA sequences that erode as cells divide. Telomerase is an enzyme found in gamete cells that can help mitigate telomere erosion. In order to slow the process of aging, a study has found a way to use modified RNA that encodes for TERT. TERT is a protein component of telomerase. With more TERT, there is more telomerase and a slowed rate of telomere erosion. This treatment can help slow the aging of patients with Hutchinson-Gilford progeria syndrome (or progeria) who experience accelerated aging at a very young age. This research project also discusses the consequences of potentially immortalizing cells and the development of cancer as a result of it. This project brings attention to possible treatments for progeria patients. While it is not a cure, we can be hopeful that it can improve the quality of life for these patients.

Vignesh Elangovan

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Ravi Patel

Abstract Name: Development and Preclinical Evaluation of Glypican-3 Antibody Fragments for Targeted Cancer Therapy

This study investigates the production and preclinical evaluation of single-chain variable fragments (scFvs) derived from the Glypican-3 (GC-33) antibody to advance targeted radiopharmaceutical therapy (RPT) for hepatocellular carcinoma (HCC). Glypican-3, a heparan sulfate proteoglycan overexpressed in HCC cells, is a promising therapeutic target due to its critical role in tumor progression and limited expression in normal tissues. However, the prolonged half-life of full-length GC-33 antibodies presents challenges for combination RPT and immunotherapy, including risks of systemic lymphodepletion, off-target toxicity, and impaired anti-tumor immune responses. To address these limitations, smaller antibody fragments—diabody (Db), minibody (Mb), and scFv constructs—were engineered to optimize pharmacokinetics, therapeutic specificity, and clinical applicability. Constructs were cloned into *Escherichia coli* for periplasmic expression, exploiting the bacterial disulfide-bond formation machinery to ensure proper folding. The fragments were purified using HisTrap™ HP columns, and their purity and molecular weights were confirmed through SDS-PAGE analysis. Surface plasmon resonance (SPR) experiments demonstrated high binding affinities, with scFv GC-33 exhibiting a K_d value of 16.3 nM, highlighting its robust target specificity and binding functionality. The successful production, purification, and validation of these antibody fragments establish their suitability for targeted RPT applications. This study provides a foundation for future biodistribution, pharmacodynamic, and radio-labeling studies, aiming to optimize these fragments for in vivo performance. Planned murine model trials will deliver critical data on safety, efficacy, pharmacokinetics, and translational potential, setting the stage for clinical applications in HCC treatment. This research represents a significant advance in targeted cancer therapies, addressing key limitations of conventional approaches while offering new strategies to enhance combination RPT and immunotherapy. By overcoming pharmacokinetic challenges, this work

improves therapeutic precision and paves the way for broader applications in treating other cancers where Glypican-3 plays a pivotal role.

Zacarya Elbash

VA - Virginia Tech

Discipline: Psychology

Authors:

#1 Daniel Cabral

#2 Laura Bruckner

#3 Anthony Nist

#4 Garrett Posey

#5 Warren Bickel

Abstract Name: Is Cognitive Intrusion Associated With Delayed Discounting and Pain in Individuals With Substance Use Disorder and Chronic Pain?

Background: The presence of chronic pain is associated with substance use disorders (SUD). Research shows that those in SUD recovery with chronic pain have a shorter temporal window. However, little research has focused on whether the cognitive intrusion of pain (i.e., the extent to which people experience pain that interrupts their thinking) plays a role in this relationship. **Objective:** This study aimed to (1) investigate the relationship between chronic pain and delay discounting (DD; a measure of one's temporal window) and (2) examine whether the cognitive intrusion of pain is associated with chronic pain and DD among individuals in SUD recovery. **Methods:** Participants ($n = 209$) were recruited from the International Quit & Recovery Registry and completed a monetary DD task, demographics questionnaire, chronic pain questions, and the Experience of Cognitive Intrusion of Pain. Linear regressions with model selection were used to test the aforementioned associations. The model with the lowest BIC was used. **Results:** No differences were observed in DD rates between those with and without chronic pain ($p = .469$). Those with chronic pain reported having higher cognitive intrusion of pain ($p < .001$). Additionally, cognitive intrusion of pain was not associated with DD rates ($p = .178$). **Conclusion:** The study did not find associations between chronic pain and DD, and between cognitive intrusion and DD. We found that chronic pain was associated with higher scores on the cognitive intrusion scale. This may potentially lead to attempts to stop thinking about the pain, which might lead to relapse.

Eva Elbert

CAN - McGill University

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: Imagining Our Futures in the Red Cedar Watershed

Conventional agriculture, defined here as planting a limited crop rotation, regular tilling, and use of chemical pesticides and herbicides, has been identified as a cause of nutrient pollution, soil degradation, and, when coupled with farm consolidation, social inequality. In contrast, greater implementation of regenerative methods, specifically rotational grazing would help restore biodiversity and enhance forage production. This project explores the viability of expanding permanent agriculture in the Red Cedar Watershed, examining what an ideal future looks like to residents and possible changes that can be made today. Eighteen interviews

with farmers and community stakeholders were conducted, transcribed, and coded for themes. This data revealed that interviewees linked farm consolidation with poverty increase, environmental degradation, and rural population decline in the Red Cedar Watershed. Residents desired clean water, economic development, and sustainable agriculture, but had different visions of possible agricultural paths. Some believed that large-scale, industrialized agriculture can be more sustainable due to advanced technology and stricter regulations. Others advocated for more grazing-based farms in order to restore habitat and mitigate climate change. Interviewees agreed that actions taken to ensure profitability in the dominant system and community divisions are barriers to agricultural transformation. Farmers are currently financially incentivized to follow potentially environmentally harmful practices. Ideological differences can also hinder cooperation between various farmers or farmers and conservationists. Reformed government subsidy programs and farmer-led learning networks could encourage changes in agriculture, including more grazing. These recommendations could, in turn, improve overall social and environmental well-being in the Red Cedar Watershed.

Mahmoud Elghandour

EGY - The American University in Cairo

Discipline: Computer Science

Authors:

Abstract Name: Sentiment Analysis on Twitter Dataset Using Apache Spark and H2O Machine Learning Framework: A Comparative Study

Sentiment analysis, an integral part of natural language processing, holds significant importance in understanding public opinion and sentiment trends, especially in the era of social media dominance. This paper explores sentiment analysis on Twitter data, focusing on the challenges posed by the platform's dynamic nature and informal communication style. Leveraging Big Data technologies and PySpark's machine learning framework, we address the complexities of sentiment analysis by developing robust models capable of accurately categorizing tweets based on sentiment polarity. Our study delves into various machine learning algorithms, feature engineering techniques, and model optimization strategies, utilizing a Twitter dataset comprising 1,600,000 annotated tweets. Through a comprehensive literature review, we highlight existing methodologies and advancements in sentiment analysis, including classical machine learning and deep learning approaches. Additionally, we categorize relevant research papers to provide insights into the diverse methodologies employed in sentiment analysis on Twitter data. Our findings contribute to the advancement of sentiment analysis techniques, emphasizing the significance of Big Data utilization in overcoming the challenges inherent in analyzing social media data.

Alexander Ellingsen

MT - Montana State University - Bozeman

Discipline: Computer Science

Authors:

#1 Neda Nazemi

Abstract Name: Teaching in the Age of GenAI: Social Media Insights on Opportunities and Challenges

Generative Artificial Intelligence (GenAI) is evolving rapidly, with sophisticated models being increasingly utilized by students. This swift adoption poses both opportunities and challenges for educators, necessitating a deep understanding of their responses to adapt effectively. Traditional methods like interviews and surveys

are often too slow to capture the rapidly shifting landscape of GenAI, risking obsolescence before studies conclude. This study addresses the need for timely insights by analyzing unstructured data from social media platforms such as X (formerly Twitter) and BlueSky, focusing on posts by educators discussing GenAI. The analysis aims to uncover real-time reactions to GenAI's role in education, track sentiment evolution since the use of GenAI became widespread, and identify categories of barriers to classroom adoption and adaptation to challenges. To achieve this, we collected and preprocessed over 1,000,000 posts across platforms that related to the field of GenAI. This data was filtered to only include posts from educators and students to provide firsthand accounts of GenAI use in education. Advanced text-mining techniques such as topic modeling and sentiment analysis were applied to extract patterns, sentiments, and recurring themes in the discourse. Our findings reveal key insights into educators' perceptions, including the benefits, risks, and challenges associated with integrating GenAI into educational practices. These results offer valuable guidance to both the educational community and GenAI developers, enabling the design of tools and strategies that better align with educators' needs and address the complexities of GenAI in learning environments.

Ashlee Ellinwood

UT - Weber State University

Discipline: Communications

Authors:

#1 Sarah Steimel

#2 Chloe Robison

Abstract Name: Bridging the Gap: A Communication Privacy Management Approach to Student-Faculty Interaction in Higher Education

This study examines the criteria undergraduate students use to develop privacy management rules when deciding whether to share personal struggles and stress with their instructors, guided by Communication Privacy Management Theory (CPM). CPM highlights individuals' belief in owning their private information and the rules they create to regulate its disclosure, emphasizing the vulnerability in sharing personal matters. High-stress levels among college students have documented impacts on academic performance, mental health, and well-being; while faculty-student relationships and social support have been shown to alleviate stress, the factors that shape students' decisions to confide in faculty remain underexplored. This qualitative, interpretive study employed semi-structured interviews and focus groups with 40 undergraduate students to investigate which criteria students use to develop privacy management rules with instructors. Data analysis, grounded in CPM, revealed four main themes influencing students' privacy management decisions: (1) Culture—norms of higher education and past experiences inform disclosure choices; (2) Motivations—help-seeking for academic support and relationship-building and reciprocity with professors; (3) Context—factors such as course policies, physical environment, relevance to class content, and the professor-student relationship influence openness; and (4) Risk-Benefit Assessment—students weigh potential stigma, face risk (embarrassment), and role risk to social and professional standing. By understanding these CPM-informed factors, educators can better support student well-being and enhance academic success through informed communication practices.

Caitlyn Elliott

NC - North Carolina State University

Discipline: Biology

Authors:

#1 Imara Perera

Abstract Name: Utilizing beneficial microbes to enhance plant growth under limiting conditions

Providing sufficient nutrients to crop plants in a sustainable way is an issue in both agriculture on Earth, with the financial and environmental cost of fertilizer, and developing agriculture in spaceflight or extraterrestrial environments, with the challenge of developing bio-regenerative life support systems. Species of rhizobacteria that support crop plants in various ways have been identified as a potential method for alleviating plant nutrient deficiencies and maintaining yields while minimizing fertilizer application. *Azospirillum brasilense* has been shown to be beneficial to crop plants under deficient conditions. This project explores the ability of two *Azospirillum* bacteria strains to improve growth under limited nitrogen and limited phosphorus conditions through synthetic auxin production, nitrogen fixation, and phosphate solubilization. Various plate and soil experiments are being conducted, and data is being collected on root development and nutrient, pigment, and hormone content. Preliminary data shows potential benefits to the model plant, *Arabidopsis thaliana*, and differences in the two bacteria strains. Adding to the growing knowledge of plant-growth-promoting bacteria aids in the continued development of solutions for sustainable agriculture and space exploration, so conclusions will be placed in the context of agricultural improvements and future research directions.

Jana Elyamany

CA - California State Polytechnic University - Pomona

Discipline: Engineering

Authors:

#1 Jana Elyamany

Abstract Name: Green Hydrogen for Sustainability

This research explores the design and feasibility of a trigeneration plant for sustainable ammonia production in the Imperial Valley, Southern California, with an emphasis on renewable energy integration and advanced air separation technologies. Ammonia, a vital component for agricultural operations, is synthesized using a process that combines solar energy and biomass-derived resources with innovative nitrogen production techniques. At the core of this system is the air separation unit (ASU), which employs cryogenic distillation to produce high-purity nitrogen required for the ammonia synthesis process. This study focuses on modeling the ASU as a key subsystem, simulating its performance to optimize energy use and operational efficiency. The ASU model incorporates dynamic parameters, including cooling demands and process flow rates, to align with the variable energy inputs from renewable sources. In addition to nitrogen, the ASU generates oxygen, which is utilized in other plant processes to enhance system integration and overall energy efficiency. The plant's design integrates solar-driven allothermal gasification to convert biomass into syngas, minimizing emissions compared to conventional fossil fuel methods. A solid oxide fuel cell (SOFC) complements the system, providing hydrogen for ammonia synthesis and electricity for plant operations, enabling a self-sustaining framework. Together, these technologies enable the simultaneous production of ammonia, power, and heat in a carbon-neutral manner. Through comprehensive modeling and analysis, this research demonstrates the feasibility of coupling an ASU with a trigeneration system powered by renewable energy. The findings highlight the potential of decentralized ammonia production to support local agriculture while addressing global challenges of energy efficiency and carbon footprint reduction. This study serves as a foundation for future innovations in integrating advanced separation technologies with sustainable energy systems for industrial applications.

Ebubechukwu Emuka

MD - Bowie State University

Discipline: Chemistry

Authors:

#1 Darnell Scott

#2 Eli Leach-Comas

#3 Larrissa Turner

Bella Mbonifor

Eric Martinez

Abstract Name: The Vitamin C Content in Organic Versus Canned Fruits

This study thoroughly investigates the determination of ascorbic acid (vitamin C) content in commercially available products and food items using titration techniques. The main goal is to establish a reliable and efficient method for determining the ultimate storage conditions that result in the highest concentration of vitamin C, a crucial antioxidant that plays a vital role in human health. The experimental approach involves titrating the samples, employing 2,6-dichloroindophenol (DCIP) as the titrant, chosen for its ability to exclusively oxidize ascorbic acid without affecting other potential substances. Additionally, DCIP serves as a self-indicator in the titration process. For a substance to function as a self-indicator, it should exhibit one color when in the presence of excess analyte (i.e., ascorbic acid) and a different color when the analyte has completely reacted, which allows for the calculation of the amount of ascorbic acid present in the sample. The study explores the optimization of storage conditions, to enhance the amount of vitamin C concentration. The goal of this project is to find if there is a nutritional Vitamin C concentration difference between organic and canned fruits. Canned fruits tend to be cheaper and more affordable for families, so if there is similar Vitamin C concentration, families could utilize canned fruit more in their diets. Samples of organic fresh and canned fruits were obtained and liquified in a blender. The vitamin C concentration was determined by titration using a 2,6-dichloroindophenol sodium salt solution.

Ebubechukwu Emuka

MD - Bowie State University

Discipline: Chemistry

Authors:

#1 Bella Mbonifer

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#5 Larissa Turner

#6 Tamera Rodriques

#7 Darnell Scott

Abstract Name: The Vitamin C Content in Fresh Versus Canned Fruits

It is presumed that fresh fruit and canned fruit contain different levels of vitamin C. The purpose of this project is to analyze the vitamin C content in fresh fruit versus canned fruit. In this project, we used a titration technique on canned and fresh versions of mandarin oranges and pineapples to determine the difference in vitamin C levels. Our results demonstrated that fresh fruit contains more vitamin C compared to the canned version. These findings suggest that preservation methods used for canned fruits may affect vitamin C retention. This also supports the higher economic value of fresh fruits compared to canned fruits.

Kenneth Encarnacion

CA - University of California - Riverside

Discipline: Environmental Science and Sustainability

Authors:

#1 Kenneth Encarnacion

#2 Sarah Petters

Abstract Name: Building of prototype real-time sub-80-nm airborne nanoparticle characterization instrument for research of ultrafine aerosol effects on human health and the environment

Ultrafine airborne nanoparticles, similar to viruses in size, significantly impact public health due to remarkably high surface-area-to-mass ratios. Typical manufacturing processes already produce an influx of such particles into the environment, such as metallic waste nanoparticles from high-temperature metal working. While the rise of interest in nanotechnology brings excellent promise in advancing vital fields, such as cancer treatment in medicine, the deliberate production increase of these materials poses a significant occupational and environmental risk if not understood from a cradle-to-grave perspective. Differential mobility analysis (DMA) is widely used to characterize particle size distributions rapidly. However, traditional instruments fail to reach adequate resolving power for particles smaller than about 80 nm in diameter. Using a prototype nano-DMA column under low-pressure, high-flow operation, we will investigate the viability of this prototype to provide real-time characterization of these particles. We are integrating a nano-DMA column into a custom instrument with a recirculating sheath flow, aerosol electrospray source, and aerosol electrometer detector. We expect to present a transfer function characterizing the relationship between sheath flow rate, particle size, and instrument voltage. We expect the high-flow operation, ranging from 100 to 1200 liters per minute, to provide significantly finer resolution than traditional DMAs, bridging the gap between DMA and mass spectrometry techniques. It is anticipated that this work will advance the research of how ultrafine aerosols impact human health and the environment with the aim of eventual local implementation in the Inland Empire to study the effects of the worst air quality in the nation, especially on low-income communities.

Nico Enerlan

TX - The University of Texas at San Antonio

Discipline: Biology

Authors:

#1 Adebayo Adeyeye

#2 Jenny Hsieh

Abstract Name: The Role of RRM2 in Aberrant Hippocampal Neurogenesis: A Potential Therapeutic Target For Epilepsy

Epilepsy is one of the most common neurological diseases worldwide, affecting over 50 million people. While many factors can cause epilepsy, brain insults, such as seizures, in otherwise healthy individuals are among the leading causes of this disease. Recent studies show that brain insults specifically disrupt adult neurogenesis, resulting in the ectopic migration of immature adult-born granule cells (abGCs) into aberrant compartments within the dentate gyrus of the hippocampus, potentially leading to epilepsy. We hypothesize that these brain insults affect gene expression within immature abGCs, contributing to their development into aberrant abGCs and ultimately leading to spontaneous recurrent seizures (SRS), a hallmark of epilepsy. To test this hypothesis, we induced seizures in wild-type C57BL/6 mice via pilocarpine injection. We then compared these mice to another group that, in addition to pilocarpine, received an hM4Di, a designer receptor

exclusively activated by designer drugs (DREADDs), and clozapine-N-oxide (CNO), a designer drug that activates hM4Di, to silence these immature abGCs. Bulk RNA sequencing of these groups identified Rrm2 as one of the top differentially expressed genes; it was upregulated during seizures and downregulated during abGC silencing with hM4Di and CNO, showing gene expression dynamics specific to seizure activity and immature abGCs. To determine the role of Rrm2 in aberrant abGC development in the pilocarpine model of epilepsy, we used triapine (3-AP) to knock down Rrm2 gene expression after pilocarpine-induced seizures in wild-type mice. Our preliminary data show that treatment with 3-AP reduces SRS and ectopic migration of abGCs in pilocarpine-induced seizure mice compared to untreated controls. These findings suggest that inhibiting Rrm2 expression prevents aberrant neurogenesis and reduces seizures. This work highlights a novel approach to gene regulation and underscores the role of Rrm2 in aberrant abGC neurogenesis, which could lead to treatments that lower the risk of epilepsy following brain insults.

Mia Eng

CA - California State University - Fullerton

Discipline: Education

Authors:

#1 Ioakim Boutakidis

Abstract Name: Evaluating the Efficacy of and Satisfaction with On-Campus Student Support Systems at California State University, Fullerton

This assessment seeks to understand which on-campus support systems (Counseling and Psychological Services, Disability Support Services, and TitanMED) are used by students at California State University, Fullerton (CSUF) and how they may improve mental health, physical health, and academics. Services like these aim to improve student retention, health outcomes, and academic success. CSUF has a high rate of students who take longer to graduate than expected, and it is imperative that support systems be in place to assist students in their academic journey. Thirty-three students were recruited via convenience sampling to participate in a non-experimental survey study. The Qualtrics survey included questions measuring participant demographics, knowledge of on-campus support systems, use of these systems, and overall satisfaction of the systems. Many questions to assess satisfaction were on a Likert scale of 1-6 (Strongly agree to Strongly disagree) followed by open-ended text boxes for participants to expand upon their answers. Students find Counseling and Psychological Services helpful, but would appreciate more availability and online options to combat barriers to care. Some, however, noted they were under satisfied with the quality of providers. Those needing physical health or academic support services tended to not use TitanMED or Disability Support Services; yet, these services are deemed generally supportive by those who use them. Findings suggest that more publicity of services may be necessary due to the lack of awareness about how to access them on campus. CSUF and other universities may benefit from this information by altering their programs and/or increasing advertising.

Christopher Eng

NJ - Kean University

Discipline: Computer Science

Authors:

#1 Christopher Eng

#2 Daehan Kwak

#3 Joseph Tomasello

Abstract Name: Generating Student Curriculum Plans with Local Large Language Models

The rise of Large Language Models (LLMs) has demonstrated their potential across various applications and user requests. Businesses and universities are increasingly exploring how AI-based chat models can streamline operations, save time, and free up resources. One promising area is the automation of administrative tasks using the Natural Language Processing (NLP) capabilities inherent in LLMs. This project aims to evaluate the viability of using LLMs to generate accurate and individualized curriculum plans for college students to support their academic journey. The focus is on how well LLMs, from various sources and configurations, can follow a series of instructions to create a schedule-based format of courses based on students' transcripts. Effective prompt engineering is crucial in enhancing the accuracy and reliability of these models. The correctness of the outputs is reviewed based on course prerequisites and semester availability constraints. LLMs such as Bard, ChatGPT (versions 3.5, 4, and 4o), and the locally hosted Hermes are initially tested. In addition, models such as Gemini, Mistral, LLaMa 3, Phi-3, and Gemma 2 are also tested. Furthermore, Retrieval-Augmented Generation (RAG) will be implemented to enhance the performance with local models by identifying unique data points. Chroma and Acorn are two proposed resources. The research will evaluate outputs using test cases, inspecting a student's year, relevant prerequisites, major, and recommended semester for each course. While LLMs offer wide-ranging applications, their stability in following complex instructions remains a concern. Inconsistencies in accuracy highlight the need for careful consideration before implementing LLMs for tasks like curriculum planning. Future work will expand the scope to include a full 4-year degree program schedule and develop a user interface and script for customizable prompts, alongside continuous testing of new models.

Catherine Engel

OK - University of Central Oklahoma

Discipline: Art History

Authors:

Abstract Name: Massimo Vignelli: A Revelational Designer

Massimo Vignelli was one of the design world's most influential designers. He had a profound impact on graphic design, typography, corporate logos, product design, fashion, and furniture design. When Vignelli is brought to mind his minimalist and modern design style is often affiliated with his work. Vignelli revolutionized design communication, especially through his work with the New York Subway map in the 1970s. Using techniques such as grids, Vignelli achieved an elegant and effective method of organization in his work. This paper explores how Vignelli's work became a symbol for modern design through his use of the font, Helvetica. Using direct sources of information from Vignelli himself, the paper explores the identity of Massimo Vignelli both as a designer and as a person. Vignelli's work continues to impact the design world today, proving that effective design is not just about aesthetics but about conveying meaning with purpose and discipline.

Hanna Enos

PA - University of Pittsburgh

Discipline: Psychology

Authors:

#1 Melissa Libertus

Abstract Name: Parent Money Talk During Pretend Grocery Shopping with Toddlers and Preschoolers

By the time children enter kindergarten, they already show significant individual differences in math skills. For example, children from higher socioeconomic status (SES) backgrounds tend to perform significantly better in math than their peers from lower SES backgrounds. Additionally, prior research has shown that the early home learning environment is vital to the development of children's math skills, but it is unclear if and how the home learning environment contributes to SES differences in math. The current study seeks to describe how parents of toddlers and preschoolers talk about money during pretend grocery shopping and examine potential age-related and SES-related differences in parental money talk. Data come from an ongoing longitudinal study in which parents and their preschooler ($n = 300$) or toddler ($n = 300$) were filmed in their homes playing with pretend grocery store toys. Conversations will be coded for all instances of utterances related to money talk (e.g., "Can I have five dollars?" and "I need change."). I expect parents of older children to engage in more talk about money. However, I do not have any expectations regarding the frequencies of different types of talk about money and their associations with SES. It is possible parents from lower SES will use more money talk as they are used to talking about money with their children. Alternatively, it is also possible that they may engage in less or similar amounts of money talk as parents from higher SES backgrounds. Understanding children's exposure to conversations about money can inform our understanding of the opportunities young children experience to learn math. This knowledge can guide educational policy and early math intervention programs.

Casey Epting

TN - Middle Tennessee State University

Discipline: Health and Human Development

Authors:

#1 Casey Epting

Abstract Name: Characterizing the healthcare experiences of Karen migrants to Middle Tennessee

The Karen people are an ethnic group originating from the Karen/Kayin state of present-day Myanmar. For decades, the Karen have been entangled in conflicts with the central government which is led by the Burmese ethnic majority. Civilians have fled to refugee camps primarily located in the Thailand border regions. Some Karen refugees have been resettled in Middle Tennessee, living and forming community here for nearly twenty years. There are countless external and personal factors which can influence an individual's experiences managing their health and receiving healthcare. Previous research suggests that refugees bring carry a heavier burden on their mental and physical health, and migrants from Asia may experience barriers to health related to language and understanding of the systems in place here. Asian Americans are observed to engage in complementary and alternative medical practices either in addition or in place of Western medical care. Thus, a combination of social, cultural, and individual factors may influence healthcare experiences. This interview study seeks to identify common themes related to health management and the healthcare experiences of individuals identifying as Karen. We want to learn what resources and actions are already being helpful and what resources and actions might still be needed. Additionally, we seek to identify the role of culture and community in managing personal health among this particular group. The proposed outcome of this study is to publish and share a list of recommendations for healthcare providers on maintain or improve quality of care for individuals in the Karen community and others who share similarities with them.

Tyler Erben

PA - Duquesne University

Discipline: Biochemistry

Authors:

#1 Joseph Makowski

#2 Adam Kensinger

#3 David Seybert

#4 Jeffrey Evanseck

Abstract Name: ATP: An alternate role of an energy currency

ATP is well established as an energy currency in all organisms, yet its concentration in the intracellular environment is vastly greater than that needed to perform metabolic function prompting inquiry into supplementary roles of ATP. Recent in vitro studies on two isozymes of malate dehydrogenase, mMDH and cMDH, revealed that ATP increases the kinetic parameter K_m in the dehydrogenation reaction much more in mMDH over cMDH. Microsecond molecular dynamics simulations of the two isozymes (with and without ATP) were performed in a periodic water box with NaCl at 300K to analyze ATP interactions and how the dynamics are affected. In both isozymes, the RMSF fluctuation and entropy were different between the ATP and non-ATP systems. In cMDH, ATP consistently formed hydrogen bonds along the mobile loop of the isozyme and affected the isozyme by lowering the RMSF fluctuation and decreasing the entropy of the mobile loop. In mMDH, there was a reversal of these observations. These results support ATP serving a regulatory role beyond its use as an energy currency as there is a differential effect between the two isozymes, but do not explain the much higher value of K_m in mMDH under the presence of ATP. Future research will involve replicate simulations to confirm the prior results. Additionally, simulations including substrate and cofactor will be performed to investigate ATP serving as a competitive inhibitor

Lara Erickson

MN - Carleton College

Discipline: Political Science

Authors:

#1 Lara Erickson

Abstract Name: Nitrate Pollution in Dunn County: Perceptions and Solutions

Nitrates are the most common groundwater contaminant in Wisconsin. Blue baby syndrome, gastric cancer, elevated heart rates and headaches are cited as health consequences of consuming nitrates at high levels. My project aims to address the following questions: What are state, county and township policies on nitrate pollution? What are the perceptions that Dunn County residents hold about nitrate pollution? How do various stakeholders perceive the results of the Dunn County 2023 Groundwater Sampling Report and the issue of nitrate pollution? I used interviews and public opinion surveys to answer my research questions. Interviews of stakeholders at the township, county and state level showed nitrate pollution is an important issue for public officials and the 2023 Groundwater Sampling Report is seen as a baseline for further testing and policy initiatives. Survey responses indicate most respondents are aware of the County's nitrate pollution program and are at least somewhat concerned with drinking water quality. However, when looking at respondents who get their water from private wells, proper well testing protocols were only followed by a small fraction of well owners. This indicates that the public is aware of nitrate contamination but maybe not how to combat the problem. My project ends with suggestions for public engagement to raise awareness of nitrate pollution and water testing in Dunn County.

Stephanie Erner

IL - Northeastern Illinois University

Discipline: Art History

Authors:

Abstract Name: Black Artivism: The Revolution of Black Creative Expression for Social Liberation

Black art is defined as cultural-politically charged art expression by and for black communities. The creative practice encompasses a cultural socio-political identity, employing factors of the black experience that have catalyzed social change. The intersection of art and activism has contested systemic injustices that persist within society advancing black social movements across generations. Beginning in Harlem, New York during the eminent Harlem Renaissance, black art and artists such as Langston Hughes, Alice Walker, and Jean Michel Basquiat reshaped the narratives around black identity countering systemic oppression and stereotypes. Social movements like the Civil Rights Movement and the Black Arts Movement amplified this legacy promoting art entrenched in Black culture, community, identity, and life. These instrumentally historical black movements have revolutionized contemporary black movements like Black Lives Matter (BLM). Black artists such as Titus Kaphar and Kara Walker employ visual art to confront systemic contemporary issues like police brutality while correcting historical knowledge and fostering solidarity. From the Harlem Renaissance to BLM, black art's transformative potential has challenged societal structures, fostering community and social reform. An examination of black art's role across social movements can uncover significance in its ability to pilot social-political development while affirming the black experience. This study examines the role of Black art within social movements during the 1960s and its impact on social advancement. Using a methodology of historical analysis and artistic practice involving the creation of original digital designs I will capture and identify themes, aesthetics, and political messages associated with black social movements. Furthermore, these designs will reflect diverse styles such as realism, modernism, and abstraction to connect past and present black social movements effectively. Lastly, this study hopes to recommend studying the continuity of Black art as a powerful agent for confronting injustice, asserting identity, and establishing an equitable future.

Alan Escalante

MN - Hamline University

Discipline: Biology

Authors:

#1 Ethan Heide

Abstract Name: Effects of NSD3 on Neural Crest Migration in Chick Embryos

Neural crest cells are migratory embryonic cells present in vertebrates. Neural crest cells are precursors for a wide variety of cell types and bodily structures including the peripheral nervous system, heart outflow tract, and craniofacial structures. NSD3 is a protein modifying enzyme with a well studied role in regulating gene expression and is commonly studied in research involving other migratory cell types, most notably metastatic cancer. However, despite the possible link between migratory cells and NSD3, its impact on neural crest development is understudied. While previous research has demonstrated that NSD3 is required for neural crest migration, the molecular mechanisms involved remain unclear. To isolate the effect of NSD3 inhibition on neural crest cells, cell cultures were made from the dissected neural folds of chick embryos. The cultures were exposed to one of two experimental conditions, one group contained an NSD3 selective inhibitor, and the other contained a chemically similar negative control. The migration distance and morphology of the cells were compared between the two groups. Migration distance was measured by taking the total dispersal area

of the cells in each culture, and two measurements were used for morphological analysis: aspect ratio, the length vs width of a cell, and circularity, a mathematical representation of how circular a cell is on a 0 to 1 scale where 1 represents a perfect circle. The cells in experimental conditions migrated less on average, were significantly more circular, and had significantly lower aspect ratios than cells under control conditions. These results suggest that NSD3 plays an important role in the regulation of neural crest migration, and future research should explore why NSD3 inhibition leads to these cellular changes and seek other molecular mechanisms that affect neural crest cell migration.

Alejandro Escorcia

MD - Loyola University Maryland

Discipline: Mathematics

Authors:

#1 Michael Knapp

Abstract Name: Graph Coloring with Restricted Colors

Graph coloring is a well-studied problem in the mathematical field of combinatorics. A (mathematical) graph consists of a set of vertices, some of which are connected by edges. As a real-world example, we could think of the vertices as being a set of cities and the edges as airline flights. Then we could say that two cities are connected if there is a non-stop flight between them. To color a graph means to assign a color to each vertex such that no two connected vertices are assigned the same color. One then asks the question: if there are only some number n of available colors, how many ways are there to color the graph? If we ask this question for the same graph, but different values of n , it turns out that there is a nice formula (which depends on the specific graph) that will give the answer no matter what n is. This formula is called the chromatic polynomial of the graph, and it is well-known how to calculate it. In this project, we will study the problem of finding the number of ways to color a graph when each color is only allowed to be used a limited amount of times. We will begin with the situation where each color can be used at most twice, and study the problem for several different categories of graphs. For graphs in these categories, we hope to find explicit formulas for the number of colorings in terms of the number of available colors. It is known that this problem is computationally hard in general, but we hope that by narrowing our scope, we will be able to find formulas for those types of graphs. Where possible, we will also attempt to prove results for different restrictions on the number of colors.

Samantha Esp

WI - University of Wisconsin-Parkside

Discipline: Psychology

Authors:

#1 Melissa Gregg

Abstract Name: The Effect of Sense of Agency on Voluntary Motor Action

The Libet paradigm (Libet et al., 1983) demonstrated that brain activity (indicated by an ERP component, the readiness potential, or RP) precedes the conscious decision to act by 500 msec, indicating that neural activity, rather than “free will” causes voluntary acts. Recent research has examined the influence of free will beliefs (FWB) on the RP. For example, Rigoni et al. (2011) found that amplitude of RP’s was lower in a group that had diminished FWB. Although previous research has established that amplitude of RP’s can be influenced

by FWB, scientific literature has yet to determine how sense of agency (SoA) may affect RP's. SoA, or perceived control over our environment, helps maintain psychological stability and flexibility when faced with challenges. The purpose of this study was to determine whether one's SoA affects amplitude of RP's. Participants completed a motor task adopted from Libet et al. (1983). An analog clock was presented to participants on a monitor. Participants watched as one clock hand made a full rotation every 2 seconds. Participants were instructed to press a button to stop the clock hand when they felt the urge. This task was repeated for 50 trials while brain activity was recorded with a 32-channel EEG system. Participants completed a Sense of Agency Scale (SoAS) before and after completing the task. The SoAS is used to quantify each participant's SoA. It was hypothesized that amplitude of RP's would differ between individuals with varying SoA. Specifically, we predicted that participants with a low SoA would have a smaller RP than participants with a high SoA. The results of this study will provide a better understanding of how SoA relates to motor acts, a broader context for understanding the nature of consciousness, and the potential to inform future investigations of the relationship between mind and brain.

Chenilyn Joy Espineda

MD - Bowie State University

Discipline: Computer Science

Authors:

#1 Soo-Yeon Ji

#2 Oluwatoyin Kode

Abstract Name: A Machine Learning-Based Multilevel Approach to Identify High Risk Dementia Prediction

Dementia is a chronic, progressive, and degenerative condition that causes a decline in brain function due to disease or impairment, becoming a major health concern among the elderly. The continuous rise of dementia cases due to the aging population has made it a critical to provide accurate, timely diagnosis, and adequate care for patients with dementia. Recently, several advancements have been introduced using machine learning techniques to analyze neuroimaging and other computer-aided data to enhance diagnostic accuracy and early detection. However, many studies lack a focus on identifying specific high-risk factors or gender-specific influences that could improve early detection and personalized care. This research aims to fill these gaps by identifying important variables associated with dementia with two main objectives utilizing data sourced from Kaggle's Open Access Series of Imaging Studies (OASIS-2), which includes 373 Magnetic Resonance Imaging (MRI) scans from 150 subjects. The study has two primary objectives: (1) examining features to identify high-risk factors of dementia including gender-specific factors, and (2) developing a multilevel predictive model. To achieve these objectives, a step-by approach is taken. First, missing values are imputed to handle incomplete data. Second, categorical variables are transformed using one-hot encoding method. Third, a feature set is generated to present relevant information by calculating time-weighted averages, differences, variability, cumulative sum, cumulative rate change, etc. Finally, machine learning techniques are applied to identify dementia and predicting their mini-mental state examination (MMSE) score. The performance of the model will be evaluated using accuracy, precision, recall, and F1-score metrics.

Sabrina Espinoza

UT - Salt Lake Community College

Discipline: Sociology

Authors:

#1 Sabrina Espinoza

Abstract Name: The persistence of poverty among U.S refugees: Exploring the Intergenerational Poverty Cycle Among U.S. Refugees and the Barriers to Effective Integration.

The cycle of poverty in U.S refugees is consistent and ongoing, passing from generation to generation with no indication of improvement. This research seeks to understand the social, economic, and policy barriers that perpetuate and contribute to this trend in poverty. By highlighting the systematic issues faced by refugees, the research aims to give voice to refugees' experiences and provide actionable recommendations to improve policies in support of refugee integration. Through an analysis of existing literature and data, the research examines barriers faced by refugees such as unrecognized credentials, insufficient housing options, and lack of legal accessibility. These issues faced by displaced persons are often overlooked and neglected in the United States. Refugees are often overqualified for their current job position due to foreign credentials that are unrecognized and undervalued. Furthermore, the evidence provided in this analysis showcases the lived experiences of housing managers in government resettlement agencies. This insight explores the living conditions and lack of available housing units for families. Additionally, refugees are faced with a daunting series of challenges in our legal system that often keeps displaced individuals and families in exile for ten to fifteen years. This state of legal limbo reinforces poverty by restricting their access to stable employment, housing, and essential resources, making it increasingly difficult to escape economic hardship. These compounded barriers create a cycle of poverty that spans generations, with each new wave of refugees facing the same struggles without significant opportunity for advancement. Without policy change, refugees will continue to be trapped in a system that hinders their ability to break free from poverty. This research calls for a reevaluation of current policies to address these systemic issues and provide refugees with the necessary tools to escape the cycle of poverty and build a better future for themselves and their families.

Jasmine Espitia

PA - East Stroudsburg University

Discipline: Mathematics

Authors:

#1 Christopher Dubbs-Nazario

Abstract Name: The Caputo Fractional-Order Derivatives of Standard Real-Valued Functions

In calculus, whole-number derivatives and integrals of functions are simple to interpret geometrically: the derivative is the rate of change of a function, whereas the integral is the area between a function and the x-axis. In a letter to L'Hospital in 1695, Leibniz raised the possibility of generalizing the operation of differentiation to non-integer orders. What would a half-derivative or half-integral mean? Despite this early interest in fractional calculus, it was not until 1974 that fractional calculus became the object of specialized mathematics conferences and texts. In recent years, applications to chemistry and physics have increased the interest in fractional calculus. Within these applications, competing definitions for the fractional integrals have been proposed: the Riemann-Liouville, Weyl, and Caputo fractional derivatives being the three most prominent. Unlike with ordinary differentiation, the fractional derivative of a function depends on which definition for the fractional derivative is chosen; in other words, the fractional derivative of a function is not unique. The focus of this research was on analytically finding and graphically showing the continuous interpolation between elementary real-valued functions and their first derivatives, as α varies continuously from 0 to 1 for the Caputo fractional derivatives. The elementary functions under study include constant functions, rational powers of x , and exponential functions. The contribution of this research was two-fold. First, it provided a record of the derivation of the Caputo fractional derivatives for elementary real-valued functions. Second, it provided the graphical interpretation of these derivatives by presenting the constant interpolation between the function and its first derivative. This research also addresses a gap in the mathematics literature identified by Machado: there is no elaboration of the simple concepts from fractional

calculus that are approachable to undergraduates and could easily be incorporated into existing third-semester calculus courses. This research provides such concepts and examples.

Lucas Esqueda

PA - Westminster College

Discipline: Biology

Authors:

#1 Joshua Corrette-Bennett

Abstract Name: The Effect of Beta-Hydroxy-Beta-Methylbutyrate on mTOR Expression During Limb Regeneration

Regeneration, the replacement of lost or damaged tissue, is essential for understanding tissue repair and organ regeneration. The axolotl, *Ambystoma mexicanum*, is a widely used model organism for studying this process due to its ability to regenerate complex structures like limbs and organs. A key regulator of this process is the mechanistic target of rapamycin (mTOR), a serine/threonine kinase that forms the mTOR complex 1 (mTORC1). This complex activates early in axolotl limb regeneration, facilitating cellular proliferation and differentiation. mTORC1 integrates external signals like nutrient availability and growth factors to regulate protein synthesis, a key process in tissue repair and regeneration. β -hydroxy- β -methylbutyrate (HMB), a metabolite of leucine, enhances protein synthesis in humans and other mammals through stimulation of the mTORC1 pathway. Despite HMB's established effect in other systems, its impact on mTOR expression during axolotl limb regeneration remains unexplored. This study aims to determine if HMB supplementation increases mTOR expression during axolotl limb regeneration and enhances the regenerative process. To test this, 24 axolotls were divided into 3 groups of 8, and assigned a specific treatment: high HMB, low HMB, and no HMB (saline). Limb amputations were performed, and each axolotl was injected with its assigned treatment. Limb tissues were collected at two time-points: non-regenerating (T0) and regenerating (T72). mTOR expression was quantified by qRT-PCR. mTOR expression significantly increased from T0 to T72 across all treatment groups. However, no significant differences in mTOR expression were observed across treatment groups within T0 and T72, indicating that HMB supplementation did not further enhance mTOR expression. These findings suggest that while mTOR is critical during regeneration, HMB supplementation may not directly influence mTOR expression in axolotls. Future research should prioritize long-term studies of HMB supplementation and its interactions with other pathways to optimize nutrient-based approaches for enhancing regeneration.

Lauren Estrada

AZ - Embry-Riddle Aeronautical University

Discipline: Interdisciplinary

Authors:

#1 Katy-Jan Bobseine

Hailey Thatcher

Abstract Name: Exploring Incentives and Barriers to Cybersecurity Education

Recent research highlights the pressing need to address the growing cybersecurity workforce shortage; a 2024 study revealed a 4.8 million personnel gap in cybersecurity skills globally. This underscores the importance of analyzing attitudes toward cybersecurity education among STEM students. Our study aimed to identify the

barriers and incentives affecting cybersecurity learning, with the goal of exposing students from diverse academic backgrounds to an interdisciplinary application of cybersecurity skills. Our team conducted a comprehensive survey engaging students from multiple majors to understand their perceptions regarding cybersecurity education. By analyzing their responses, we identified strategies for interdisciplinary cyber education and proposed actionable changes applicable to the College of Business, Security, and Intelligence (CBSI) at Embry-Riddle Aeronautical University-Prescott, including the introduction of new cybersecurity courses tailored to different fields of study. Additionally, we suggested revised course sequences that would help students gradually build a solid foundation in cyber-related knowledge and skills. We also considered employer perspectives, noting the need for a workforce equipped with foundational cybersecurity knowledge. Discussions with industry representatives highlighted the growing demand for employees who understand cybersecurity's practical implications across fields. By combining insights into student motivations with employer needs, we gained a clearer sense of how educational institutions can improve cyber-related curricula. Our research revealed the need to restructure courses and integrate cybersecurity-related content into non-cybersecurity majors, showing connections to their primary studies. In response, our team restructured a cybersecurity course and proposed its integration into a non-cybersecurity major flowchart. By making cybersecurity education accessible, this approach equips students across disciplines with essential skills, preparing them for evolving cybersecurity challenges in diverse organizations. Moreover, it could serve as a model for other institutions, demonstrating the potential for widespread interdisciplinary cybersecurity education to enhance workforce readiness across sectors.

Carolina Estrella

TX - Laredo College

Discipline: Psychology

Authors:

#1 Carolina Estrella

#2 Axel Garcia

#3 Laura Lpez

Abstract Name: The Role of Neuroscience and Data Analytics in Understanding the Impact of Beverage Advertising on Perceptions of Women

This research investigated the portrayal of women in alcohol advertisements and explored the broader societal implications of these representations. Although these ads often depicted women in glamorized, idealized ways, the reality for many women in the alcohol industry was far less glamorous, with numerous challenges, including the risk of physical and sexual harassment. The research methodology included a voluntary survey where participants shared their perceptions of women's portrayals in alcohol advertisements, the themes used in these ads, and the analysis of MRI scans highlighting related brain activity. Participants were also asked to explain what stood out to them the most in these advertisements and how they felt about the content they observed. It was hypothesized that the data would reveal differences in how men and women perceive these portrayals. Specifically, men were anticipated to view the depictions more positively, while women were expected to interpret these portrayals more negatively. Additionally, it was hypothesized that alcohol advertisements would often reinforce traditional gender roles, depicting women in more submissive or passive roles, thereby contributing to harmful societal norms. Certain themes and stereotypes associated with women in alcohol advertisements were also expected to reflect a more submissive role. Overall, the results supported these hypotheses based on survey findings. These findings suggested that the portrayal of women in alcohol advertisements, as well as the marketing strategies employed by companies, were perceived differently by the public, reflecting underlying gender biases in advertising.

Jasmine Eubanks

Abstract Name: Childhood Independence in Japan and Canada: How Cultural Differences Influence Development and Esteem in Children's Artwork

In most Japanese preschools, children are given tasks and positions of leadership that instill a sense of autonomy and community, allowing them to create their own classroom rules and solve problems when there are issues amongst them. In addition, Japanese parents put more emphasis on collectivism rather than individualism, while still allowing children walk to school without parental supervision and run errands on their own. In Canada, however, children lack opportunities to develop their autonomy due to narcissistic and helicopter parenting that isolates children from opportunities to learn from their peers and extended family members. This study explores the difference in the two parenting styles and classroom management, through the quality of children's artwork. This exploration of children's artwork demonstrates Japanese children's greater observational skills of the outside world, since they are given more freedom and responsibilities. The difference in observational skills is highlighted when looking specifically at landscape artwork from children of each culture. By quantifying the amount of detail in each artwork, this study shows that Japanese children tend to create more detailed and developed artwork, and this can be connected to the freedom and independence those children experience at home and in the classroom. This research is crucial for western educators, as it covers the positive developmental outcomes of Japanese teaching and parenting strategies.

Emily Euler

VA - James Madison University

Discipline: Chemistry

Authors:

#1 Haley Frankovich

#2 Kendra Letchworth-Weaver

#3 Ashleigh Baber

Abstract Name: Experimentally Guided Computational Investigation of Reactivity of Isomeric Butanol on TiO₂/Au(111)

Biofuels such as butanol can be utilized to minimize global fossil fuel reliance while contributing to a carbon-neutral cycle. Developing a deeper understanding of the fundamental thermal catalysis processes of butanol over heterogeneous model catalysts can aid in the design of more efficient catalysts. Temperature-programmed desorption (TPD) experiments demonstrate differences in both reactivity and selectivity for butanol isomers with 1-butanol showing little reactivity and only elimination products while 2-butanol shows both oxidation and elimination. To gain an atomically-detailed perspective on these processes, density functional theory (DFT) was used to investigate energetic trends and identify comparisons between 1- and 2-butanol as they adsorb on Ti₃O_x nanoparticles supported on a Au(111) surface. There are two favorable interactions between the butanol and the catalyst material; the oxygen on butanol covalently bonds to the nanoparticle and the alkane chain interacts with the gold surface through dispersion forces. Initial conclusions determine the adsorption energies of both 1- and 2-butanol to be less dependent on coordination number of the Ti and more dependent on gold surface interactions. Preliminary results indicate that there are more active sites available for 2-butanol to interact favorably with both the nanoparticle and the gold surface compared to 1-butanol, potentially influencing reactivity and selectivity. DFT calculations to further investigate the reaction pathways for 1- and 2-butanol elimination and oxidation are ongoing.

John Evans

WV - West Virginia University

Discipline: Criminology/Criminal Justice

Authors:

#1 John Evans

Abstract Name: In the Public Eye: Focus Group Insights on Policing and Safety in Morgantown

In contemporary America, policing has become as divisive as political debates. While much research has focused on understanding this in urban areas, rural communities like Morgantown, WV, remain largely overlooked. Despite rising crime rates and growing discontent with law enforcement, little effort has been made to address these issues at a local level. Our research seeks to fill this gap, providing much-needed rural representation by exploring public perceptions of safety and the role of the Morgantown Police Department. Using a Community-Based Participatory Action Research (CBPAR) approach, we engaged key stakeholders—including police officers, advocacy groups, the unsheltered population, businesses, and more—through focus groups to capture a diverse range of viewpoints. Early findings reveal evolving expectations of police roles, with participants emphasizing the need for law enforcement to balance consistent enforcement with community engagement. Citizens expressed a desire for greater collaboration and transparency, while concerns were raised about whether the police mission aligns with community needs. Recommendations included improving communication, increasing police visibility, and fostering stronger community-police partnerships. By centering these perspectives, we aim to inform actionable, inclusive reforms tailored to Morgantown's unique challenges.

Hailie Evans

WI - University of Wisconsin-Superior

Discipline: English and Literature

Authors:

Abstract Name: One Condemning Decision: Reader Perpetuated Trauma and Misrepresentation of Helen of Troy and Chaucer's Criseyde

Words have the ability to define who we are to ourselves, the world, and generations to come; they have the power to elevate us or to condemn us. Two women, in particular, continue to feel the villainizing power of words that can stain one's reputation beyond easy or foreseeable repair. One of these women is Helen of Troy, whose story is told by Colluthus in "Rape of Helen" and Homer in *The Iliad*; the other is Criseyde, from Chaucer's work *Troilus and Criseyde*. Both Helen and Criseyde are criminalized for their part in betraying the men in their lives; however, the picture that we have crafted of these women as unfaithful and conniving traitors unfairly treats two women silenced and abused, made victims of their society. Both Helen and Criseyde are condemned for one decision: Helen for leaving and Criseyde for never returning. Yet, readers' assignation of heavy blame and a negative reputation to each woman—which fails to consider the factors surrounding each woman's choice—is wrongful. Responding to readers' unjust assignation and perpetuation of blame on Helen and Criseyde, I analyze and expand upon the Greek rhetorician Gorgias' *The Encomium of Helen* (a rhetorical defense of Helen). Engaging with Chaucerian, Greek, Psychology, and rhetorical scholars, I then extend Gorgias' defense to Criseyde, a woman, I argue, whose position in society, experiences with the men in her life, and victim-blaming relationship with readers parallels that of Helen. In doing this, I

demonstrate how Helen and Criseyde have endured centuries of abuse for the reputations that readers have wrongfully assigned them. I conclude by discussing the common literary depiction of women as despicable and untrustworthy. Addressing this normalized negative reputation of women in literature, I open up a conversation about victim blaming and actions for survival within a patriarchal society.

Sabrina Ezell

IN - Valparaiso University

Discipline: English and Literature

Authors:

Abstract Name: The Female Power to Create Unity: Subverting Freudian Paradigms in *To the Lighthouse*

JaneMaree Maher and Nini Fang have argued that Lily Briscoe's character in *To the Lighthouse* exemplifies the central ideas of Kleinian psychoanalysis, which emphasizes the importance of a powerful maternal presence as the center of an individual's universe. It presents such an influence as necessary for proper development and family unity. Maher and Fang argued that in the novel, Mrs. Ramsay's maternal attributes make her valuable to all and especially desirable to Lily for her abilities to embody power and to create. Likewise, Nadia Fusini believed not only that Lily desires to be like the maternal, powerful Mrs. Ramsay, but that Woolf was suggesting that all women should strive to emulate Mrs. Ramsay. While Woolf herself admitted that *To the Lighthouse* was written with psychoanalytic motivations, this Kleinian view of the importance of maternalism overlooks the specifically Freudian psychoanalytic ideology exemplified in both characters, and undermines Lily Briscoe's radical character. Reading with the Freudian lens allows one to understand a central character tension in the novel between Mrs. Ramsay and Lily Briscoe and to discern the significance of its resolution. Throughout the novel, Virginia Woolf depicts Mrs. Ramsay as Freud's ideal female with an inferior, submissive attitude towards men and a whole-hearted embrace of the nurturing image of a mother. On the other hand, Lily's lack of passivity, powerfully active creativity, and rejection of the accepted female role characterizes her as Freud's definition of a neurotic female. This essay argues that Virginia Woolf implicitly criticizes Freudian psychoanalysis by reframing female "neurosis" into a norm for women to pursue: creativity, activity, and a rejection of the assigned female role. Throughout the novel, Woolf shows her desire for women to possess these traits through Lily Briscoe's success, and Mrs. Ramsay's failure, to achieve permanent, all-encompassing social and aesthetic unity.

Jacobo Fabregas Navas

FL - Florida Atlantic University

Discipline: Criminology/Criminal Justice

Authors:

#1 Jacobo Fabregas Navas

Abstract Name: Navigating Justice: Gender Perspectives on AI's Role in Court

Many have stood by the judicial system and many have criticized it. These opposing perspectives have raised the question of whether people really believe if the judicial system is fair? This question of fairness has led many to wonder if A.I could perhaps have a role in some processes within the judicial system. In order to answer these questions, I wrote a 16 question survey and distributed using Amazon Mechanical Turk to individuals 18 and over across the United States. Specifically, I wanted to test two hypotheses. First, is there a statistically significant difference between gender and the views of fairness of the Judicial System; and

second, is there statistically significant differences on the incorporation of A.I into the Judicial System. I used IBM SPSS to analyze the data and found that there is a statistically significant difference between gender and the views of fairness, with 19% of males indicating that the judicial system is very fair whereas only 4.8% of women believe the system is very fair. Additionally, 87% of respondents believe AI should be incorporated into the judicial system, with no significant difference between males (89%) and females (87%). In conclusion, my research shows that people are open to AI in the judicial system, paving the way for future studies on how it could be implemented.

Grace Fagan

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Devin Burris

#2 Brianna DiSanza

#3 Livia Sertori Finoti

#4 Rebecca Ahrens-Nicklas

Abstract Name: Morphology Analysis of iPSC-derived BCAT1 Deficient Neurons

Branched chain amino acid metabolism disorders are rare, inborn disorders associated with devastating neurologic dysfunction. Within the metabolism of branched chain amino acid, branched chain amino acid transaminase 1 (BCAT1) is an enzyme that catalyzes the reversible transamination of branched chain amino acids. Although BCAT1 deficiency has been associated with cellular dysfunction, the role of BCAT1 in neurodevelopment has not been elucidated. Thus, we aimed to study how BCAT1 mutations affect neuronal morphology over maturation. To study neuronal morphology, we built a lentiviral system with myristoylated tdTomato to sparsely label cells with high resolution. The lentiviral system was first transfected into mouse neuroblastoma cell line to ensure successful labeling of ultrastructure with the system. Then, the lentiviral system was transfected into a patient-derived induced pluripotent stem cell line (iPSC), and these cells were differentiated into induced neurons (iNeurons) and collected on Day 2 and Day 7 of differentiation. Finally, ImageJ Simple Neurite Tracer was used to process images, trace cells, and run Sholl and branch analyses. We found that there were subtle delays in BCAT1 diseased iPSC differentiation. Additionally, sparse labeling showed more variable morphology in BCAT1 diseased iNeurons compared to the wildtype (control) iNeurons throughout maturation. Neuronal tracing and Sholl analysis also showed varying morphology between the BCAT1 diseased cells and the wildtype cells. Moreover, branching analysis established a significant difference between genotype at Day 2 of maturation, yet normalized by Day 7 of maturation. Ultimately, these analyses suggest that the BCAT1 diseased iNeurons mature slower and with different morphology than the wildtype iNeurons, and understanding the morphology of BCAT1 diseased neurons over maturation is a step towards elucidating the role of BCAT1 in neurodevelopment.

Jason Fahmy

MI - Wayne State University

Discipline: Biochemistry

Authors:

#1 Charlie Fehl

Abstract Name: Using Fluorescent Tools to Detect the Regulation of Sugar Cycling Enzymes in Cellular

In the last twenty years, despite overall cancer incidence decreasing, hyperglycemic-related cancers have continued to rise. In the Feh1 Lab, we are interested in how cancers utilize sugars to develop and grow. One sugar of interest to us is the glucose-derived N-Acetylglucosamine. (GlcNAc) GlcNAc is used to modify proteins post-translationally, becoming O-linked β -N-acetylglucosamine, and can impact a protein's localization, stability, and activity. O-GlcNAc levels have been shown to increase in cancer but decrease in neurodegenerative disease significantly. As such, our cells must carefully regulate O-GlcNAc modifications. The study of O-GlcNAc regulation is currently limited, however, as only two enzymes modulate the addition and removal of O-GlcNAc, O-GlcNAc transferase (OGT) and O-GlcNAcase (OGA), respectively. These enzymes constantly cycle O-GlcNAc on and off proteins to maintain a basal O-GlcNAc modification level. However, relatively unknown mechanisms shift this regulation towards high or low O-GlcNAc in varying disease states. One mechanism behind O-GlcNAc regulation is the complexation of OGA and OGT in vivo. It is theorized that when GlcNAc concentration is relatively stable, these enzymes will inactivate each other; likewise, when GlcNAc levels vary, these enzymes will dissociate and regain their activity. Several studies have confirmed that OGA and OGT form a complex in vitro, with a crystal structure released in recent years. However, to our knowledge, this complex has not been confirmed in vivo. We aim to verify the interaction of OGA and OGT in vivo via Förster Resonance Energy Transfer (FRET). This technique uses fluorescent microscopy to confirm protein-protein interactions in live cells. We have successfully designed our system to tag OGA and OGT with light-releasing tags, and our FRET experiments are underway. We are confident that confirmation of an in vivo OGA and OGT complex would provide a key regulatory mechanism behind O-GlcNAc cycling in various disease states.

David Fahy

GA - Georgia College and State University

Discipline: Psychology

Authors:

#1 Stephanie Jett

Abstract Name: Mental Health Treatment Choice in a Queer Population

People who identify as queer - members of gender and/or sexual minority groups - face unique stressors in society both on a personal and political level. Increased incidence of anxiety, depression, and PTSD in the queer population due to novel stressors like discrimination or dysphoria can lead to complex problems. First-line treatment options, which are those that are considered standard options by mental health professionals, may not be the best suited interventions for these issues. Previous studies have looked at the barriers to accessing therapy that queer people face, but few studies have looked at individual perceptions of different interventions despite it being an important factor in therapeutic success. This study sought to assess queer people's perceptions of and preferences for mental health interventions whilst also examining their relationship with and perception of mental healthcare. Participants (n = 112) were recruited through snowball sampling and our university's online participant pool (SONA). Status as a gender or sexual minority group member was self-reported. Our survey assessed demographic information, anxiety, depression, PTSD symptomology, interest in mental health interventions, and attitudes towards seeking counseling. A list of mental health interventions was developed that was organized by first-line (empirically validated and approved options, considered standard options by mental health care professionals), alternative (conditionally approved for treatment by the APA), and experimental (interventions that are still seeking empirical validation) treatments. Brief summaries of the treatment options were provided and participants were then asked to indicate their willingness to participate in each treatment. Data suggests that queer individuals tend to prefer first-line and alternative treatments, with interventions that medicalize mental illness being the most unpopular. Results could inform clinicians who work with queer populations on possible attitudes that exist towards different interventions.

Xiao Fang

MN - Minnesota State University - Mankato

Discipline: Mathematics

Authors:

#1 Deepak Sanjel

Abstract Name: Optimizing Solar Energy Efficiency Using Machine Learning Models

The global shift toward renewable energy is critical for combating climate change and ensuring sustainable energy supplies. Solar energy systems, as one of the most promising renewable energy sources, face challenges in optimizing efficiency due to complex dependencies on environmental conditions and energy output. This research aims to address these challenges by applying machine learning models to predict solar energy output and identify the key factors affecting efficiency. The study utilizes plant-level data from the California Energy Commission, including variables such as plant type, geographic location, and energy production metrics. Environmental datasets, including solar irradiance and weather patterns from the National Renewable Energy Laboratory, are integrated to identify trends and relationships. Machine learning models—such as Linear Regression, Decision Trees, and Random Forest—are utilized to develop predictive models and evaluate the influence of environmental variables on energy efficiency. While the primary focus is on California plants, the research may expand to other regions depending on data availability and relevance. By combining machine learning techniques with comprehensive datasets, the study aims to generate actionable insights into optimal solar panel configurations and strategies to improve energy output. Anticipated outcomes include a predictive model capable of estimating solar energy output under varying conditions, as well as recommendations to reduce inefficiencies, enhance system reliability, and support the widespread adoption of renewable energy. These findings will provide valuable contributions to advancing global sustainability efforts and addressing the pressing challenges of climate change.

Soheil Farid Azar

VA - George Mason University

Discipline: Computer Science

Authors:

#1 Soheil Farid Azar

Abstract Name: Leveraging Transfer Learning for Pneumonia Detection: Fine-Tuning a Deep Neural Network Model for Medical Imaging

Recent developments in Artificial Intelligence and Machine learning have enabled more efficient and precise medical diagnosis. Still, the development of these AI and ML models from scratch is expensive and time-consuming. An alternative to creating these models from scratch is fine-tuning pre-trained models. Attempts were made to create such models for pneumonia detection. Tensorflow with Keras API was used as the framework. Resnet-50 weighing ImageNet was used as the pre-trained Convolutional Neural Network model and fine-tuned to detect pneumonia in X-rays collected from children ages 1-5 visiting Guangzhou Women and Children's Medical Center. Multiple data augmentation and preprocessing modifications were applied to the training dataset including `rescale=1./255`, `shear_range=0.2`, `zoom_range=0.2`, `horizontal_flip=True`, `rotation_range=15`, `width_shift_range=0.1`, `height_shift_range=0.1`. Batch sizes containing 16 images were used for training, validation, and testing of the model. Class weighting was used as a method to compensate for imbalances between the number of pneumonia and normal classes. Only the last 10 layers of the ResNet50 model were set to be trainable. GlobalAveragePooling2D was used to reduce the dimensionality of

feature maps. The dense layer had 128 neurons with relu activation and regularized via L1L2 regularization, dropout rate for this layer was set at 0.3. The final dense layer contained 1 neuron with sigmoid activation. Adam was used as the optimizer for this model with an initial learning rate of 10^{-4} subject to modification by the ReduceLROnPlateau function. Binary-cross-entropy was used as the loss function. 25 epochs (training rounds) were used to train the model. The fine-tuned model was able to detect normal and pneumonia cases with a precision of 0.89 and 0.97 and F1 scores of 0.92 and 0.95, respectively. These findings demonstrate the promising use case of transfer learning in creating efficient and effective deep learning models for medical image classification.

Tyler Faris

PA - Villanova University

Discipline: Engineering

Authors:

#1 Vito Puzni

#2 Dorothy Skaf

Abstract Name: Use of Eggshell Waste to Neutralize Low pH Water and Wastewater

This research explores the feasibility and benefits of using eggshell waste (ESW) as a cost-effective and environmentally sustainable alternative for neutralizing acidic waste streams. Due to mining activity, rocks containing sulfur and other compounds can become exposed to air and water, creating acidic runoff. This contaminated water can harm plant and animal growth, and in extreme scenarios damage human infrastructure. Current methods of acidic wastewater treatment include the addition of limestone, which adds operating costs and can further the environmental burden. ESW is largely made up of the same material as limestone, calcium carbonate (CaCO_3). CaCO_3 is important as it is the primary chemical that performs the adsorption. In addition, using ESW can provide use for materials that are often landfilled. This research explores both batch and fixed bed processes to test the neutralization capacity of different sizes, types, and preparation methods of ESW. With this, testing ESW's in various acids was performed to analyze its effectiveness in industrial settings. In multiple experiments, ESW has demonstrated neutralization performance similar to limestone, and recent work has started to investigate performance in fixed beds. Beyond the immediate economic advantages, such an approach underscores a broader commitment to resource efficiency and environmental stewardship. By capitalizing on the inherent value of food waste and promoting circularity in resource utilization, this innovative solution holds promise for advancing sustainability objectives across diverse industries and geographic regions.

Jenna Farrell

OK - University of Central Oklahoma

Discipline: Art History

Authors:

#1 Jenna Farrell

Abstract Name: Art that Makes a Statement: A Comparison of Art in Relation to the Vietnam War

This study will examine how the Vietnam War impacted art in both the United States and Vietnam with a specific emphasis on the artists Peter Saul, Martha Rosler, and Tiffany Chung. Though there is a large amount of writing about the Vietnam War and its impacts, there is little research done through the artistic perspective.

I argue that the artistic representation from all sides is crucial in understanding the extent of this war's societal impact. This argument will be supported through national archives, refugee biographies, artistic references, and art historical writing. First, I will briefly discuss the background of the war and its tragic consequences on Vietnamese people and humanity in general. Then, I will provide references to the direct impact and influence of the war in American artworks, focusing on Peter Saul's and Martha Rosler's works. Following will be a description of the impact of the war on the Vietnamese people, as revealed in art. I will provide examples through the work of contemporary artist and Vietnam refugee, Tiffany Chung. This study holds value because this war caused a great division between two nations as well as within the nations themselves. Because of this division and conflict, both societies have been changed, which was inevitably reflected through an artistic lens.

Joshua Farrelly

NC - North Carolina State University

Discipline: Engineering

Authors:

#1 Joshua Farrelly

#2 Kyla Bosh

#3 Katherine Saul

#4 Jacqueline Cole

Abstract Name: Effects of brachial plexus birth injury on muscle spindle quantity in biceps, supraspinatus, and subscapularis muscles

Brachial plexus birth injury (BPBI) is a neuromuscular injury that occurs in about 1 out of every 1,000 live births, often causing lifelong shoulder muscle paralysis, reduced range of motion, and musculoskeletal deformities. Deficits depend on severity and location of injury (preganglionic vs. postganglionic), resulting in different effects on functional mobility and neuromusculoskeletal signaling that disrupt muscle and bone development. Muscle spindles are stretch sensory organs located within skeletal muscle responsible for afferent (sensory) signaling pathways and can be denervated following injury. We hypothesize muscle spindle quantity will be lower in injured limbs and higher in uninjured limbs to overcome limitations in injured limb muscle function. Sprague Dawley rats underwent surgery on one forelimb at 3-6 days postnatally: preganglionic neurectomy (n=8/endpoint), postganglionic neurectomy (n=8/endpoint), forelimb disarticulation (mimicking disuse without nerve injury, n=8/endpoint), or sham (n=6/endpoint). Biceps, supraspinatus, and subscapularis muscles were dissected for injured and uninjured limbs at 2, 3, 4, 8, or 16 weeks post-injury, snap-frozen, cryosectioned, and stained using hematoxylin and eosin. Muscle sections were imaged, and muscle spindles were counted. Limb comparisons were made using paired t-tests, and group comparisons were performed with Kruskal-Wallis tests (GraphPad Prism, $\alpha=0.05$). Analyses are ongoing to understand the progression of altered muscle composition following BPBI. Preliminary results indicate that muscle spindle quantity was greater in the uninjured biceps muscles following postganglionic neurectomy than following forelimb disarticulation at 3 weeks ($p<0.05$), tended to decrease in injured and uninjured biceps and supraspinatus muscles from 2 to 16 weeks following sham neurectomy ($p<0.1$), and decreased from 2 to 16 weeks following forelimb disarticulation ($p<0.05$). This study is the first to characterize progressive changes to muscle spindles after BPBI injury, which may inform optimal treatment timing, as well as potential mechanisms underlying muscle detriments following BPBI.

Isabella Farrington

PA - Messiah University

Discipline: Interdisciplinary

Authors:

Abstract Name: When Trauma Lasts: How The Histories We Carry Shape Us

How does trauma, experienced over generations, impact identity – both individual and familial? This study aims to explore how intergenerational trauma occurs, functions, and interacts with family history, collective memory, and concepts of identity within the matrilineal line of a family. As a case-study utilizing oral history interviews with family members across three generations, the project aims to explore the family history of intergenerational trauma to then be analyzed and synthesized with existing research. Trauma experiences within the case study include immigration, parental abuse, domestic violence, familial estrangement, disability, and religious abuse. Unlike most existing research, the methodology utilizes oral history as the primary vehicle for data collection with interdisciplinary focuses on the conversation between family history, identity, and collective memory under familial intergenerational trauma. The results will inform the fields of family history, public history, memory, and mental health, among others. Specifically, the study will provide holistic analysis on the transmission, perceptions, and impacts of intergenerational trauma on the family history narrative and familial relations. The study emphasizes the opportunity of future work to promote empowerment over silence when grounding one's identity against family history.

Feaven Fasil

TX - Southern Methodist University

Discipline: Interdisciplinary

Authors:

Abstract Name: Addressing Mental Health Barriers Among Ethiopian-American Youth in the Dallas-Fort Worth Metroplex

Mental health challenges among Ethiopian-American youth remain underexplored, particularly in the Dallas-Fort Worth (DFW) metroplex, home to one of the largest Ethiopian diasporas in the United States. This study investigates barriers inhibiting mental health resource utilization among Ethiopian-American young adults aged 16-30. Cultural stigma, lack of awareness, and financial barriers are critical factors discouraging individuals from seeking care. Employing mixed methods, the research gathers quantitative data through surveys distributed among youth via Ethiopian Orthodox Tewahedo Church networks and East African student associations. Qualitative data is collected through focus groups and interviews with Ethiopian-American youth, church leaders, and healthcare providers to explore cultural attitudes and potential interventions. Findings will inform culturally sensitive solutions, including the development of faith-integrated workshops and community programs designed to destigmatize mental illness and improve access to mental health care. The study emphasizes the critical role of the Ethiopian Orthodox Church, leveraging its trusted position within the community to bridge the gap between mental health resources and those in need. Additionally, collaboration with mental health professionals ensures that proposed interventions align with both cultural and clinical standards. This research not only aims to uncover systemic barriers but also to provide actionable recommendations for fostering a supportive environment where Ethiopian-American youth can seek mental health care without fear of judgment or stigma. By addressing these barriers holistically, this study contributes to improving the mental well-being of this underserved population while offering a model for similar immigrant communities.

Areeba Fatima

GA - University of Georgia

Discipline: Biology

Authors:

#1 Shanmathi Ramasubramanian

#2 Lohitash Karumbaiah

Abstract Name: Puromycin Resistance and Transfection Challenges with Primary Glioblastoma Stem Cells

Glioblastoma (GBM) is a highly aggressive malignancy, with its complex and adaptive tumor microenvironment (TME) contributing significantly to therapeutic resistance and rapid progression. A critical focus in understanding GBM biology is characterizing the extracellular matrix (ECM), a glycosylated network of proteins and glycans that is profoundly remodeled in tumors. Efforts to manipulate the ECM, such as targeting glycosaminoglycan biosynthesis through gene knockdown (e.g., XYLT1), are promising but face substantial technical hurdles. Transfection of primary patient-derived glioblastoma stem cells (GSCs) presents unique challenges compared to immortalized cell lines. These challenges include low transfection efficiency, variability in cellular viability post-transfection, and difficulties in achieving stable gene knockdown or overexpression due to the heterogeneity and sensitivity of primary cells. Furthermore, patient-derived GSCs frequently exhibit resistance to antibiotics, such as puromycin, which are used to select successfully transduced cells. This resistance complicates the screening process, as higher concentrations of antibiotics are required, often compromising cell viability and limiting the scalability of experiments. Optimizing antibiotic selection conditions, such as balancing puromycin concentration to achieve effective selection without excessive cytotoxicity, has proven particularly difficult in our studies. Additionally, primary GSCs often show variability in viral transduction efficiency, necessitating rigorous optimization of lentiviral titers (transfecting units, TU/mL) and infection protocols. For example, generating viral particles to efficiently knock down XYLT1 in these cells while maintaining their viability requires extensive trial and error, especially when combined with the challenges posed by antibiotic resistance. Future work must address these technical challenges through innovative approaches to enhance transfection efficiency, refine antibiotic selection strategies, and ensure the reproducibility of functional assays in patient-derived models. Overcoming these obstacles is essential for advancing ECM-targeted therapies and evaluating their potential to disrupt tumor progression and therapeutic resistance in GBM.

Nabeeha Fatima

CT - Eastern Connecticut State University

Discipline: Psychology

Authors:

#1 Jenna Scisco

Abstract Name: The Relationship Between Culture and Parenting Styles on Young Adult Intimacy

This study examined the interconnections between cultural orientation (individualism vs. collectivism), childhood parenting styles, and their combined influence on intimacy in adulthood. While prior research has explored these factors separately, few studies have integrated parenting style and cultural orientation to investigate their joint impact on intimacy and relational dynamics. Meta-analytic findings suggest that authoritarian parenting is more prevalent in collectivistic cultures, where group harmony and collective well-being are prioritized over individual needs and autonomy. Additionally, studies show that authoritative parenting—marked by a balance of structure and responsiveness—has been associated with higher levels of intimacy, particularly in friendships. Though research on romantic relationships remains limited, existing evidence suggests that authoritative parenting promotes greater overall intimacy, which may extend to romantic contexts. Conversely, collectivistic cultures are often associated with lower intimacy levels compared to individualistic cultures, possibly due to reduced autonomy, a critical factor in fostering secure

attachments and intimacy. This study sought to address these gaps by examining these variables in tandem. A convenience sample of 34 undergraduate students from Eastern Connecticut State University participated in the study by completing validated self-report measures: the Parental Authority Questionnaire, the Individualism-Collectivism Interpersonal Assessment Inventory, and the Personal Assessment of Intimacy in Relationships-Revised. The study hypothesized that (1) collectivism would positively correlate with authoritarian parenting, (2) authoritative parenting would positively correlate with intimacy, and (3) collectivism would negatively correlate with intimacy. Using Pearson's r correlation, results confirmed significant relationships between collectivism and authoritarian parenting; participants who experienced authoritarian parenting were more likely to come from collectivistic cultural backgrounds. However, no significant correlations were observed between parenting style and intimacy or between culture and intimacy. These findings highlight the complexity of these relationships and underscore the importance of further research with larger, more diverse samples.⁴

Adeeba Fatima

GA - University of Georgia

Discipline: Biology

Authors:

#1 Nathan Gonsalves

#2 Lohitash Karumbaiah

Abstract Name: Lectin Profiling of Altered Glycosylation in Severe Traumatic Brain Injury Lesions

Severe traumatic brain injuries (sTBI) lead to chronic secondary neuroinflammation, which often culminates into brain tissue atrophy and volume loss, and is associated with poor clinical outcomes. Changes in N-glycosylation (Asn-linked glycans to glycoproteins) on immune cells have been shown to play a critical role in inflammation. High-mannose N-glycans on endothelial cells can facilitate immune cell adhesion to inflamed tissues. However, changes in mannosylated N-glycan signatures on brain-resident cells after sTBI, have not been characterized. We hypothesize that sTBI leads to the upregulation of high mannose N-glycans on activated microglia and reactive astrocytes. We used a controlled cortical impact-suction ablation (CCI-SA) model to induce sTBI in Sprague Dawley male rats. Sham animals ($n=4$) underwent craniotomy without injury, while CCI-SA animals received craniotomy and CCI on Day 0, followed by suction ablation (SA) on Day 2 ($n=4$). Animals were euthanized 5 weeks after sTBI and brain tissue was flash frozen and cryosectioned. Immunohistochemical analysis was performed to stain for mannosylated N-glycans using Concanavalin-A (Con-A), ionized calcium-binding adaptor molecule 1 (IBA1) to label activated microglia, and glial fibrillary acidic protein (GFAP) to label reactive astrocytes. Our results revealed a significant upregulation of IBA1+ activated microglia in CCI-SA tissue, compared to Sham controls ($p<0.001$). An increase in IBA1+ cells corroborated with significant upregulation in Concanavalin-A (Con-A) expression ($p<0.0001$). We observed a significant correlation between IBA1+ microglia and Con-A expression ($p<0.0001$). Additionally, GFAP+ reactive astrocytes were significantly upregulated, bordering sTBI lesions ($p<0.0001$). Although Con-A expression showed an increasing trend around the perilesional area in CCI-SA animals ($p=0.0525$), there was a significant correlation between GFAP and Con-A expression ($p<0.0001$). These findings suggest that activated microglia and reactive astrocytes could contribute to elevated high-mannose glycans after sTBI, highlighting their role in chronic inflammation and altered glycosylation following brain injury.

Elizabeth Fatokun

MD - Bowie State University

Discipline: Physics and Astronomy

Authors:
Munirat Balogun

Abstract Name: Evaluation of Distance-Related Emission of Radiation From Tablets and Laptops

The wide usage of electronic gadgets such as tablets and laptops in daily life has aroused concerns about exposure to electromagnetic radiation generated by these devices. This study is intended to measure the level of such radiation coming from a tablet and laptop while powered off and on as a function of distance. Through the use of standardized measurement protocols and equipment, we performed experiments to measure the intensity of radiation from various laptop and tablet models as they were positioned at different distances from the devices.

Elizabeth Fatokun

MD - Bowie State University

Discipline: Biology

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Adriana Ganthier

Abstract Name: Bioreduction of Copper-Contaminated Wastewater using *Shewanella Oneidensis* MR-1

Copper contamination in water poses significant environmental and health challenges due to its toxicity and persistence. > This experiment explores the use of *Shewanella*, a metal-reducing bacterium, as a bioremediation tool to reduce copper concentrations under aerobic and anaerobic conditions at different time intervals (24 hours, 1 week, and 1 month). Copper acetate solutions of varying concentrations (1, 2 & 4 mM) were treated with *Shewanella*, and copper levels were measured before and after bioremediation using spectrophotometric methods. > Results showed a significant decrease in copper concentrations in the long term after the bioremediation process. There was no significant reduction in the copper concentration after 24 hours of the bioremediation process, while the 1-week process showed a significant decrease only for the 1 mM concentration. In the following, it took one month to reduce high copper concentrations of 2 & 4 mM significantly. > These findings highlight *Shewanella*'s potential for eco-friendly copper remediation and provide a foundation for future applications in cleaning metal-contaminated water.

Chloe Faudree

OK - University of Central Oklahoma

Discipline: Health and Human Development

Authors:

#1 Chloe Faudree

#2 Leann Laubach

Abstract Name: Adolescent Type 1 Diabetes Mellitus and Self-Efficacy

AbstractBackground: Type 1 Diabetes Mellitus is a common disease affecting adolescents. This is a chronic condition that continues throughout life, requires supplemental insulin, and necessitates close monitoring of blood glucose to prevent complications. Adolescents are at a developmental stage focused on preparation for young adulthood, including increased independence. This independence becomes a sensitive issue when factoring in a chronic illness such as type 1 diabetes. Many researchers have identified barriers to adolescent diabetes self-management, and many have tried and failed to implement interventions to improve self-efficacy. The most effective modalities included family, nurses, and technology. Family systems theory assumes that all family members play a part in how each member of the family relates to each other and how the systems erupt as a whole. Nurses must understand the system as a whole to understand individual functioning within it. There is a need for research into the family systems of adolescents with diabetes and family perception of intervention effectiveness. **Purpose:** The study aims to evaluate the effectiveness of family-centered interventions compared to other intervention modalities for the outcome of improved self-efficacy. **Methods:** The study will survey participants using a qualitative design with open-ended responses using both Family Systems Theory and The Adolescent Autonomy Questionnaire (AAQ). **Conclusion:** Many barriers to adolescent self-efficacy exist, and these barriers are not entirely understood. The research chosen will uncover the complexities of this issue and provide insight to guide future interventions. **Keywords:** Adolescents, Diabetes, Self-efficacy, Family, Management

Imran Fazal

NY - SUNY Buffalo State College

Discipline: Social Work and Human Services

Authors:

#1 Jessica Fitzpatrick

Abstract Name: Understanding the Stateless Rohingya Refugee Community in Buffalo: Resettlement Experiences and Educational Aspirations

This research explores the lives of stateless Rohingya refugees resettled in Buffalo, focusing on their resettlement experiences and the educational aspirations of the Rohingya youth. Given the lack of scholarly literature on the Rohingya in the U.S., this study aims to fill a critical gap by providing insights into the unique challenges faced by this community, particularly after the end of the U.S. resettlement support program, which only lasts for the first three months. The study employs a mixed-method approach, including interviews with Rohingya adults and surveys of Rohingya students and resettlement agencies. Findings suggest significant barriers due to illiteracy, lack of a written language, ongoing trauma, and lack of continuous support, which exacerbate difficulties in adapting to life in the U.S. They struggled with life-and-death situations most of their lives and never got the opportunity to understand the value of education. The research highlights the need for improved support systems, especially tailored to the unique linguistic and cultural needs of the Rohingya. The study suggests that a Rohingya-led organization could greatly benefit the community in the long run as it will allow the community members to receive the services in a language that they understand, and it can also play a major role in helping the Rohingya students pursue their further education by exposing them to careers that they never thought existed. The implications of this study could inform more effective resettlement strategies and advocate for better educational pathways for Rohingya youth. The project also opens avenues on refugee studies, education in underserved communities, and trauma in displaced populations and contributes to ongoing discussions about creating sustainable support networks

within refugee communities. More research is needed to understand these experiences longitudinally and qualitatively.

Alysse Fazal

NY - Adelphi University

Discipline: Biology

Authors:

#1 Sarah Schrauben

Abstract Name: Sleep Quality, Physical Activity, and Healthcare Utilization Amongst Adults with Chronic Kidney Disease (CKD)

Proper sleep efficiency and physical activity are common concerns in those with chronic diseases, including chronic kidney disease (CKD). High levels of physical activity have been associated with less healthcare utilization in the general population, while markers of poor sleep efficiency (insomnia) have been associated with greater healthcare utilization. Though there has been previous research on the risk factors for both poor physical activity and sleep efficiency in those with CKD, little research has drawn associations between these two measures and other patient-reported outcomes. The current study therefore sought to answer the following question: “Are sleep quality and physical activity associated with healthcare utilization by adults with CKD?” In this investigation, patients from CKD advocacy groups were recruited via an online survey for remote sleep and step data collection over 8 weeks utilizing a Fitbit watch. Participants also completed a Demographics survey, a Healthcare Utilization survey, and an abbreviated Kidney Disease Quality of Life Instrument during data collection. Descriptive statistics were used to summarize demographic data, and logistic regression models were used to determine the associations between participant characteristics and sleep efficiency, and healthcare utilization. Linear regression was used to assess the association of patient characteristics and step counts. Adjusted and unadjusted logistic regression modeled the association between step count and sleep efficiency with healthcare utilization. It was observed that greater sleep quality (defined as $\geq 90\%$ mean sleep efficiency) and higher step count (defined as ≥ 5450 steps per day) were associated with less healthcare utilization (defined as ≤ 5 doctor visits within 1 year) in both unadjusted and adjusted models. This data can be used to implement advantageous changes for patients in healthcare practice and policy, such as future interventions that improve sleep quality and step counts, thereby lessening healthcare utilization and the financial burden of healthcare for patients.

Jacob Federbusch

DC - American University

Discipline: Political Science

Authors:

#1 David Lublin

Abstract Name: Voting Behavior of Minorities in Panama and Peru

Many scholars have attempted to estimate minority support for political parties in various countries worldwide. These measures can help researchers understand the extent to which minorities are included in government and the institutions that can promote minority inclusion. This project contributes to this research by estimating the voting behavior of ethnic minorities in Peru and Panama. For Panama, I used data from the 2019 election and the 2023 census. For Peru, I used the 2021 election and the 2017 census. Much of the focus

was on gathering and cleaning census and election data from Panama and Peru, focusing on ethnic populations and party vote totals from each political unit. Separate R programs had to be developed to organize the raw data into files that could be quickly sorted by political unit and minority group. I could then use this data to perform ecological inference analysis, which gave estimates of the percentage of each ethnic group that voted for a political party. In general, minority groups in Panama, including indigenous groups and Afro-Panamanians, voted at relatively similar rates to non-minorities. In Peru, the situation was different—the Free Peru party, the winner of the 2021 election, saw much more significant support from indigenous groups than the rest of the population. These results suggest that minorities in Panama vote based on values and interests much more aligned with the rest of the population than minorities in Peru. However, more research should be done to fully understand the implications of these results on minority inclusion.

Liam Feigin

MT - Montana State University - Bozeman

Discipline: Biology

Authors:

#1 Liam Feigin

#2 Chris Organ

Abstract Name: Influence of Shared Ancestry on the Expression of Traits in Tissues

Like all living things, cells and tissues have an evolutionary pathway that has led to their genetic and physical makeup. The concept of evolutionary history has been used commonly in ecological frameworks when studying species and organisms but is frequently missing from medical research. This has led medical research to treat diseases like cancer as individual occurrences or populations, rather than having relatedness through their shared ancestry. In this research, we extensively reviewed the literature to create an accurate phylogenetic tree portraying the developmental pathways of human tissues from the point of fertilization to the point of viability. With this phylogeny, we analyze the shared ancestry of tissues and their relationship to traits, such as genes, material properties, cancer risk, and stem cell divisions, to determine whether their expression is phylogenetically patterned. We use BayesTraits, a phylogenetic analysis program, to calculate the phylogenetic signal, Lambda, to determine the importance of shared ancestry on how the trait is expressed across our phylogeny. Then, we compare traits at set phylogenetic signals, among other tests, to determine the best-fit model, recommending that trait for future research. Through this project, we hope to highlight the non-independence of tissues and emphasize the importance of evolutionary lineages in studying medical topics. Additionally, we hope to find traits that significantly link to cell phylogeny for future research, in our lab or elsewhere, to help find cures for diseases like cancer.

Eugenie Feitosa Amidou

NC - University of North Carolina at Pembroke

Discipline: Biology

Authors:

#1 Silvia E. Smith

Abstract Name: Cardiopulmonary and Neuroendocrine Involvement in Sleep Disturbance in People with Dysautonomia

The autonomic nervous system (ANS) regulates many physiological processes that occur during sleep such as

blood pressure (BP), heart rate (HR), and respiratory rate (RR). Cardiopulmonary and neuroendocrine functions vary from wakefulness to sleep states and during different parts of sleep. Given the involvement of the ANS in physiological processes that occur during sleep, it is not surprising that sleep disorders and non-restorative sleep are a common complaint by people affected by autonomic dysfunction. The goal of this study is to describe the occurrence of disturbed sleep in dysautonomia, focusing on the effect that dysfunction of the autonomic nervous system has on cardiopulmonary and neuroendocrine physiology during sleep. To this end, we conducted a literature review to synthesize the known physiological mechanisms that are regulated by the ANS during sleep. We found that the ANS may improperly regulate cardiopulmonary parameters such as HR, BP, and RR during different sleep stages but also the inhibition or activation of hormones involved in the control of stress growth, development, and many other neuroendocrine parameters. The parasympathetic ANS maintains the body in a calm state, especially in non-rapid eye movement (NREM) sleep, decreasing HR and RR. During REM sleep, which is when dreams occur, the sympathetic ANS increases the cardiovascular reflexes (i.e., control mechanisms) similarly to the state of wakefulness, increasing HR, RR, and BP. Future studies should aim to improve our understanding of sleep disturbance in dysautonomia, including its prevalence and impact on quality of life.

Cintya Felix

CA - Chapman University

Discipline: Political Science

Authors:

Abstract Name: Aquí y Ahora: The Role of US Spanish-Language TV News in Financial Vulnerability

In today's world, the news we watch often does more than inform us; it can shape how secure or insecure we feel about our future. In this paper, I examine the extent to which an individual's consumption of particular Spanish-speaking TV news channels contribute to their sense of financial vulnerability. Using an original data set of responses to the questions in the 2022 American National Election Studies (ANES), I find a moderately strong relationship between the television news channel Aquí y Ahora, and the degree to which they are worried about their financial situation. While it is true that various factors such as employment status, household size, and marital status contribute to this financial worry, a person's choice of television station can be an indicator of an increased sense of financial insecurity. This suggests that watching Aquí y Ahora, especially for immigrants and first generation Americans, may influence financial distress, leading to a tense relationship with personal finances, economic uncertainty, and low financial confidence. Therefore, it is highly important to recognize media biases within the Spanish-speaking television networks to address the urgent need for informing the immigrant and first-generation Hispanic population on how news may influence their opinions. Ultimately, this highlights how critical it is to be cognizant of communication rhetoric in Spanish-speaking television networks to accurately inform the Hispanic population while setting them up for upward financial mobility.

Madison Fellabaum

PA - Duquesne University

Discipline: Biochemistry

Authors:

#1 Leah Mrosko

#2 Samantha Rock

#3 Warren Lowther

#4 Michael Cascio

Abstract Name: Probing the Structure of the Serotonin Transporter by Crosslinking and Mass Spectrometry

Serotonin is a neurotransmitter that improves mood and mental wellness. The serotonin transporter (SERT) re-uptakes serotonin from the synapse back into pre-synaptic neurons. Selective serotonin reuptake inhibitors (SSRIs) target SERT and are used for treating anxiety/depression but are not always effective. We propose to better understand SERT structure to facilitate more effective therapeutic design. To do this, SERT was tagged with the mutation L406C in an extracellular loop to contain a single Cystine residue that can be targeted by crosslinkers. Overexpressed SERT was purified, reconstituted, and crosslinked with methylthiosulfonate-benzophenone. After photoactivation, SERT was isolated by gel-electrophoresis and proteolyzed for bottom-up mass spectrometry (MS) to identify crosslinked residues in the vicinity of the introduced mutation. In the future, MS/MS will be performed to identify specific residues that are crosslinked within mass-shifted peptides. Further refinement of SERT structure will allow for subsequent design of more effective and selective SSRIs in the future.

Jackson Fender

NC - Elon University

Discipline: Environmental Science and Sustainability

Authors:

#1 Jackson Fender

#2 Amanda Chunco

#3 Michael Kingston

#4 Josh Johnson

Abstract Name: The Lightbulb Tunicate: A Study of Climate Change, Invasion Ecology and Risk Assessment

Clavelina oblonga, also known as the lightbulb tunicate, is an ascidian species native to the Caribbean. Over the last 80 years, it has invaded throughout western Europe and on the eastern seaboard of the United States from South Florida to portions of South Carolina and, most recently, Beaufort, NC. This isolated invasion has putatively occurred as a result of ballast water in shipping. Our research involved hand sampling docks along the North Carolina coast to observe occurrences of this species and map how far it has spread since it was first observed in the state in 2014. We have combined this data with citizen science and museum data to generate comprehensive maps using GIS software. These maps demonstrate the current geographic distribution and environmental conditions. We also modeled the location of suitable habitats across the globe. Using these results, we evaluate the threat that this species poses in North Carolina and beyond.

Grace Feng

MI - University of Michigan - Ann Arbor

Discipline: Nursing and Public Health

Authors:

#1 Jinju Li

Abstract Name: Determining Casual Relationship Between COVID-19 and Acute Kidney Injury Using Mendelian Randomization

Acute kidney Injury (AKI), previously known as Acute Renal Failure (ARF) is characterized by a sudden loss of the ability to filter blood. AKI has been observed in over 20% of COVID-19 hospitalizations, occurring at twice the rate among patients admitted to intensive care units. Approximately 10% of these cases require dialysis, and AKI is linked to high mortality rates even after hospitalization. While these clinical associations have been documented, the causal relationship between COVID-19 and AKI remains unclear due to potential confounding factors and mediators. To address this, we conducted a Mendelian randomization (MR) analysis to investigate the causality of relevant quantitative traits. MR is a statistical method used to infer causal relationships between risk factors (exposures) and outcomes using genetic variants as instrumental variables (IVs). These genetic variants are assumed to be randomly assigned at conception, mimicking a randomized controlled trial and mitigating confounding and reverse causation. This analysis utilized a combined dataset of genome-wide association studies (GWAS) summary statistics from multiple COVID-19 studies across different hospitalization levels, integrated with GWAS summary statistics for AKI for European populations. By applying robust MR methods, such as inverse-variance weighted (IVW) analysis, MR-Egger regression, and weighted median estimation, we aimed to address potential pleiotropy and ensure reliable causal inference, shedding light on the genetic interplay between COVID-19 severity and AKI risk.

Samantha Ferguson

OK - University of Central Oklahoma

Discipline: Sociology

Authors:

Abstract Name: Addressing Educational Disparities and Strengthening Community Cohesion: A Multi-dimensional Study

This study examines the intersection of socioeconomic status, public perception of government policies, and community development programs in shaping educational equity and community resilience at the University of Central Oklahoma (UCO). Using a mixed-methods approach, the research employs a large-scale survey targeting approximately 10,000 UCO students to assess their perspectives on access to educational and community resources, financial barriers, and perceived equity in institutional support. The findings will be compared with state and national data to contextualize UCO's environment within broader educational trends. Grounded in Social Capital and Educational Equity theories, this research highlights how systemic barriers and community networks influence student outcomes. Preliminary insights suggest significant disparities tied to socioeconomic factors, underscoring the critical role of localized policies and community programs in addressing educational inequities. The study concludes with actionable recommendations for UCO administrators and policymakers, emphasizing the need for enhanced financial aid, expanded support services, and strengthened community partnerships to foster resilience and equity. This research aims to contribute to a deeper understanding of how targeted interventions can bridge gaps in educational access and support sustainable community development.

Daniella Fernandez

AR - University of Arkansas

Discipline: Psychology

Authors:

#1 Riley Gournay

#2 Ellen Leen-Feldner

Abstract Name: Exploring The Role of Shame In The Relation Between Cannabidiol And Problematic Alcohol Use: A Randomized Double Blind, Placebo-Controlled Trial

Background: For millions of Americans suffering from clinically relevant alcohol use problems, evidence-based treatments can be difficult to access (Kranzler & Soyka, 2018); thus, novel therapeutics are necessary. Cannabidiol (CBD) presents broad therapeutic potential (Blessing et al., 2016). Data suggest that CBD has the potential to reduce problematic alcohol use (Viudez-Martinez, 2020); however, no work has examined the role of shame in this context. Shame is a complex emotion involving a negative evaluation of the self (Dearing et al., 2005) and is related to problematic alcohol use (Luoma et al., 2019). From a theoretical perspective, trait shame may be expected to attenuate the effects of CBD on alcohol-related problems. The current study aims to assess the effects of 300mg CBD versus placebo administered daily for 3 weeks on alcohol-related outcomes as a function of shame proneness. Methods: 34 participants (Mage = 24.43; SDage = 6.26) who met criteria for hazardous drinking (along with a set of eligibility criteria ensuring participant safety and reducing scientific confounds) were randomly assigned to condition (300mg CBD or placebo) and instructed to self-administer the product daily for 3 weeks. The Test of Self-Conscious Affect (TOSCA; Tangney et al., 1989) was administered to assess trait shame at baseline, and the Alcohol Craving Questionnaire (ACQ; Singleton et al., 2014) was administered to assess alcohol cravings at three weeks. Results: Preliminary findings suggest that there were no main effects of condition ($b = -0.23$, $t(30) = -0.16$, $p = .875$, $\eta^2 = 0.004$) or trait shame ($b = 0.005$, $t(30) = 0.16$, $p = .872$, $\eta^2 = 0.003$) on alcohol craving. Additionally, there was no condition by trait shame interaction ($b = 0.003$, $t(30) = 0.07$, $p = .943$, $\eta^2 = 0.0002$) for alcohol craving. Conclusions: Given the small sample size of the current study, more work is needed to discern the effects of CBD on alcohol-related indicators.

Diego Fernandez

OK - The University of Tulsa

Discipline: Chemistry

Authors:

#1 Viresh Rawal

#2 Daler Baidilov

#3 Yun-Jeong Shin

Abstract Name: Total synthesis of cevanine-type Veratrum alkaloids

A strategic total synthesis that aims to access members of the Veratrum family of cevanine-type alkaloids. The Veratrum family of alkaloids all share a unique C-nor-D-homo [6-6-5-6] steroid skeleton and can be divided into three subtypes based on the connectivity to its piperidine ring with the cevanine-type being the largest subtype. The synthetic approach explored utilizes an asymmetric synthesis of a propargyl-substituted piperidinone fragment and an enantioselective synthesis of a bicyclic diyne fragment. After the unification of these two fragments an intramolecular [2+2+2] cycloisomerization reaction is performed creating three additional rings to offer total access to the Veratrum steroidal alkaloid family.

Elijah Fernands

VA - James Madison University

Discipline: Biochemistry

Authors:

#1 Frank Muscarella

#2 Bethany Droubay

#3 Diana Northup
#4 Paris Salazar-Hamm
#5 Lindsay Caesar

Abstract Name: Induction of Secondary Metabolites in Bat-associated Bacteria using SAHA to Fight White-Nose Syndrome

Bat populations in North America are in decline due to the fungus *Pseudogymnoascus destructans*, the species that causes White-Nose Syndrome (WNS). Over 7 million bats have died in the last decade from this disease, greatly harming ecosystems and agriculture. Fortunately, some caves are still WNS free, leading scientists to explore how bats living in these caves obtain protection from this disease. In a recent study, 632 bacterial isolates from WNS-free bats were isolated, 36 of which had antifungal activity against *P. destructans*. Interestingly, the compounds responsible for this activity were not identified. A pilot study on 18 bioactive strains from this study identified a set of target metabolites with putative antifungal activity. The most bioactive bacterium, *Streptomyces buecherae* AC536, was chosen for scale up growth for targeted isolation studies. Unfortunately, upon scale up growth, the target metabolites stopped being produced, most likely due to a lack of required environmental triggers in a laboratory setting. Bacterial biosynthetic pathways are under strict transcriptional regulation so that energetically expensive products are only formed when they provide a competitive advantage. To activate these silent biosynthetic pathways, we varied growth conditions by adjusting temperature, light exposure, carbon source, and/or chemical additives. Interestingly, growth of AC536 in the presence of the histone deacetylase inhibitor suberoylanilide hydroxamic acid (SAHA) led to significant upregulation of secondary metabolites. We have identified six compounds that are reproducibly upregulated or completely unique to SAHA-treated cultures compared to controls and putative identifications of these compounds made using mass spectrometry data. Due to the success of the SAHA treatment, 10 of other bat-associated bacteria have been treated with SAHA and mass spectrometry based metabolomics analyses are underway to identify new and upregulated products.

Rosalynne Ferraro

OH - University of Findlay

Discipline: Health and Human Development

Authors:

Troy Wolfe

Abstract Name: Exploring the Cytotoxic Effects of Fungal Secondary Metabolites on Human Cancer Cells

Fungi are eukaryotic cellular organisms that compete with other microorganisms to survive in a niche environment. They do so by releasing chemical defensins, some of which are toxic to competing fungi. In this work, fungi were collected from trees and leaves and isolated to generate pure specimens. A Kirby-Bauer disc diffusion assay was used to select specimens that exhibited bioactivity against other fungi. We hypothesized that fungi exhibiting bioactivity against other fungi may also have a bioactive effect on cancer cells. Those fungi that exhibit bioactivity were selected and grown in pure culture using potato dextrose media. After growth their secondary metabolites were extracted using sonication followed by ethyl acetate treatment. The samples were further concentrated and the final extract recovered in dimethyl sulfoxide (DMSO). Human cancer cells were then challenged by the extract in a colony survival assay. Several cancer cell lines were grown using appropriate growth media and standard cell culture techniques. Cancer cells were plated uniformly in triplicate and challenged with the fungal extracts using DMSO treatment as a control vehicle. Several fungi showed a strong cytotoxic effect against cancer cells. We then hypothesized that fungi that showing cytotoxicity in a pure growth environment may show heightened cytotoxicity when grown in a competitive growth environment with another fungal strain. Fungal plugs from two different specimens were placed three inches apart from one another on a potato dextrose agar plate. When fungi were one-inch apart, specimens were collected from each strain and processed as described. Cancer cells will be treated with

extracts derived from fungi grown in isolation compared to those grown in a competitive environment to measure if there is an increase in cytotoxicity.

Kaitlyn Ferreira

CA - University of the Pacific

Discipline: History

Authors:

Abstract Name: Silent Soundscapes: The Instruments, Musicians, and Scores that Defined Storytelling in Silent Cinema

Our modern world of film has been characterized by blockbuster movies and elaborate soundtracks. This is a stark contrast to the humble beginnings of the film industry. Early film music served as a form of entertainment for the audience that allowed them to be more engaged with the production. During the 1920s, however, film music progressed from being mere entertainment to becoming a crucial part of defining characters and evoking emotions, actions, and narrative contexts. The diverse group of performers and instruments used in silent film music highlights the technical development that the music experienced through the decade. As the 1920s continued and silent films grew in popularity, early methods of scoring that relied on pre-existing musical materials gave way to scores specifically developed for large-scale productions. These scores were meticulously crafted to highlight the action on screen and to influence the emotions of the audience. This research analyzes the history of the silent film era in order to interpret the role music has in storytelling. Film scores, motifs, leitmotifs, and sound effects are examined to understand how they have influenced the way in which society assigns meaning to music. More specifically, this project analyzes how we have come to connect with certain themes and motifs as descriptive of emotions and actions. By examining the history of music in silent films, we can see how musical works have become synonymous with specific film genres and how we have come to view music as descriptive of the action on screen.

Dayana Ferrufino

MD - Bowie State University

Discipline: Chemistry

Authors:

#1 Giselle Nunez
#2 Kameron Banks
#3 Saniyah Dyches
#4 Adriana Florence
Chenilyn Espineda

Abstract Name: Effect of Food Preparation on Vitamin C Concentration in Fruit

This study thoroughly investigates the determination of ascorbic acid (vitamin C) content in commercially available products and food items using titration techniques. The main goal is to establish a reliable and efficient method for determining the ultimate storage conditions that result in the highest concentration of vitamin C, a crucial antioxidant that plays a vital role in human health. The experimental approach involves titrating the samples, employing 2,6 dichloroindophenol (DCIP) as the titrant, chosen for its ability to exclusively oxidize ascorbic acid without affecting other potential substances. Additionally, DCIP serves as a self-indicator in the titration process. For a substance to function as a self-indicator, it should exhibit one

color when in the presence of excess analyte (i.e., ascorbic acid) and a different color when the analyte has completely reacted, which allows for the calculation of the amount of ascorbic acid present in the sample. The study explores the optimization of storage conditions, to enhance the amount of vitamin C concentration. The goal of this team's project to find out how different food preparation affects Vitamin C concentrations in fruits. We will be testing this on three different fruits; pineapple, orange and lemons. The preparation techniques include boiling, freezing and dehydration. Samples of juice from the fresh fruits were tested in both the as obtained and processed condition. The analysis technique consisted of titration using a 2,6-dichloroindophenol sodium salt solution.

Drew Fetterolf

NC - Elon University

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

#1 Drew Fetterolf

Abstract Name: The Elephant in the Room: Being Maasai, Tourism, and Conservation

This research investigates how the boundaries between indigenous religion, culture, and species conservation intersect through the lifestyles of the Maasai people in southern Kenya. Focusing on Maasai interactions with African elephants, the research examines how Maasai spiritual and cultural practices shape conservation efforts in a rapidly changing ecological landscape. The presentation explores four central arcs: 1) the influence of indigenous religious beliefs on Maasai perspectives toward land use, wildlife, and conservation; 2) ethical questions surrounding conservation responsibilities and the Maasai's role in land protection; 3) the often-overlooked role of animals in anthropocentric land-use decisions; and 4) the impact of tourism on conservation efforts. Drawing from ethnographic data collected through narrative inquiry and direct observations during fieldwork, this essay analyzes the complex interplay between religion and ecology and considers how social mobility—across geographical, cultural, and ethical boundaries—shapes conservation in this region.

Tori Field

CO - University of Colorado at Boulder

Discipline: Engineering

Authors:

#1 Tori Field

#2 James Monaco

#3 John Marino

#4 Scott Palo

Abstract Name: Automating Calibration of Colorado's Zephyr Meteor Radar Network with ADS-B Data

The upper mesosphere/lower thermosphere (MLT) acts as a middle ground between space weather's influence on the upper atmosphere and terrestrial weather. Understanding this region provides insights into how different layers of the atmosphere interact. It is difficult to collect atmospheric data in the MLT, as its high altitude makes dense in-situ sampling methods infeasible. The MLT is largely neutral, without electromagnetically reflective media for most remote sensing techniques. Meteors act as tracers of opportunity, enabling remote measurements of the MLT by analyzing returned radar signals. The Zephyr meteor radar network observes meteors by transmitting signals which reflect off the meteor trail and are

collected by the receiver. Interferometry and other techniques can be used to determine the meteors' precise location and environment. Small errors in antennas phase center can cause drastic errors in the estimated position of the meteor. These errors can be minimized by calibrating the network, achieved here by using objects with a known location, calibrating all system components at once. Airplanes are reflective targets that broadcast their location and velocity via ADS-B and are used here as known calibration targets, but the process so far is labor intensive. This project aims to automate the calibration process of Zephyr, reducing the need for human involvement. ADS-B data of planes traveling over Zephyr will be acquired through external sources and used to determine each plane's position. The expected phase for each transmitter receiver link will be computed based on the known location of the plane. This will be compared to received data from Zephyr. For each transmitter-receiver link, an offset is calculated so that the received phase matches the predicted phase. Extending this research, this project aims to determine guidelines of what makes a flight good for calibration and automate collecting flight data which meets those guidelines.

Christian Fiergbor

GHA - Ashesi University

Discipline: Health and Human Development

Authors:

#1 Jochebed Basil

#2 Samantha Reindorf

#3 Elvira Agbatsi

#4 Disraeli Asante-Darko

Abstract Name: The "No Bed Syndrome" in Ghanaian Tertiary Hospitals

The current global scarcity of hospital beds, especially in the developing world, is a major concern to human health. This paper explores Ghana's No Bed Syndrome, which is a phenomenon that describes the shortage of hospital beds. The hospital bed-to-1000 population in Ghana is 0.9 in 2021, which is extremely lower than the World Health Organization's (WHO) recommended minimum of 5 beds per thousand population. The main research question aims to understand how the lack of adequate hospital beds in Ghana affects access to quality healthcare and the interventions that can be adopted to address this problem, focusing on tertiary hospitals. This research enhances the study of public health by offering insights into the challenges faced in healthcare delivery in Ghana, contributing to the subject of healthcare infrastructure in developing countries. Although past studies establish the extent of global bed scarcity, this research studies system contributors in the Ghanaian context, including resource allocation, systemic issues, and patient behavior, further promoting high hospital overcrowding and delayed treatment. The study uses a sequential mixed-method approach, with qualitative key informant interviews with selected healthcare providers and quantitative data analysis to quantify the findings. Key findings reveal that "bed capacity" involves physical beds and the necessary resources to make them functional, including staff and equipment. Furthermore, the hierarchical healthcare structure in Ghana encourages decentralization, but inadequate resource distribution causes patients to bypass lower-level facilities and overburden tertiary hospitals. The results underscore the complex interaction between resource shortages, healthcare system inefficiencies, and patient behaviors, exacerbating the No Bed Syndrome. Effective interventions, such as increasing bed numbers and establishing Bed Bureau Offices, are already showing promise. The study concludes with recommendations for systemic reforms, including collaborations with key government ministries, public education, and resource allocation to lower-level healthcare facilities.

Christian Fiergbor

GHA - Ashesi University

Discipline: Environmental Science and Sustainability

Authors:

Abstract Name: The Political Economy of Climate Finance in Ghana

Climate finance has emerged as a critical subject in the global fight against climate change. This study provides insights into the political economy of climate finance in Ghana and how political factors impact the mobilization and allocation of climate finance resources. It highlights key political drivers such as policy measures, government engagement, international conventions like the Paris Agreement, intergovernmental organizations, and funding bodies. These drivers are crucial in influencing national strategies and the impact of climate finance policies such as the Ghana National Climate Change Policy (GNCCP). While climate finance is a critical tool for developing countries to combat climate change, the intersection of governance, international commitments, and local politics often complicates its mobilization and allocation. This research contributes new insights into these dynamics within the Ghanaian context. Some identified challenges include inadequate domestic resources, weak institutional capacity, cumbersome donor processes, corruption, absence of information, and lack of synergy among all stakeholders. The study provides a comprehensive understanding of the political facilitators and barriers to climate policy implementation. This study also adopts a qualitative research approach, using primary data collected through semi-structured interviews of participants within the categories of mid-level officials in the Ministries of Finance and Environmental, Science, Technology, and Innovation (MESTI), local government environmental officers, NGO, academics and researchers, private sector, international development organizations and donor agencies, and journalists. It employs thematic analysis, which involves the identification, analysis, and reporting of patterns or themes within data to analyze data. The study emphasizes that governance structures, institutional settings, and coordination play a significant role in enhancing the climate finance mobilization and allocation system. The study also offers policy implications such as enhanced domestic resource mobilization, enhanced institutional capacity, and strengthened transparency and accountability.

Aurora Figard

WI - University of Wisconsin-Whitewater

Discipline: Geography/Geology

Authors:

#1 Dale Splinter

#2 John Frye

Abstract Name: Flood Disaster Declarations and Warnings in FEMA Region Five

Climate change is expected to increase the significance of floods over the next 25 years. Because of an increase in flooding, disasters will lead to more widespread economic damage. An example of this occurred in the Wisconsin Driftless area during the historic 2018 flood. Around 12 inches of rain fell in about six hours and was not retained by five out of 23 dams. This caused about \$14 million in public infrastructure damage in Vernon County, and approximately \$3 million in damage to homes and businesses in Coon County. With this in mind, the spatial and temporal relationship between flood disaster declarations and flood warnings in FEMA Region 5 are being examined. The ultimate purpose of this project is to identify if trends in flood disaster declarations and flood warnings are increasing in states comprising FEMA Region 5. Flood disaster data was collected from the Open FEMA Data Set v2. All disasters in the US are organized from Present-to-1953. Filtering of the data was required to categorize floods in FEMA Region 5 from 2023-1974. The total number of flood declarations were recorded, as well as each flood event by state and the number of counties affected by each incident. Analysis includes completing summary statistics to examine trends in flood hazard incidents, investigating changes in cost of impact over the 50-year period, and looking at precipitation amounts to see if any major changes have occurred during this time. Initial results show that Minnesota is

steadily increasing in the number of flood disaster declarations and counties affected, Wisconsin is subtly increasing in both, and Ohio is increasing in the number of counties impacted despite its decreasing flood declarations. With further examination we expect to see a seasonal correlation between these events, as well as economic damages increasing.

Emma Fightmaster

WA - University of Washington - Seattle

Discipline: Psychology

Authors:

Zac Petrillo

Astha Mishra

Abstract Name: State Sex Education Legislation as a Predictor of Sexual and Relationship Health

Recent research suggests there is an association between comprehensive sex education and improved sexual health—as demonstrated by lowered rates of STIs and teen pregnancy, as well as higher rates of contraceptive use in states with comprehensive sex education as compared to states without comprehensive sex education. Some further research suggests that gender equality education programs are related to lower levels of intimate partner violence, however there is still an overall dearth of literature regarding the association of sex education legislation and relationship health. This project aims to provide further insight into how sex education legislation is associated with this and other relationship health indicators by examining the relationship between legislative requirements such as consent education and medically accurate curricula and relationship health outcomes such as intimate partner violence rates, sexual health measures, and sex life satisfaction. The association between the requirement of consent education and intimate partner violence rates and the correlation between medically accurate curricula and sexual health will be computed as point biserial correlations; the association between statutory requirements and sex life satisfaction will be computed as a point multiseriate correlation. Finally, exploratory regression analyses will be carried out to determine which combination of legislation requirements best predicts each indicator of sexual health (teen birth rates and STI rates). By exploring existing health data sets, this study aims to clarify the relationship between relationship health variables, sex education, and legislation in the United States. These results can inform policy development around sex education in a direction that promotes higher-quality public health outcomes.

Ava Figueroa

PA - Point Park University

Discipline: Psychology

Authors:

Abstract Name: Degrowth through a Psychological Lens

Degrowth is a socioeconomic ideology that recognizes the benefits that can come from a drawback from a mass-producing, over-consuming way of living. Our society has been mass-producing goods non-stop since the Industrial Revolution, which has only made the economy grow larger and larger in line with greater supply and demand. In recent years, the effects of these advancements have led us to the poststructuralist question: How has something that was initially better for our world turned against us? Many interpretations and critiques have been made in regard to the concept of degrowth. Some theorists believe, in fact, that we may reach a point where degrowth will be the inevitable result of extreme recession if we do not collectively

proceed with the movement ourselves, putting our materialistic values aside. Degrowth implies a regression from capitalizing off of ourselves for the sake of our own prosperity. It calls for a return to consuming goods from local businesses rather than continued investment in large corporations that already have ownership over most of the brands we buy. Perhaps most importantly, in regard to human psychology, degrowth can lead to enhanced community-building, where there is less emphasis on individualistic (self-reliant) living. This presentation will explore the societal and individual benefits of degrowth through the lens of critical-community psychology and psychoanalysis. It will consider the roots of growthism through a psychoanalytic lens, considering the following questions: How are our capitalist tendencies shaped by certain aspects of human nature? How do they influence and create our desires? Recent research has begun to pose these questions in response to not only the circumstances of today's world, but to those of our looming future. Ultimately, this presentation will consider the potential for strategic degrowth as a means of developing more promising directions for societal development.

Ami Figuerrutia

PA - Lafayette College

Discipline: Economics

Authors:

Abstract Name: Business Case: People with Disabilities

This paper aims to determine whether a potentially causal relationship exists between the inclusion of people with disabilities in a company and that company's revenue, sales, profit, and market valuation. As such, this paper contributes to the academic literature examining the effects of corporate social responsibility (CSR) on firm outcomes. Most of this literature finds a positive correlation, but doesn't focus on the disabled population. To test this hypothesis I use the Disability Equality Index, assembled by the American Association of People with Disabilities and Disability:IN, to identify companies where people with disabilities are not structurally marginalized. I merge this index with financial and other firm level data obtained from Standard & Poor's Compustat for the years 2015 to 2019. Although the dataset goes up to 2023, I limit the timeframe of this paper to avoid the economic shock caused by the pandemic. The finalized dataset consists of longitudinal data on over 200 firms. First, I structure the index into a dataset sorted by year and firm. Because firm name usage varies (e.g., EY vs Ernst and Young) by year, I employ STATA's fuzzy matching technique to identify a firm's presence. Then I merge the resulting dataset with the Compustat data. However, not all firms in Compustat are in the index. Consequently, I use propensity score matching to obtain a more homogeneous control group. Lastly, I estimate a two way fixed effects model to test my hypothesis and use event study analysis to check for dynamic effects. These models control for industry, capital expenditures, number of employees, assets and survey year, to test if firms scoring over 80% on the index enjoy greater revenue, sales, profit, and market valuation. Preliminary interpretations indicate that results are sensitive to model specification, but there appears to be a strong relationship.

Madison File

NC - University of North Carolina at Charlotte

Discipline: Psychology

Authors:

#1 Victoria Scott

#2 Annalise Tolley

Abstract Name: Strengths and Challenges of School-Based Health Centers in South Carolina: Findings and Insights from Assessment

A host of barriers ranging from individual to macrosystem factors can prevent youth and adolescents in the United States from accessing timely healthcare. School-based health centers (SBHCs), can mitigate common barriers to care by providing primary care services directly to students in school settings. Despite the importance of SBHCs for youth and families, the capacity of these healthcare organizations to serve youth, particularly youth mental/behavioral health, is not well understood. In October 2024, the Youth Access to Psychiatry Program administered a state-wide asset and needs assessment to understand the landscape of school-based health (SBH) programs and centers in South Carolina. The assessment was distributed via an online survey to all identified SBH program administrators within South Carolina (n=17 SBH programs representing 292 SBHCs). Twelve SBH programs responded (71% response rate), reflecting 254 SBHCs. The assessment examined a variety of organizational factors, including operational and clinical characteristics. Results revealed that 86% of programs offer behavioral health services, 57% offer vision, 7% offer oral, and 57% offer health education resources. The majority of SBH programs (93%) indicated that they had access to mental health professionals within their program. Among telehealth programs offered, oral health care emerged as the sector with the greatest gap in service delivery across SBHCs. Barriers to care included limited client interest (58%), low-quality internet (50%), and a shortage of dedicated telehealth providers (50%). In this poster session, additional findings will be discussed along with implications for youth access to health services in school settings. Findings from the needs assessment are essential in evaluating the current strengths and growth edges across SBHCs.

Peter Filfil

NJ - New Jersey City University

Discipline: Biology

Authors:

#1 Cristina Montagna

#2 Yokechen Chang

Abstract Name: Mitotic Abnormalities in HPV+ Integrated Cervical and Intestinal Carcinomas by Histopathological Evaluation

The majority of cervical cancers are caused by the human papillomavirus (HPV), which also plays a major role in the development of various other cancers, including those of the head and neck, anal, vulvar, and penile regions. HPV causes chromosome instability through abnormal mitosis, leading to genomic instability, which is crucial for cancer development. This study sought to determine the spatial distribution of mitotic aberrations in HPV-positive integrated cervical carcinomas and compare chromosomal instability (CIN) caused by HPV to CIN in HPV-negative intestinal tissues, as CIN is a common feature of tumors. Through histological assessment. HPV-positive intestine and cervical tissues were used as controls. When compared to HPV-tissues, a comparative examination showed that HPV+ tissues exhibited a notably larger quantity of mitosis cells and aberrant mitotic events, such as multipolar mitosis, lagging chromosomes, and misaligned metaphase. These abnormalities suggest that normal cell division mechanisms are disrupted and there is an increase in genomic instability in HPV+ tissues. The study found that the viral oncoproteins E6 and E7 were important in causing these aberrant mitotic processes, which in turn led to the cells' malignant properties. The work effectively delineated the tissue regional distribution of mitotic aberrations using Hematoxylin and Eosin (H&E) staining and high-resolution scanning techniques, offering important insights into the processes of HPV-driven carcinogenesis. This study clarifies the significant influence of HPV integration on the mitotic cycle and cellular changes, which advances our knowledge of HPV-related cancer development

Laura Finlayson

UT - Utah State University

Discipline: Film/Photography Studies

Authors:

#1 Li Guo

Abstract Name: Exploring the Axioms of Reality: A Comparison of Parasite (2019) and The Dark Forest (2008)

Liu Cixin's renowned sci-fi novel The Dark Forest introduces readers to two axioms of cosmic sociology. The first axiom is survival is a primary need of civilization, the second axiom is civilization continuously grows and expands. These two axioms operate following two important concepts, which are chains of suspicion and the technological explosion. Drawing from the novel's social cosmological theory, this presentation offers a reconsideration of Bong Joon-ho's directed film Parasite (2019), which portrays two families of drastically different status and their positions in the class system in Korea. The Kim family's house in the film is also an example of society's class system. While the wealthy high class is ever-growing and changing. The lower class is repressed and made to stay in the same poverty cycle, never able to break the cycle. [good; generational poverty] The lower class can never "go up the stairs" without fearing for their life. Because they might be discovered for what they really are. While the wealthy upper class can bask in the sun, buy new things, and not worry about life. At the end of the movie, Ki-woo says that he wants to make enough money to save his father and let him out of the basement. This imaginative arrangement in the son's mind however fosters multiple and sometimes conflicting interpretations. Both audiences from middle and upper-middle class and grassroots background can relate to the characters, and find a way of eliciting moral message from it. The film does not simply portray the Park family through the lens of victimized and marginalized social members, but focuses on the seemingly irreducible distance between different social classes. As the ending of the film shows, for the Park family, their struggles of living in poverty and the lower class are generational and perpetual.

Alexander Fischette

NY - St. John Fisher College

Discipline: Biology

Authors:

#1 Jonelle Mattiaccio

#2 Matthew Slowinski

Abstract Name: Investigation into the effects of Pseudomonas aeruginosa bacteriophage on cytokine expression in macrophages in vitro

Antibiotics have long been the go-to therapy for bacterial infections, but the rise of antibiotic-resistant bacteria makes for a reduction in both the effectiveness and quality of antibiotic treatments. Both healthcare and the economy are seeing the harsh reality that comes with antibiotic resistant bacterial infections, an alternative or coupled therapy is needed. Bacteriophages which are viruses that infect and lyse bacterial cells, offer a promising alternative. Discovered in the 1900s by Felix d'Herelle, phage therapy was initially viewed as a potential for bacterial infection therapy, however interest in phage declined after antibiotics emerged in the 1940s. Phage therapy has regained interest recently due to an increase in antibiotic resistance. Recent clinical trials show promise, but more research is needed to understand the immune system's impact on phage therapy. This project utilized bacteriophage of Pseudomonas aeruginosa, which are opportunistic pathogens common in hospitals. Most often seen as secondary infections to immunocompromised individuals. Pseudomonas aeruginosa resistance has spread to a large proportion of antibiotics on the market. This project

examines pro- and anti-inflammatory cytokine production in macrophage cells exposed to varying concentrations of *Pseudomonas aeruginosa* phage. Phage stocks were endotoxin-purified to remove contaminants that could trigger an immune response. Macrophage cells (RAW264.7) were incubated with phage for 24 hours, and total RNA was isolated to study cellular responses. DNase treatment conditions were tested and optimized before cDNA synthesis, using GAPDH primers as a control for RT-PCR. Current work focuses on analyzing pro-inflammatory cytokines (TNF α , CXCL5, IL-1B, IL-1A, and CXCL1) using RT-PCR to monitor their regulation. This analysis aims to provide insights into the immune responses of macrophages to bacteriophage exposure.

Hailey Fish

WI - University of Wisconsin-Whitewater

Discipline: Psychology

Authors:

#1 Heather Guiney

#2 Iliana Aviles

#3 Heather Niemeier

Abstract Name: The Role of Experiential Avoidance in Disordered Eating Attitudes and Behaviors and Alcohol and Nicotine Consumption in College Students

Young adulthood is a high-risk developmental stage for multiple potentially harmful behaviors including disordered eating, alcohol misuse, and nicotine use. Experiential avoidance refers to the tendency of an individual to avoid or control distressing psychological experiences. Experiential avoidance has been used to understand why individuals, such as college students, engage in high-risk behaviors. Some individuals may use alcohol or nicotine to avoid or control distressing psychological experiences, such as disordered eating attitudes and behaviors. Experiential avoidance may play a mediating role between disordered eating attitudes and behaviors and alcohol and nicotine use. Much of the previous research has focused on these relationships in women; this study includes college students of all genders and utilizes updated assessment measures validated in all genders. This study explores the relationships amongst disordered eating attitudes and behaviors and alcohol and nicotine consumption, and how these behaviors could be mediated by experiential avoidance.

Hanna Fish

PA - Lafayette College

Discipline: Economics

Authors:

#1 Adam Biener

#2 Lui Hongxing

#3 Elaine Reynolds

Abstract Name: The Economic Burden of Obesity in the Elderly

Prescription anti obesity medications offer potential benefits for improving health outcomes but access to these medications is limited due to high out-of-pocket costs and limited insurance coverage. This issue is of importance for the elderly, who do not have guaranteed access to these medications because they are not fully covered by their insurance. Currently, there are very few studies of obesity costs in the elderly and most

published studies were from before recent developments such as Ozempic of diabetes. This paper will estimate the potential cost savings and benefits of the elderly having better access to anti obesity medications using more recent data. The study will use 2008 - 2019 data from the Medical Expenditure Panel Survey which has information from large scale surveys of Americans, their families, medical providers, and employers. It is an ongoing study focused on the use and spending on healthcare conducted by the Agency for Healthcare Research and Quality. I will subsample to elderly adults aged 65 and older. I will estimate a regression model to analyze the relationship between BMI and healthcare expenditures for elderly adults. My models will control for individual demographics, insurance type, employment and retirement, and other health conditions. I will use the model to perform a cost benefit analysis for newer anti obesity medications; costly but effective medications which studies have shown have a weight loss effect of about 15%. I will compare predicted medical spending for high BMI individuals to their predicted spending at lower levels of BMI reflecting the weight they could lose were they to take the new anti obesity medications. Based on the efficacy of these drugs and their impact on overall healthcare spending, I will provide insights for policymakers to improve drug access and address socioeconomic disparities in obesity treatment for the elderly.

Hailey Fisher

MI - University of Michigan - Ann Arbor

Discipline: Education

Authors:

#1 Dr. Bridget L. Maher

Abstract Name: The Impact of Racial Representation in Educational Spaces

A general sense of belonging established within educational spaces is crucial to the success and motivation reflected among students. This may be especially true and important for racially minoritized students, who have historically faced marginalization and lack of inclusion in the dominant narratives of schooling and knowledge. This study aims to evaluate the presence of racial representation within multiple educational media and its influence on Black female students in both elementary and high school settings. This evaluation will help establish how these forms of media impact individual identity development and perceptions of other identities students are exposed to through educational content. This study takes place within a unique university and public school partnership in a large Midwestern city. This study documents experiences across elementary and high school contexts as part of a single educational campus. Data will be collected through ethnographic methods, observations, and in-situ interviews with teachers and students in elementary and high school contexts. These observations will investigate what material realities, figures, texts, people, and more exist in these spaces and how they shape the identities of students engaging in learning in the space. In this in-work-in-progress study, I anticipate uncovering potential positive impacts of the racial concordance students find within different demonstrations of racial representation and the simultaneous positive impacts of accessing content that contrasts with their individual identities. I also anticipate the various racially representative aspects of these educational settings will reflect the individual connections students have with this media. Furthermore, educational motivation, perceptions of learning, and sense of belonging in different educational spaces and domains will be investigated. Ultimately, I foresee this study continuing to uncover the significance of diverse media embedded within the two school settings in relation to the positive development of student identity, motivation, sense of belonging, and perceptions of the world.

Jillian Fitzpatrick

OH - Capital University

Discipline: Biology

Authors:

Abstract Name: Infection Rates of Chytrid Fungus and Ranavirus in Amphibians from Southeastern and Central Ohio

Amphibians are the most threatened group of vertebrates due to emerging infectious diseases and other human impacts. *Batrachochytrium dendrobatidis* (Bd), a chytrid fungal pathogen, and Ranavirus (FV3), a deadly virus infecting amphibians and reptiles, have been implicated in serious declines and extinctions although little is known for the Midwest region of the United States. The goal of this research is to evaluate the prevalence of both Bd and Ranavirus at the Primmer Outdoor Learning Center (Logan, OH) and Highbanks Metro Park (Westerville, OH). Amphibians were hand-caught and live-trapped during three sessions at the streams and wetland at Primmer and a pond at the Dragonfly Day Camp at Highbanks during Fall of 2024. Swabs and tissue samples were collected from 22 individuals including pickerel frogs (*Lithobates palustris*), northern green frogs (*Lithobates clamitans melanota*), American bullfrogs (*Lithobates catesbeianus*), and southern two-lined (*Eurycea bislineata*) and dusky (*Desmognathus fuscus*) salamanders. To date, DNA extraction and duplex real-time qPCR testing has been completed on 14 oral swab samples from Primmer and 2 oral swab samples from Highbanks. Taqman-based assays were run in duplicate and consisted of forward and reverse primers with probes labeled with FAM-MGB and VIC-MGB, TaqPath BactoPure Microbial Detection Master Mix, and RT-PCR water. Negative controls and a gBlock designed positive control containing both targets were serially diluted and included on each plate. Preliminary results showed that 14% (2/14) of samples from Primmer were positive for both Bd and Ranavirus from an American bullfrog tadpole and a Northern green frog tadpole with 0% (0/2) from Highbanks. Additional fieldwork at three Metro Park sites in Central Ohio and qPCR testing is planned for February-March 2025. This research is important to better understand threats to biodiversity in amphibians as well as aid in conservation efforts in Ohio.

dakota flanagan

WV - West Virginia University

Discipline: Interdisciplinary

Authors:

#1 Jordan Masters

#2 Anne McFarland

#3 Nichole Van Beek

Abstract Name: The Effects Skill-building has on Self-esteem and Self-Efficacy

Art therapy is a new field, as it develops new models and methods should be developing through research. Taking a skill building focus and examining the relationship between mental health and learning new skills is a new approach this research seeks to develop The purpose of the research is to observe the relationship between skill building and increased self-esteem and self-advocacy, With the goal of using the information gathered to form new methods of art therapy. Participants will build the chosen skill in this study creating watercolor paints from scratch was chosen for its simple but engaging processes. The participants will take a survey before and after the workshop for data on initial self-esteem and post self-esteem. Using the data collected researchers will infer whether there is a positive correlation or not. It is anticipated that the workshop will make people feel better about themselves and have a positive impact on self-advocacy. If there is a confirmed positive correlation, this will open opportunities to expand research on the topic. Developing new models within art therapy will expand the kinds of treatment plans available to clients and expand the overall knowledge of art as therapy.

Brady Flanagan

IL - Loyola University of Chicago

Discipline: Psychology

Authors:

#1 Robert Morrison

Abstract Name: Examining Interactions between the Default Mode Network, Executive Control Network, and Salience Network

The triple network model proposed by Menon et al. plays a major role in many psychiatric illnesses, including anxiety disorders, schizophrenia (SCZ), and autism spectrum disorder (ASD). The triple network model involves the interplay of activity between the Default Mode Network (DMN), which plays a role in mind wandering, creativity, and social cognitive processing, the Executive Control Network (ECN), which plays a role in working memory, decision making, and goal-directed behavior, and the Salience Network (SN), which is proposed to play a role in modulating the activity between these two networks. While research has explored the applications of the triple network model, the dynamics upon which these three networks interact is still relatively unknown. In this study, we will use transcranial Direct Current Stimulation (tDCS) aimed at the Posterior Cingulate Cortex (DMN), dorsolateral Prefrontal Cortex (ECN), and the Anterior Insula (AI) to modulate activity between the three networks. As part of the study, we will verify the stimulation of these networks with a modified version of the Multi-Source Interference Task (MSIT), incorporating a Stop Signal Task (SST) into the trials. We predict that stimulation of the DMN would result in a decrease in performance at the MSIT, stimulation of the ECN would lead to an increase in performance at the MSIT, and stimulation of the SN would result in an increase in performance at the MSIT as well as the SST.

William Flannery

VA - Christopher Newport University

Discipline: Chemistry

Authors:

#1 William Flannery

#2 William Kessler

#3 Matthew Shackelford

#4 Jeffrey Carney

Abstract Name: Final Steps of Torreyunlignan D Total Synthesis

Our research group has investigated the synthesis of the Torreyunlignans A-D, a family of natural products isolated from *Torreya yunnanensis*. These compounds have shown high affinity for inhibition of the phosphodiesterase 9A (PDE9A) enzyme, decreasing the degradation of cyclic guanosine monophosphate (cGMP), a known treatment for various heart conditions, diabetes, Alzheimer's disease, and other neurodegenerative diseases. Retrosynthetic analysis revealed a synthetic route for formation of these compounds by coupling phenylpropanoid fragments. Previous work on a model compound developed this pathway for a practical synthesis. Recently, work has focused on the final synthetic steps for Torreyunlignan D: a Pd-catalyzed Tsuji-Trost coupling reaction, a diastereoselective and lithium aluminum hydride (LAH) reduction, and acetal formation. The Tsuji-Trost coupled the first two phenylpropanoid units, after attachment of an allylic acetate and β -keto ester. A cerium-promoted reduction gave a selective yield towards the targeted anti-diastereomer. Then the LAH reduced this diastereomer from a β -hydroxy ester to a diol compound. The final step in this total synthesis was attachment of the final phenylpropanoid (2-methoxycinnamaldehyde)

using tosylic acid to drive acetal formation. Completion of the synthesis of Torreyunlignan D provides insight to the successful formation of the other three natural products, as well as supports investigation into the biological activity and medicinal application of this family of compounds.

Elaina Fleming

NC - University of North Carolina at Charlotte

Discipline: Geography/Geology

Authors:

#1 Colleen Hammelman

Juliette Gwanfogbe

Abstract Name: The Impact of the COVID-19 Pandemic on Tropical Crop Cultivation in Eastern Thailand

This research sought an understanding of how the COVID-19 pandemic impacted tropical crop cultivation in Eastern Thailand, primarily in the Chanthaburi province, a critical agricultural hub. The province supplies goods domestically as well as internationally, emphasizing crops such as durian, rambutan, and mangosteen. Globally, the COVID-19 pandemic brought unprecedented challenges to agricultural systems. Despite ongoing research on the pandemic and its impacts on global systems, there is a need to investigate changes implemented that remain or are expected to shift long-term practices. This research was conducted on farmer adaptations and lasting consequences identified through in-depth interviews and farm visits in Eastern Thailand. The research team completed structured interviews with 52 farmers and 10 in-depth interviews with key stakeholders. Data collection took place between June and July 2024. The research found that the region faced three primary challenges: labor shortages due to disrupted migrant worker flows, shifts in market demand and channels from changes in consumer behavior and supply chain disruptions, and evident mental shifts partially due to a lack of government support. Agricultural producers in the Eastern region of Thailand responded to pandemic disruptions at the national and international levels by pursuing new efficiencies on their farms, seeking out new markets, attending more to health and hygiene, and crop diversification to build self-efficiency. Many of these shifts continue post-pandemic in ways that produce lasting consequences for environmental, social, and economic systems. Our results provide insights into social system changes produced by shifting relations between consumers and producers, farm owners and farmworkers, farm-to-farm cooperation, and economic system changes in the expansion of online markets and value-added goods. These findings have important implications for agricultural policy and resiliency planning, informing other regions with similar agricultural systems, and contributing to understanding sustainable food systems and adaptation in the face of global challenges.

macey fletcher

OK - Oklahoma State University

Discipline: Engineering

Authors:

#1 Hong Je Cho

Abstract Name: The Adsorption of Per- and Polyfluoroalkyl substances (PFAS) using Zeolite

Per- and poly-fluoroalkyl substances (PFAS) are persistent organic pollutants commonly found in water, linked to serious health issues such as cancer and birth defects. Due to their environmental persistence, effective methods are needed for PFAS removal. One potential solution is the use of Zeolite Beta, a porous

silicon crystal with known adsorption properties. While some research has explored Zeolite Beta's ability to adsorb PFAS, there is limited understanding of how its hydrophilic or hydrophobic properties influence PFAS removal. This study aims to investigate the impact of varying hydrophilicity/hydrophobicity on PFAS adsorption by Zeolite Beta. The hydrophobicity arises from siloxane (Si-O-Si) groups, while hydrophilicity is due to silanol (Si-OH) groups that interact with water via hydrogen bonding. The goal is to synthesize Zeolite Beta with different degrees of hydrophilicity and hydrophobicity and evaluate its PFAS adsorption performance. Experimental conditions, including adsorption time, temperature, pH, and Zeolite varieties, will be tested. Aqueous PFAS solutions will be analyzed before and after treatment using Liquid Chromatography-Mass Spectrometry (LC-MS). Preliminary trials with Zeolite Beta (CP814E) and PFOA show promising results. This study will address key gaps in understanding the optimal conditions and properties of Zeolite Beta for efficient PFAS removal, contributing to improved water treatment strategies.

Kylie Fligg

AZ - Northern Arizona University

Discipline: Nursing and Public Health

Authors:

#1 Whitney Brown

#2 Alexis Robbins

#3 Makayla Moore

Abstract Name: Providing Winter Warmth in Flagstaff Arizona: Providing Health Education and Resources to the Local Community

Project Purpose: The purpose of our health intervention was to assist in lessening the impact of lack of access to winter warmth resources and education; as well as researching and reducing any associated health disparities and determinants. We used the diverse, centralized, and well-representative population of Flagstaff Family Food Center (FFFC) as our basis for intervention. **Background:** Coconino County has a poverty level of 16.9% and a below-average overall health score, with a score of 42 out of 100. FFFC serves thousands of people in our community and distributed 6.7 million pounds of food in 2023. In addition to addressing food insecurity, FFFC also addresses risk factors and related issues (such as winter warmth), due to lack of access to resources. The city of Flagstaff receives over 100 inches of snow per year, and access to affordable housing and shelter can be an issue. **Methods:** Our intervention was based on the Health Belief Model. We addressed perceived susceptibility and severity, reduce barriers, and increase self-efficacy around winter warmth. We organized, promoted, and facilitated a clothing drive with a local church and additionally created winter relief kits. These included gloves, lip balm, hand warmers, lotion, and paper infographics outlining winter relief resources, tips, hygiene/skincare, and more. We then distributed educational materials along with winter kits to clients at the food center and collected paper surveys to evaluate our intervention's effectiveness. **Conclusions:** Overall, 60% of participants indicated high levels of self-efficacy around winter warmth after our intervention. We found that the participants were very receptive and grateful for our intervention through the use of our survey. 100% of participants reported they would use at least one of the resources provided. They also expressed an understanding of the resources provided and offered suggestions for future kits.

Ethan Flood

VA - Virginia Commonwealth University

Discipline: Architecture, Construction Management, and Interior Design

Authors:

#1 Ethan Flood

Abstract Name: Hostile Architecture in Philadelphia Public Spaces: Producing a Physical and Social Deterrent for Unhoused People

Cities across the globe have enforced hostile architecture and other forms of defensive design implemented through urban design methods, such as Crime Prevention Through Environmental Design (CPTED) and the "broken window model of policing." Defensive design methods seek to combat crime and poverty in an attempt to improve the image of cities. The emergence of hostile architecture is prevalent in Philadelphia, Pennsylvania through the addition and removal of amenities; including proper seating, accessible pathways, and raised surfaces; to exclude groups such as the unhoused and skateboarders. This comprehensive literature review aims to evaluate hostile architecture within Philadelphia that attempts to render public spaces unusable to facilitate the relocation of unhoused individuals from those public spaces. The locations of public spaces

within Philadelphia will further narrow to Center City and surrounding areas that experience an influx of tourists. The analysis of peer-reviewed studies on hostile architecture internationally finds that implementing defensive design discourages social connectivity within spaces and encourages crime. This review examines public opinion regarding anti-homeless design through architecture, social, and environmental journals. The goal of this review is to highlight the necessity of certain measures of hostile architecture within Philadelphia, including the intent behind ground spikes and inaccessible seating implemented by the city of Philadelphia. Cities may attempt to disguise the reason for defensive design installation by arguing that hostile architecture may provide increased accessibility for the elderly. These findings contribute to a larger understanding of hostile architecture and discussion of apparent and implicit defensive fixtures within Philadelphia and larger metropolitan cities.

Luis Flores

TX - The University of Texas at San Antonio

Discipline: Mathematics

Authors:

#1 Luis Flores

#2 Spalding Garakani

Spalding Garakani

Abstract Name: the impact of population heterogeneity and migration on vaccination strategies and disease dynamics in mpox

Mpox is a viral zoonotic disease, a member of the Orthopoxvirus genus, and is characterized by rashes or skin lesions primarily on the face, palms, and soles. In 2024, a significant outbreak occurred in the Congo, involving a new strain of the virus. Previous modeling efforts commonly assumed a population divided into two distinct groups without migration and, from an epidemiological perspective, treated population heterogeneity as negligible. In such simplified frameworks, neither interactions nor transmission rates depended on an individual's group. Yet, in realistic populations, interactions are inherently heterogeneous—individuals may have different contact patterns and risk exposures depending on their group affiliations, geographic settings, or socio-economic factors. This heterogeneity can produce differing disease burdens across subpopulations, as seen in the greater prevalence of Mpox in urban areas relative to rural ones. Utilizing structured population approaches, which incorporate age-stratified mixing patterns, we can enhance our game-theoretic framework to more accurately display these complex relationships. The work presented here extends existing game-theoretic models by incorporating migration between groups, heterogeneous transmission rates, and scenarios where vaccines may have limited efficacy or transmission rates are high. We analyze a system of ODEs to characterize disease-free and endemic equilibria, using game theory to identify Nash equilibria of vaccination strategies under realistic conditions. Analytical expressions and sensitivity analyses reveal how migration rates, interaction heterogeneity, and vaccine efficacy influence long-term disease outcomes. Numerical MATLAB simulations will validate these findings, showing how parameter variations and heterogeneity affect equilibrium vaccination behavior and disease prevalence. By incorporating these changes into our modeling framework, we aim to show how realistic population structures and interaction patterns can lead to multiple Nash equilibria that shape disease trajectories and guide more effective public health interventions.

Luis Flores Sanchez

NM - University of New Mexico Main Campus

Discipline: Physics and Astronomy

Authors:

#1 Luis Flores Sanchez

#2 Sally C. Seidel

#3 Radek Novotny

Abstract Name: Precise modelling of the B_s^0 invariant mass distribution in the B_s^0 decays to $J/\psi(\mu^+\mu^-)\Phi(K^+K^-)$ channel using data from the ATLAS experiment at the LHC

A model of the B_s^0 meson mass is being developed using data from decays in the channel $B_s^0 \rightarrow J/\psi(\mu^+\mu^-)\Phi(K^+K^-)$ using information from the ATLAS experiment at the LHC. The data were collected during Runs 2 and 3. Measurement of the $B_s^0 \rightarrow J/\psi(\mu^+\mu^-)\Phi(K^+K^-)$ decay probes CP violation due to interference between a direct decay and a decay with B_s^0 – anti B_s^0 mixing. Precise fits of peaking and combinatorial backgrounds will be applied. Assessment of the stability of the reconstructed mass over time is an essential contribution to the understanding of the systematic error of the measurement of the branching ratio.

Andrea Florian

TN - Belmont University

Discipline:

Authors:

Abstract Name: Flexibility within a Framework: Engaging Undergraduate Students in Cancer Research

Engaging undergraduate students in independent scientific research presents unique challenges, including teaching advanced laboratory skills and helping students grasp background literature deeply enough to develop meaningful experimental questions, all within limited a time frame. I developed a research system that addresses these challenges by providing students with guided flexibility, allowing them to explore personalized research questions within a structured framework. In this work, students investigate the potential synergy between traditional chemotherapies and readily available supplements on cancer cells. Students are empowered to tailor their projects by selecting a cancer type, a chemotherapeutic agent, and a supplement of their choice. Despite this flexibility, all projects follow a shared experimental flow. Initial experiments assess the effects of single agents and their combinations on cancer cell proliferation, establishing baseline efficacy. Follow-up studies are conducted to explore mechanistic outcomes, including cell migration, tumorigenesis, and apoptosis. The streamlined process facilitates efficient management of multiple student projects and encourages collaboration and troubleshooting within the research cohort. To demonstrate the success of this approach, I have compiled results from four different student projects that examine a variety of cancers, chemotherapies, and supplements and demonstrate varying degrees of synergy. This research strategy offers a scalable model for facilitating student project ownership within a manageable framework.

Madison Flynn

WI - Carthage College

Discipline: Communications

Authors:

Abstract Name: The Role of Company Culture in Employee Retention: A Focus on Generation Z

This paper examines company culture's profound role in employee retention while emphasizing Generation Z's unique needs and expectations as they enter the workforce. The literature review explores the different definitions of company culture, its impact on employee satisfaction, productivity, and turnover, and the values and challenges of Gen Z workers. An analysis of employee insights and customer reviews was conducted using Organizational Commitment theory to analyze two local coffee shops in Kenosha, Wisconsin: Harborside Common Grounds and Anna's on the Lake. These contrasting businesses demonstrate how cultural practices impact retention and overall business success. The results of this study suggest that aligning company culture with the evolving expectations of Generation Z will result in workplaces that retain talent and drive long-term success for organizations.

Isabella Flynn

NY - Cooper Union for the Advancement of Science and Art

Discipline: Engineering

Authors:

#1 Isabella Flynn

#2 Michelle Rosen

Abstract Name: CubeSat Payload: Thermal Regulation Applications of E-Ink for Small Satellites

This research explores the effectiveness of E-paper as a potential thermal management system for small satellites. E-paper is an electronic display that consists of a film filled with a clear fluid and charged ink particles. When a field is applied to the film, it pushes or pulls the charged ink particles to or from the screen, where it will remain in that state when the field is released. When the pattern shown on the screen is not being changed, it draws negligible leakage current. Satellites in low earth orbit go from an extremely cold environment (-65°C) to an extremely hot one (125°C) within the course of 4 hours. Typically, satellites are fitted with thermal control systems. However, thermal regulation can be a high consumer of energy for electronics that must operate at consistent temperatures. These electronics are typically heated by surrounding heating element systems. Implementing a low energy thermal controller will allow for the constant thermal regulation of electronics that must operate at consistent temperatures while minimizing the power consumption of the thermal regulation system. This research presents the thermal characterization of E-paper, using a system consisting of a metal plate and an E-paper module at steady state, in which the thermal impact of radiation on the screen can be quantified. The experimental results were used to create a mapping function between the pattern shown on the screen to the coefficient of emissivity. The implementation of this lays the foundation for autonomous variable thermal control on a small satellite; usage of this low-power thermal system in orbit may improve the battery economy of small satellites.

Emma Foley

IA - Iowa State University

Discipline: Chemistry

Authors:

#1 Daniel Howell

Abstract Name: Synthesis of Mesoporous Titania-Silica Catalyst for Polyolefin Upcycling

In today's society, there are more than 7.3 billion metric tons of plastic on Earth, which has caused significant environmental pollution that is detrimental to human and ecological health. Conventional plastic recycling methods need to be revised to address this challenge because they degrade the properties of the plastic and result in a product with limited uses. An alternative to plastic recycling is chemical upcycling, which converts plastic waste into other value-added chemicals. Previous studies show mesoporous silica catalysts can upcycle plastics via catalytic hydrogenolysis. This research project aims to create a new, porous catalyst composed of titania and silica to break down polyolefin plastics into products such as lubricants, solvents, jet fuels, and diesel fuels. The checkpoints of this project are creating a desired catalyst made of titania and silica, inserting metal nanoparticles into the titania-silica structure, and testing the catalyst's performance in the hydrogenolysis reaction. We predict this new catalyst will have a higher catalytic potential because titania is more reactive than silica.

William Follis

TX - Texas Lutheran University

Discipline: Computer Science

Authors:

#1 Will Follis

#2 Ridwan Noel

Abstract Name: Evaluating Bias and User Perceptions of Generative AI Chatbots at a Liberal Arts College

This study investigates the biases of generative AI chatbots and examines how individuals interact with these tools at a liberal arts college. Generative AI is widely used for text generation and problem-solving through platforms such as ChatGPT, Google Gemini, and Microsoft Copilot. While these technologies offer significant utility, they are susceptible to spreading misinformation due to biased programming or reliance on unreliable sources. The objective of this research is to analyze the biases in chatbot outputs and assess user perspectives on their accuracy, helpfulness, and overall trustworthiness. The research employed two surveys targeting the student body at Texas Lutheran University. The first survey collected student opinions on 20 sociopolitical issues, including topics like presidential elections and firearm regulations. These responses were compared with answers generated by the three AI chatbots to identify patterns of agreement or divergence. The second survey explored students' usage of AI, focusing on the frequency of engagement, purposes for using chatbots, and their perceptions of chatbot reliability and effectiveness. The findings reveal that chatbot responses generally aligned with student opinions across most topics. However, significant deviations were observed on controversial issues, particularly those related to government policies. Students found chatbots useful for addressing straightforward queries but noted that their performance diminished when handling sensitive subjects. Additionally, the second survey highlighted that most students engage with AI tools sparingly, with many expressing a cautious approach toward the accuracy of the information provided. These results underscore the dual role of generative AI as both a valuable tool and a potential source of misinformation, emphasizing the need for critical evaluation by users. This study contributes to ongoing discussions about the ethical implications of AI and its integration into educational and societal contexts.

Alexandra Fomina

CA - Chapman University

Discipline: Computer Science

Authors:

#1 Trudi Qi

Abstract Name: Toward Personalized Virtual Reality Gait Training System for Full-Body Obstacle Avoidance Using Real-Time Motion Analysis

Human motion tracking is essential for medical evaluations, activity monitoring, and rehabilitation. When combined with virtual reality (VR), it creates safe, controlled environments to simulate real-world scenarios, making it ideal for gait training and obstacle navigation. However, current VR gait training systems often overlook the complexity of full-body obstacles and lack real-time performance assessment, limiting their utility for personalized rehabilitation therapies. This project introduces a VR system for personalized gait training with full-body obstacle avoidance. Built in Unreal Engine 5, the system simulates real-world obstacles such as branches, rocks, and logs to mimic natural environments. Sony Mocopi sensors capture full-body motion at multiple key points, while the Meta Oculus Quest 2 provides an immersive VR interface. A real-time motion analysis module employs a decision tree algorithm to classify user movements into ducking, stepping over, side-stepping, or combinations of these from body position changes and validated, personalized gait characteristic thresholds derived from rigorous data analysis collected from multiple users. To successfully avoid tree-like obstacles, the user must duck their head at least 12 cm below their initial standing position. Stepping over obstacles requires the foot to rise at least 11.5 cm above their general walking range, determined during the initial simulation phase. Side-stepping is indicated by hip sensor data: a negative value corresponds to stepping left, while a positive value signals stepping right. The decision tree first checks for ducking, followed by stepping over, distinguishing between left and right foot movements. If stepping over is not detected, the algorithm assesses side-stepping behaviors. Combinations, such as ducking while stepping over or side-stepping, are classified accordingly. Initial tests demonstrate the system's ability to detect obstacle-avoidance strategies with high accuracy in real time. Future work includes a user study, and developing machine learning models to predict optimal strategies to support personalized gait rehabilitation.

Ana Fonseca

FL - Florida International University

Discipline: Health and Human Development

Authors:

#1 Ana M Valentin Cabrera

#2 Mark J Henderson

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#5 Joshua D Hutcheson

Abstract Name: c-Abl inhibition as a therapeutic to reverse existing atherosclerotic plaque

Despite the advent of therapies that have lowered risk, cardiovascular disease remains the global leading cause of death. This “residual risk” likely exists due to a lack of therapeutics that reverse late-stages of disease, especially in atherosclerosis where plaques develop undetected as fats deposit in the arterial wall. In atherosclerosis, fat accumulation drives inflammation and promotes remodeling within the arterial wall, which increases the risk of plaque rupture and subsequent acute vascular complications. Vascular calcification, late-stage remodeling characterized by bone-like mineral formation, also contributes to plaque rupture by generating significant mechanical stress. Abelson tyrosine kinase, referred to as c-Abl, is a non-receptor tyrosine kinase involved in cell proliferation and signaling, and it has recently been identified as a leading contributor in activating inflammation pathways. c-Abl also phosphorylates caveolin-1 (CAV 1), a plasma membrane scaffolding protein involved in vascular calcification. Given its known role in modulating both inflammation and calcification, we hypothesize that c-Abl inhibition could target the two key drivers of late-stage atherosclerosis. Our collaborators at the National Center for Advancing Translational Sciences

(NCATS) recently developed allosteric c-Abl inhibitor Neurotinib, which has enhanced pharmacokinetic and pharmacodynamic properties that make it well-suited for drug development. This study aimed to determine whether Neurotinib could prevent and reverse late-stage atherosclerosis. Neurotinib was administered to the Apoe^{-/-} murine model of atherosclerosis, where the subjects were placed in an untreated control group, a group receiving exclusively Neurotinib to assess prevention, or a group that received Neurotinib after development of atherosclerosis to assess reversal. To study associated mechanisms involved in calcification, Vascular Smooth Muscle Cells (VSMCs) were cultured and exposed to osteogenic media, inducing vascular calcification in vitro. These VSMCs were treated with Neurotinib at different concentrations (0.5 μ M and 1.0 μ M) and endpoint analyses assessed mineral formation and the elaboration of inflammatory cytokines.

Daniela Fonseca

FL - Miami Dade College

Discipline: Psychology

Authors:

#1 Trinidad Argüelles

#2 Erik Belokon

#3 Miguel Pérez

Abstract Name: The Impact of Language Barriers on Therapy-Seeking Behavior Among Bilingual Immigrant College Students

Language barriers can significantly affect therapy-seeking behavior among bilingual immigrant college students, limiting access to critical mental health resources. This study combines a comprehensive exploration of existing research with an empirical approach to address the mental health needs of this population. By integrating prior findings with newly collected data, the project aims to provide actionable solutions to reduce these barriers. The research focuses on designing and conducting surveys at Miami Dade College, starting with the Eduardo J. Padrón Campus. These surveys will assess bilingual immigrant students' mental health needs, their likelihood of seeking therapy if offered in their native language, and perceived obstacles to accessing mental health care. Insights gathered will inform the development of a multilingual text message crisis line as a scalable and accessible resource tailored to the needs of diverse student populations. The findings aim to demonstrate the critical importance of culturally competent mental health services and advocate for systemic changes, such as increasing the availability of bilingual therapists and expanding training opportunities for mental health professionals. This project emphasizes the role of language accessibility in fostering stronger therapeutic relationships, improving emotional expression and identity, ultimately encouraging students to seek the support they need in the more appropriate, comprehensive, flexible ways. By integrating existing literature with new data, this study contributes to a broader understanding of therapy-seeking behavior among bilingual immigrant students and underscores the need for innovative, linguistically inclusive mental health solutions in multicultural communities like Miami.

Mayra Fonseca

CA - California State University - San Marcos

Discipline: Nursing and Public Health

Authors:

#1 Areya Blanco

#2 Marlene Flores

#3 Daisy West

#4 Rebecca Fielding-Miller

Abstract Name: Reducing Pathogens in Built Environments: Ethical and Responsible Translational Activities

We are working to implement a new safety tool using the bacterium *Bacillus subtilis* to reduce pathogens in built environments, such as hospitals. Antimicrobial resistant (AMR) pathogens, more prevalent in healthcare settings, pose significant health risks like diseases and infections. *Bacillus subtilis* can aid in pathogen reduction, and our interdisciplinary team is integrating it into 3D printing technology to create probiotic surface materials. While developing this technology, it is important to investigate healthcare staff perceptions of integrating this technology into their workplaces, and to communicate common themes to the biotechnology team to help refine the technology and ensure successful implementation. We conducted qualitative research, interviewing seven healthcare and lab professionals—including administrators, graduate students, and clinic managers—to gain insights into their concerns and suggestions. We then analyzed six of the transcribed interviews and used Google Sheets and MAXQDA to make a codebook, then identified common themes. Participants expressed key concerns regarding safety, cost, and effectiveness. There were significant worries about the potential risks associated with the technology, and many asked if it complied with hospital regulations. Questions arose about the initial investment for purchasing and installing the technology and potential hidden expenses such as maintenance and repair. Participants sought a clearer understanding of how the technology operates and its benefits. Ensuring the technology is safe for users, affordable, and proven effective would be crucial in gaining public trust and acceptance. Moving forward, we plan to conduct additional interviews with hospital staff, including doctors, nurses, and janitors, to assess their comfort with working in an environment where this technology is present and to understand its potential impact on their routines. Additionally, we aim to advance to the next phase by testing the technology in a hospital setting, allowing us to observe its real-world application and gather more comprehensive data.

Christian Foti

LA - Louisiana State University, Baton Rouge

Discipline: Physics and Astronomy

Authors:

#1 Frank Arturi

#2 George Tabatadze

#3 Brian Miller

#4 Firas Mourtada

#5 Lydia Wilson

Abstract Name: Advancing Dosimetry for Radiopharmaceutical Therapy with a Novel Ionizing Quantum Imaging Detector

Radiopharmaceutical therapy (RPT) shows promise for improving survival for patients with metastatic prostate cancer. However, the characterization of RPT radiation dose, known as dosimetry, is underdeveloped and poorly understood. Further RPT advancement will require novel tools that can precisely measure RPT dosimetry. This project aimed to benchmark a novel system for measuring RPT dosimetry: the Ionizing Quantum Imaging Detector (iQID). The scintillator-based iQID maps individual alpha or beta emissions on a $10 \times 10 \text{ cm}^2$ detector. We tested spatial resolution by measuring the full width at half maximum (FWHM) of a collimated ($5 \mu\text{m} \times 5 \text{ mm}$) alpha-emitting source (5 mCi , ^{210}Po). We repeated the spatial resolution test for two scintillator materials (ZnS:Ag and Gaddox) and at 17 positions on the detector surface. To ensure placement reproducibility, a custom holder was designed and printed on a Bambu Lab X1-Carbon printer. We tested variations in FWHM with position via Bonferroni-corrected Spearman's Correlation ($\alpha=0.02$). The number of alpha particles detected from a $50.2 \pm 1.1 \text{ Bq}$ source (^{243}Am , ^{242}Pu , and ^{239}Pu) over 48 hours quantified sensitivity. Finally, we quantified uniformity via the variation in total particles detected from 200 Bq of ^{210}Po at 17 positions on the detector surface. The FWHM averaged $57.35 \pm 4.36 \mu\text{m}$ with ZnS:Ag and $57.29 \pm 4.78 \mu\text{m}$ with Gaddox. FWHM was insensitive to position on the detector ($p \geq 0.03$). The sensitivity measurement

yielded 4,241,627 counts, representing 48.69 ± 0.02 Bq and 97% sensitivity. Uniformity tests revealed a significant variation in counts detected with radial distance from the detector center with a loss of 450 counts/mm from the center. Our results revealed the novel iQID can identify individual alpha emissions with high sensitivity at spatial resolutions approaching the cellular scale. However, corrections for non-uniform response may be needed. With advanced RPT dosimetry, precision RPT can offer optimal cancer management to patients with metastatic prostate cancer.

Sofia Fraile

FL - Florida International University

Discipline: Psychology

Authors:

#1 Aaron Mattfeld

Abstract Name: Associations Between Trace Eyeblink Conditioning and Hippocampal Subfield Structure in 4-to-6-Year-Olds

The brain is integral for learning and memory, with no region more important for learning facts and events than the hippocampus. This region develops slowly and is linked to academic success. Understanding functional development will have important consequences on academic achievement and life outcomes for many children. No reliable and valid measure to assess hippocampal function in very young children is currently available. Trace eye-blink conditioning (EBC) is a well-established task with a clear link to hippocampal function and has been extensively used to investigate associative learning in children as young as a few months old. Previous work by our group has shown a relation between trace EBC and hippocampal development. The current study aims to re-examine the relation between trace EBC and hippocampal development by replicating our prior findings in a larger sample and extending our results to consider the subfields of the hippocampus. The hippocampus' cornu Ammonis (CA) region is made up of four main subfields: CA1, CA2, CA3, and dentate gyrus (DG). In general, these are thought to have different functional attributions with the DG/CA3 being important for fine-grain memories. As part of a larger study, we collected structural MRI and trace EBC from 4–6-year-olds. We preprocessed and analyzed the structural data to extract volumetric information of the hippocampal subfields. We anticipate that DG/CA3 subfield will be associated with greater percentage of conditioned responses and more accurate response latency timed to the unconditioned stimulus. These results will be important because they will offer further proof of the relation between hippocampal structure and performance on trace EBC – thereby providing a task to assess hippocampal function in very young children.

Grace Franceschi

MN - University of St. Thomas, Minnesota

Discipline: Interdisciplinary

Authors:

#1 April Eichmeier

Abstract Name: Pitch Perfect: Gender Doesn't Matter, but a Great Story Does

There is a growing desire for more gender representation in business, especially in entrepreneurial startups and the venture capital industry. Various studies have explored why there is a gap between male and female entrepreneurs who receive funding for their businesses, and many have explored gender- or sex-based biases

as potential causes. Other studies have examined that narratives are useful tools for persuasion. This experimental study explores the potential of these topics through an online survey with a national sample (N = 276), testing the effect of storytelling on the participant's willingness to fund an entrepreneur. Treatment included stories where the gender of the entrepreneur was specified, and the control condition which used the same story but with an unspecified gender. In the results of our study, the gender of the respondents was not significant, which is different from previous assumptions. Instead, the results showed that a person's level of intuition and attitude towards the story were most influential when it came to the decision to fund an entrepreneur. More research is needed, but findings indicate that storytelling can close the funding gap between male and female entrepreneurs.

Ximena Franco

WI - University of Wisconsin-Madison

Discipline: Psychology

Authors:

#1 Ximena Franco

#2 Ellie Breitfeld

#3 Jenny Saffran

Abstract Name: The Role of Category Formation in How Infants Distinguish Between Object Features

Words are often used to refer to categories, rather than individual objects. For example, the word 'house' does not just refer to your home, but also your neighbor's house or a dollhouse. When learning words, infants are tasked with the challenge of identifying which objects belong to which categories. How do infants accomplish this task? One possible strategy is for infants to focus on the commonalities between objects labeled with the same word to form the correct category. For example, infants might notice that all objects called houses have doors. The current study investigates this possibility using a novel word-learning task where infants are familiarized with a series of novel objects such as shapes with different colors, patterns, and symbols on them, that are each labeled with the same novel word (e.g., "This is a boff!"). The design includes two conditions: the Common Feature and the Distinct Feature condition. All novel objects in the Common Feature condition share a commonality: a swirl symbol in the middle. In the Distinct Feature condition, the symbols of the novel objects are all different. Then using an eye-tracking test, we measured which features babies remembered about the novel objects. We hypothesized that infants would focus on the features common among the objects to help them learn the category. Results from pilot data are consistent with this hypothesis. Looking-time measures indicated that infants remembered the commonalities between objects but forgot differences. Therefore, these data reveal that when learning new words, for example, "house," babies focus on common features across objects labeled with the same word (e.g., doors and windows for "house") and ignore differences (e.g., size, shape, color, etc.) to successfully form the correct category.

Dany Franco

COL - EAFIT University

Discipline: Environmental Science and Sustainability

Authors:

#1 Daniela Zapata

#2 Sofia Giraldo

#3 Juan Pablo Jaramillo

#4 Estefania Alzate

#5 Mishelle Murcia

Abstract Name: Solid waste management in smart cities: the case of Medellin-Colombia and Seoul-South Korea.

Inadequate solid waste management contributes 5% of global greenhouse gas emissions. In Medellín, the situation is critical, with 55% of landfills near the end of their useful life and the main landfill, La Pradera, at risk of collapse. This research compares Medellín and Seoul, two leading cities in the IMD Smart City Index, focusing on their approaches to urban waste management. While Seoul utilizes advanced waste-to-energy technologies and smart pricing systems, Medellín relies on manual waste separation and informal recycling actors, highlighting the need for sustainable solutions. Key differences emerge in education and technology. Medellín aims to implement solid waste management education programs but struggles with conceptual unification. Seoul, in contrast, has integrated environmental education into its school system, creating a structured framework for effective waste management. Technologically, Medellín is conducting feasibility studies for biogas collection and flaring at La Pradera landfill. Meanwhile, Seoul uses biogas from landfills to generate electricity for 43,000 residents, significantly reducing CO2 emissions. This comparative study employs a descriptive qualitative methodology, utilizing primary and secondary sources. It reviews technological advances, plans, and projects in both cities to identify best practices and propose strategic recommendations. The findings aim to enhance waste management in Medellín, integrating technological innovation and policy frameworks for smarter, more sustainable cities. Ultimately, these measures can positively impact the environment, health, and quality of life for Medellín's residents.

Olivia Franklin

WI - University of Wisconsin-Stevens Point

Discipline: Political Science

Authors:

#1 Kimberly Zagorski

Abstract Name: From Puddles to Policies: Public Perceptions of Actions Surrounding Urban Runoff

Urban runoff is one of the hardest sources of pollution to mitigate and regulate. This is especially true in rural communities, where there are limited resources and a greater focus on problems regarding agricultural runoff. Dunn County, Wisconsin faces water quality degradation in Lakes Menomin and Tainter. Most blame these water quality issues on agricultural runoff, but with both lakes also being surrounded by residential and urban areas, other factors are at play as well. My project focuses on Dunn County residents to determine their awareness of urban runoff issues, local government action regarding urban runoff, and if opinions of sustainability and political ideology impact awareness. To understand awareness, I used survey and interview data. Surveys of Dunn County residents indicated awareness of urban runoff, behaviors designed to limit use of lawn chemicals, and views of sustainability that see it as policies directed towards preservation of local resources and environmental health. Interviews with government officials found that policy preferences and public outreach depended on their positions, with County officials centered on agricultural runoff and Local officials on runoff from construction projects and city infrastructure. My project ends with recommendations for both County and Local governments regarding public education and policy proposals.

Miles Fraser

PA - University of Pittsburgh

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Trans experience, community, and healthcare; inexorable pieces of one puzzle

The focus of this visual display is the interaction between social transgender community building and healthcare, primarily stemming from marginalization of the community through limited access to selective lifesaving procedures specifically related to identity, rather than a lack of access to healthcare altogether. The piece draws attention to the identity-focused nature and specificity of gender-affirming healthcare, whether hormones or procedures, and the resulting difficulty in acquiring either of these. The resulting collage claims that a significant aspect of social interaction for transgender people in the early days of mass media was the distribution of medical information and the acquisition of healthcare, and that it is an example of a marginalized community attempting to fill the gap left by traditional medical systems. The art piece, still in progress, is a handmade and sized-up zine- an easily distributable and copiable collection of information typically collaged and copy-printed on cheap poster paper for self-publish- featuring cutouts and collage with cultural and medical information from historical and modern magazines and newspapers. It will be 2-3 pages, possibly only one sided but ideally double, and the title page, if possible, will be mounted on a piece of wood, which has a braille image translation laser-cut into the back of it for ease of access. The creation of the zine necessitated medical research to gauge the complexity of procedures completed in the 60s and 70s, consistent utilization of the Hillman historical archives, and the use of laser cutters in a student creative space. It will also require reaching out to the university network to ensure the image description translations have been checked and are all correct.

Kaitlyn Frasher

OH - Capital University

Discipline: Biology

Authors:

Courtney Carpenter

Abstract Name: Determination of antibiotic resistance patterns isolated from Canadian Geese in Central Ohio

This study investigates the role of Canadian geese in the spread of antibiotic-resistant bacteria in urban parks in Columbus and Dayton, Ohio. Urban wildlife, particularly waterfowl like geese, are increasingly recognized as potential vectors for antibiotic-resistant bacteria due to their frequent interaction with human-impacted environments such as sewage systems, agricultural runoff, and public parks. These environments can harbor bacteria that carry antibiotic resistance genes, which can then be disseminated by geese through their feces. Fecal samples will be collected from geese in urban parks, and bacteria will be isolated and tested for resistance to antibiotics using the Kirby-Bauer disk diffusion method. The antibiotics tested will include amoxicillin, penicillin, naproxen, and tetracycline. Bacterial isolates showing resistance will undergo further molecular analysis to detect specific resistance genes, such as tet A, tet B, and tet C, using Polymerase Chain Reaction (PCR) and gel electrophoresis. Previous studies have demonstrated that waterfowl can harbor resistant strains of *E. coli* and *Enterococcus* and play a significant role in the spread of resistance genes across ecosystems. This study builds on that work by exploring the presence of resistance in urban Canadian geese and their role in disseminating resistant bacteria in human-populated environments. Identifying phenotypic resistance and genetic markers will provide critical insights into how these bacteria are spread in urban ecosystems, with implications for public health.

Annette Freeman

PA - Community College of Allegheny County

Discipline: Sociology

Authors:

Abstract Name: Plant-based Diets: A Demographic and Sociological Analysis

The adoption of plant-based diets has continued to rise in recent years driven by environmental, ethical, and health related concerns. However, those who follow plant-based diets remain a small portion of the population, and widespread adoption still faces significant barriers. This research examines the demographic groups most likely to adopt a plant-based diet and seeks to answer the question: Why are these demographics more likely to adopt a plant-based diet, and how do factors such as cultural norms, socioeconomic backgrounds, and ethnic identity impact these choices? Existing data suggests that younger generations, women and gender-nonconforming people, and BIPOC are more likely to adopt plant-based diets, while residency location and income play roles in adoption and accessibility. My research also investigates the influence of cultural factors such as, religious practices related to vegetarianism and the role of plant-based diets as a part of social justice movements in marginalized communities. My analysis uses a synthesis of existing scholarly works and demographic data to identify trends and the disparities in plant-based diet adoption between groups. My findings highlight key barriers in plant-based adoption including; accessibility and affordability in rural and underserved areas, cultural and social stigma, and lack of education surrounding plant-based diets. Conclusions from my analysis highlight the deep interplay between cultural, social, and economic factors in demographic trends affecting plant-based diet adoption. This underscores the importance of addressing barriers to adoption and making plant-based diets more inclusive.

Paris Freeman

SC - Anderson University

Discipline: Health and Human Development

Authors:

#1 Paris Freeman

#2 Cooper Rylands

#3 Kayode Karunwi

#4 Thomas Nathaniel

Abstract Name: The Use of Statistical Analysis and Convolutional Neural Network as Tools in Predicting Alzheimer's Patients

Alzheimer's is a neurodegenerative disease that affects millions of people every year. Further research is being done to identify early stage Alzheimer's and its progression over time. Our objective is to analyze if different perspectives are accurately able to evaluate the development and presentation of patients with Alzheimer's disease through statistics and deep learning using Convolutional Neural Networks (CNN). Data from the AIBL (Australian Imaging Biomarkers & Lifestyle) was used for statistics while magnetic resonance imaging scans were used for the machine learning. From AIBL, 92 patients from 3 groups, for a total of 276 patients, were statistically analyzed. Clinical Dementia Rating Scale scores and biomarker levels were evaluated. From the Alzheimer's Neuroimaging Data Initiative (ADNI), 306 patients' magnetic resonance imaging (MRI) scans were used. The CNN model will output two confidence scores between zero and one, each corresponding to the model's guess of whether the patient has or does not have Alzheimer's disease, with zero being the least confident and one being the most confident. Another dataset of MRI brain scans of non-Alzheimer patients will be used and the two datasets will be mixed to create a dataset to train and test a CNN model. Statistically significant differences were observed with the results of the analysis of Clinical Dementia Rating scores between normal and Alzheimer's groups. Some biomarker levels displayed

statistical significance between groups. Data is being prepared, so there are no new findings yet as to whether a CNN model can be an effective way of predicting if a patient has Alzheimer's disease. Further evaluation is required to know if CNN is enough to accomplish our goals or if we must find another hybrid method.

Miriam Freer

PA - Duquesne University

Discipline: Environmental Science and Sustainability

Authors:

#1 David Kahler

Abstract Name: Hydrology, Water Quality, and Invasion in the Sabie-Sand River Catchment

The rivers of Kruger National Park, South Africa are critical water resources for downstream communities and support the biodiversity of the park. Three rivers in the park, the Olifants, Sand, and Sabie, are endangered to various extents. This is a risk to both the biodiversity in these waters and to the surrounding areas that are dependent upon these rivers. The purpose of this experiment was twofold to determine the water quality and invasive species presence in the Sand River to contribute to the Park's river health assessments and determine the status of the alien crayfish invasion. The first was to assess the water quality with standard water quality measurements. The second was to determine the presence of invasive crayfish in the Sand River. Water quality was assessed by physicochemical measurements and benthic macroinvertebrate surveys by the South African Scoring System (SASS) along several sites along the Sand River. Finally, Promar traps were set along three different locations, in multiple habitats in the river to determine the presence of crayfish. The physicochemical water quality parameters were within acceptable limits for ambient water quality. The SASS scores were above the threshold in the two sites surveyed. Two crayfish were found in the Sand River, which indicates that a possible crayfish invasion has not fully set into the Sand River. There is no conclusive data on the habitat of the crayfish as the amount found was so few, but there are potential correlations that open the topic to further study. Additional studies are needed to determine if crayfish in the Sand River came from upstream, whose headwaters is within protected natural areas, or downstream in the Sabie River, where similar low numbers of crayfish have been observed.

Rose French

WI - University of Wisconsin-Superior

Discipline: Chemistry

Authors:

#1 James Lane

Abstract Name: Investigation of Bioactive Compounds Derived from Cinnamon and Vanilla

Finding new, plant-based bioactive compounds with antioxidant, anti-inflammatory, and antimicrobial activity is an important part of scientific research and drug discovery programs. Both cinnamon and vanilla are known for their therapeutic properties. The goal of our research was to obtain the essential oil from cinnamon and vanilla, identify and isolate their major organic compounds, create derivatives of these compounds, and finally test those compounds for their antioxidant and antibacterial qualities. We used techniques such as hydrodistillation and Soxhlet extraction to obtain our essential oils which we purified using column chromatography and then reacted using oxidation, reduction, and Schiff-base forming reactions. Our initial results indicate that some of the compounds showed observable activity in both antioxidant assays

and antibacterial assays. In particular, our data indicates that the phenol moiety plays a key role in reducing radicals in the antioxidant assays. Further experiments involving additional Schiff-base derivatives as well as their coordination complexes could prove interesting.

Benjamin Friedman

FL - Florida Atlantic University

Discipline: Economics

Authors:

#1 Benjamin Friedman

Abstract Name: Examining Gender Differences in Financial Risk Tolerance and Attitudes Toward Economic Security

Research shows that men and women often have differing levels of economic education, shaped by societal expectations and disparities in financial exposure. Men tend to encounter financial concepts earlier and more thoroughly, building confidence in handling financial risks. In contrast, women, who may receive less formal economic education, often adopt more conservative financial approaches, prioritizing stability over risk, especially during economic uncertainty. Observing these gender differences in financial attitudes around me, I became interested in examining if these patterns held true on a broader scale. My goal was to explore how gender impacts attitudes toward economic stability and investment risk and to investigate if educational differences in gender contribute to this divide. Data was collected via Amazon Mechanical Turk, with 153 participants answering questions about their willingness to invest in volatile markets and perceptions of financial security. I hypothesized that men would show a higher tolerance for financial risk, while women would prioritize economic security. The results confirmed my hypothesis with the data being statistically significant at the 1% level. The findings confirmed this, with 31.1% of men displaying high levels of willingness to investment risks while only 12.7% of women display those same risky investing styles. These findings highlight the need for financial literacy programs that address gender-specific needs, helping to close educational gaps and support informed financial decision-making for people of every gender.

Amanda Friedman

PA - Lafayette College

Discipline: Biology

Authors:

#1 Tamara Stawicki

Abstract Name: Investigating the Potential Protective Mechanism of Probiotics in Mitigating Cadmium-Induced Hair Cell Death and Reactive Oxygen Species Production in Zebrafish

I will be investigating whether probiotic administration in zebrafish may mediate toxic effects of cadmium on hair cells. In the current literature, there's been investigation into the effects that heavy metals have against sensory cells, yet little is known about the capacity for protecting against these insults. I will use zebrafish to investigate this as they have hair cells on their surface that are easily accessible and biologically conserved, which makes them prime targets to look for protective agents against cadmium. Interestingly, an area yet to be investigated is whether probiotics, commonly used to lessen body-wide inflammation in human and animal models alike, may be protective in sensory/peripheral systems as opposed to the previously established protection in the gut-brain axis. Even further, it is unclear what mechanism probiotics may use to

initiate these protective measures, so levels of reactive oxygen species (ROS), along with levels of endogenous antioxidant activity will be measured to determine the role of oxidative stress in cadmium toxicity and potential protection from probiotics. I will address these questions through three aims, first by administering cadmium and probiotics to fish and then assessing for endogenous GSH activity, then by carrying out a dose response curve of cadmium along with probiotics to test for protection against cadmium-induced toxicity, and finally by using an ROS indicator dye to investigate ROS levels between treatment groups. I hypothesize that the results of these experiments will show a protective capacity of probiotic treatment in combination with cadmium administration, and that ROS and GSH levels correlate directly to ototoxic insult from cadmium exposure and subsequent protection from probiotics. The goal of this study is ultimately to fill the gap surrounding the mechanistic possibilities of probiotics in the quest to ameliorate heavy metal toxicity.

Sarah Fry

CT - Eastern Connecticut State University

Discipline: Psychology

Authors:

#1 Sarah Fry

Abstract Name: The Relationship Between Relationship Satisfaction, Communication, and Intimacy

This study observed the correlation between an individual's relationship satisfaction, communication, and intimacy in their current romantic relationship. Research has shown greater levels of relationship satisfaction in couples experiencing elevated levels of emotional intimacy. Additionally, the literature has found that attaining relationship satisfaction lies heavily on responding constructively, by expressing care and appreciation for one's partner. Though research on the association between intimacy and couple communication is limited, it does show that those who experience lower perceived responsiveness and higher perceived punishment from their partner, experience lower feelings of intimacy. This study aims to evaluate these variables from a young adult's point of view. A convenience sample of 30 undergraduate students from Eastern Connecticut State University completed the Romantic Partner Conflict Scale (RPCS), the Relationship Assessment Scale (RAS), and the Personal Assessment of Intimacy in Relationships (PAIR). The first hypothesis of this study was that intimacy and relationship satisfaction are positively correlated, thus the more intimacy in a relationship, the more satisfaction. The second hypothesis stated that communication and intimacy have a positive relationship, therefore the more communication in a relationship, the more intimacy. The third hypothesis declared that communication and relationship satisfaction have a positive correlation, thus the more communication, the more relationship satisfaction. This study used Pearson's r correlation to assess results from hypothesis two and Spearman's Rho correlation for hypothesis one and three. There were significant findings for the relationships between relationship satisfaction and intimacy and the relationship between relationship satisfaction and communication. However, there were no significant findings for the relationship between communication and intimacy. Future researchers could explore using sexual orientation as an additional measure to examine how these variables would change within the LGBTQ community.

Kevin Fuentes-Gonzalez

NY - Colgate University

Discipline: Biology

Authors:

#1 Therese Frauendorf

#2 Abigail McGuire

Abstract Name: Hungry, Hungry Snails? Importance of Hippo Dung and Potential Overloading in the Mara River, Kenya

Hippopotami play an important role in the Mara River ecosystem, where they spend most of their lives in the water, adding high amounts of dung into the river. Previous research showed that aquatic invertebrate diversity and abundance benefit from hippo dung. With current hippo population declining, we want to understand why hippo dung is important to invertebrates and if the amount of hippo dung matters. Twenty experimental streams in Florida contained one of three types of hippo dung: blended dung (to determine if dung was an important food source for invertebrates), boiled dung (to determine if hippo dung was structurally important for invertebrates), or unprocessed dung (food and structure). The amount of dung in each stream ranged from 0g to 240g for each dung type. These amounts reflected concentrations observed in the Mara River, except the 240g concentration. This high concentration of dung helped us determine if overloading of dung can be a problem. After 3 weeks, invertebrates were collected from each stream and we identified, counted, and measured them this past summer. Our results showed that hippo dung is important not only as a food source but also as a habitat, providing safety against abiotic (flooding) and biotic (predators) factors. Across treatments, the abundance of invertebrates increased as the amount of dung increased. However, concentrations of hippo dung higher than what has been documented in the Mara River (240 g) showed declines in invertebrate abundance. This indicates that more dung is not always better. Additionally, dominating snails, which are algal grazers, had the highest abundance in all samples. This was attributed to higher algae as a result from hippo dung providing fertilizing nutrients, and structure complexity where algae can grow on.

Raime Fugate

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Alana Colafrancesco

#2 Karen Gamble

#3 Rita Cowell

Abstract Name: Exploring CD38's Role in NAD Metabolism and Circadian Regulation

Nicotinamide adenine dinucleotide (NAD⁺) metabolism has been implicated in regulating transcription, metabolism, and healthy neuronal aging. Fluctuations in NAD⁺ levels are also rhythmic and closely tied to the oscillations of circadian rhythms in both the brain and peripheral tissues. The availability of NAD⁺ is primarily regulated by sirtuins (SIRT1s), poly ADP-ribose polymerases (PARPs), and CD38. Interestingly, CD38 accounts for 90% of NAD⁺ conversions and plays a crucial role in converting NAD⁺ to ADPR, adenine diphosphate ribose, with the byproduct nicotinamide (NAM) providing energetic precursors necessary for neuronal function. It is known that CD38-deficient mice have disrupted circadian rhythm behavior, such as shorter period lengths and loss of siesta during nighttime. Our preliminary results also show that CD38 deficient mice have elevated NAD⁺ levels and NAD/NAM ratios, increased poly (ADP-ribose), (PAR) modifications, and decreased sirtuin deacetylation in the midbrain and striatal tissue. To demonstrate the effect of CD38 on molecular clock function, we used organotypic cultures from Cd38^{-/-}:Per2Luc ^{+/+} mice and found an increased amplitude of PER2::LUC rhythmicity, further suggesting that elevated NAD⁺ may increase the strength of clock-controlled gene expression. Ongoing experiments will focus on measuring cellular PER2::LUC amplitude, period, phase, and cell-cell synchrony in Cd38^{-/-}:Per2Luc ^{+/+} mice and determining whether the expression of CD38 is rhythmic in astrocytes. Together, this could elucidate the mechanism of circadian disruption in CD38 deficiency and implicate CD38 as a key regulator in NAD⁺ metabolism and in age-related circadian disruption.

Rebecca Fujino

PA - Carnegie Mellon University

Discipline: Sociology

Authors:

#1 Julie Downs

Abstract Name: The Efficiency of Financial Literacy Programs Across Demographic Groups: Addressing the Gaps in Low-Income Communities

Financial literacy programs are crucial for improving financial stability and economic outcomes, particularly in low-income communities. However, research indicates that the efficiency of these programs often varies across different socioeconomic, geographic, and demographic groups. This project explores how the effectiveness of financial literacy programs differs based on community characteristics such as income level, educational background, and neighborhood context. Through a review of existing literature, the study highlights key findings related to socioeconomic factors influencing the success of financial education, the barriers to program utilization in marginalized communities, and the role of community engagement in enhancing program impact. Studies have shown that financial literacy programs that are tailored to local contexts, integrate psychosocial support, or are community-led tend to produce better results. However, barriers such as distrust in financial institutions, lack of access to financial services, and the challenges posed by financial scarcity persist. The research also addresses why free financial literacy programs, despite being available, are often underutilized by low-income populations. By identifying gaps in existing research, the study aims to provide a deeper understanding of the challenges faced by these communities and the structural barriers hindering the success of financial literacy interventions. The findings of this study will inform the design of more effective financial literacy programs that can be adapted to different community needs, particularly in underserved areas.

Isaac Fuksman

IN - Purdue University Main Campus

Discipline: Computer Science

Authors:

#1 Durga Mandarapu

#2 Milind Kulkarni

Abstract Name: GPU-Accelerated Collision Detection for Spherical Particles

Discrete collision detection is the problem of detecting if two geometric objects intersect with each other. It is important to various areas of computing, including rendering, physical simulations, and virtual reality. Naive algorithms solve this problem in quadratic time by examining every pair of geometric objects for collisions. Previous works have accelerated collision detection for circular particles in two dimensions by dividing objects using a grid data structure and indexing efficiently with parallel algorithms running on GPU hardware. In this work we present an extension of this accelerated detection algorithm into three dimensions, allowing fast collision detection between spherical particles. By indexing particles into a 3-dimensional grid based on their location, the required search space is reduced to just neighboring cells. To quickly partition particles, we extend a cumulative sum algorithm that uses GPU hardware to compute particle counts in parallel. When running a discrete element method (DEM) simulation of thousands of particles, we can

simulate free-falling objects using just 3.8x the time used for the same amount of particles in two dimensions, demonstrating a low performance overhead despite the additional dimension of simulation.

Darius Fullenwinder

SC - Clemson University

Discipline: Psychology

Authors:

#1 L Simon

#2 J Meadows

#3 M Hampton-Jarmon

#4 L Ross

#5 A Sardina

#6 A Gamaldo

Abstract Name: The Association Between Enrollment Duration and Perceptions of Social Determinants of Health Among Community Service Providers

This study investigated the association between the duration of a community service provider's enrollment within their organization and their perceptions of the importance and impact of social determinants of health (SDOH; e.g., the conditions in which people are born, live, work, and age). Health and social service providers from local and regional organizations (e.g., Area Agency on Aging, Prisma Health System, among others) were invited to participate in mobile outreach health and resource fairs (MOHRFs) conducted at various locations (2 low-income housing facilities and 1 community center) targeted towards lower-income, and rural- and urban-dwelling older adults. Prior to participating in the MOHRFs, providers were asked to complete a survey that employed a Likert-Scale ranging from 1 (strongly disagree) to 5 (strongly agree) to evaluate vendors' perceptions of 9 questions related to their attitudes, beliefs, awareness, and understanding of SDoH. The survey also included an item that asked the provider for the length of time they have worked for their organization. Data was collected from 12 providers, with varying lengths of tenure ranging from 4 months to 25 years. Pearson correlations revealed that longer-tenure within an organization was significantly associated with reporting greater agreement with the importance of the impact of SDoH ($r = -0.50$ to 1.00 , $p < .05$). These findings provide insights into how duration of engagement within an organization may influence vendors' beliefs, attitudes, awareness, and understanding of social determinants of health, potentially strengthening relationships with vendors by aligning organizational goals with the greater social and health-related needs of the communities they serve. These results are preliminary, and further research with larger samples should be conducted to identify whether observed findings are consistent across health and service providers and the potential influences for why length of time engaging in this activity impacts providers' views on SDoH.

Kennedy Funa

OK - Oklahoma State University

Discipline: Biology

Authors:

#1 Kennedy Funa

Abstract Name: Does Experience in Multiple Contests Affect Cricket Exploration Behavior?

Previous experiences strongly influence animal behavior, particularly in response to social interactions. In this study, I investigated how sequences of positive and negative outcomes in aggressive contests influenced exploration and latency behaviors in male house crickets (*Acheta domesticus*). I divided crickets into five experimental groups: two wins (WW), two losses (LL), win-loss (WL), loss-win (LW), and a control group (CG) without contests. I measured behavioral responses both before and after the contests and conducted additional observations on subsequent days to evaluate lasting impacts. I assessed exploration by recording movements between defined areas in a test arena, and I measured latency by timing how long crickets took to exit a shelter. I analyzed behavior in a designated thigmotaxis area, a zone near the arena walls, to evaluate anti-predatory responses such as stress and risk aversion. I staged aggression contests by pairing crickets with either larger or smaller opponents to produce specific outcomes. The staged contest design allowed me to examine how winning or losing, as well as the sequence of these outcomes, influenced key behavioral metrics. I hypothesized that the most recent contest experience strongly influenced exploration, latency, and time spent in the thigmotaxis area. I expected patterns to vary based on the sequence and proportion of wins and losses. Crickets experiencing predominantly negative outcomes likely displayed more pronounced and prolonged behavioral changes than those with positive experiences. This research highlighted the ecological importance of behavioral plasticity and demonstrated how social experiences dynamically shaped behaviors critical for survival, including dispersal, mating, and predator avoidance.

Alayna Funke

PA - Duquesne University

Discipline: Chemistry

Authors:

#1 Derek Bedillion

#2 Paul Lummis

#3 Thomas Montgomery

#4 Daniel Chase

Abstract Name: Accessing group 13 and 14 Azadipyrrromethene chelates via alkali salt precursors for applications in optical contrast material

As the medical field continues to progress, doctors are looking for more efficient ways to treat and diagnose patients. One of the best methods used to accomplish this is medical imaging, this technique gives medical professionals the ability to quickly visualize abnormalities in the body without using other invasive procedures. Real-time fluorescence imaging is an approach to medical diagnostics that utilizes an optical contrast material that can highlight internal anatomical features such as vasculature and organs. These contrast materials need to be moderately inexpensive, harmless to living tissue, and have emission and absorption wavelengths in the near-infrared range. These NIR wavelengths are capable of being absorbed into the body without causing extensive damage to surrounding organs and anatomy, and benefit from a higher penetration depth relative to higher energy photons. There are currently three FDA approved optical imaging contrast agents for real-time fluorescence imaging: methylene blue, indocyanine green, and Fluorescein. All of these agents are fairly toxic in large doses, and due to their photophysical properties it is often required to use close to the LD50 in order to obtain the necessary signal response in medical applications. While these contrast agents are available commercially, the medical community needs move towards less toxic alternatives. Azadipyrrromethenes, (Aza-DIPYs) are a class of compounds that emit between 600 – 1500 nm and have a molar absorptivity high enough that in very low concentrations an optical response can still be detected. In previous studies, we have assessed the behavior of a series of Aza-DIPY chelates of group 13 elements, specifically to investigate the effects of ligand substitution on the photophysical properties of the resultant compounds. In this investigation, a novel Aza-DIPY core is synthesized and chelated to various group 13 elements with the intention of probing the effect of oxidation state on these properties.

Jessica Fuss

WV - West Virginia University

Discipline: Biochemistry

Authors:

#1 Jessica Fuss

#2 Abigail Jones

#3 Dainel Panaccione

Abstract Name: Functional analysis of candidate genes for converting lysergic acid amides in *Aspergillus leporis*

Ergot alkaloids are a family of chemicals including lysergic acid derivatives that are produced by fungi and can be used in pharmaceuticals to treat dementia and migraines. Understanding the genes and enzymes that control formation of lysergic acid derivatives will facilitate their production. Several fungi, including *Aspergillus leporis*, produce the ergot alkaloid lysergic acid α -hydroxyethylamide (LAH). In some fungi LAH is relatively stable but in *A. leporis* much of it is converted to ergine and then later to lysergic acid. The hypothesis that the relatively rapid conversion in *A. leporis* is enzymatically catalyzed was supported by studies with fresh versus autoclaved extracts from the fungus. Fresh extracts rapidly converted LAH to ergine along with some lysergic acid, whereas extracts inactivated by autoclaving catalyzed minimal conversion of LAH. Since genes involved in ergot alkaloid synthesis are typically clustered, we hypothesized that genes adjacent to one of *A. leporis*'s ergot alkaloid synthesis clusters might catalyze one or both of these reactions. We identified two such genes: *easU*, encoding a Zn-dependent beta-lactamase-like enzyme, and *easV*, encoding an amidohydrolase, and used a CRISPR-Cas9 approach to mutate them. Cas9 complexed with sgRNA targeted to *easU* or *easV* was introduced into *A. leporis* along with a gene conferring resistance to pyrithiamine. Pyrithiamine-resistant transformants were screened for mutation at *easU* or *easV* by PCR primed from positions flanking the target site. Transformants with amplicons varying in length relative to the wild type were chosen for Sanger sequencing of the target locus. One transformant contained a mutation at *easU* and four independent transformants contained mutations at *easV*. Future chemical analysis by high performance liquid chromatography will determine whether mutation of the candidate loci affect the formation of ergine or lysergic acid. The ability to control formation of different lysergic acid derivatives may aid in pharmaceutical development.

Olivia Gaar

TN - University of Tennessee at Knoxville

Discipline: Nursing and Public Health

Authors:

#1 Susan Hébert

Abstract Name: Simulation Based Mastery Learning and its Effect on Undergraduate Nursing Students' Psychomotor Skill Competencies

Errors stemming from inadequate knowledge, skills, and/or education pose a significant challenge in healthcare. Mastery Learning, an educational approach designed to enhance competencies through deliberate practice, has demonstrated effectiveness in improving skill acquisition. However, its application in undergraduate nursing education remains underexplored. This study aims to evaluate the impact of Mastery Learning on the psychomotor skill competency of undergraduate nursing students, focusing specifically on Foley catheter insertion, central line dressing changes, and suctioning an open system tracheostomy. The research question guiding this study is: What is the effectiveness of mastery learning curricula in improving

psychomotor skill competency among undergraduate nursing students in Foley catheter insertion, central line dressing changes and suctioning an open system tracheostomy. This retrospective quasi-experimental study analyzes data from undergraduate nursing students at the University of Tennessee College of Nursing, Class of 2024. Competency changes were assessed using a pre-test/post-test design, and convenience sampling was employed. Data analysis revealed a statistically significant improvement in students' competencies from the pretest to the first posttest, suggesting the effectiveness of education and deliberate practice. Furthermore, no statistically significant differences were observed between the first posttest and the second posttest, indicating that students successfully retained their mastery of the skills over time.

Priya Gadhe

CA - Chapman University

Discipline: Computer Science

Authors:

#1 Priya Gadhe

Abstract Name: Bridging the Gap: Comparing Motor Task Performance in Lab and Home Environments for Stroke Rehabilitation

Recovering motor function after a stroke is a journey that extends beyond the clinic, where the familiar walls of a lab can't fully mimic the dynamic, unpredictable environments of daily life. This study bridges that gap by comparing biomechanical data from stroke patients as they perform movement tasks in controlled lab settings versus their own homes, aiming to uncover how real-world surroundings influence rehabilitation outcomes. The objective was to assess how environmental context influences the quality and execution of motor tasks, providing insights into the feasibility of remote monitoring for rehabilitation. Data was collected from stroke patients performing 360-degree turning and sit-to-stand tasks under varied conditions—eyes open, eyes closed, on foam, and on foam with eyes closed. For the turning tasks, completion time, peak acceleration, and peak angular acceleration were measured. For sit-to-stand tasks, movement time was divided into segments: initiation to peak flexion, peak flexion to peak extension, and peak extension to termination. Additional metrics, including peak flexion, peak extension, seat-off, acceleration initiation, and termination, were analyzed. Data from both environments were compared for each metric. Differences in movement dynamics were observed between lab and home environments, particularly in acceleration and timing metrics. These results suggest that patients perform movement tasks differently outside a controlled setting, emphasizing the impact of environmental factors on rehabilitation monitoring and outcomes. This study highlights significant variations in motor task performance between lab and home settings, underlining the need to consider the environmental context in remote patient monitoring. These findings support further investigation into the design and application of home-based monitoring tools for effective stroke rehabilitation tracking.

Andria Gadson

MD - Bowie State University

Discipline: Physics and Astronomy

Authors:

Devan Coehins

Chiwe Ikwu

Abstract Name: The Velocity of a Squirrel

Picture this: a squirrel, dashing effortlessly across the campus of Bowie State, whose movements appear purposeful yet spirititic. Now, let's use technology to our advantage by using a tracker to precisely monitor its movements against the context of its natural habitat. Tracking technology allows us to study a squirrel's movements across Bowie State's campus, revealing insights into its velocity, mass, and kinetic energy. These measurements tie into concepts like kinetic energy and velocity from our physics course. By analyzing how these factors shape the squirrel's motion, we enhance our understanding of physics principles and uncover the intricate relationship between theoretical knowledge and real-world observations. Additionally, we can deepen our understanding of these fundamental concepts we have learned throughout the semester.

Kelton Gagnon

UT - Weber State University

Discipline: Health and Human Development

Authors:

#1 Kelton Gagnon

#2 Jeffery Ward

Jeffery Ward

Abstract Name: Examining Elevation Adjustments and Altitude schools Impact on the Number of Athletes Qualifying for NCAA Regionals and Nationals

This study examines how NCAA elevation adjustments impact the qualification rates of track and field athletes from altitude schools compared to non-altitude schools for regional and national championships. Using NCAA data from 2010 to 2023, we analyzed athlete qualifications from 125 West region and 215 East region schools, focusing on trends across sprint, distance, and hurdle events. The purpose of this research is to assess whether elevation adjustments effectively promote equity in collegiate athletics by mitigating geographical advantages associated with high-altitude training environments. The analysis revealed a significant increase in qualification rates for distance events among athletes from altitude schools. Interestingly, most altitude school athletes qualified for NCAA championships at lower elevation venues, where they did not receive elevation adjustments. This finding suggests that the physiological benefits of high-altitude training may enhance performance even when competing at sea level, contributing to their success. These results demonstrate how elevation adjustments and high-altitude training collectively provide athletes from smaller, budget-limited schools with a fair opportunity to compete at the highest levels. This study highlights the importance of NCAA elevation adjustments in promoting fairness and inclusivity in collegiate track and field. The policy not only levels the playing field by balancing geographical disparities but also ensures representation for athletes from underfunded and geographically disadvantaged programs. Future research should investigate the broader impacts of elevation adjustments on non-distance events and examine how high-altitude training influences athletic performance across different competition settings. By exploring these dynamics further, this work underscores the importance of continuously evaluating NCAA policies to support fairness, diversity, and athletic excellence in collegiate sports.

Sofia Galiana

MA - Massachusetts Institute of Technology

Discipline: Biology

Authors:

#1 Lindsay Case

#2 Kyle White

Abstract Name: Exploring the Role of Calpain Proteases in the Disassembly of Talin Condensates

Focal adhesions are large protein assemblies that allow cells to attach to the extracellular matrix and are vital for cell migration during embryonic development, wound healing, and the immune response. Misregulation of focal adhesions also contributes to the metastasis and invasion of cancer cells highlighting their clinical and biological significance in disease progression. While the assembly of focal adhesions has been extensively studied, the disassembly of these complexes has not been as well-characterized or understood. Liquid-liquid phase separation is one of the driving forces for the formation of these focal adhesions, enabling dynamic assembly. Thus, focal adhesions are an example of a biomolecular condensate, cellular compartments that form through phase separation driven by interactions between macromolecules. Talin plays an important role in the focal adhesion complex, acting as a scaffold to link together various other proteins in the complex. Purified talin undergoes phase separation in its open, uninhibited conformation, forming micron-sized liquid-like condensates in vitro. Calpain2, a calcium-dependent protease, has previously been shown to cleave talin at specific residues, and calpain2 protease activity is required for efficient focal adhesion disassembly in cells. Thus, we sought to test the effect of calpain2 on talin condensates. Here we show that calpain2 can disassemble preformed talin condensates. This implies that calpain2-mediated cleavage of talin specifically disrupts talin phase separation. Our results suggest that calpain2 protease activity is sufficient to disassemble talin condensates. Our study improves our understanding of the mechanism of cell migration by addressing the question of how calpain2 promotes focal adhesion disassembly.

Mia Gallagher

PA - Grove City College

Discipline: Biology

Authors:

#1 Aaron Crain

#2 Robert Duronio

#3 Lisa Antoszewski

Sarah Jacob

Abstract Name: Forward and reverse genetic screens to identify genes that participate with H4K20 methylation in controlling cell proliferation in Drosophila

Control of cell proliferation is essential for organismal development and survival and occurs through a series of steps called the cell cycle. During the cell cycle, the genome is copied before the cell divides and, if this process is compromised, DNA damage and death can result. The ability to effectively replicate DNA and therefore control cell proliferation is affected by chromatin structure and accessibility, which is influenced by post-translational modifications to histone proteins including methylation. Data suggest that cell proliferation is compromised when H4K20 methylation is disrupted. However, the exact mechanism behind a requirement for H4K20 methylation in the cell cycle is still unknown. Our goal is to identify genes on the third chromosome of Drosophila that regulate cell proliferation through H4K20 methylation. Using a histone deletion on the second chromosome and a transgene on the third chromosome that expresses either wild type or H4K20R mutant histone, we are utilizing the FLP/FRT system to create histone mutant clones in the adult eye. Wildtype cells are marked with GFP and histone mutant cells with RFP, and the size of histone mutant clones relative to wildtype clones are determined with fluorescence microscopy. To identify genes that interact with H4K20 methylation, we are simultaneously performing screens with Set8-interacting proteins and 3rd chromosome deficiencies. Set8 is the only known H4K20 histone mono-methyltransferase in eukaryotes, and the action of Set8 is required for subsequent di and tri methylation of H4K20. The size of histone mutant clones is analyzed when heterozygous loss of function mutations in genes encoding Set8-interacting proteins or 3rd chromosome deficiencies are introduced. Initial results have identified a deficiency

of interest and further analysis of annotated genes within this deficiency will be performed to pinpoint the gene(s) that interact with H4K20 methylation to control cell proliferation.

Maricella Gallardo

AZ - Northern Arizona University

Discipline: Health and Human Development

Authors:

#1 Maricella Gallardo

#2 Grace Adams

#3 Alondra Duarte

#4 Jessica Jensen

Grace Adams

Abstract Name: Addressing Oral Health Among the Unsheltered Community of Flagstaff, Arizona

Purpose: This project focused on addressing the oral hygiene needs of the unsheltered population in Flagstaff, Arizona, with the partnership of Willow Bend Environmental Education Center. Based on our needs assessment, a portion of this population experiencing chronic homelessness were faced with health disparities related to oral hygiene. We aimed to improve the oral hygiene of this population by providing accessible hygiene resources and education on proper oral hygiene practices. **Background:** According to a 2018 survey, a portion of the unsheltered population in Flagstaff includes Native Americans (44.1%) and White, non-Hispanic individuals (47.5%). Additionally, 45.8% are considered chronically homeless, meaning they have been experiencing homelessness for a long time, often facing various health issues like oral related illnesses. Unsheltered people are a transient population that don't live in one place permanently. They can transition from residing in shelters, hospitals, jails, hotels, streets/camping, with friends or family, etc. Due to the fluctuating stability in their living situation, they experience a lack of access to necessary facilities and resources to perform proper oral hygiene. **Methods:** The event was modeled using the Health Belief Model and the constructs self-efficacy, perceived severity, perceived benefits and perceived barriers. This model was used to develop event activities for oral hygiene awareness, oral cancer screening instruction, distribution of hygiene kits and meal incentives to encourage participation. Our evaluation plan included pre- and post-surveys, which determined effectiveness of the activities. While strategies for longevity aimed to integrate awareness into existing community programs like Willow Bend and the CATS engagement bus. **Conclusions:** The results saw an increase in confidence levels in understanding and identifying oral related risks. Similarly, there was an increase in the likelihood of continued use of provided resources. Overall, the intervention succeeded in increasing participant knowledge on oral health and resource awareness in Flagstaff.

William Gallie

PA - Lafayette College

Discipline: Engineering

Authors:

#1 Joshua Smith

Abstract Name: Experimental Determination of Parameters Affecting Backflow During Infusion into Agarose Gel from a Stepped Catheter

Direct drug infusion into the brain via convection-enhanced delivery (CED) has been a promising therapeutic

pathway for the treatment of various neurodegenerative diseases since the 1990s. CED allows for targeted treatment of small sections of brain tissue using drugs that are not typically able to be administered by conventional intravenous delivery. A major limitation of CED is the backflow of infusate up the outside of the catheter used to deliver the drug, resulting in the infusate being distributed along the length of the catheter rather than forward from the tip of the catheter towards the targeted tissue. One of the most promising solutions for this problem is the use of a stepped catheter in which a large step in outer cannula diameter occurs a length from the catheter tip. Despite previously demonstrated effectiveness of stepped catheters to limit backflow, there does not exist a major parametric study that determines how the geometric parameters of stepped catheters limit backflow. This study focuses on the main parameters presumed to have an effect on backflow during CED, that being: tip length, step width, inner cannula diameter, and infusate flow rate. This study will provide a rigorous correlation between these parameters and backflow, which may be used in the optimization of catheter designs for clinical applications.

Benjamin Gallion

WI - University of Wisconsin-Milwaukee

Discipline: Biology

Authors:

#1 Sandra McLellan

Abstract Name: Geographic distribution patterns of *Arcobacter cryaerophilus*, a common microbial resident of sewer conveyance pipes

Wastewater conveyance systems are colonized by a robust and diverse microbial community. Previous research has focused primarily on microbial communities of wastewater treatment plants, but few have focused on the resident bacteria within conveyance systems. Our lab has shown a high abundance of *A. cryaerophilus* in wastewater systems. In this work, we examined the phylogenetic relationships of these organisms across a broad geographic area and their metabolic potential to cause detrimental effects. One major issue is sulfur cycling throughout the wastewater system which creates harmful byproducts that can cause corrosion, infrastructure failure, and wastewater treatment issues. We tested *A. cryaerophilus* isolated from sewer conveyance systems in geographically distant cities including Sydney, Honolulu, and Milwaukee (two distinct systems). We screened these isolates using different PCR assays to confirm the genus, then select samples were sequenced for the 16S rRNA gene, and phylogenetic trees were constructed. We also amplified and sequenced the sox genes of isolates of the different sewage systems. We found *A. cryaerophilus* from Sydney and Honolulu were more similar than those from Milwaukee. We further examined phylogenetic relationships based on temperature and location within a single city. We found the sox genes, which are part of sulfur oxidation pathways, which are often linked to sewer corrosion, were present in these species as core genes. We also examined if the sox genes followed the same phylogenetic patterns across the isolates to confirm the geographic patterns found with analysis of the 16S rRNA gene. This work gives us a better understanding of the wastewater ecosystem and provides more information about the sulfur cycle in these systems which could help us understand how infrastructure failures occur in sewage systems and how these cycles may vary across city and geographical scales.

Alejandra Galvan

IL - Elmhurst University

Discipline: Psychology

Authors:

#1 Joshua VanArsdall

Abstract Name: Feeling at Home: Exploring Third Places and University Student Belonging

Students are often torn between their academic obligations and time taken to relax and socialize. In university settings, third places are defined as places that foster socialization and allow students to be a part of a community (McLane & Kozinets, 2019), as opposed to first (home) or second (work/academic) places. Third place characteristics include a neutral, regularly accessible location that fosters a playful mood where conversation is the main activity and can act as a home away from home (Oldenburg, 1999). Our research aims to understand how students use third places on campus, and how third place use influences their sense of belongingness and community at the university. Elmhurst University students will be recruited to complete an online Qualtrics survey about their use of third places on campus and multiple measures related to belongingness and sense of community. We expect positive correlations between time spent in third places and psychological variables. As a majority commuter school, other important comparisons will be between commuter and residential students, as well as 4-year and transfer students. Literature leads us to believe that we will find a greater sense of belongingness and community among our residential students and our 4-year students, as they have had more time and access to third places compared to their counterparts (Alcozer Garcia et al., 2019; Holloway-Friesen, 2018; Lester et al., 2013). We will also get a sense of which third spaces are used most frequently on campus, an actionable piece of information for campus policy. We hope to have a greater understanding of the role of third places on campus and be able to create a greater sense of community by looking into how third places available at Elmhurst University can be enhanced.

Sashenka Gamage

HON - The Hong Kong Polytechnic University

Discipline: Engineering

Authors:

#1 Sashenka Gamage

#2 Tian Wang

#3 Pai Zheng

Abstract Name: Enhancing Human-Robot Collaboration in Smart Manufacturing: “Natural Language-Driven Navigation Framework” - Autonomous Drone Navigation with Natural Language Processing for Intuitive Control

Smart manufacturing represents a transformative approach in the manufacturing sector that integrates advanced technologies into manufacturing processes. In smart manufacturing, Human-Robot Collaboration (HRC) serves as a core concept creating interdependent interactions between human operators and robotic systems. This collaboration is designed to enhance the strengths of both humans and robots, combining human creativity, problem-solving abilities, and adaptability with the precision, speed, and endurance of robots. Within this framework, Unmanned Aerial Vehicles (UAVs), commonly known as drones, have emerged as versatile robots for HRC. Drones can be used in smart manufacturing for emergency operations, infrastructure maintenance, logistics, and warehouse management. As a result, studies are conducted to navigate drones autonomously using localization algorithms and virtual simulation. Despite the potential, challenges such as obstacle avoidance, explosion risk, collision avoidance, and reliance on human supervision result in low adaptation rates. To overcome these challenges, this research proposes the ‘Natural Language-Driven Navigation Framework,’ which includes low-cost computation path-planning algorithms and Visual Integral Navigation Systems (VINS), integrated with Natural Language Processing (NLP). This novel approach to using natural language commands in drone navigation minimizes the need for training and supervision in drone piloting. The proposed solution calculates the gradient only at necessary waypoints while using VINS to enable remote visualization of the environment. The algorithms are executed as ROS (Robot Operating Systems) packages, and they provide safe trajectories with reasonable smoothness and precise coordinates of localization. Furthermore, the integration of natural language processing is achieved by

using the Open AI API large language model with the PX4 (Pixhawk) Chat module. Results show that path-planning algorithms successfully map the trajectories in indoor navigation environments. The natural language integration was conducted in the PX4 simulation environment. Simulation results demonstrated that the OpenAI API can successfully enable drone navigation through text and voice commands expressed in everyday language.

Alejandro Gamarra

AZ - Northern Arizona University

Discipline: Nursing and Public Health

Authors:

#1 Ryan Denaro

#2 Vining Durueke

Abstract Name: Improvement of Mental Health in High School Students by Stress Management

Project Purpose: Our intervention aimed to improve the mental health of students enrolled in an alternative high school utilizing stress reduction. The main objective was to provide the students with the knowledge and self-efficacy to manage their stress more effectively, by providing them with techniques and resources they can complete on their own time. **Background:** High school students face high levels of stress in their lives, which is detrimental to their mental health. These stresses range from peer pressures, academic pressures, home environments, and a sense of not belonging. Alternative high school students are the most at risk, as statistics show they have higher rates of anxiety and depression. **Methods:** Three different types of interventions were used during this practice, each one being a way to help cope with stress and a way to potentially reduce stress. The first intervention was targeted at the benefits of outdoor physical activity, the second focused on the benefits of team collaboration, and the third focused on the benefits of mindfulness. During each day of the intervention, we had small presentations to help educate the students on the benefits and different things they can do themselves to reduce stress that may have been different from our activities. **Conclusions:** During the intervention, a pre-survey and post-survey were conducted that asked about their personal stress self-efficacy and coping mechanisms. Overall, there was a 46% increase in confidence to manage stress in a positive way. The results also showed that 70% of the students started to do physical activity and went on hikes to help reduce their stress. Most students reported that they have been less stressed in their lives and that they were using new techniques learned during the intervention to help with stress management. Word count: 289

Juan Gamboa

GA - Kennesaw State University

Discipline: Biology

Authors:

Abstract Name: Understanding EcR Transcriptional Control of Glial Cell Development

Ecdysone (20E) signaling plays a crucial role during *Drosophila* development. In particular, the third instar stage, to make sure the tissue grows synchronously. Transcriptionally, 20E binds to its receptor, Ecdysone Receptor (EcR), activating or repressing transcriptional targets. Studies have shown how impactful it is for wing disc and salivary glands, but not for glial cells which are structural brain cells. The EcR transcriptional mechanism for glial cells is not yet understood. This study aims to understand how the ecdysone receptor

transcriptional control affects glial development during the third larvae stage. We developed tools that allow us to disrupt the binding partners of EcR. We created a transgenic fly EcR-LBD that when expressed disrupts the binding between EcR and 20E and other proteins. We then introduced a point mutation A483T, EcR-LBD-A483T, which cannot bind to the repressor Smrter. To test the transcriptional mechanism of EcR, we expressed our tools in glial cells using the GAL4 driver, repo-Gal. We analyzed the brain tissue volume and also if flies made it to adulthood. Together, this work helps understand the crucial role of ecdysone for glial development. Our preliminary survival data shows that Ecdysone signaling in glial cells is critical for the survival of the animal. Loss of Ecdysone signaling in glial cells caused by the expression of EcRLBD resulted in fewer adult *Drosophila* compared to adults. Interestingly, while some animals still died, expression of the EcRLBD-A483T did show as severe as a phenotype, suggesting that Smrter repression of EcR target is important for glial development and survival. Future work includes generating qualitative data to determine if brain volumes change with loss of EcR signaling in glial cells.

Biella Games

MI - University of Michigan - Ann Arbor

Discipline: Interdisciplinary

Authors:

Abstract Name: Leveraging AI to Empower Neurodivergent Individuals: Maximizing Strengths and Minimizing Challenges in Education and the Workplace

The UM Neurodiversity Project aims to build a neuro-inclusive university environment by exploring pathways to support and empower neurodivergent communities. This research focuses on how artificial intelligence (AI) can be used to empower neurodivergent individuals by maximizing their unique strengths and minimizing challenges in educational and workplace settings. While neurodivergent individuals, including those with autism, ADHD, and dyslexia, often possess unique strengths such as creativity and attention to detail, they often face barriers in traditional environments. Additionally, many individuals remain undiagnosed, limiting the understanding and tailored support for this population. To address these challenges, this study explores how AI can be tailored to meet neurodivergent needs by enhancing accessibility, personalization, and usability for neurodivergent users. Using qualitative and quantitative methods, including interviews, surveys, and case studies, the research examines AI-driven strategies to reduce cognitive overload, simplify navigation, and provide personalized support. Initial findings demonstrate the potential of AI to personalize learning experiences, streamline content, and create sensory-friendly educational environments. In workplaces, AI-enhanced tools can improve task management, productivity, and inclusivity through tailored systems and inclusive hiring practices. One aspect of this study includes collaboration with the University of Michigan IT department to assess the role of AI in improving accessibility for student and staff facing websites. Given the size and diversity of the neurodivergent population, addressing accessibility gaps and leveraging AI to enhance neurodivergent strengths while reducing challenges could be significantly impactful by informing real world practices that help facilitate a more inclusive, supportive, and empowering future for neurodivergent communities.

Keller Gammons

PA - Lafayette College

Discipline: Biology

Authors:

#1 Keller Gammons

#2 Elaine Reynolds

#3 Sej Cho

Abstract Name: Seizures in a Bang-Sensitive Epilepsy Model Impact Associative Learning in *Drosophila* Larva

The seizures associated with epilepsy may impact learning and memory and are associated with early cognitive decline, however, the mechanism of how the seizures themselves lead to these deficits is not clear. *Drosophila* mutant flies that have seizure phenotypes has been used as a model for human epilepsy. In this study, we tested whether seizures induced in *Drosophila* *parabss* mutants, a mutation in fly sodium channel gene, affect learning. We used both rewarding and aversive stimuli to test associative learning in *Drosophila* larvae, similar to the methods developed by Apostolopoulou et al. (2010) and Pauls et al. (2010). Third instar larvae were collected from CS (wildtype) and *parabss* laid bottles. In rewarding stimulus task, larvae were trained 3x by pairing an odor (octanol or amyl acetate) with a reward (fructose). Larva then tested for movement towards the odor they were trained on, in a choice assay. In aversive learning tasks, a brief shock was paired with odor as training and then movement away from the trained odor was determined. We found that these odors were not neutral as described in the literature. Control experiments, octanol was repulsive in our assays while amyl acetate was attractive. And so, octanol was used to train in a positive associative learning task and amyl acetate was used in aversive assays. We could demonstrate associative learning using larva in assays with both odors and that *parabss* learned well as compared to wildtype using both rewarding and aversive stimulus tasks. To test the impact of seizure, larvae were exposed to the cold between the training and testing trials, which cause the *parabss* mutant larva to seize. Seizure in the mutant larva disrupted the rewarding and aversive associative learning. Similar to results we obtained previously in an adult courtship assay, seizures in *parabss* mutants can disrupt learning.

Evelyn Gannon

NC - Elon University

Discipline: English and Literature

Authors:

Abstract Name: Agency and Creation of Space; Empowered Women in the Gothic Fictions: Mexican Gothic and Build Your House Around My Body

This paper examines how two 21st-century gothic novels, *Mexican Gothic* (2020) by Silvia Moreno-Garcia and *Build Your House Around My Body* (2021) by Violet Kupersmith, represent women with more agency and as more developed characters than their 19th to mid-20th-century counterparts. Feminist and postcolonial analysis reveals how both authors have developed their complex female protagonists and modified traditional gothic motifs to bring their women into the 21st century. Drawing on the feminist positions of Roxane Gay, Jane Mitchell, Sandra Gilbert, and Susan Gubar, the paper establishes the traditional gothic motifs and examines how the authors alter them to show change in the gothic mode. This section will focus on the reconfiguration of relationships between men and women, and of relationships among women; on the rejection of the traditional gothic ending of either marriage or death; and on the re-situating houses in which

the women are trapped, with houses shifting from inanimate and unyielding structures to a hybrid of living and non-living, gaining sentience. Drawing upon Ignacio M. Sanchez Prado, Homi K. Bhabha, and Sharae Deckard's postcolonial and ecocritical positions, this paper also focuses on how these modern gothic novels reject and alter traditional masculine Eurocentrism, critiquing the patriarchal and imperial dominance of earlier novels. This section also reveals the authors' re-figuring of colonial gothic space, both manmade and natural. In these ways, the representations of women in gothic fiction have now changed to characterize women with more agency and complexity than in earlier gothic novels.

Adriana Ganthier

MD - Bowie State University

Discipline: Physics and Astronomy

Authors:

Abstract Name: Radiation Emission from Cell Phones

This study aimed to investigate the radiofrequency (RF) emissions of commonly used cell phones to assess potential exposure levels. A total of 2 cellphones from various manufacturers and models were tested using standardized methods to measure RF radiation levels. Measurements were taken at different distances from the devices, simulating various usage scenarios. The electromagnetic radiation that a cell phone releases in order to communicate with cell towers is known as its radiofrequency (RF). It's critical to comprehend RF exposure because excessive and prolonged exposure to RF radiation may have negative impacts on one's health. Researching RF technology in-depth is the first step in this project, which includes learning about the several RF bands, modulation methods, and communication protocols that are frequently found in mobile phones. Finding opportunities for innovation or improvement can be facilitated by analyzing the RF systems and technologies used in phones today.

Joy Gao

IN - Purdue University Main Campus

Discipline: Computer Science

Authors:

Alexis Ogrinz

Abstract Name: Developing an Interactive Data Dashboard for Strategic Neighborhood Revitalization in Lafayette, IN, Neighborhoods

The city of Lafayette, Indiana, has identified above-average levels of transiency in the neighborhoods of Lincoln, Hanna, Vinton, Monon, St. Lawrence McAllister, and Historic Jefferson. Despite the availability of funding for community development projects, the city lacks consistent and updated data to inform its proper usage to spur neighborhood revitalization in the target neighborhoods. This study aims to utilize the Polk Directory, Property Condition Surveys, and US Census data to help the city council identify target areas for funding and support. The Polk Directory is an online database housing demographic and socioeconomic data on the residents of Lafayette. Data contained in the Polk Directory provides the city of Lafayette with important context surrounding the well-being and lifestyle of its citizens including spending habits, income, and assets and liabilities. Property Condition Surveys are hand-collected at the behest of the city council of Lafayette. Using randomly sampled houses in each of the six neighborhoods, the Property Condition Surveys construct a holistic overview of the state of houses, roads, and amenities in each of the neighborhoods.

Finally, the US Census data is used to analyze aggregate trends in education, poverty, and demographics shared among the six-neighborhoods. The data from the Polk Directory, Property Condition Surveys, and US Census will be mined and analyzed to discover factors and trends that contribute to transiency and/or neighborhood revitalization. To combine these different avenues of data, an interactive data dashboard will be created and will present city officials with holistic and detailed socioeconomic trends across the six target neighborhoods. The city of Lafayette will be able to access visualizations about each neighborhood detailing the conditions of houses, average income of residents, and percentage of residents on government welfare, etc, allowing them to propose targeted policies for each neighborhood to reduce transiency and promote neighborhood revitalization.

Meilin Gao

PA - University of Pittsburgh

Discipline: Engineering

Authors:

#1 Meilin Gao

#2 Masoud Zamani

#3 Anne Robertson

#4 Tobe Yasutake

#5 Alireza Asadbeygi

Abstract Name: Quantitative Analysis of the Changing Collagen Fiber Organization During Tissue Loading

Collagen, the main structural protein in biological soft tissues, is crucial for maintaining the strength and integrity of the extracellular matrix. Therefore, knowledge of the relationship between the organization of collagen fibers and the mechanical function of soft tissue organs such as arteries and the bladder, is vital for understanding diseases affecting these organs. Such knowledge is also needed for creating structurally informed constitutive models. Collagen organization can be imaged using multiphoton microscopy (MPM). However, commercial software often faces challenges in accurately identifying collagen organization in these MPM datasets due to the high density and waviness of collagen fibers. We developed a semi-automatic tracing method and custom postprocessing code to precisely analyze collagen fiber orientation and tortuosity in MPM datasets. In this study, we applied this approach to MPM datasets from human cerebral arteries under various stretch conditions. We subjected cerebral vessels to uniaxial testing under MPM, allowing simultaneous mechanical response assessment and imaging of collagen fibers at prescribed stretch levels. Our semi-automated approach was then used to analyze tortuosity, defined as the ratio of the fiber's length to the straight-line distance between its endpoints, and orientation of each fiber. A collagen fiber was considered recruited to load-bearing if its tortuosity fell below a specified threshold of 1.02. Fibers in the adventitia exhibited a tortuous, bimodal orientation distribution before stretching. As stretch increased, recruited fibers became more numerous, and the bimodal distribution of fiber orientations gradually transitioned into an unimodal distribution. Eventually, this unimodal distribution centers around a zero-degree angle, reflecting the alignment of fibers in the direction of the applied stretch. With our method, we have successfully enhanced the analysis of collagen fiber orientation and tortuosity in human cerebral arteries enabling a structurally based understanding of the mechanics of cerebral arteries that can be applied to other collagenous tissues.

Spalding Garakani

CA - Cuesta College

Discipline: Mathematics

Authors:
#1 Spalding Garakani
#2 Luis Flores
Luis Flores

Abstract Name: The effect of disease-induced mortality and imitation dynamics on population vaccination rates for Mpox

The work presented here examines vaccination dynamics in the context of Mpox, a historically neglected tropical disease that gained global attention during its 2022–2023 outbreak, followed by the emergence of a new strain in 2024. Although vaccines are available, inequities in distribution and heterogeneous perceptions of relative vaccination costs have led to suboptimal vaccination uptake. To address these challenges, we extend existing game-theoretic frameworks in two key directions: incorporating disease-induced mortality and incorporating imitation dynamics. First, we allow infectious individuals to experience elevated mortality compared to the natural death rate, capturing how increased severity influences both personal risk assessments and collective vaccination decisions. Second, we shift from a static equilibrium approach to an imitation dynamics framework, which might be appropriate for diseases not yet fully endemic. Under this approach, individuals adapt their vaccination strategies over time by imitating others perceived to have more favorable payoffs. We analyze the resulting system of ordinary differential equations to characterize disease-free and endemic equilibria, using techniques from dynamical systems and the next-generation matrix approach to determine the basic reproduction number R_0 . We derive analytical expressions for equilibrium conditions and examine parameter sensitivities to understand how cost distributions, disease-induced mortality, and imperfect vaccine efficacy interact to shape long-term outcomes. To confirm and complement our analytical findings, we implemented numerical simulations in MATLAB, exploring how different parameter values, cost ratios, and imitation rates influence equilibrium vaccination levels and population health. By incorporating disease-induced mortality and exploring imitation dynamics within this modeling framework, we aim to clarify how realistic mortality assumptions and adaptive behavioral strategies may shape vaccination decisions and disease trajectories, which can then enhance our theoretical understanding and inform more effective public health interventions.

Ethan Garard

IL - North Central College

Discipline: Political Science

Authors:
#1 Suzanne Chod
#2 William Muck

Abstract Name: A (MAD)der World: Practiced Nuclear Deterrence or Lip Service?

To determine the applicability of Mutually Assured Destruction (MAD) in today's geopolitical landscape, this study will observe and analyze the evolution of nuclear-use doctrines across the Cold War administrations (1945-1991) of the United States and the Union of Soviet Socialist Republics (U.S.S.R.). This study will catalogue nuclear doctrines throughout the Cold War to determine whether MAD kept state actors within the rational guardrails of deterrence, as well as highlight the similarities and differences of the nuclear doctrines across administrations. I review written and rhetorical communication of Cold War presidents and Soviet premieres from 1945-1991 using primary and secondary sources to determine if MAD is being communicated as an operating doctrine. I also examine weapons system development programs of Cold War presidents and Soviet administrations. Examining publicized doctrine and weapons advancement and stockpiling can uncover the dissonance between the language of executives and the weapons and militaristic proliferations. If

I observe dissonance, it tells us that MAD was used more as a smokescreen as opposed to a practiced nuclear doctrine. This finding compels us to reconsider the current relevance and application of MAD.

Zachary Garcia

AZ - Embry-Riddle Aeronautical University

Discipline: Engineering

Authors:

#1 Elliott Bryner
#2 Gabriel Ledezma
#3 Zachary Garcia
#4 Olivia Wood
#5 James Shour
#6 Gabriel Corneaux
#7 Isaiah Veidmark
#8 Katherine Rolle
Gabriel Ledezma

Abstract Name: Jumbo Shoo: A Cost-Effective System for Human-Wildlife Harmony

Human-wildlife conflict is a significant challenge in rural Namibian communities, where elephants, essential to biodiversity and ecotourism, frequently disrupt village life by damaging crops and water sources. Despite their ecological and economic importance, the increasing overlap between human settlements and wildlife habitats calls for innovative and sustainable solutions to mitigate conflict. The Jumbo Shoo project addresses this issue by developing a cost-effective, low-maintenance system that autonomously deters elephants from crop areas while preserving their access to vital water sources. This project integrates detection and deterrence mechanisms to provide a scalable and humane approach to wildlife management. The system employs a two-layer detection mechanism. The first layer uses a seismograph to detect elephant motion at a distance, triggering the second layer, which utilizes cameras and object detection software to confirm their presence at close range. Once confirmed, the system autonomously activates deterrents tailored to daylight or nighttime conditions: in daylight, an infrasound alert is deployed, while at night, a strobe light sequence is activated. This dual approach ensures high reliability and adaptability to varying environmental conditions. Solar panels power the system, providing energy and enabling time-of-day assessments, supported by a battery backup for continuous operation. Designed for ease of use, the system requires no specialized training and is scalable to form networks of interconnected devices, enhancing protection over larger areas. The Jumbo Shoo team hopes to further optimize the system to improve the reliability of the detection and deterrence states. The team will return to Namibia in May of 2025 to conduct field testing of the prototype in rural communities, collecting data to refine its performance and integration. Additionally, efforts will focus on expanding the system's applicability to address other human-wildlife conflict scenarios, supporting broader conservation goals.

Samantha Garcia

TX - The University of Texas at El Paso

Discipline: Health and Human Development

Authors:

#1 Beatrice Lee
Edward Cordova

Abstract Name: Examining the Mediating Roles between Gratitude and Life Satisfaction in People with Multiple Sclerosis

This study aimed to examine the cumulative mediating effect of perceived stress and mental health between gratitude and life satisfaction among people with multiple sclerosis (MS). Prior research has discussed gratitude as a source of human strength that enhances well-being while increasing the likelihood of experiencing positive emotions that facilitate happiness. While research has previously found benefits of gratitude on life satisfaction in people with MS, there is limited research on the associations among psychological distress, mental health, and well-being in the MS population. This cross-sectional design study, a serial mediation analysis was performed to investigate the mediating roles of perceived stress and mental health symptoms between gratitude and life satisfaction. Findings demonstrated that gratitude was negatively associated with perceived stress and mental health symptoms, and was positively associated with life satisfaction. Perceived stress was positively associated with mental health symptoms, and was negatively associated with life satisfaction. Mental health symptoms were negatively associated with life satisfaction. The findings demonstrated that the relationship between gratitude and life satisfaction was partially mediated by perceived stress and mental health symptoms in individuals with MS. These findings provided preliminary support for the effect of gratitude on life satisfaction through perceived stress and mental health symptoms in people with MS. Findings also provided implications on integrating gratitude interventions when working with people with MS. By increasing gratitude levels in MS, this may lead to reduced perceived stress and mental health symptoms, which can enhance their life satisfaction.

Samantha Garcia

TX - The University of Texas at El Paso

Discipline: Health and Human Development

Authors:

#1 Carolina Valencia

#2 Samuel Womack

Melissa A. Calderon-Herrera

Jose L. Rivera

Abstract Name: Culturally Relevant Exercise Interventions: Improving Balance, Gait, and Quality of Life in Hispanic Elderly Populations

Balance and muscle strength decline with age, leading to decreased physical independence and an increased risk of falls and related injuries, which are major concerns for elderly populations. Physical activity, especially exercises targeting lower body strength and balance, has been shown to significantly reduce fall risk and improve mobility, balance, and quality of life (QoL). Group-based exercise interventions further enhance socialization and emotional well-being, which are vital for maintaining high QoL and addressing health disparities among the elderly. This study examines the effects of a structured, culturally relevant exercise program on balance, gait, and QoL in Hispanic elderly populations. Participants aged 70+ completed a five-week exercise program, held twice weekly for one hour per session, focusing on balance, mobility, and flexibility. Outcomes were assessed using the Timed Up and Go (TUG) test, Tinetti Balance and Gait Assessment, and Quality of Life Enjoyment and Satisfaction Questionnaire–Short Form (Q-LES-Q-SF). Pre- and post-intervention measures evaluated changes in balance, gait, fall risk, and QoL. Results showed a statistically significant improvement in TUG performance ($t(9) = 2.438, p = 0.037$), with pre-intervention times (mean = 14.07, SD = 2.39) exceeding post-intervention times (mean = 11.86, SD = 2.34). Improvements approached significance for the Q-LES-Q-SF ($p = 0.054$) and Tinetti Gait Assessment ($p = 0.056$). Participants also reported enhanced mobility, gait, and confidence, highlighting the importance of exercise in promoting health and independence. A longer intervention with a larger sample size could yield more robust statistical improvements across all measures. This study highlights the value of culturally tailored

exercise programs in fostering active aging, reducing fall risk, and enhancing QoL among Hispanic elderly populations.

Karla García

MN - Macalester College

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Religious Placemaking: Community and Pertenencia Fluyente - A Midwest Case Study of the Latinx Diaspora at the Catholic Church of San Miguel Arcángel

How has the Latinx diaspora utilized the Catholic Church as a space to construct an environment of “home”? To answer this question, I draw upon five semi-structured ethnographic interviews conducted with parish members and leadership at the shared parish of San Miguel Arcángel, situated in the Upper Midwest. Understanding that community exists partly due to parish members' distinct methods of community cultivation over the last twenty years, I question if belonging inherently follows. Analysis of interview responses shows that community, belonging, and tensions coexist within the parish. Puerto Rican scholar Felix Padilla's 1985 study utilizes the term “situational identity” while Peruvian American scholar Susan Oboler labels this same shifting actuality of belonging and expendability as “temporary sense of belonging.” In employing the terms, Padilla and Oboler attempt to highlight how minoritized communities are at times belonging and at other moments seen as dispensable in the eyes of dominant society. The transient implications of these two terms do not fully encompass the multifaceted and fluctuating Latinx experience at the case study parish. The Latinx sector of the parish of San Miguel Arcángel has transcended the unequivocal understanding of community and belonging, breaking the norms of temporality. To better describe their unique experience, I propose the concept of “Pertenencia Fluyente” (in English: “Fluid Belonging”). Understanding how community manifests within Latinx religious institutions is a launching point for learning from each other and nurturing solidarity.

Dulce Garcia Galvan

TX - Texas Woman's University

Discipline: Nursing and Public Health

Authors:

#1 Barbara Baudler

Abstract Name: Effectiveness of a Medication Safety Checklist on Final-Semester Nursing Student Competency

Purpose: To determine the effectiveness of a medication safety checklist on nursing students' medication administration competency. Background: Medication errors in hospitals occur at a rate ranging from 5% to 41.3%. To minimize these errors, nursing programs emphasize the "Five Rights" of medication administration (right medication, right patient, right dose, right route, right time). Despite this training, many students continue to struggle with this fundamental skill. In one study, only 30% of nursing students in their final semester verified the right dose during a simulation. Yet, nurses are expected to perform safe medication administration in professional practice 100% of the time. In Fall 2024, a nursing program implemented a new simulation lab course for final-semester students, integrating medication administration competency into each simulation. Methods: Quantitative outcomes were measured utilizing a medication administration safety

competency checklist grounded in best practices. Prior to each simulation, students received education and a pre-briefing session. Following each simulation, faculty reviewed student performance and provided feedback. Education materials were adjusted based on performance patterns. Student competency will be analyzed in SPSS using repeated measures of ANOVA. Expected Results: Data collection was completed on December 5, 2024, and analysis will be completed in January 2025. Preliminary findings indicate that students' competency checklist scores improved over time. The results will be utilized for data-driven decision-making across the curriculum, and future studies will explore student progress across all four semesters.

Ashley Garcia Torres

CO - Regis University

Discipline: Criminology/Criminal Justice

Authors:

#1 Dr. Jenna Martin

Abstract Name: Youth Perspectives on the School-to-Prison Pipeline: Phenomenology from Colorado Public Schools

The school-to-prison pipeline (STPP) refers to the policies and practices that push students, particularly those from marginalized backgrounds, out of schools and into the criminal justice system. This research seeks to explore the development of the STPP in Colorado, and interview youth on how they have experienced these systems have shaped their lives. The STPP has its roots in various social, political, and legislative actions. These policies arose during the Reagan administration's "War on Drugs" and "tough on crime" policies and contributed to the rise of zero-tolerance approaches within education. In Colorado, the Columbine High School shooting significantly reshaped school security. Following the shooting, schools across the state increasingly adopted heightened policing measures, such as the expansion of school resource officers and isolative punishment, embedding a punitive approach to punishment within educational settings. This study investigates how these policies have impacted the lived experiences of students in relation to the STPP. This study poses the questions; How do school disciplinary policies and practices, such as zero-tolerance policies and the presence of school resource officers, affect the incidence of students becoming involved in the pipeline? How does that experience impact their education? Using a phenomenological approach, this study draws on snowball sampling to reach students who have directly interacted with systems involved in the STPP. Open-ended interviews are used to explore their encounters with school disciplinary practices and law enforcement. Data is currently being gathered from 10 youth participants with experience in a large urban school district in Colorado. The goal of this project is to interview youth (ages 18-25) on their stories and collect their narratives on the impact of the STPP.

Karina Garcia-Rivera

VA - University of Richmond

Discipline: Nursing and Public Health

Authors:

Abstract Name: Supporting Spanish-Speaking Immigrants in Accessing Healthcare

Spanish-speaking Immigrant populations in the United States, especially undocumented individuals, face significant barriers to accessing healthcare, including language barriers, lack of insurance, and exclusion from

government programs. These challenges often lead to poorer health outcomes, such as delayed care, undiagnosed conditions, and increased reliance on emergency services. This presentation will explore the role of a volunteer Spanish interpreter in bridging this gap, particularly in the community, from a medical setting. Drawing from my experience as a Spanish interpreter in a community clinic, I will highlight how this role goes beyond simply facilitating communication between patients and providers. The interpreter's role is crucial in ensuring patients understand their diagnosis, treatment options, and healthcare rights, by also creating a welcoming and supportive environment. The task involves navigating cultural nuances, fostering trust, and ensuring patients feel understood. Interpreters face linguistic, cultural and diverse dialects they have to solve professionally and in a reliable manner. The presentation will explore how interpreters must use inclusive language and be sensitive to the linguistic diversity within Spanish-speaking communities, adapting to various dialects and communication styles to ensure more effective care. Furthermore, by providing language support and cultural insight, volunteer interpreters help overcome systemic barriers that often prevent immigrant patients from receiving adequate care. The interpreter's role is to understand the unique needs of each patient, recognizing that every experience is different, and to avoid generalizing or misrepresenting the patient's voice. Through this presentation, I will argue for expanded language services and increased resources to improve healthcare access for Spanish-speaking immigrants, ultimately fostering more equitable healthcare outcomes.

Jaycie Gard

KY - University of Kentucky

Discipline: Biology

Authors:

#1 Robin Cooper

#2 Kaitlyn Brock

#3 Elizabeth Elliott

#4 Alaina Taul

#5 Jeremy Nadolski

Abstract Name: Investigation regarding the physiological effects of cobalt on physiological functions in *Drosophila*, crayfish, and crab: behavioral, cardiac, neural, and synaptic properties

Cobalt, a metallic element found naturally in the earth's crust, is essential to survival. It is the active center of cobalamins such as vitamin B12 and is also a micronutrient for bacteria, algae, and fungi. The effects of cobalt (II) chloride (CoCl_2), the inorganic form of cobalt, are dependent on the dosage. High dosage or chronic exposure to CoCl_2 can have negative effects, such as carcinogenic properties, intoxication, and "beer drinker's cardiomyopathy." This investigation was designed to test the effects of acute, high-concentration cobalt exposure on physiological functions in *Drosophila*, crayfish, and crab, particularly in terms of behavioral, cardiac, neural, and synaptic properties. When exposed to 1 mM of CoCl_2 , decreased neural transmission was observed at the neuromuscular junction (NMJ) of both crayfish and *Drosophila* larvae. Within the crayfish proprioceptive organ, no conclusive changes in activity were observed due to the high variability among individuals, but activity was observed to increase in the crab proprioceptive organ after 10 minutes immersion the CoCl_2 . In larval *Drosophila*, heart rate decreased to near-cessation, though the in-situ preparations were able to recover regular heart rates after sufficient saline rinsing. Systemic injections of CoCl_2 into crayfish hemolymph produced no significant effects on heart rate or tail flip response. In larval *Drosophila* that had consumed food tainted with CoCl_2 , no effects were observed on behavior, mouth hook movements, or body wall movements; however, this led to adults bearing a slightly decreased lifespan, which indicates that 1 mM CoCl_2 has differing effects by tissue and organism.

Emily Gardiner

Authors:

#1 Kimberly Szucs, Ph.D, OTR/L

Abstract Name: The Hidden Curriculum in Gross Anatomy – Fostering Humanistic Values in Health Sciences Students Through Anatomy Pedagogy

Cadaver dissection is the gold standard for anatomy education in health sciences. In addition to content knowledge, dissection may have added benefits for developing professional and clinical skills. This study explores how the “hidden curriculum” of a gross anatomy course fosters humanistic values such as altruism and respect, essential professional skills for clinical interactions. In this first iteration, occupational therapy (OT) students enrolled in gross anatomy were purposively sampled to participate in a pre-post, mixed methods study. An adapted version of the Human Dissection Questionnaire was administered twice at the start of the semester: once before entering lab and once after the first week of dissection activities. Surveys will be completed again at the end of the semester. The Likert scale survey focuses on emotional preparedness and perceptions about dissection and the donor body. Open-ended questions were added to the second survey but have not been analyzed yet. Descriptive statistics were calculated for student perceptions and readiness for dissection. Paired t-tests were run to assess change in these areas after the first week of lab. 100% of students agree dissection is fundamental for learning anatomy, and 90% agree they are excited for the process of discovery via dissection. A significant change ($p < 0.05$) in “readiness to make an incision” was found after the first week, along with preference to refer to the donor by their name. Students agree they want to know about the donor’s life and believe they can do so via dissection. However, they feel neutral about developing connections and identifying with the donor. OT students are excited to interact with and learn from cadavers through dissection. Early results suggest lab activities can be designed to foster humanistic values, including altruism and respect, which are critical soft skills for healthcare practitioners.

Emmaleth Gardner

WI - University of Wisconsin-Eau Claire

Discipline: Nursing and Public Health

Authors:

#1 Marilyn Gardner

#2 Liam Grossman

Abstract Name: Queer Belonging on Campus: The Call For Institutional Transparency

Roughly 17% of college students identify as Queer. Compared to their peers, Queer students are more likely to face harassment and discrimination on campus and experience a lower sense of belonging, which is associated with decreased retention and increased mental health issues. The Campus Pride Index (CPI) provides a nationally benchmarked database of campuses that have come out to improve the academic experience and quality of campus life for Queer students. As such, it is a fundamental tool for prospective students to identify campuses where they will feel safe and supported. Because the CPI does not capture the lived campus experiences of Queer students, it recommends campuses to conduct and report findings of cultural climate surveys. To determine if this occurred, the websites for a census of colleges and universities in the CPI database ($N=214$) were searched. Ninety institutions (42.3%) reported having conducted a cultural climate survey, and an independent t-test indicated they had a statistically higher CPI score. However, of those who reported having conducted a cultural climate survey, less than half (46.7%) reported the results publicly. An independent t-test indicated these institutions had a significantly higher CPI score than those who did not publicly report their findings. Additional analyses revealed that residential campuses had a

statistically significant difference in CPI scores and a moderate positive association with campus size. There were no statistically significant differences in CPI scores by region, religious affiliation, or minority-serving status. To provide Queer students with the support and safety they need, campuses need to conduct Cultural climate surveys and have them easily accessible to the public. Such transparency of the results demonstrates their commitment to creating and fostering an inclusive environment.

Ziyyah Gardner

OK - Langston University

Discipline: Biology

Authors:

#1 Lindsay Davis

Abstract Name: Investigation of Capillin and Its Effects Microbial Growth using *Artemisia absinthium* from Wormwood

The Center for Disease Control and Prevention (CDC) estimates that at least 2.8 million antimicrobial-resistant infections continue to occur in the United States each year, killing more than 35,000 people. Globally, the World Health Organization projects that these infections will cause up to 10 million deaths annually by 2050 if new antibiotics are not developed. Capillin is an organic compound known for its cytotoxic properties, which can induce cell apoptosis. It also exhibits antitumoral, antibacterial, antimicrobial, and antifungal activities. This study investigates the inhibition of bacterial growth using *Artemisia absinthium* extract from wormwood, isolating capillin as a key active component. By examining the antibacterial effects of capillin, this research contributes to the understanding of natural compounds in medicine, offering insights into anti-microbial-resistant patients through the development of novel treatments and therapeutic options. The research findings support our hypothesis that the extract displays antibacterial properties, as evident through our preliminary bacterial growth trials. Our future studies will involve using GC-MS and HPLC techniques to verify capillin purity and concentration. Furthermore, we will investigate the mechanism of capillin in inhibiting bacterial and fungal growth.

Sydney Gardner

NC - North Carolina State University

Discipline: Biology

Authors:

#1 Adam Ehmke

#2 Vi Greene

#3 Oz Carl

#4 Kayla Ruff

#5 Nicole Acosta

#6 Lisa Paciulli

#7 Adam Hartstone-Rose

Abstract Name: Exploring Demodex Mites on Captive Lemurs (Class: Arachnida)

Mites (Class Arachnida) are arthropod ectoparasites living on hosts. Demodex mites are a genus of mites that are normally benign, typically only causing dermatological issues when the host is immunocompromised. Mites have been extensively investigated in mammals such as humans and dogs, yet few studies have

examined mites on lemurs. Therefore, to study mite presence on lemurs, the Duke Lemur Center (DLC) provided lemur hair samples on slides taken from six facial and eight limb regions during routine vet procedures. These samples were examined under compound light microscopes using 10x and 40x objective lenses. Novel objects were then photographed and later reexamined in order to determine whether it was a mite. Mites were identified based on morphology. Data gathered from analyzing samples were organized by lemur characteristics (e.g., species, sex, age, etc.). Hair slides were examined from a total of 59 lemurs belonging to ten species, with mites being found on eight of the lemur species. Thirty-seven potential mites were found with most of the mites looking like they belong to *Demodex*, a mite genus commonly found on dogs. At least one of the mites found could potentially be a new species. This study marks the first systematic sampling of *Demodex* mites performed across lemur species. In the future, genetic analyses should be conducted to identify the specific mite species found. Studying the presence of mites on lemurs will provide insight into the largely unstudied relationship between ectoparasites and lemurs, and if / how ectoparasite frequency in lemurs can be indicative of population health.

Lauren Gardner

FL - The University of Tampa

Discipline: Biology

Authors:

#1 Carlos A. Santamaria

#2 Taylor Cady

Abstract Name: Cryptic Diversity of *Ligia novizealandiae* Isopods from Te Ika-a-Māui / North Island of Aotearoa New Zealand

Ligia are a globally distributed genus of isopods mostly found in the intertidal region of rocky coastlines. Due to their poor dispersal capabilities, *Ligia* in isolated locations often harbor highly unique genetic lineages. In some instances, these lineages have been shown to represent cryptic species (i.e., two or more morphologically similar species recognized as a single species). High levels of cryptic diversity within *Ligia* have been reported from the Hawaiian Islands, the Caribbean region, Southern Africa, the Seychelles, amongst others. We used molecular methods to characterize populations of *Ligia novizealandiae* from Aotearoa New Zealand and thus determine if cryptic diversity is found within this remote region of the Southwest Pacific. We extracted DNA from individuals collected in six localities from Te Ika-a-Māui / North Island of Aotearoa New Zealand. Three mitochondrial genes (CO1, 16S rDNA, 12S rDNA) and two nuclear genes (NaK, 28S rDNA) were sequenced from each individual. Phylogenetic reconstructions indicate the presence of three distinct and well-supported *L. novizealandiae* lineages: (a) one found in four localities on the western coastline, (b) another found at Moa Point at the southern end of the island, and (c) a lineage found at Waiwera Beach in the northeast. These lineages are highly divergent, as estimates of evolutionary divergence between 16S rDNA sequences using the Kimura 2-parameter amongst genetic range from 13.5% to 29.7% and exceed those reported for comparisons between *Ligia* species. To further our understanding of cryptic diversity within Aotearoa New Zealand, additional sampling will need to be conducted on the east coast of Te Ika-a-Māui / North Island and on Te Waipounamu / South Island. Further analysis will need to be completed to identify any additional lineages and determine whether these lineages represent new species.

Jasmine Garg

IL - Elmhurst University

Discipline: Nursing and Public Health

Authors:

Abstract Name: The Experiences of Incarcerated Postpartum Women: A Comprehensive Literature Review

The majority of women in prison are of reproductive age; currently, there are an estimated 55,000 pregnant women in jail, the majority will continue to serve their sentence after childbirth and be separated from their child within 24 hours. Postpartum women have significant physical and emotional needs, these needs are complicated by: isolation, mother-child separation, and non-standardized care within prisons. Prisoners typically receive substandard care that fails to address the unique needs of postpartum women. This study offers an overview of the experiences of incarcerated postpartum women who have participated in supportive programs. Postpartum care programs are defined as programs focused on maternal and infant care that include women from delivery to one year after birth. A comprehensive literature review of qualitative studies will be used to understand the perceptions and experiences of women who are in postpartum programs while incarcerated. This study will include articles that are peer-reviewed, English, published between January 1, 2000 and November 1, 2024, and from the databases: CINAHL, PubMed, & PsycINFO. Studies will be evaluated using the JBI Critical Appraisal Checklist for Qualitative Research. Preliminary findings have shown that imprisoned postpartum women feel significant grief due to infant separation and lack of support. Postpartum programs modestly improve the health outcomes of mothers. Programs can help mothers by providing opportunities for improved lactation, nutrition, and crucial maternal-infant bonding. There are limited programs focused on psychosocial health. Postpartum and maternal support is minimal in prison, however, prison programs help improve outcomes and should be more widely implemented throughout the prison system.

Sageena Garg

IA - Iowa State University

Discipline: Engineering

Authors:

#1 Anuj Sharma

Abstract Name: SignalVerse: Harnessing LLMs to Revolutionize Traffic Signal Management

The optimization of traffic signal systems is a critical challenge in urban transportation planning, requiring quick and reliable access to precise and context-specific information. Despite advancements in adaptive signal control technologies and performance measurement systems, a gap remains in integrating these technologies effectively and making their knowledge widely and quickly accessible. To address this gap, we introduce SignalVerse, a specialized chatbot designed to support traffic engineers by providing reliable answers to complex queries about traffic signal operations and management. SignalVerse employs a dual-response system that merges information from a custom-built knowledge base—comprising specialized traffic signal documents—with responses sourced globally. This allows users to compare the relevance and accuracy of different sources of information. Our methodology involved continuous user feedback to refine its' responses, ensuring they meet the real-world needs of traffic engineers. The results indicate that SignalVerse provides highly satisfactory and contextually relevant answers, significantly aiding traffic signal optimization tasks. While SignalVerse shows great promise, it has limitations, such as the initial scope of its knowledge base. Future research focuses on expanding the knowledge base, enhancing natural language processing techniques, and exploring broader applications in traffic engineering. In conclusion, SignalVerse represents a significant advancement in the field, offering a practical solution for traffic engineers to access specialized knowledge quickly and reliably. By addressing the critical need for efficient information retrieval in traffic signal management, SignalVerse contributes to safer and more efficient urban transportation systems. Keywords: SignalVerse, Traffic Signal Management, Natural Language Processing, Performance Measurement Systems, Urban Transportation Optimization

Meher Garg

IL - Springfield High School

Discipline: Biology

Authors:

#1 Victoria Fox

Abstract Name: Human Neuroblastoma Cancer Stem Cells (SH-SY5Y) Differentiation using Retinoic Acid: A Potential Therapeutic Strategy

ObjectiveTo test if retinoic acid (RA) can induce differentiation of Human Neuroblastoma cancer stem cell line (SH-SY5Y) into normal neurons and offer a chance for cure for patients with Neuroblastoma.
Background:Neuroblastoma is a neurological malignancy with high relapse rate and mortality in young children despite optimal treatment.Retinoic acid (RA), a compound of vitamin A, can induce cell differentiation. It is used as treatment in acute promyelocytic leukemia by inducing differentiation of cancer cells. Whether RA can induce differentiation of Neuroblastoma cancer stem cell line SH-SY5Y is unknown.
Material and methods SH-SY5Y human neuroblastoma stem cells. RA, 1.25, 2.5, 5 and 10 micromolar (mm) concentrations, prepared along with 2% and 10% Fetal bovine serum (FBS) media. Cells are plated in wells of 2% and 10% FBS and incubated for 24 hours. RA concentrations from 1.25 to 10 mm added to wells with 2% and 10% FBS. Media replaced daily for 5 days. Plate fixed using phosphate buffered saline. Stain for neurons using 0.1% Triton X-100 TUJ1 primary antibody and secondary antibody mIgC129 added. Cells imaged for differentiation into neurons under fluorescent microscope
ResultsRA incremental concentrations from 1.25 to 10 mm concentration were tested with FBS of 2% and 1 %. FBS poor media resulted in cell death. Concentration of RA below 5 mm did not induce optimal cell differentiation.The optimal concentration of 10 mm retinoic acid and 10% fetal bovine serum effectively induces the differentiation of neuroblastoma stem cell lines into neurons, presenting a potential therapeutic strategy.
Conclusion: Neuroblastoma is a high-risk malignancy in children. This study suggests that retinoic acid, in combination with the optimal concentration of fetal bovine serum, can induce differentiation of the SH-SY5Y human neuroblastoma stem cell line. Testing retinoic acid in vivo should be considered, as it may offer a potential chance for cure for neuroblastoma patients.

Cole Garland

PA - Duquesne University

Discipline: Biology

Authors:

#1 Cole Garland

#2 Meghan Wells

#3 Wook Kim

Abstract Name: Identification of genes that dictate spatiogenetic structure formation in *Pseudomonas fluorescens* colonies through random and directed mutagenesis

The spatial organization of individual cells within a densely structured bacterial population profoundly impacts their survival and adaptation. In a colony model of *Pseudomonas fluorescens* Pf0-1, rsmE mutants spontaneously and repeatedly emerge as localized patches by solving the problem of overcrowding. These mutants use extracellular secretions that are consequently de-regulated by the altered post-transcriptional

regulator RsmE to form a dominant spatial structure. Through random transposon mutagenesis, 14 distinct genes were identified to impact spatial structure formation. We are currently validating our initial findings by constructing deletions of the candidate genes in the wildtype *P. fluorescens* Pf0-1 strain and a rsmE mutant and competing individual knockout isolates against the wildtype to assess their relative fitness and changes in spatial structure formation. Here, we report the results of the transposon mutagenesis screen and our current progress on the validation efforts. The mutant set includes genes that are bioinformatically predicted to encode extracellular secretions, signal transduction components, and proteins of unknown function. Mechanistic insights into the molecular architecture and regulation of bacterial community organization could provide a new path of discovery toward optimizing biotechnological processes and developing therapeutic strategies against chronic bacterial infections.

Anna Garren

VA - George Mason University

Discipline: Political Science

Authors:

#1 Anna Garren

Abstract Name: The Interplay of Policy Content and Institutional Dynamics in Legislative Behavior: Insights from Cosponsorship and Roll Call Networks

Does the content of bills explain cooperation among US Senators? How do policy, partisanship, and institutional roles shape legislative behavior in the US Senate? This paper addresses these questions by examining cosponsorship and roll call voting behavior during the 117th Congress using Exponential Random Graph Models (ERGMs). This study incorporates two networks: a cosponsorship network that includes senator-level attributes (e.g., party, seniority, leadership) and edge-level covariates (e.g., text similarities of sponsored bills) and a roll call voting network that includes party affiliation, bill similarity, and cosponsorship behavior. A unique aspect of this study is the use of Bi-LSTM processed BERT embeddings to quantify the textual similarity of bills sponsored by each senator, capturing the influence of policy content on legislative decision-making. My findings demonstrate that policy alignment significantly affects cosponsorship ties, surpassing traditional factors such as partisanship. In contrast, roll call voting behavior is more strongly influenced by prior cosponsorship patterns and party affiliation, though policy alignment also plays a minor role. Together, these findings explain the drivers of legislative networks, highlighting the interconnected yet distinct drivers of cosponsorship and voting behavior in the Senate.

Pallas Garvey

DC - American University

Discipline: Communications

Authors:

Abstract Name: Fear and Fascination: A Computational Analysis of Personal Safety Discourses within the Subreddit r/TrueCrime

True crime has become an extremely popular genre of media and is more widespread than ever, with countless stories being adapted into biopics, documentaries, podcasts, TikTok series and more. As true crime becomes more popular, there is a scramble in Hollywood to make the best and scariest renderings of the most heinous crimes. This morbid fascination can be viewed as simple consumption of enjoyable media, but I

hypothesized that watching and listening to true crime stories can have real life emotional implications that can be detrimental to how consumers interact with the world around them. Recent research on the true crime genre suggests that consumption of true crime content is connected to increased feelings of fear. In this study, I aim to further answer the research question “Do those who consume true crime perceive a heightened sense of danger in the real world?” I performed a computational topic analysis—an automated technique for identifying language-based clusters within a sample of texts—of the subreddit message board r/TrueCrime via Communlytic to analyze the emotional responses of true crime consumers. I chose the subreddit r/truecrime to focus the study on heavy consumers of true crime content and limited my sample to posts featuring keywords related to personal safety. The topic analysis generated 10 clusters of Reddit posts, and I am currently in the process of analyzing them to develop categories describing how r/TrueCrime members understand and describe personal safety. Ultimately, this study underscores the real life implications of violent stories sensationalized for the purpose of entertainment.

Abigail Garvey

NY - St. John Fisher College

Discipline: Biology

Authors:

#1 Daryl Hurd

Abstract Name: The Cellular Role of par-1 in the Development of the *C. elegans* Male Tail

The par-1 gene codes for PAR-1 kinase protein, which contributes to cell polarity during cellular development in *C. elegans* and other organisms. The human orthologs of par-1 have been found to contribute to the progression of Alzheimer’s Disease through phosphorylation of Tau protein in the brain. Previously, PAR-1 has been found to play an essential role in the development of the *C. elegans* vulva with a post-embryonic RNAi silencing approach. Several new worm strains were created in order to visualize development of the tail cells with GFP reporters. Post-embryonic RNAi treatment of par-1 was used to study the development of *C. elegans* male tails. Worms that underwent RNAi treatment showed visible defects in male tail rays and cuticle shape. Visualization by DIC and epifluorescence microscopy shows that par-1 plays a role in the development of the *C. elegans* male tail.

Sofia Garza

CA - University of California - Los Angeles

Discipline: Nursing and Public Health

Authors:

#1 Erika Nguyen

#2 Sofia Garza

#3 Citlali Perez

#4 Alberto Romo Valenzuela

#5 Rosemarie Diaz

Erika Nguyen

Abstract Name: Increasing Bystander CPR Training in Latino(x) Communities

Latinos in Los Angeles receive bystander CPR at about half the rate of White residents, a disparity linked to barriers such as cost, limited Spanish-language training, fear of liability, and lack of bilingual 911 dispatchers.

Researchers surveyed attendees at health fairs in predominantly Latino neighborhoods to better understand CPR knowledge and utilization in the local Latino community, including the Vision y Compromiso conference and the Latino Student Health Project Health Fair. Eighty-two participants completed a 30-question survey assessing CPR knowledge and identifying barriers to learning and performing CPR. The survey results revealed that while 77.3% understood CPR's purpose and 88.9% had some knowledge of it, only 58.0% felt comfortable demonstrating CPR techniques. Additionally, 74.4% had attended a CPR course, but only 45.3% held an active certification. Key barriers to obtaining certification included cost (39.3%) and lack of Spanish-language courses (25.0%). Barriers to performing CPR in emergencies included language barriers (75.0%), fear of legal consequences (53.2%), and uncertainty about when CPR is needed (41.6%). The findings highlight the need for low-cost, bilingual CPR training programs in Latino communities. These programs should address Good Samaritan laws to alleviate liability concerns and include guidance on recognizing cardiac arrest to improve confidence in performing CPR. Enhancing CPR accessibility and knowledge in the Latino community is vital to increasing bystander CPR rates and improving cardiac arrest outcomes.

Gabriela Garza

PA - Westminster College

Discipline: Chemistry

Authors:

Abstract Name: Identifying the Chemical Composition of Kombucha Tea

Kombucha tea has gained popularity for its reported antimicrobial properties, antioxidant content, and polyphenol content. These properties are attributed to acetic acid production during fermentation, which subsequently lowers the pH of kombucha and contributes to the production of kombuchas' proposed health benefits. In this study, eight different types of herbal kombucha-fermented teas (HKFTs) were studied over a two-week fermentation period, during which the chemical profiles of these different HKFTs were analyzed. Colorimetric assays such as DPPH and the Folin-Ciocalteu assay resulted in a positive increase of both antioxidants and polyphenols as fermentation progressed in all HKFTs. The antimicrobial properties of the HKFTs were also measured against *Escherichia coli*, resulting in partial antimicrobial properties of the different teas regardless of the pH value of the HKFTs. The results suggest that the chemical profile of kombucha changes throughout the fermentation process and is dependent on the organic material used to brew the tea.

Efrain Garza

TX - The University of Texas at San Antonio

Discipline: Business

Authors:

#1 Mark Leung

Abstract Name: Optimizing Mentor-Mentee Pairing: A Linear Programming Approach for Diverse Business Majors

This paper presents an optimization framework for mentor-mentee pairing using a linear programming approach. The model incorporates multiple weighted attributes, such as the alignment of mentor industry backgrounds with student majors and the Euclidean distance between their profiles. By maximizing

compatibility and minimizing total weighted distances, the proposed solution effectively addresses the challenge of pairing mentors and mentees across diverse business disciplines. This research highlights the power of mathematical optimization techniques in enhancing undergraduate research experiences and fostering meaningful mentor-student relationships.

Jared Gasi

FL - University of West Florida

Discipline:

Authors:

Abstract Name: Exploring the Integration of Cybersecurity Tools in Software Development Pipelines: A Literary Analysis and Research Proposal

As cyber threats increasingly target software development processes, integrating cybersecurity tools into CI/CD pipelines is essential for minimizing vulnerabilities. This research explores the effectiveness, integration points, and costs associated with various commercial and open-source cybersecurity tools within CI/CD pipelines. Through a comprehensive literature review of scholarly articles, industry reports, and case studies, this study categorizes tools—such as OWASP ZAP, Veracode, and GitLeaks—by their application points, assessing their effectiveness and integration challenges. Additionally, hands-on testing with a GitLab CI/CD pipeline will be conducted to validate findings and evaluate the tools' real-world applicability. The study adopts a mixed-methods approach, combining literature analysis, empirical testing, and professional interviews with cybersecurity experts. Expected outcomes include a detailed catalog of tools, best practices for integration, and practical recommendations for small to medium-sized organizations seeking cost-effective security solutions. The catalog will cover each tool's integration costs, points of application, and performance in vulnerability detection. By bridging the gap between development speed and security needs, this research offers actionable insights for developers and security professionals, equipping them to make informed decisions about cybersecurity investments and pipeline protections. This work contributes to the broader DevSecOps movement, providing foundational guidelines that can help organizations enhance their CI/CD security frameworks effectively and affordably.

Gabrielle Gaspar

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Taylor L. Schanel

#2 Rhea Pandit

#3 Christopher D. Willey

Abstract Name: Impact of Tumor Treating Fields Therapy on Patient-Derived Glioblastoma Models with Varying Radiation Sensitivities

Glioblastoma (GBM) is the most frequently occurring malignant primary brain tumor in adults. Current standard of care includes maximal safe tumor resection, chemotherapy with temozolomide (TMZ), and radiotherapy followed by adjunct TMZ and Tumor Treating Fields. Tumor Treating Fields (TTFields) delivers low intensity, intermediate frequency alternate current electric fields to tumors by transdermal application. TTFields has been shown to broadly induce autophagy, cell membrane permeability, DNA replication stress,

and anti-mitotic and anti-migratory effects. Despite clinical evidence in support of the benefits of TTFIELDS for GBM, prognosis remains poor. GBM shows an inherent and acquired resistance to TMZ and radiation, driven in part by brain tumor-initiating cells (BTICs), and a more thorough understanding of the effects of TTFIELDS in radiation-resistant GBM is needed. Patient-derived xenografts (PDX) were previously developed through subcutaneous implantation of patient GBM cells into immunodeficient (nu/nu) mice, and acquired radiation-resistant PDX were generated through serial in vivo radiation. We assessed the survival of PDX with varying radiotherapy sensitivities by cell viability assay Cell Titer Glo five days post-radiation. PDX were cultured on geltrex-coated coverslips under serum-free conditions. TTFIELDS was administered to PDX with the Novocure inoventro™ in a cooling incubator to maintain a 37°C sample temperature in the device ceramic well plates. Results showed that TTFIELDS provided varying growth inhibition across GBM PDXs depending on radiation sensitivity or resistance.

Gabrielle Gaspar

AL - University of Alabama at Birmingham

Discipline: History

Authors:

Abstract Name: Cholera and Colonization: The Racialization of the Philippine-American War

Increased disease outbreaks are noted with a greater frequency during times of conflict. Most studies on cholera focus on peacetime, removed from periods of war, yet its highest casualties are noted in the immediate aftermath. The annexation of the Philippines and its preceding conflicts coincided with the height of jingoism and were driven by the belief in the inherent supremacy of white America over the Orient. American expansion emphasized the idea of benevolent assimilation: the idea that colonialism existed not for the subjugation but rather domestication for acceptance into the broader American empire. Successive wars in the Philippines at the turn of the 20th century created one of the highest civilian mortality combat rates at the time. V. cholera, already present and endemic within the Philippines, is especially proliferative in conditions that arise immediately in the years post-war. Through the analysis of American martial law, first-hand accounts of the Philippine-American war, and the availability of 20th century bacteriology, I argue that the destruction of local public health infrastructures, hypermobility of troops and refugees, importation of and co-infection with disease, and destruction of food systems during the Philippine-American war enabled the spread of cholera during the 1902-04 epidemic in the Philippines.

Sneha Gatuku

VA - Virginia Commonwealth University

Discipline: Biochemistry

Authors:

Abstract Name: Expression, Purification, and Characterization of NMA1

According to the National Council of Aging, 94.9% percent of adults aged over 60 have at least one chronic medical condition. During aging, an essential coenzyme found in all our cells known as nicotinamide adenine dinucleotide (NAD⁺) decreases, which causes functional and metabolic decline. NAD⁺ is used in many cellular redox reactions for energy metabolism and involved in biological processes, such as DNA repair, calcium-dependent signaling pathways, chromatin structure, lifespan extension, and age-associated diseases. It also fuels another important regulator of our metabolism, the deacetylase enzymes sirtuins, that assist in

delaying cellular senescence and extending lifespan. As a result of the NAD⁺ levels diminishing with aging, researchers have been trying to increase NAD⁺ levels. One method is targeting the biosynthetic pathways that produce NAD⁺. The three major ones are the de novo, nicotinamide (NAM) salvage, and nicotinamide riboside (NR) salvage pathways. NMA1, a homolog of human nicotinic acid mononucleotide adenylyl transferase (NMNAT), is found in yeast and is a key enzyme in the NAD⁺ salvage pathway. I aimed to purify NMA1 to help facilitate further studies on producing enzymatically active NAD⁺ analogues in the laboratory and shifting from synthetic production. After several weeks of expressing our NMA1 protein with a His-tag from transformed Rosetta DE3 cells and purifying it with nickel column chromatography, I isolated the protein as indicated by the SDS-PAGE gels. For further purification of NMA1 protein from the impure fractions, I cleaved the His-tag with thrombin, which didn't prove to be efficient. By performing an enzymatic assay with the NMA-1 protein without the His-tag, I found that our purified NMA1 can successfully convert NMN to NAD⁺ as an enzymatically active protein, which can be a valuable therapeutic intervention against aging.

Kam Gauldin

TX - Texas Woman's University

Discipline: Psychology

Authors:

#1 Aimee Myers

Abstract Name: The Disconnect Between the American Dream Ideology and the Evolving Work Culture of Younger Generations: A Study of Changing Values, Economic Realities, and Career Expectations

Abstract The concept of the American Dream has long been associated with the belief in upward social mobility and the idea that hard work can lead to success. For generations, this narrative has shaped individual's aspirations in the United States. However, this traditional ideology is increasingly viewed as outdated, often disconnected from the realities of modern economic challenges. This study seeks to explore the disconnect between the traditional ideals of the American Dream and the evolving work culture of younger generations, particularly Generation Z, as they enter the workforce. In an era marked by rising student debt, economic insecurity, and the decline of traditional career paths, young workers' values and expectations are shifting dramatically. This research examines how younger workers are rethinking key aspects of the American Dream, including job security, financial stability, and personal fulfillment, alongside issues such as work-life balance, career goals, and definitions of success. Through open-ended surveys, interviews, and an analysis of current demographic trends, this study aims to offer a deeper understanding of how changing work dynamics are reshaping the American Dream. The findings will contribute to discussions around organizational policies, economic inequality, labor market reforms, and strategies to reduce burnout, ultimately guiding organizations in adapting to the needs and values of the new workforce. Keywords: American Dream, work culture, economic challenges, cultural shifts, generational values

Brianna Gaulin

WI - University of Wisconsin-Whitewater

Discipline: Environmental Science and Sustainability

Authors:

#1 Cody Bunch

Abstract Name: Water Quality of Spring Brook Creek in Southeast Wisconsin: Implications for Cravath Lake

The Southeast Wisconsin Regional Planning Commission (SEWRPC) is working with the city of Whitewater, Wisconsin to develop a Lake Management Plan for Cravath Lake. In cooperation with SEWRPC, a study was organized to establish monthly (June-November) indicators of water quality on Springbrook Creek that can be used to better understand the environmental conditions in the watershed. Five sampling sites were identified. At each site water temperature, pH, conductivity, dissolved oxygen, total dissolved solids, and water clarity were examined. At the most downstream location water samples are collected for total phosphorus, reactive phosphorus, total kjeldahl nitrogen, ammonia, nitrate + nitrite (as N), chloride, and total suspended solids. Initial results show total phosphorus levels were much higher in June (0.511 mg/L), July (0.120 mg/L), and August (0.117 mg/L) than the 0.075 mg/L criterion identified by the Wisconsin DNR for Cravath Lake. Reference values of total phosphorus for streams of similar size in southeast Wisconsin are 0.03-0.04 mg/L. Nitrate + Nitrite (as N) averaged 5.0 mg/L during June, July, and August, which is double the reference values for sampled streams in southeast Wisconsin. The high values of total phosphorus entering Cravath Lake is concerning. Samples are currently being processed and when complete, will provide a more detailed examination of nutrients entering Cravath Lake.

Sydney Gdanski

NY - Brooklyn College

Discipline: Political Science

Authors:

Abstract Name: The Russo-Ukrainian War and Implications for the Western Balkans

The Russian sphere of influence extends far beyond the borders of the former Soviet Union—as seen through events as varied as the Russian military operations in Africa and the growing Russian media presence in Latin America. In Europe, Russian influence outside of the nations of the former Soviet Bloc has appeared most aggressively in countries of the former Yugoslavia, where Russia has used military, political, religious, and media pressure to expand influence over European territory. This continued influence makes the Western Balkan region a particularly fruitful region for study. The Yugoslav successor states and Albania are at risk of experiencing negative spillovers from the ongoing Russian invasion of Ukraine. In the context of the Balkans, these developments could feature increased nationalist sentiment and an enhanced desire for autonomy or sovereignty of independence movements (both of which may lead to violence) as a result of ethnic tensions, heightened by factors like EU and NATO integration. My research question asks how the Russian war on Ukraine — usually seen outside of the Ukrainian theater as a confrontation between Russia and NATO — might affect the nonaligned countries of the Western Balkans. My research gathers data from interviews with local actors, building off my work this past spring in Bosnia and Herzegovina with the Post-Conflict Research Center an NGO active in the area, to better understand how Russian actions hundreds of miles away in Ukraine, combined with the preexisting Russian influence in the region, have destabilized events on the ground in the Western Balkans. The present research also asks what this sustained influence could mean for the Balkans depending on the outcome of the war in Ukraine. This understanding is crucial for the prevention of violence and for exploring the interconnected nature of threats to European security and peace from Russian aggression.

Ashley Geary

KY - University of Kentucky

Discipline: Engineering

Authors:

Abstract Name: On the Verge of a Flood: An Investigation of High Hazard Dams in Rural Kentucky

There are approximately 300 Kentucky dams considered high hazard dams by the state, and two-thirds of these threaten communities. Many Kentucky dams were built in the early 20th century; most of them have experienced deferred maintenance and are used beyond their limits. The issues and safety hazards posed by these dams are only escalating, especially as the populations increase and weather patterns change. Funding is difficult, grants are scarce, and it often falls on citizens of rural communities to pay for the upkeep. This research will explore the five most critical condition dams and evaluate threats, societal impacts, and possible solutions. Using archival records from a dam engineering consultant, as well as current-day interviews and prediction mapping, dams will be analyzed by considering their past, present, and future. The Hiram J. Graham papers, 1915–1950, at the University of Kentucky Special Collections Research Center contains reports, photographs, and planning documents for numerous dams in Kentucky, focusing on the numerical data. This research will be inspired by his documentation and will provide a unique analysis of hazardous dams by considering engineering, political, and humanitarian viewpoints. This research calls for greater awareness of the growing flood issues and the lack of support for dam upkeep, particularly in rural areas. As a result of this research, an easily accessible guide written for community members—not engineers—will inform the communities affected by potential dam flooding and highlight the humanitarian impact that is usually forgotten within technical reports.

Aspen Gehrman

PA - Commonwealth University - Bloomsburg

Discipline: Education

Authors:

#1 Carolyn Reid-Brown

Abstract Name: The Impact of Faculty, Staff, and Student Perceptions of Campus Accessibility on Academic and Social Outcomes for Students with Disabilities

This project seeks to examine the question: Does faculty/staff/student perception of campus accessibility impact academic and social outcomes for students with disabilities? College student success is a heavily talked about and researched topic. Interactions in the various student populations are what creates an individualized environment for each student. For students with disabilities, this environment and the individuals within are crucial to their ability to thrive. Students with disabilities are statistically less likely to achieve a bachelor's degree with a completion rate of 41% in the United States alone. This isn't due to a lack of ability as students with disabilities have been shown to have the skills to achieve the same goals and tasks as students without disabilities. Research suggests that the accessibility within the environment and support systems for students with disabilities heavily impact this achievement. Accessibility refers to access to not only the physical space, but the academic learning environment. Students with disabilities face challenges related to accessibility including, but not limited to, medical challenges, financial difficulty, and stigmatism from university staff and students. Many students are hesitant to receive the support they need because of stigmatism from disability disclosure and its impact on peer and faculty interactions. For this project, a mixed-method approach was employed. Data were gathered and analyzed using a systematic literature review in conjunction with a survey that will be completed by faculty, staff and students at a state university in Pennsylvania. The expected conclusions will explicate how perceptions of campus accessibility for persons with disabilities by the university population in this particular setting can impact how a student with disabilities will manage and achieve success. This study will help further identify challenges for this setting and present solutions for improving academic and social outcomes for students with disabilities in this setting.

Aiden Geleta

FL - Florida Atlantic University

Discipline: Biology

Authors:

#1 Caylla Martin

#2 Erik Duboue

Abstract Name: Developmental Dissection of Neuroanatomical Disruption Following Early Life Adversity

In the United States, over 36 million individuals live in poverty, with millions of children affected by domestic violence and prenatal substance exposure. These adverse experiences are forms of early life disturbances that can have debilitating effects on brain development or predispose individuals to psychological disorders. While research has shown that genetic and environmental factors influence brain development and adverse environments have harmful effects, exactly how early life disturbances change the brain's growth, maturation, and impact behavior later in life is still not well understood. Existing research has demonstrated that early life adversities (ELA) can result in altered neural activity, however no one knows how the developmental programs that lead to those changes emerge. The goal of my research is to understand how early life adversities affect neuroanatomical changes throughout development, such as changes in size and structure of key brain regions. Recent research has demonstrated that zebrafish subjected to ELA as larvae, induced by random pulses of mild electric current, have elevated stress-like responses in later life. In this study fish will be exposed to shock then grown and tested at different time points, 7dpf, 28dpf, and 60dpf. Fish will be imaged using advanced microscopy with tERK as a neuroanatomical marker. These images will be registered to the larval or novel juvenile/adult brain atlases. Differences in whole-brain neuroanatomy will be performed using the CobraZ platform for analysis. We hypothesize that regions traditionally associated with stress like the amygdala and hippocampus will differ in size between ELA and control fish. This research will provide valuable insights into how ELA affects the brain anatomically and the timeline in which that occurs. The regions found to be affected and the time points in which they occur provide a strategic roadmap for future research investigating the exact molecular mechanisms causing the changes.

Sofia Genareo

PA - Allegheny College

Discipline: Psychology

Authors:

#1 Megan Bertholomey

Abstract Name: THE EFFECT OF CAFFEINE ON ALCOHOL CONSUMPTION IN ADOLESCENCE

Caffeine and alcohol are two of the most widely consumed drugs worldwide, and their combined consumption is becoming increasingly popular among adolescents. When caffeine and alcohol are consumed together, caffeine can increase hazardous behaviors associated with alcohol consumption. Although this trend is growing, there is still limited understanding of the potential effects of mixing these substances on the developing adolescent brain. The purpose of the present experiment was to assess the effect of caffeine administration on alcohol consumption when the two substances were not administered on the same day. Ethanol consumption in male Sprague-Dawley rats was measured via intermittent-access two-bottle choice (IA2BC) procedure, wherein 20% ethanol was placed on the home-cage for 24 hours, every other day, for a 20-day period (water was continuously available). Rats were randomly assigned to one of four treatment conditions: ethanol and caffeine, ethanol and vehicle, water and caffeine, or water and saline. Water served as

the control for ethanol, and saline served as the control for caffeine. On days when ethanol was unavailable to the ethanol group, all rats received an intraperitoneal (IP) injection of either caffeine or saline. Preliminary findings suggest that caffeine attenuated ethanol consumption, specifically on days p40 to p45. This raises the question of whether this period of development is more sensitive to the effects of drug use. Future research in this field could explore the effects of this adolescent exposure on adult ethanol consumption, as well as anxiety-like behavior. Caffeine is known to mimic the somatic symptoms of anxiety or panic attacks, prompting the question of whether caffeine exposure during adolescence would affect anxiety-like behavior after rats develop into adulthood.

Luke Genco

PA - University of Pittsburgh

Discipline: Chemistry

Authors:

#1 Sean Garret-Roe

Abstract Name: Studying the Bending Mode of Carbon Dioxide in Ionic Liquids

Ultrafast multidimensional spectroscopy, or 2D-IR spectrometry has been used to study CO₂'s asymmetric stretch to further the understanding of the interactions between CO₂ and ionic liquids. This interaction is important because ionic liquids are a promising method of carbon capture. The current laser setup in Prof. Sean Garrett-Roe's lab is optimized to study this interaction through the asymmetric stretch of carbon dioxide. Unfortunately, the current laser spectroscopy setup is incapable of examining the bending mode of CO₂. This bending mode is important because observing it would provide greater insight into the molecular mechanism involved in carbon capture. This research project is working to develop a new spectroscopic method that would generate data about carbon capture from the bending mode in various materials. This has involved modeling and building a modified laser setup which will provide a new means of testing the central hypothesis developed by the lab, and that predicts the interactions between CO₂ and ionic liquids. This hypothesis is based on previous experimental results collected in Sean Garrett-Roe's lab as well as collaborations with the Corcelli group (University of Notre Dame). To test this hypothesis, an optical parametric amplifier (OPA) was built. This is a laser setup that uses many optics and crystals to modify the light from the lab's existing laser to the specific wavelength of light needed to interact with the CO₂ bending mode. This modified setup was designed in FreeCad and the crystal behavior was modeled using Select Nonlinear Optics (SNLO) to determine which crystals would be ideal for generating this wavelength of light. The project will continue to work construct a 2D-IR spectrometer to record data on the interactions between CO₂ and ionic liquids.

Annmarie Gendy

VA - Virginia Commonwealth University

Discipline: Health and Human Development

Authors:

#1 Annmarie Gendy

Abstract Name: Bridging the Gap: Enhancing Access to Dental Care in Low-Income Communities Through Mobile Dentistry

Millions of children in low-income communities face significant barriers to accessing basic healthcare

services, including dental care, which can lead to health concerns that negatively affect overall health, education, and social development. The question is: how can children's access to dental care in underprivileged areas be enhanced? This study investigates the efficacy of mobile dental care as a solution to improve access to dental care for adults and children. The methodology for this research involved a comprehensive review of existing literature related to the implementation, cost-effectiveness, and outcomes of mobile dental clinics in low-income communities. A detailed analysis was conducted on the prevalence of dental care access, community needs, and the financial impact of providing mobile dentistry services in economically disadvantaged regions. This included reviewing data on the availability of dental care, as well as assessing the effectiveness of mobile dental units in overcoming geographic and financial barriers to care. Data was gathered on the financial strategies used to support mobile dentistry programs and the potential for long-term sustainability. The study evaluated outcomes such as the reduction in untreated dental issues, improvements in oral health, and the overall impact on children's health and educational performance following treatment in mobile clinics. Research suggests that mobile dentistry not only increases access to dental care but leads to improvements in children's general overall health. The study concludes that mobile dental clinics have the potential to bridge the healthcare access gap in low-income communities. The research emphasizes the importance of investment in mobile dentistry, advocating for policy changes, securing funding, and conducting further studies to refine the delivery of care. These efforts are essential to ensure that all children, regardless of their socioeconomic background, receive the dental care necessary for a healthy future and a healthy smile.

Mark Genkin

NY - Brooklyn College

Discipline: Biology

Authors:

#1 Mubasshir Mumtaz

#2 Edward Genkin

#3 Edwin Rojas

#4 Igor Levin

#5 Qi He

Tony Joseph

Pratyai Dey

Abstract Name: Evaluating Google and ChatGPT 4o as Patient Information Repositories Regarding Bone Grafting

The aim of this study is to demonstrate the impact of search engine information and comparing that quality between Google and Chat GPT4o in regards to the categories of questions, readability of responses, source analysis, and precision for frequently asked questions in regards to bone grafting. Analyzing this difference in information would be vital to understanding knowledge gaps between Google and Chat GPT4o in terms of patient education, since these gaps would be able to lead to confusion and anxiety in patients about commonly performed dental procedures. Through this analysis, we determined that the quality of answers from Google and ChatGPT4o had significant differences for readability. This is proven through scales like the Flesh-Kincaid and Flesch Reading Ease score ($p < 0.01$). The questions that were asked were similar between the two search methods. This is shown through the Rothwell grading system, which shows that questions were almost equally divided between value, fact, and policy questions. In addition to responses, we found significant differences in source quality between the search methods, which is illustrated by the JAMA source criterion ($p < 0.05$). ChatGPT4o was shown to provide higher quality and more reliable sources with higher JAMA scores. We also measured Automated Readability Index scores and saw that ChatGPT had a significantly more difficult reading score than Google ($p < 0.05$). Further research must be done to find ways of improving the quality and ease of information recovery for patients, with a focus on credible sources, easy to read articles, and in-depth information.

Mark Genkin

NY - Brooklyn College

Discipline: Biology

Authors:

#1 Alexander Genkin

#2 Anna Petrovicheva

#3 Igor Levin

Tony Joseph

Salmah Akbar

Abstract Name: Balancing Efficacy and Safety: Chlorhexidine, Sodium Hypochlorite, and Ozone Therapy as Endodontic Irrigants

Root canal therapy, a dental procedure, includes removing infected pulp, sealing canals, and covering the tooth with restorations such as a crown. Endodontic irrigation, a major step of this procedure, is used to eliminate bacteria and biofilm within the canals with the use of a disinfecting agent. After irrigation, the root canals are sealed to prevent reinfection, usually with gutta percha, a rubber substance, which is then followed by a crown restoration. Usually, sodium hypochlorite (NaOCl) is used as a common irrigant for its antibacterial properties but can lead to detrimental side effects like tissue and gum damage. Chlorhexidine (CHX), with its effectiveness against *Enterococcus faecalis* - a common cause of caries and periodontitis - is a safe alternative but may alter dentin's properties and doesn't erode organic material as well as NaOCl. A newer alternative, ozone, has powerful oxidizing qualities, minimal toxicity, and a wide range of antimicrobial effects, but only reaches full bactericidal potential when administered in conjunction with other irrigants. Our study evaluates these agents by comparing their antimicrobial mechanisms, efficiency, organic material erosion, and toxicity. Through such analysis, 2.5% sodium hypochlorite followed by ozonated liquid rinse were shown to be successful in eliminating bacteria like *Enterococcus faecalis* and getting rid of decay, while not posing serious risks to the patient or side effects. Further research is required to explore the possible benefits of combining ozone and sodium hypochlorite while minimizing toxic effects, as well as research on outside factors like temperature and moisture and their impact on antibacterial effects.

Madison Genslinger

KY - Thomas More University

Discipline: Chemistry

Authors:

#1 William Wetzel

#2 Jyoti Saraswat

Abstract Name: A Chemical and Mathematical Analysis of Agave Spirits

Produced in Central America, tequila is a very well-known spirit that has historic links to the fermented drinks of Aztecs, pulque and maguey, which were made from the sap of agave plants. The Spaniard influence and industrialized distillation processes have modified these historic beverages to create the tequila that is available today. To prepare tequila, agave plants are carefully grown and the heart of the plant is removed, steamed, shredded, and milled to yield agave juice. This juice is then fermented with yeast, distilled, diluted, aged, and bottled to create a final 80 proof beverage. Variations in the aging process give rise to several

classifications of tequila: blanco, joven, reposado, añejo, and extra añejo. Not surprisingly, these different aging conditions yield alcohols with very distinct and different taste profiles. While the coloration of each product can serve as a preliminary method to characterize these spirits, a more sophisticated analysis of the chemical profile is often helpful. In this work, nearly 30 different agave spirit samples having a variety of classifications were analyzed by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES) and Gas Chromatography Mass Spectrometry (GC-MS) to examine the levels of metal ions and volatile organic compounds, respectively, in the alcohols. Approximately 17 metal ions and 85 volatile compounds have been identified and trends in the major components were used to generate a chemical fingerprint to differentiate one tequila from another. To examine the patterns in the data in more detail, more sophisticated mathematical methods (Principal Component Analysis and Linear Discriminant Analysis) were employed to characterize and categorize the tequila samples.

Jillian Gerasimek

IL - Quincy University

Discipline: Psychology

Authors:

Abstract Name: Digital Validation to Clinical Recognition: Mapping the Evolution of Adult Autism Diagnosis

Adult autism diagnoses have increased significantly over the past decade, sparking extensive debate within both public discourse and professional psychological communities. While popular narratives often reduce this phenomenon to simplistic explanations, the reality encompasses a complex interplay of shifting diagnostic paradigms, emerging self-advocacy movements, and diverse pathways to recognition. This study examines how these interconnected factors shape an adult's diagnostic journey, investigating the systematic elements and individual experiences that influence access to and understanding of autism diagnosis. This study investigates the rise in adult autism diagnosis through three connected research approaches. Document analysis provides the foundation, examining ten years of clinical literature and healthcare policies from 2014-2024, with specific focus on how diagnostic practices have affected women, racial minorities, and people from different economic backgrounds. Social media discussions and online communities reveal firsthand accounts of adult diagnosis experiences, showing how marginalized groups have reshaped our understanding of adult autism. Examination of case studies then explore individual diagnostic journeys, demonstrating how gender, race, and economic status influence access to diagnosis. This research structure allows for examination of both systemic barriers and personal experiences in adult autism diagnosis, while highlighting traditionally overlooked voices in autism research. This research expects to demonstrate that marginalized voices fundamentally reshape our understanding of adult autism diagnosis through three key findings: first, how diagnostic criteria have historically overlooked diverse presentations particularly in women and minorities; second, how online communities have created alternative spaces for recognition and validation; and third, how economic and social barriers continue to impact access to diagnosis. These findings will be contextualized within broader healthcare policy implications and recommendations for more inclusive diagnostic practices. By examining both systemic barriers and personal narratives, this study aims to contribute to a more nuanced and equitable approach to adult autism diagnosis.

Janet Gerges

NY - Pace University

Discipline: English and Literature

Authors:

#1 Eugene Richie

Abstract Name: An Imposter at the Palace Door - A Poetry Collection

An Imposter at the Palace Door is a creative inquiry and a testament to the common experience of not understanding your own identity. This poetry collection seeks to tell multiple intertwining stories—contradictions that can simultaneously be true. Given the delicacy of this topic, this collection has a fantastical aspect woven into it. I look to formally publish this collection of poems. This poetry collection is a tribute to the life path I have chosen for myself. Growing up in a multicultural New York suburban household, with one immigrant parent and one first-generation American parent, my lifestyle was unique from those around me. Along with that, I was diagnosed at a young age with a chronic illness that I still struggle with. The emotional turmoil I felt growing up has followed me into adulthood, yet I have learned from this experience that surrounding yourself with accepting people is healing. Pouring your soul into art is healing. This collection is about learning to trust your own body and judgment, to lean onto those around you for support, and to never let your imagination and spirit die. To understand that you do not need to fit fully into a group in order to have a valid existence. The beginning of this poetry collection contains many poems of journal entries, lists, and other forms to express the anxiety of day-to-day life. The familiar stress of being away from loved ones, of feeling misunderstood, of not understanding yourself and your purpose. This bleeds into more upbeat poems exploring the mundane joys of life, and closes in a hopeful conclusion. My goal with this poetry collection is to help others feel seen in ways I have struggled in the past and to resonate with people. After all, that is what the human experience is wholly about.

Maryam Gerges

TN - Lipscomb University

Discipline: Biology

Authors:

#1 Amanda Williams

Abstract Name: Understanding the role of HD5 in Colonic Epithelial Cell Death

Inflammatory bowel disease (IBD) is an autoimmune disorder that occurs when an individual's immune system attacks healthy tissue. IBD can occur in both adults and children, describing Ulcerative Colitis (UC) and Crohn's Colitis (CC). Our lab studies human alpha defensin 5 (HD5), an antimicrobial peptide that normally aids in immune defense by keeping the small intestine sterile. However, in CC patients, HD5 is overexpressed in the colon. Preliminary data from our lab indicates that colonic cell death increases in the presence of HD5. The main aim of this project is to determine if HD5 triggers cell death through apoptosis and, if so, to explain the exact mechanisms involved. To this end, we will test if the suppression of caspase enzymes with a pan-caspase inhibitor reduces cell death triggered by HD5. We will use two methods: the MTT assay, which assesses cellular viability while avoiding the autofluorescence problems we encountered previously, and Western blotting, which aids with detecting specific caspase activation. These methods will allow us to verify if HD5 triggers cellular death via caspase-dependent apoptotic pathways and which are affected. We expect that cellular apoptosis will be reduced upon treatment with both HD5 and the caspase inhibitor, and we hope to prove by Western blotting which caspases are activated by HD5. The findings will specify the mechanism HD5 mediates cell death and its role in CC. This is an important study since it will extend knowledge showing that HD5 induces apoptosis in colonic epithelial cells. Using non-fluorescent techniques, we aim to eliminate some of the limitations seen in earlier studies and clarify the effects of HD5 in more detail. The results will provide new insights into the impact of HD5 on gastrointestinal health and inform future approaches to treating inflammatory bowel disease.

Elisa Gevorgian

Discipline: Biology

Authors:

#1 Lesslie Jocol-Perez

#2 Cindy Malone

Abstract Name: TLE-1 Promoter- Role in Gene Regulation

The central dogma explains how genetic information flows from DNA transcribing into RNA and translating to protein. In gene regulation, genes are activated or repressed in response to external stimuli which is mediated by transcription factors – proteins that bind directly to specific DNA sequences called transcription factor binding sites. Transducin Like Enhancer of Split 1 (TLE-1) is a transcriptional corepressor that interacts with transcription factors, playing a critical role in the regulation of gene expression. TLE-1 exerts its effects by binding to transcription factors and modulating their ability to activate or suppress target genes. This study aims to identify specific transcription factor binding sites within the TLE-1 promoter region that are critical for regulating TLE-1 gene expression. The putative promoter region was amplified using polymerase chain reaction and then directionally cloned into the pGL3-basic, a promoter-less vector containing a luciferase gene which allows for the quantification of gene expression to provide insight into the regulatory elements of the TLE-1 promoter region. After directional cloning, deletion constructs of the TLE-1 promoter will be generated by Site Directed Mutagenesis to shorten the TLE-1 promoter region to identify the role of the regions using luciferase expression. Newly constructed plasmids will be transfected into Human Embryonic Kidney cells and analyzed using a dual luciferase assay to identify the key regulatory elements responsible for TLE-1 activity. Investigating the dynamic regulation of transcription factor binding sites and coactivator recruitment can provide insights into gene expression.

Sara Ghoddoussi

MI - Wayne State University

Discipline: Psychology

Authors:

#1 Alexis Pinela

#2 Roger Pique-Regi

#3 Francesca Luca

#4 Samuele Zilioli

Abstract Name: Understanding Asthma Symptom Management: The Intersection of Routines and Socioeconomic Status

Background: Consistent routines have been associated with better asthma management among children, as medication adherence increases with reliable routines. Similarly, children from higher socioeconomic backgrounds tend to demonstrate better asthma management than those from lower socioeconomic backgrounds, likely due to healthcare access. To better understand the relationships between protective and risk factors, this study examines how child routines may moderate the association between socioeconomic status (SES) and asthma symptoms. Methods: Data were collected from the Asthma in the Lives of Families Today 2.0 study, involving youth with asthma (N = 72, Mage = 13.34, SD = 2.18, range 10–17, 49% female, 85% African American). Youth participants completed the asthma functional severity scale (AFS), where lower scores indicate fewer symptoms. One parent of each participant also completed questionnaires documenting their child's routines (Child Routines Inventory, CRI) and reported their household income (SES). Results: Using multiple linear regression, we ran separate models investigating the relationships across the four CRI subscales and total score. We found no significant main effects for the total CRI, Discipline, Daily Living, or Homework routine subscales. However, more frequent household routines were significantly associated with lower asthma symptoms ($p = 0.024$), and higher income was significantly associated with lower asthma symptoms ($p = 0.038$). No interaction effect between household routines and household income ($p = 0.077$) was observed. Conclusion: Our findings highlight the role of socioeconomic factors and certain domains of routines in asthma symptom management among African American youth. While household routines demonstrated a significant main effect on asthma symptoms, other routine domains did not. Further research should explore the characteristics of routines that improve symptom management and emphasize the potential for routine interventions across all SES backgrounds.

Datamis Ghorbanian

PA - Villanova University

Discipline: Engineering

Authors:

Abstract Name: The Blind Robot, Implication of reinforcement learning into control systems

Research Purpose This project developed a robot navigation algorithm using reinforcement learning (RL) to assist visually impaired individuals in navigating unfamiliar environments with minimal sensory feedback. The aim was to create a system that could effectively operate in dynamic, obstacle-laden scenarios, mimicking how humans use intuition and other senses for navigation. Background Reinforcement learning integrates machine learning and optimal control to enable robots to navigate by maximizing rewards, such as reaching a target while avoiding obstacles. RL has proven successful in autonomous vehicles and multi-agent systems, demonstrating its real-world navigation potential. This research focuses on applying RL to a small

robotic vehicle for simplified navigation. Relevant Scholarly Work Since 2019, RL has gained significant attention for its applications in autonomous systems. Companies like Tesla and OpenAI have used RL in autonomous vehicles and multi-agent systems, showcasing its ability to replicate human-like decision-making and learning. RL has been applied widely in decision-making and pathfinding across institutions like Purdue University and the University of Toronto. This project builds on these advancements, applying RL to autonomous systems where robots navigate uncertain environments. Methodology The robot, equipped with a LiDAR sensor, collected data processed by a Raspberry Pi to detect obstacles. An RL algorithm adjusted the robot's movements, controlled by an Arduino Due, to reach a target while avoiding obstacles. The robot's performance was evaluated by testing its navigation in obstacle-filled environments. Findings Initial results showed that the RL algorithm effectively guided the robot to its destination without complex control systems, validating RL's potential in autonomous navigation for assistive technologies. Future Work and Impact Future research will explore multi-agent systems to improve collaborative navigation. The broader impact includes potential applications in autonomous vehicles and other areas requiring pathfinding, contributing to enhancing mobility and independence for individuals with disabilities.

Huyen Anh Giang

IL - University of Chicago

Discipline: Health and Human Development

Authors:

#1 Miwa Yasui

Abstract Name: Investigating the Impact of Sacrifice Ideology on Help Seeking Patterns in Vietnamese Mothers

In Vietnam, research has shown that mothers are disproportionately suffering from mental health problems, while the Vietnamese population as a whole is underutilizing mental health services. This study seeks to investigate what factors play a role in Vietnamese mothers' willingness to seek help. Specifically, we want to investigate mothers' conceptualization of motherhood and the sacrifice ideology that so often comes with it. We also explore how mothers deal with distress, and how they imagine themselves within a network of social relationships and social support. By delivering surveys (N = 120) and semi-structured interviews (N = 20), we hope to have a holistic insight into how sacrifice ideology impacts help-seeking behavior in an Asian context. Qualitative data shows that mothers envision motherhood as a responsibility and as a sacrificing process, but they also create meanings and enjoyment from this identity. Further findings show that mothers often find support in themselves, in self-coping mechanisms, and to a lesser extent their romantic partner, rather than seek social support from their family members.

Katelyn Gianni

MN - Minnesota State University - Mankato

Discipline: Environmental Science and Sustainability

Authors:

Ashley Waletski

Abstract Name: Non-response of *Quercus agrifolia* to drought

With the impacts of anthropogenic greenhouse gas emissions on the global climate, models predict radical fluctuations in the hydrological cycle. These extreme weather events and fluctuations in water availability

have negative impacts on local vegetation, particularly in specialist plants adapted to niche environmental conditions, because water is a limiting factor to plant growth and carbon assimilation. California has already experienced this – chronic drought events have decimated ecosystems in recent years. *Quercus agrifolia*, the California live oak, is noted for its drought tolerance in such an arid region, so it is of interest for water stress studies. Between specimens acclimated to mesic or xeric conditions, stress indicators and physiological responses to low water availability were compared. Increased synthesis of the amino acid proline is also a ubiquitous plant stress response, so concentrations of proline as a specific osmolyte were assessed. Total leaf osmolarity was also assessed since plants osmotically adjust in response to low water availability and increasing osmotic pressures. Specific leaf area (SLA), a measure of area density associated with both drought acclimation and photosynthetic capacity, was also examined. For all metrics, no significant differences were found between mesic- and xeric-conditioned groups, but high variance overall was noted, as was stability in water content relative to leaf mass. This could mean that *Q. agrifolia* may be more resistant to future climate change-induced drought than other species, especially when compared to public datasets. The remarkable phenotypic diversity within the species is also of interest for future studies, and may play a role in this drought resistance through lack of physiological and stress responses.

Laila Gibson

IL - Trinity Christian College

Discipline: Biology

Authors:

#1 Clayton Carlson

#2 Emily Briscoe

Abstract Name: Paclitaxel and Vitamin D's Effect on MDA-MB-231 Breast Cancer Cells

Breast cancer is a leading cause of cancer death in women, it is estimated that 42,240 women will die from cancer in 2024. MCF-7 is a breast cancer cell line that is estrogen-positive and has estrogen and progesterone receptors while MDA-MB-231 is a cell line that is triple-negative and lacks estrogen and progesterone receptors. Cholecalciferol (vitamin D3) is a pro-hormone with numerous health benefits. Individuals with higher Vitamin D levels have been found to have improved breast cancer survival rates. The ability of Vitamin D to improve the effectiveness of the chemotherapy Paclitaxel will be measured using an Alamar Blue assay to track cell survival.

Mya Gibson

CA - California State University - Dominguez Hills

Discipline: English and Literature

Authors:

#1 Dr. Helen Oesterheld

Abstract Name: Surviving the Heteropatriarchy: Mary Wollstonecraft's "The Wrongs of Woman"

The Romantic Era (the late 1700s to early 1800s) was extremely concealed in queer studies, erasing the history of queer people, due to things such as heteronormativity (white, straight, etc.) being perceived as the “right” and “normal” way of living. Feminist scholarship of the Romantic Era remains an understudied area within queer studies, with gaps in the scholarship that focus on the queer-coded relationships within the novels by different Romantic Era women writers, such as Mary Wollstonecraft. By examining the primary

text of Mary Wollstonecraft's *The Wrongs of Woman*, I contribute to this gap in feminist scholarship by examining texts through a queer analytic lens. I have noted and pulled quotes from each literary work that allude to female companionship as a relief from heteropatriarchy. Given the concealed nature of non-heteronormativity during this era, I argue that there is evidence in Romantic Era literary works of women writers that demonstrate queerness in female companionship despite the heteropatriarchal mainstream culture. This includes narratives such as 1. The bond between Wollstonecraft's main character Maria with fellow asylum member Jemima, 2. The posthumous ending of *The Wrongs of Woman*, in which Maria and Jemima raise Maria's child together, and 3. the tragic short ending of the male character Darnford. Together, this proves further the importance of companionship in the face of oppressive patriarchal systems. These findings suggest that female companionship plays a role in going against heteropatriarchy despite the chains and weights placed on women at the time.

Sophia Gibson

MN - St. Catherine University

Discipline: Art History

Authors:

Abstract Name: Heads: Reintroducing the Work of Jerry Rudquist

This presentation offers a look into the worlds of art documentation and curating as they pertain to the work of Minnesota artist Jerry Rudquist (1934-2001). Living, working, and creating during the second half of the 20th century, Rudquist produced a body of work that spans materials, styles, subject matter, and decades. In the twenty-three years since Rudquist's passing, new goals surrounding the updated documentation and reintroduction of his collection have emerged. My work with Rudquist's collection includes developing a system for documenting and digitizing hundreds of his artworks and curating an exhibition that explores his head studies and self-portraits. The former objective aims to preserve the artist's work in a digital archive reliant on upgraded technology; the last archive was created in 2014. The latter relates to reintroducing the work of a prolific local artist to a broader public and will augment a separate joint exhibition curated by Monica Rudquist, Jerry's daughter and clay artist. In order to document and digitize Rudquist's work, I have captured high-resolution photographs, gathered metadata including measurements and medium for Rudquist's paintings, prints, and drawings, as well as created a database to house the images and metadata. Curatorial work is ongoing and will culminate in the opening of an exhibition in February 2025. At this time, the curatorial process includes selecting the artworks, conducting oral history interviews with those who knew Rudquist and his work best, and considering how archival materials can be integrated into the exhibition. Both goals - documenting and curating - aim to make Rudquist's work newly accessible and add to conversations surrounding the artist's life and work. In addition to aiding the preservation of Rudquist's artwork and legacy, this project provides insight into the relationship between art documentation and curation, and how the former is a necessary part of the latter.

Madelyn Gilbert

CA - California Institute of Technology

Discipline: Biology

Authors:

#1 Jasmine Emtage

#2 David Prober

Abstract Name: The Roles of stk32a and gpr156 in Zebrafish Sleep Regulation

Despite being vital for survival, the genetic mechanisms that govern mammalian sleep regulation remain largely undiscovered. Zebrafish (*Danio rerio*) are a convenient sleep model because they sleep during natural night and exhibit similar sleep behaviors to mammalian sleep. The human gene STK32A (serine/threonine kinase 32a) was identified as a candidate sleep gene in a genome-wide association study, and has a zebrafish ortholog of unknown function. When the zebrafish *stk32a* gene is mutated, the fish are less active and sleep more at night. One location where *stk32a* is expressed is the neuromasts of the lateral line system, a system that spans the length of the dorsal midline. Neuromasts are composed of sensory hair cells and identify water flow changes that help the lateral line confer environmental sensitivity. *Stk32a* and *gpr156* (a G protein-coupled receptor) are two genes that function together in the same pathway to provide hair cell orientation. We hypothesize they are implicated in zebrafish sleep regulation by altering lateral line function and consequently, arousal threshold. Utilizing high-throughput behavioral assays in conjunction with molecular biology techniques and fluorescence imaging, we investigated two inquiries: 1) if the *stk32a* mutant sleep phenotype results from atypical lateral line function and 2) if *gpr156* mutant fish exhibit a disordered sleep phenotype. Work is ongoing to determine if any additive behavioral effect to the *stk32a* mutant sleep phenotype will result from lateral line disruption. We found that mutations to *gpr156* result in decreased activity and increased sleep at night, similar to the *stk32a* mutant phenotype. Additionally, we discovered that *stk32a* and *gpr156* are coexpressed in the hair cells of the lateral line. These findings suggest that *stk32a* affects sleep via interaction with *gpr156* in the hair cells, and thus they act in the same pathway within the lateral line to regulate zebrafish sleep.

Sydney Gilbert

VA - Liberty University

Discipline: History

Authors:

Abstract Name: Women in Virginia Manumission

The general dismissal of women's rights and political influence from the 17th to the 19th centuries greatly underestimates the power of women in the public and economic spheres in Virginia's history. Women who participated in Virginia's slave and manumission system, though more limited in scope compared to men, influenced society in ways that are under recognized. In the realm of manumission or the voluntary freeing of slaves, women supported anti-abolition efforts, women slaveholders procured and carried out manumissions, and black women fought for self and familial liberation. There were also many women who used their enslaved for their own economic gain or resorted to manumission out of fear or obligation. As women generally held the responsibility to advocate morality in society, the role of women in manumission allows a better understanding of the ethics behind race relations in Virginia before federal emancipation. In this paper, I explore the wide range of roles women played in Virginia manumission as abolitionists, slave owners, administrators, manumitters, and enslaved individuals to present an accurate and diverse perspective of women in the process of manumission. Primary sources including wills, deeds of emancipation, letters, and court cases reveal the influence and prevalence of women in Virginia manumission. These documents indicate varying points of view that highlight the diverse beliefs and positions of women on slavery and manumission in Virginia.

Justin Gilbert

NC - Appalachian State University

Discipline: Health and Human Development

Authors:

#1 Justin Gilbert

#2 Martie Thompson

#3 Sophie Ryan

#4 Manan Roy

Abstract Name: Covid-19 School Closures in North Carolina and the Effect on Adolescent Emergency Department Visits for Mental Health

Suicide is a leading cause of death among youth and along with worsening mental health, poses a critical public health problem. The onset of the Covid-19 pandemic only made this problem worse, especially with school closures and the increase of social isolation during the lockdown. The purpose of our study is to investigate if and how school learning modalities (remote, in-person, hybrid) during the pandemic period were associated with risk for mental health crises among school-aged youth in the state of North Carolina. State-wide data sources that provide information on school closures (COVID-19 School Data Hub) and emergency department visits (North Carolina SHEPS data) will be merged to determine if a remote learning modality was associated with an increased risk for seeking emergency medical care for a mental health crisis. We will assess if the proportion of ED visits due to mental health reasons each month is correlated with the learning modality that the school district was operating under. Implications of our study findings and suggestions for interventions will be discussed.

Audrey Gilbert

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 HaoSheng Sun

#2 Shelby Lauzon

Abstract Name: C. elegans as a Model Organism to Study the Effects of Acute and Chronic Cocaine Exposure

Cocaine Use Disorder (CUD) is a prevalent issue affecting more than 1 million people in America. Currently, there are no therapeutics or effective clinical interventions for cocaine addiction or overdose making CUD's biological mechanisms of particular interest. We are working to establish C. elegans as a model organism to explore cocaine's molecular implications due to its short developmental timeframe, well-documented genotype, and conserved neurotransmitter pathways. An effect that can be easily quantified is the worm's pharynx. This behavior provides insight into the underlying molecular mechanisms and neural pathways cocaine exposure affects. We hypothesize that the characterization of pharynx behavior under cocaine exposure will identify neurons of interest for future cocaine studies. Using automated tracking software, I was able to record and analyze videos of adult C. elegans' pharynxes under different cocaine exposure patterns. Preliminary data has trends suggesting a decrease in the pharynx pumping rate of chronically and acutely exposed worms when on cocaine which indicates that the dosage paradigm is having a molecular effect on the C. elegans. The observation of decreased pharynx pumps provides a foundation for further pharynx pump analysis in both wild-type and mutant strains to further explore cocaine's molecular level effects that induce these behavior changes.

Bella Gilberto

PA - California University of Pennsylvania

Discipline: Biology

Authors:

Adriana Marina

Abstract Name: Understanding Ecosystem Interactions: Microbial Dynamics in Leaf Litter Decomposition

Leaf degradation plays a significant role in ecosystems by supplying a rich nutrient source to plants and animals. Once decomposed, with the help of microorganisms and environmental factors, leaves enrich the soil with carbon, influencing the growth of future plants. While the importance of leaf degradation is well-established, the effects of environmental factors and tree species on microbial communities during the decomposition process are not fully understood. This research aimed to identify the organisms found in and on leaf litter at various stages of decomposition and to investigate how native and invasive tree species influence microbial composition. To achieve this, leaf litter samples were collected bimonthly from both native Sycamore and invasive Knotweed species and analyzed using DNA extraction and sequencing to track changes in bacterial and fungal community composition over time. An in vitro experiment was also conducted to isolate and study microorganisms present on leaf matter, with a focus on those capable of digesting cellulose. Colony morphology was documented, and biochemical testing was performed to better understand their functional capabilities. This study revealed diversity in microbial community composition across different phases of leaf decomposition, tree species, and environmental conditions. Similarities were also observed in samples from similar environmental conditions and tree species. The identification of cellulose-digesting microorganisms and their biochemical capabilities provides a better understanding of the organisms contributing to leaf decomposition. These findings enhance our understanding of how environmental conditions and tree species influence microbial composition and nutrient cycling in ecosystems.

Jayda Giles

WV - West Virginia University

Discipline: Dance

Authors:

#1 Yoav Kaddar

Abstract Name: Stones to Hearts

Stones to Hearts. This piece gave me the physical vehicle to demonstrate the struggle and battle in showing one's emotions. The work also focuses on the struggle that one cannot always control when it comes to one's emotions. The music that I picked, Made of Stone, by Matt Corby, allowed me to create a dance that brings music and concept true partnership. I believe that both move my initial narrative forward. Throughout the creative process, I worked closely with the music to create dynamics within the movement and to portray a variety of emotions that the dancers presented physically. Through a collaborative process, I was inspired by how my cast interpreted my ideas and overall concept. This allowed me to bring forth better ideas. Some of the musical moments that we explored included moments of silence, slow or fast tempo, and areas that were only instrumental. This music structure allowed me the ability to explore and push my choreographic skills. This piece of music has been integral to my choreography. It has acted as a backbone to the piece and my creative process. The overall process has allowed me to better understand the issue of sharing emotions. This experience has paved way for me shed light on a topic that we seldom like to discuss. Dance is so much more than just beautiful movement. Through it we are able tell stories and communicate feelings. Through this dance I hope to bring empathy and a better understanding between people.

Sophia Gill

PA - University of Pittsburgh

Discipline: Political Science

Authors:

#1 Sophia Gill

Abstract Name: Language as Power: Hungarian Language Policy and Education in Romania

Historically, the Hungarian population in Romania has faced discrimination in many aspects. My research focuses on the complicated challenges that Romania's language policy environment creates for the Hungarian ethnic minority, specifically in regard to education. As well as how these language policy power dynamics are reinforced via the education system for Hungarian-speaking students, and the effects this has on Romanian society at large. A large percentage of the Hungarian population in Romania lives in exclusively Hungarian areas within the Transylvania region where they have established their own Hungarian language institutions, namely schools. When it comes to language policy, the official language, and thus the institutional language, of Romania is Romanian, leading to a lack of support for the Hungarian ethnic minority. Hungarian-speaking schools lack proper resources, despite policies that supposedly promise equality for all minority languages in the Romanian school systems. Mandatory graduation exams require great proficiency in Romanian, even if students only speak Hungarian. University acceptance and success in the job market are also dependent on proper Romanian-language knowledge, placing Hungarian students at a significant disadvantage. This language policy environment continually reinforces the power dynamic between Romanian speakers and Hungarian speakers in Romania, as Hungarian speakers must mobilize significantly more energy and resources to get to the same place where Romanian speakers begin.

Arshdeep Gill

CA - University of the Pacific

Discipline: Chemistry

Authors:

#1 Arshdeep Gill

#2 Skylar Carlson

#3 Savannah Pierce

Abstract Name: Chasing Settlement Activity from the Chloroform Partition of *Padina* sp. on Surface Bacteria

Climate change is lowering the pH and increasing the temperature of the ocean which effects both the surface microbiome of macroalgae and oceanwide calcium equilibrium. These environmental changes could lead to an increase in pathogenic bacteria creating revisors of harmful bacteria in the food chain. *Padina* sp. is a particularly interesting brown algae as it is one of the few algae able to deposit CaCO_3 inside its thallus (body) thereby creating a fan-like calcified structure. This process helps mitigate climate change by removing CO_2 from the water. This alga is also known to produce a suite of bioactive compounds with anticancer and antioxidant activity. Algal samples were collected from the Florida Keys in 2022; the surface of the algae was swabbed and plated onto a variety of agar. The surface associated bacteria (SAB) were then isolated on A1 (starch, yeast, peptone, and synthetic ocean salts) and cryopreserved for later use. The algae sample was frozen, lyophilized, and extracted using 50% ethyl acetate in methanol. The extract was concentrated and partitioned between hexane and water; the hexane partition was further partitioned between chloroform and 30% aqueous methanol. The chloroform partition from *Padina* sp. inhibited 79% of all SAB isolated from 3 different algae (42 strains total) in a 96-well plate assay tested at 100 $\mu\text{g/mL}$ of algal extract. This partition was then fractionated using high-performance liquid chromatography (HPLC) to generate 6 fractions.

Settlement assays will demonstrate which fraction(s) modulate SAB settlement. Further isolation will allow us to determine the structure of the active metabolite. Identifying the compound(s) responsible for this activity will elucidate the role of specific metabolites in modulating the surface microbiome.

Simran Gill

VA - Roanoke College

Discipline: Psychology

Authors:

#1 Lauren Kennedy-Metz

Lauren Kennedy-Metz

Abstract Name: Analyzing the Correlation Between Practicing Self-Compassion and Using Maladaptive Coping Mechanisms to Treat Anxiety and Depression

With anxiety and depression prevalent worldwide, but especially among undergraduate students, many have developed an interest in mindfulness. One avenue within meditation is practicing self-compassion, which is defined as supporting yourself during hardship and treating yourself with kindness. Literature has found that self-compassion can be an emotional regulation strategy and improve anxiety and depressive symptoms. Additionally, many individuals tend to develop maladaptive coping mechanisms in response to their declining mental health. This study focused on assessing the relationship between amounts of self-compassion, anxiety, and depression. Another goal was to focus on two common coping strategies: substance use and unhealthy attachments to family and friends. The survey consisted of basic demographics and validated self-report questionnaires to measure anxiety, depression, self-compassion, substance use if applicable, and attachment styles. The survey was uploaded to Prolific to recruit seventy-five participants globally, and an online platform (SONA) to recruit eighty-three undergraduate students. Among Prolific responses, anxiety and self-compassion were not significantly related, $r(73) = -.042$, $p = .725$; depression and self-compassion were also not significantly related, $r(73) = -.0179$, $p = .127$, while anxiety and depression were positively correlated, $r(73) = .600$, $p < .001$. Of the attachment styles subscales, level of closeness ($r(73) = .288$, $p = .013$) and feelings that others can be depended on ($r(73) = .271$, $p = .020$) were both positively correlated with self-compassion while attachment anxiety and self-compassion were negatively correlated, $r(73) = -.410$, $p < .001$. It was also found that substance use and level of self-compassion were not related, $r(11) = -.131$, $p = .670$. Data from undergraduate students will be analyzed next, and it is anticipated that there will be significant correlations between anxiety, depression, and self-compassion since college students tend to have worse mental health than other populations.

Emilia Gillen

NY - Pace University

Discipline: History

Authors:

Abstract Name: Rhythms of Resistance: The Migration of the Argentine Tango and Political Dissent

This is a study about culture. More specifically, cultural exchange. The Argentine Tango is undoubtedly a cultural phenomenon that shook the world, but then dynamically transformed in New York City. In this study I will track the Tango's journey through the world, specifically from Buenos Aires over the Atlantic to the Vatican, Berlin, and London and across to New York City. Then, focus on the fluid relationship between New

York City and the Tango, and highlight the impact New York City had on Tango's culture. I tell this story of the Tango because, I am descended from Argentina – and if we do not grab onto our heritage, our culture, our history, we lose it in translation, and the importance of the authentic art we made is forever displaced. The time span covers the early creation of the Tango in the alleyways of 1880's Buenos Aires and follows the dance as it migrates, eventually landing on the stage of 1910's New York City. While exploring the migration of the Tango, this study focuses on answering how the Tango serves as a form of political dissent while influencing New York City's social and cultural landscape and, in turn, how New York City influenced the Tango. This study uncovers the dichotomies between the Tango in its home of Argentina and the Tango around the world. As the dance progresses and expands, this study highlights the nuanced ways the Tango serves as political pushback, how the complexities of the Tango's journey contributes to New York's evolution (while focusing on the cultural relationship between New York City and the Argentine Tango), analyzes the anglicization of the Tango, and asks how artistic culture can reshape political climate.

Rahsaan Gilliam

CA - California State Polytechnic University - Pomona

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Tested Kinship: The Generatively Messy and Multidirectional Relationship Between Black Gay Men and Black Women

Dominant discourse focuses on HIV transmission from Black Gay Men (BGM) to Black Women (BW) by way of “down-low” culture when considering the relationship between BGM and BW. I seek to intervene and Blacken the culture of white centered queer discourse and research by investigating through a multidirectional lens how BGM and BW navigate their relationships while negotiating with systemic forms of oppression like misogynoir, patriarchy, and queer antagonism. To investigate this further, I've proposed research questions: What are the dynamics of relational patterns, interdependence, and symbiosis between Black gay men and Black women, considering the impact of cultural representation and identity formations? And how do these communities navigate queer antagonism and discourse on “femmes” while also fostering mutual support and solidarity, encompassing various aspects of social, familial, and political life? These connections encompass family dynamics, notions of brotherhood, intimacy, and the shared experience of navigating a patriarchal system that is both white-adjacent and inherently hostile to various expressions of Black femininity. To research these relational pattern expressions, I'll contextualize their experiences through frameworks: Queer of Color Critique, Black Feminist Thought, and Intersectionality. In applying these frameworks, I'll be using a qualitative method, specifically a Dyad study. This method refers to the study of two participants who share a close relationship. Dyad studies are crucial in exploring the web of convergent and divergent points in interdependent relationships between these different communities. I'll be interviewing 15 - 20 BGM and BW. I'm currently finalizing my IRB Application (all sections completed), to begin this study in early spring.

Caroline Gilmore

DC - The George Washington University

Discipline: Political Science

Authors:

#1 Caroline Gilmore

Abstract Name: Feminine Not Feminist: How Conservative Young Women See Themselves in 2024

In the last ten years, misogyny and anti-feminism have been on the rise, especially within the American conservative political movement. Despite evolving societal understandings of gender, some young women in the conservative movement advocate for returning to traditional gender norms and gender roles. Although there is scholarship on women's involvement in conservatism and anti-feminism, too often, scholars have sought to explain such involvement as due to a lack of awareness or intelligence, negating the agency of women who identify as conservative or anti-feminist. This research project focuses on how women perceive themselves and the roots of their beliefs to more accurately portray conservative women as agentive individuals. It illustrates how conservative young women narrate their identification as conservatives and perceive feminism in 2024. With notable exceptions, literature on women's affiliations with the conservative and anti-feminist movements is outdated. It focuses on women in their thirties, excluding women in their teens and early twenties who associate with the movements. Thus, this research seeks to expand the scholarship's understanding of the people, specifically young women ages 18-26, who occupy the ever-changing ideological landscape of political conservatism and right-wing political thought. Young women between 18 and 26 are critical to study, as their political attitudes and affiliations will likely shape the future political landscape. Through semi-structured interviews with conservative young women in the summer of 2024, this research reveals that many form their political identities based on their childhood experiences with politics and their religious views. Using qualitative textual analysis, I found that in narrating their views, many viewed the left as enforcing harmful gender views. This research illustrates why young women join right-wing movements and how they understand themselves and their political views, which holds implications for future research on young women's political affiliations and attitudes.

Visishta Ginjupally

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Irina Zabbarova

#2 Youko Ikeda

#3 Anthony Kanai

Abstract Name: Effects of Aging and Vasopressin Receptor Agonists on Water Reabsorption in the Mouse Urinary Bladder

Aim: Nocturia is a common condition among the elderly where the need to urinate multiple times at night disrupts restful sleep. This may be a consequence of deficient endocrine arginine vasopressin (AVP) signaling and poor water reabsorption by the kidney collecting ducts during sleep. However, we have demonstrated that AVP is produced in the bladder and is involved in altering urine/blood osmolarity to decrease bladder volume. AVP receptors were recently demonstrated in the bladder as intraluminal desmopressin (dAVP, synthetic AVP) promotes bladder smooth muscle relaxation in a mucosa-dependent manner. Therefore, we investigated whether the age-associated rise in nocturia is linked to decreased water and salt reabsorption in mouse bladders and the therapeutic benefits of exogenous AVP/dAVP. **Results:** In absence of AVP/dAVP, female mice exhibited a two-fold age-related decline in water reabsorption. AVP/dAVP significantly increased water reabsorption in adult female and aged male mice in the first 30 minutes. In adult males the effect was more prominent with dAVP than AVP. At 15 minutes post instillation, AVP/dAVP doubled the absorbed dose in aged males compared to 60% with AVP in aged females ($p < 0.0001$). dAVP was more efficacious than AVP in both adult and aged females at 15 minutes while neither had significant effects in adult males. AVP/dAVP raised water reabsorption 5 fold (2 to 10 mL/min) with saline in aged animals. **Conclusion:** We demonstrated aged male/female mice exhibit significantly less bladder water reabsorption compared to adults which may be linked to impaired AVP signaling and contribute to nocturia in aging.

Christopher Ginn

NC - Western Carolina University

Discipline: Psychology

Authors:

#1 Gabriella Loreda Marquez

#2 David de Jong

#3 Katie Adams

Abstract Name: The Brief Attitudes Toward Solo Masturbation Scale: Exploratory Factor Analysis

Solo masturbation is common across adulthood, with 12-52% of women and 28-69% of men having masturbated alone in the past month. For some, masturbation is a source of pleasure, joy, relaxation, and fulfillment. For others, masturbation is seen as wrong and immoral, which can lead to feelings of shame and spiritual turmoil. Past research on whether solo masturbation is associated with health and well-being vs harm and poor health has yielded mixed results. Years of social psychological research has shown that attitudes towards a behavior can predict the experience of that behavior. Thus, understanding individuals' attitudes towards solo masturbation could disentangle mixed findings on the association between solo masturbation and well-being. The most widely used measure of masturbation attitudes, created in 1975, has limitations from current standards of scale development: the 1975 measure is too long, uses dated language, and does not distinguish between positive and negative attitudes. Therefore, the goal of this study is to develop a psychometrically sound and brief scale of attitudes toward solo masturbation. Data will be collected via a 10-minute online survey of 1500 adults. Participants will respond to a pool of 24 newly written items assessing positive and negative attitudes towards solo masturbation and report on related constructs. These 24 attitude items will be reduced to a 10-item scale of positive and negative attitudes using exploratory factor analysis. Convergent and divergent validity will be assessed with Pearson's correlations between the new attitude scale and related constructs to be presented by a colleague, Gabriella Loreda Marquez. We expect these positive and negative subscales to be correlated with the old attitude measure, religiosity, attitudes towards sex, masturbation frequency, and masturbation pleasure. Thus, this new measure will shed light on why solo masturbation is associated with positive well-being for some, and negative well-being for others.

Skyler Gipson

FL - Stetson University

Discipline: Computer Science

Authors:

#1 Hala ElAarag

Abstract Name: Power Naps to Improve the Performance of Consolidated Learning

In the context of training deep neural networks (DNNs), continual learning (CL) methods reduce model inaccuracies resulting from a model "catastrophically forgetting" previous knowledge learned when updated offline. In humans, memory consolidation has been found to be related to sleep phases. The wake-sleep consolidated learning (WSCL) model proposed in Sorrenti et al., 2023 successfully improves CL performance. In this research, we propose a novel approach that utilizes the biological effect of power naps as being an influential aspect of memory consolidation. We build on the Sorrenti et al. 2023 framework to incorporate napping into the DNN training process to reduce catastrophic forgetting. In our approach, the interaction between the DNN and buffer represent the relationship between the neocortex and hippocampus, which work together to consolidate memories and facilitate human learning. As memory consolidation occurs in the neocortex, hippocampal-dependence decreases such that the hippocampus encoding capacity is restored

for the next wake period, meaning the neocortex has learned the stored information. We model this interaction by breaking the WSCL wake phase into wake-nap cycles that handle chunks of task data, where fast adaptation occurs before NREM sleep. We demonstrate that including power naps improve aspects of model performance using simulations. This indicates that the information stored during a nap may be learned more deeply. We compare our approach to 6 state-of-the-art CL methods (namely, DER++, ER, ER-ACE, and WSCL combined with each of these) using important performance measures. Our preliminary results indicate our approach outperforms the state-of-the-art-methods we compare to in terms of backward transfer and computational efficiency. It has comparable performance to WSCL in terms of forward transfer and catastrophic forgetting. Our future work will experiment with different memory models to further reduce the catastrophic forgetting in our wake-nap framework.

Mahima Giri

UT - Southern Utah University

Discipline: Communications

Authors:

#1 Lijie Zhou

Abstract Name: Using eye-tracking technology to understand how visually appealing elements in skincare product packaging attract consumer attention.

The skincare industry has become competitive in domains like packaging, natural ingredients, product development, market presence, and customization. With multiple brands trying to connect with consumers, effective product packaging is the first point of contact through which brands can capture attention and establish a communication channel with potential buyers. In this study, we will use eye-tracking technology to understand how visually appealing elements in skincare product packaging attract consumer attention. For data collection, we have selected three skincare products that stand out with their unique and distinctive visual allure. All three products are liquid in texture, with prices varying from \$42 to \$600. We will recruit around 50 participants who will first be asked to view each skincare product individually, followed by a simultaneous presentation of two products, and finally, all three products together, each display lasting ten seconds. The eye-tracking device will be used throughout the process to monitor the heat map and gaze plot. Afterward, participants will be asked to complete a questionnaire based on visual appeal, colors, imagery, typography, illustrations, and the likelihood of purchase based on these elements. It will also help researchers correlate responses with the eye-tracking data. After data collection, we will examine how color, typography, imagery, and illustrations enhance product packaging and help gain consumer attention. This research can help brands understand the relationship between visual appeal and consumer attention. The study can be used to aid in the development of brand identity, awareness, and visibility. Brands can enhance their packaging design to increase engagement and optimize product placement, garnering consumer attention and influencing purchasing decisions. The findings could contribute to larger discussions about the role of visually appealing elements, providing insightful concepts for brands and marketing professionals in the makeup and skincare industry.

Grace Givens

WV - West Virginia University

Discipline: Art History

Authors:

Abstract Name: It's All Latin to Me: Uncovering the Local and Liturgical Customs of a Monastery in Seville, Spain

This project will investigate the context surrounding a fifteenth-century manuscript from Seville, Spain that resides in West Virginia University's rare books collection. It is a large choral gradual which would have been used by a choir to sing various parts of the Mass at different times of the liturgical year in the Catholic Church. It is recorded that it comes from a Dominican monastery, however this requires further research as there does not appear to be any history of a Dominican monastery in Medieval Seville—only Dominican convents. In conjunction with its provenance, the gradual's content will be studied to discern its relevance to the Mass; this will be done by cross-referencing with other Medieval liturgical sources, as well as some ecclesiastical translation databases to assist in interpreting the Latin. It is currently suspected that it contains music only for major feasts and does not pertain to the ordinary time of the year. A part of the project will also include thorough research on the materials used in the book, primarily in the inks and the binding. This will be done by exploring the details in a handwritten note that contains information about its commission, as well as a survey of local materials in Seville. In addition, a mock-up demonstrating the Medieval book-binding technique will be constructed using modern materials to reveal the masterful technique hidden under the leather spine to provide an opportunity for research to future students interested in Medieval book-binding. Overall, the main goal is to contextualize the history of this book simultaneously in the local setting of Seville, Spain, in the rich tradition of the Catholic Church, and in the historical methods of book-binding. Promoting further understanding of this fifteenth-century choir book will better facilitate our relationship with the ancient traditions associated with it.

Megan Gleason

CA - California State University - Northridge

Discipline: Mathematics

Authors:

#1 Megan Gleason

Abstract Name: Packing the Torus with Squares

At some point in our everyday lives, we pack objects into a finite space, for example putting books into a bookshelf or food into a grocery bag. The problem of packing objects into a confined space is not new, in fact, it is a topic in discrete geometry. In the 17th-century a mathematician/astronomer named Johannes Kepler came up with a mathematical conjecture about the optimal way of packing spheres into a three-dimensional space. Kepler's Conjecture was finally proved in 2014. In our study, we focused on packing the surface of a torus of area one with congruent isothetic squares. More precisely, for any given square S of a fixed size, we present the exact optimal number of non-overlapping parallel and congruent copies of S that fit in the torus. This is joint work with the members of the CSUN Combinatorics Research Group.

Jacob Glenz

WV - West Virginia University

Discipline: Art History

Authors:

Abstract Name: Selections from the GramLee Collection

For this project, I created a catalog and set of hand-made artist books based on artifacts from the WVU Gramlee Collection of Commercial Wood Engravings. These wood engravings and related materials from a flour sack manufacturer and printer represent a specific moment in printing history when illustrations and multi-color graphics were engraved using end-grain wood. I focused on a small sampling of printer's proofs for my exploration. Used by the print shop to check for accuracy before running on the press, these proofs were made on low-quality paper that has severely deteriorated over time. After scanning torn fragments, I pieced them back together in Photoshop, preserving the folds and creases from the originals. I wanted to focus more on the graphics and typography rather than digital restoration. The catalog will be made through the Newspaper Club and will follow their tabloid size of 289mm by 380mm and will feature 20 proofs that have been digitally restored. In my research on strategies to document posters in a publication, I came across explosion books made from folded pages that expand when the book is opened, creating an explosion of content. Because of this, I felt I could also display the details of the proofs to create floods of color and form. So, while the catalog shows the full proofs, the explosion book focuses on the details of the type and imagery to have a more up-close look at the proofs. In my research, I used *Before Rosebud was a Sled* by Clifford Harvey. There is little published scholarship around the Gramlee Collection so I hope that this project can add to the body of knowledge by showcasing a small corner of the collection and adding interest in this particular part of commercial printing history.

Megan Glista

PA - Duquesne University

Discipline: Chemistry

Authors:

#1 Nicholas Frankos

#2 Thomas Montgomery

#3 Aiden Lane

Abstract Name: Synthesis of 1,2,4 triazolidine N-heterocycles through the [3+2] cycloaddition

Nitrogen containing heterocycles have repeatably displayed interesting biomedical properties, inspiring interest from synthetic and medicinal chemists. This has led to a strong drive to create novel pathways for synthesizing N-heterocycles, as an important step for drug discovery and manufacturing. Our project focuses on efficiently generating various N-heterocycles through a [3+2] cycloaddition of tertiary amine N-oxides. More specifically, emphasis is placed on synthesizing 1,2,4 triazolidines via azobenzene precursors. Synthesis of azobenzene derivatives with varying functional groups on the ortho, meta, and para positions of the compound are generated using manganese oxidation, followed by a [3+2] cycloaddition to afford triazolidine compounds. Thin layer chromatography and NMR were used to monitor reaction progress and confirm purity of intermediates and products.

Sean Godfrey

NC - Elon University

Discipline: Psychology

Authors:

Abstract Name: Vigorous Physical Activity Correlates with Mental Health Related Cognition

Mental health continues to be a pervasive problem in college aged students, now more than ever. Past

research has described a positive correlation between maladaptive thought behaviors (e.g., rumination, perseveration, and worry) and depression and anxiety. A large body of literature has also established the affective benefits of exercise in the context of anxiety and depression. However, the relationships between exercise and maladaptive thought behaviors have yet to be elucidated. The present study sought to determine the associations between physical activity and the aforementioned aspects of mental health through the assessments of various survey measurements. During the study, 133 undergraduate students ($M_{age}=20.1\pm1.3$, range=18-24; 33% male) responded to 6 previously validated questionnaires, assessing physical activity (IPAQ-SF), rumination (RRS), perseveration (PTQ), worry (PSWQ), anxiety (GAD-7), and depression (PHQ-9). A series of univariate linear regressions confirmed that rumination, perseveration, and worry were each significant predictors of anxiety and depression ($B's \geq .142$, $p's < .001$). Spearman's correlations revealed weak to moderate inverse relationships between vigorous physical activity (VPA) and each of the 5 psychometric constructs: $r=-.348$; $p < .001$ (rumination), $r=-.332$; $p < .001$ (perseveration), $r=-.278$; $p=.002$ (worry), $r=-.281$; $p=.002$ (anxiety), $r=-.313$; $p < .001$ (depression). In initial separate univariate linear regressions, VPA was a significant predictor of rumination, perseveration, and worry ($B's < 0.018$, $p's < .001$). These analyses replicated the finding that higher levels of physical activity engagement relate to lower levels of anxiety and depression. Novel to this investigation, vigorous exercise engagement was also related to lower levels of rumination, perseveration, and worry. Future research will further examine the predictive role of VPA in the context of mental health, as well as the potential for vigorous exercise to serve as a tool for addressing maladaptive thought behaviors.

Frank Godinez

CA - University of California - Los Angeles

Discipline: Sociology

Authors:

#1 Frank Godinez

Abstract Name: Police, Nonprofits and the Carceral Web: A Study of Police Nonprofits in Los Angeles

In the past 28 years, the United States has seen a dramatic rise in police nonprofits— an emerging category of tax-exempt organizations that work with police departments to raise private dollars. Despite this spike in police nonprofits throughout the US, research has only recently begun to consider how these organizations pose problems of governance and accountability with respect to promoting private interests. This project explores the symbiotic relationship between the nonprofit industrial complex (NPIC) and the police state. By examining their board compositions and organizational outputs (e.g., services, programs, partnerships), I investigate how “police nonprofits”, or nonprofit organizations that directly or indirectly support the police, engage in practices that reinforce the carceral apparatus. I employ an abductive approach to a digital archive of police nonprofits compiled by the UChicago Justice Lab. To demonstrate cross-sectoral police influence and collaboration, I explore the police affiliations of board members who serve on multiple nonprofit boards between 2014-2019 (i.e., former police officers who are board members). Additionally, I draw on (5/10) semi-structured interviews with police nonprofit organizations in Los Angeles City. This project bridges the literature on police with that on nonprofits, then contributes to a body of scholarship still in its infancy: police nonprofit studies. With recent activist-efforts and calls to defund/abolish the police, I hope that this project will illustrate the magnitude of the police-carceral state, allow for a political economy critique, and help us reimagine public safety.

Megan Goff

IN - Valparaiso University

Discipline:

Authors:
#1 Holly Cross

Abstract Name: Crisis at the Stand and on the Streets: Understanding the Intersections Between Mental Illness, Substance Abuse, and Criminalization in Competency Outcomes Amongst People Experiencing Homelessness

The criminalization of homelessness is a phenomenon that took root in the United States during the late 20th century, making people experiencing homelessness more likely to face legal issues. Because people experiencing homelessness are more likely to experience a myriad of mental health problems, they sit at the intersection of the criminalization of poverty and of mental illness. As such, when they make contact with the criminal justice system, they may have more involvement with competency to stand trial (CST) cases— an evaluation used to determine if a defendant is able to defend themselves and to comprehend the charges they face. This is one of the factors hypothesized to contribute toward the national competency crisis— where there are too few evaluators for the number of CST cases. This study aims to investigate the relationship between homelessness, CST referrals, and CST outcomes. Using the Odyssey Public System, this study had access to a population of over 4000 CST evaluations in one Midwestern state and sampled 200 of these evaluations for the current research question. Using mycase.in.gov, student research assistants coded additional data about the case (including specific charges, whether the defendant was homeless, and the outcome of CST in those cases). This presentation will review the background of this growing problem, identify how many CST evaluations involve homeless individuals, and examine the outcomes of those cases. The study anticipates that people experiencing homelessness will both be more likely to experience CST referrals and incompetent evaluations.

Bridget Goins

AL - University of Alabama at Birmingham

Discipline: Exercise Science and Nutrition

Authors:
#1 Christine Ferguson

Abstract Name: Comparing Symptom Severity in Parkinson's Patients on the Protein Consistent and Protein Redistribution Diets

Parkinson's Disease (PD) is a progressive neurological disease affecting almost 6.1 million people worldwide. Currently, the most effective treatment is Carbidopa Levodopa (Ldopa), a pharmacologic for symptom management that controls motor fluctuations (MF) in PD patients. Previous studies on Ldopa's bioavailability show it is reduced by dietary protein, creating the need for strategic timing of protein intake and Ldopa schedule. The only clinically recommended treatment to address this interaction is the Protein Redistribution Diet (PRD), but by limiting protein intake to the evening meal, the risk to older adults with PD is the progressive loss of muscle health and function. The overall aim of this five-week randomized crossover pilot trial was to explore the effects of a Protein Consistent Diet (PCD) versus PRD diet on symptom severity using the Movement Disorder Society's Unified Parkinson's Disease Rating Scale (MDS-UPDRS). Participants received meal plans, recipes, and instructions to follow each diet for two weeks with a one-week washout period between the two diets. Participants were assessed pre and post-diet included the full MDS-UPDRS assessment. Preliminary data in this pilot study was collected from 11 total participants, and analyzed via paired t-tests using the SPSS 30.0. Results demonstrate that both the PRD ($p=0.187$, 95% CI [-2.81, 12.63]) and PCD ($p=0.493$, 95% CI [-5.08, 9.92]) were shown to reduce MDS-UPDRS, indicating symptom improvement from both dietary patterns. Though the diets did not have significantly different effects, This data shows the need to design future studies to test both diets' effects on symptom severity with a larger sample size, eventually leading to more individualized nutritional recommendations for PD patients.

Adam Goldstein

NY - New York University

Discipline: Psychology

Authors:

Abstract Name: To Seek or Not to Seek? Understanding the Barriers and Facilitators to Adolescent Help-Seeking Behavior for Suicide Prevention

Suicide is a leading cause of death among adolescents, yet rates of suicide-related help-seeking remain low among this population. The proposed study seeks to identify the key barriers and facilitators to adolescent help-seeking for suicidal ideation. Previous research has investigated the barriers for general mental health disorders, but few studies have explored barriers specific to suicide-related crises. Additionally, research on the facilitators to help-seeking for suicide-related crises is practically nonexistent. The proposed study will analyze existing survey data from California high school students who participated in a school-based suicide prevention program. Analyses of close-ended survey responses will approximate rates of help-seeking behaviors in this sample. Analyses of two open-ended survey items will be conducted to identify common themes regarding barriers and facilitators to suicide-related help-seeking behavior. Preliminary coding suggests barriers such as social judgment, burdensomeness, and fear of disclosure, with facilitators being social support, attentive listening or validation, and external check-ins. The results of this study will guide current school-based suicide prevention programs on optimal methods to reduce barriers and leverage facilitators to help-seeking. Additionally, they may inform the development of new interventions designed to bolster identified facilitators. By addressing critical literature gaps, this study aims to improve the comprehensive understanding of adolescent help-seeking behaviors for suicide-related issues, with implications that will hopefully reduce suicide rates.

Celestial Gomes

DC - American University

Discipline: Health and Human Development

Authors:

#1 Celestial Gomes

Abstract Name: Growing Up in “The Pile”: The Effect of Mild to Moderate Hoarding Disorder in Parental Figures on Children’s Development

Growing up in a household dominated by parental figures with mild to moderate hoarding disorder alters childhood development. There are various avenues of ways children’s lives and development are affected by an overly cluttered home and unsanitary environment. By investigating what these effects are and how they manifest throughout the impacted children’s lives, trauma and psychological effects can be addressed. Understanding the experiences of children who grew up in these environments and referencing studies that have identified trends due to these household environments allows further analysis of the significance of where a child grows up. Parental figures creating an abnormally cluttered home environment negatively impacts a child’s emotional state, social development, early maturation, and mental health. These children take in excessive stress and anxiety due to the overwhelmingly chaotic environment that is intended to be their safe place: home. This dysregulation leads children to mature early by taking on adult responsibilities to clean up the clutter and lessen the anxieties it causes them. Furthermore, children become ashamed of their

household, preventing them from inviting friends over to socialize and grow bonds. The children become isolated from their peers and develop self-esteem issues because of their shame. Being unable to maintain a routine in a disorganized environment leads to developmental difficulties pertaining to personal organization and space to participate in age-appropriate activities crucial for reaching milestones. Understanding the various ways these impacts manifest in children is crucial in best supporting their futures through treatment and recovery from this environmental impact. When parental figures exhibit mild to moderate hoarding behavior their children develop within an abnormal environment leading to significant changes in behavior and mental health throughout their life.

Noémie Gomes-Jourdan

PA - Carnegie Mellon University

Discipline: Biology

Authors:

#1 Sandra Cascio

Abstract Name: The Modulation of Natural Killer Cells by Macrophage-Secreted TGF β 1 in Ovarian Cancer

While immune checkpoint inhibitor (ICI) therapy has had success in treating many types of cancer, its effectiveness remains low in ovarian cancer (OvCa) due, at least in part, to an immunosuppressive tumor microenvironment (TME), typified by a high infiltration of M2-like macrophages. TGFBI, an extracellular matrix interacting protein, is present in the TME and has been correlated with reduced anti-tumorigenic immunity and poor OvCa prognosis. We have demonstrated that macrophage-secreted TGFBI is highly expressed in ICI-resistant tumors and inhibits the tumor killing activity of natural killer (NK) cells. However, its mechanisms of action have yet to be identified. TGFBI is known to bind β -integrins found on cancer cells, modulating their differentiation and migration, and thus we hypothesized that TGFBI also binds to β -integrins on NK cells, similarly inducing changes in cell behavior. Using co-immunoprecipitation, we found that TGFBI potentially binds integrins β 1 and β 3 on NK cells isolated from ovarian tumors. Furthermore, in vitro experiments revealed that stimulation of healthy splenic NK cells with rTGFBI inhibits the activation of Src and PI3K, two factors important for NK cell maturation and cytotoxicity. To assess the role of macrophage-secreted TGFBI on tumor growth and immune response, we will conduct an in vivo experiment using a syngeneic mouse model of OvCa. Specifically, we have silenced the expression of TGFBI in the RAW264.7 macrophage cell line (TGFBI-KO RAW264.7). A 1:1 co-culture of ovarian tumor cells (TC) and TGFBI-KO RAW264.7 will be injected into mice. As a control, mice will receive a co-culture of TC and control RAW264.7 cells. We expect that mice injected with TC/TGFBI-KO RAW264.7 will have diminished tumor growth and an increased immunostimulatory TME. Thus, our studies provide preliminary evidence that TGFBI may be an effective therapeutic target for ovarian cancer patients undergoing ICI therapy.

Jesus Gomez

TX - San Jacinto College

Discipline: Environmental Science and Sustainability

Authors:

#1 Madhu Gyawali

Araceli Aranda

Joanna Garza-Ramirez

Abstract Name: ANALYZING TRENDS AND VARIATIONS OF NITROGEN DIOXIDE POLLUTION (2005-2024): USING DATA FROM PANDORA SPECTROMETER, EPA, AND OMI SENSORS

Nitrogen oxides ($\text{NO}_x = \text{NO}_2 + \text{NO}$) are a class of highly reactive gases primarily emitted from fuel combustion processes, including vehicle emissions, power plants, and off-road equipment. Monitoring the concentration of these compounds is vital because they are of significant concern due to their environmental and human health impacts. This study investigates nitrogen dioxide (NO_2) levels in Houston, TX, from January to November 2024, using data collected by the Pandora spectrometer. A comparative analysis is conducted with NO_2 levels from Austin, TX, during the same period. Additionally, Environmental Protection Agency (EPA) ground-based data are utilized to examine long-term NO_2 variations across five major cities. Furthermore, NASA satellite data are analyzed to explore NO_2 trends before and during the COVID-19 pandemic.

Salvador Gomez

CA - University of California - Berkeley

Discipline: Environmental Science and Sustainability

Authors:

#1 Salvador Gomez

Abstract Name: An Analysis of Climate Change Adaptation Planning in California Counties and their Unincorporated Communities

The State of California has been a pioneer in planning for climate change and enacting legislation. However, recent studies have shown that adoption and implementation of state-mandated climate change adaptation planning has varied results. Furthermore, county plans—and unincorporated communities by proxy—have been neglected in research. This content analysis aims to identify high-vulnerability communities by referencing California Disadvantaged Communities and assess their resilience to climate change based on county plans and examples of substantiated implementations.

Emilia Gomez

TX - The University of Texas at San Antonio

Discipline: Chemistry

Authors:

#1 Syed Muhammad Usama

#2 Emilia Gomez

Abstract Name: Development of Non-Aggregated Cyanine Fluorophores

Heptamethine Cyanine (Cy7) are a class of polymethine dyes that absorb light in the near-infrared (near-IR; 750-900 nm) region. This region is of great biomedical interest because light penetrates deeper into tissues due to reduced absorption and scattering by the tissue. Cy7 fluorophores can be conjugated to biomolecules such as carbohydrates, lipids, nucleic acids, and proteins. An ideal Cy7 fluorophore should exhibit high photostability and minimal aggregation in aqueous solutions. However, Cy7 tends to aggregate due to π - π stacking of its symmetrical fluorophores, which can quench fluorescence and result in low signal-to-background ratios. There are limited methods to synthesize non-aggregating Cy7. Consequently, there is an urgent and unmet need to construct a general synthetic scheme for non-aggregating Cy7. We hypothesized that unsymmetrical heptamethine cyanines could help prevent π - π stacking and inhibit aggregation. To test

this hypothesis, we modified the polymethine chain (composed of alternating dienes) by introducing a phenyl group at the C4' (symmetrical) and C3' (unsymmetrical) positions to create a novel Cy7 dye. We evaluated the photophysical properties (absorbance, emission, quantum yields, and photostability) of these modified dyes in organic solvents and aqueous buffer solutions. We have developed a general method for synthesizing Cy7 fluorophores. We conducted bioconjugation experiments using the NHS ester conjugating it to lysines of IgG1 at pH 8.5 at varying concentrations. The degree of labeling (DOL) ranged from 1 to 8 and increased with higher equivalents of the unsymmetrical dye. These results demonstrate, for the first time, that unsymmetrical Cy7 fluorophores do not aggregate in aqueous conditions and that the unsymmetrical dye can be effectively used for protein labeling. Our findings suggest that this novel approach to designing unsymmetrical Cy7 fluorophores could be extended to other polymethine fluorophore systems, potentially advancing the development of more stable and effective dyes for various biomedical applications.

Mateo Gomez Bedoya

IL - Elmhurst University

Discipline: Education

Authors:

#1 Simeon Stumme

Abstract Name: Interactive English as a Second Language Teaching Resources

This project helped students learn basic English concepts, continue to develop their language skills, and express themselves in English as their second language through a variety of didactic material and culturally responsive activities that cover the four domains of language through the interaction between speaking, reading, writing and listening. Further, the research focuses on high school students and understanding that if a student can not manipulate academic and social English, they will fall behind, not be able to go into regular, honors, AP courses, and not have an opportunity to further their educational careers. The goal of this research was to make the ESL program much more efficient, engaging, and culturally responsive by creating engaging activities at the different ESL levels. Further, the key concepts of culturally responsive pedagogy were implemented to help students reach academic success, be culturally competent, and develop critical consciousness. It is important to note that one way to address the effectiveness of ESL classes is by implementing culturally responsive practices and content which has pointed to language development and success. Gloria Ladson-Billings, Sonia Soltero, Danling Fu, Sonia Nieto, and Laurie Olsen are academics that informed this project. They look at effective ways on how to teach ESL, the challenges immigrant students face in the public school system, and the solutions that can transform language learning. Equally important, this empirical research focused on the use of different teaching resources with the purpose of students acquiring the English language, and teachers assessed the students to see results. Finally, one conclusion that is drawn from the research is that the use of interactive and culturally relevant activities enhanced learning to the fullest in English as a second language. Results included students completing all activities designed for their ESL level and achieving better academic results in the classrooms.

Ilhiana Gomez Del Campo Rojas

NY - Syracuse University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Author Intention & Reader Interpretation Through a Queer Lens

Historically, television, film, and literature have lacked greatly in diversity. Yet, the same cannot be said for the audiences consuming such content. Underrepresented communities have learned to adopt stories and characters as representations of themselves based on themes, ideologies, or mannerisms because it is in our nature to want stories we can see ourselves in. As a Queer Latino, I related to Voltron: Legendary Defender's Lance McClain, who I was certain was also Queer; yet this was never confirmed. My Queer/Trans peers have said they felt the same towards Nick Carraway from Great Gatsby, or even Franz Kafka's Metamorphosis. I tried to think of why I felt sure Lance was Queer, aside from my desire to have the perfect representation of myself; I asked peers why they felt that same kinship towards different stories or characters, but for many, there wasn't a direct answer besides speculation. Thanks to social media, underrepresented communities have become closer than ever, and here we find that it is a common practice to examine texts that aren't considered Queer and find representation in it. There has been some research as to how cultural or historical contexts may affect an audience's interpretation of a text, especially regarding Queer/Trans themes, but we typically pay less attention to the process by which creators' visions are translated to the texts we encounter on page or screen. Drawing on archival research surrounding the creation of specific texts such as Looney Tunes or The Adventures of Sherlock Holmes, I explore how audiences sometimes identify and/or resonate with themes that circulate more subtly in these texts. Through my presentation, I hope to answer the following questions: How do LGBTQ+ audiences find Queer/Trans themes in texts that lack explicit representation? How intentional may that interpretation be from creators?

Diana Sofia Gomez Gallo

KY - University of Kentucky

Discipline: Biology

Authors:

#1 Ethaniel Banzon

#2 Fatimah Alomar

#3 Brooke Tyree

Abstract Name: Alcohol Abstinence Effects on Anxiety-Like Behavior and Drinking Behavior in Mice

Background: Alcohol abstinence is associated with increased anxiety-like behavior and neuroadaptive changes in the bed nucleus of the stria terminalis (BNST), a critical region for affective regulation. Past studies demonstrate that females are more likely to drink alcohol and relapse due to alleviate psychological distress. Objective: This study investigates sex differences during and after alcohol abstinence periods by measuring drinking behavior and brain activity. Methods: Male and female mice (n=30) underwent a two-bottle choice paradigm (2BC) for 6 weeks. The mice had continuous free access to two bottles, one with water, and one with 10% ethanol. The bottles and animals were weighed every 48h to measure how much ethanol they consumed. After the first 6 weeks of drinking, they had a 2-week abstinence period. Next, they were exposed to the novelty suppressed feeding test (NSFT) to measure anxiety-like behavior. The bottles were placed back for 6 weeks. Next, they had a 3-week abstinence period and were exposed to a stress restraint test and a second NSFT. Results: Females consumed more alcohol before abstinence compared to males. In the first NSFT, there was no difference in anxiety-like behavior between males and females. After abstinence, only females consumed more alcohol than before. In the second abstinence, the second NSFT showed a history of restraint stress increased anxiety-like behavior in males and not females. Overall, females preferred and consumed more alcohol than males before and after abstinence, and repeated restraint increased anxiety in males. Our conclusion is that both females and males are sensitive to abstinence, with females consuming more alcohol and males showing increased anxiety. Next, we will look at their brain activity, focusing on the participation of the bed nucleus of the stria terminalis (BNST), given its central role in abstinence-induced anxiety.

Annis Gong

PA - University of Pittsburgh

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

Abstract Name: Explaining the mind-body problem present in the Monist philosophies of ancient China

Medicine during the classical period was deeply influenced by metaphysics, and the Shen Nong Bai Cao Jing provides insight into ancient Chinese beliefs about the relationship between the natural world, the body, and the human soul. In traditional Chinese medicine, the chrysanthemum flower is commonly used to treat inflammation, while dragon bones—less frequently used—are believed to have properties akin to the human soul. A section of the Bai Cao attributes the medicinal qualities of dragon bones to their composition, which is thought to be similar to the soul. According to traditional Chinese thought, the human body is composed of Yang, which forms after Tai Chi separates the original Qi, while the human soul is formed from Qi which remains undivided by Tai Chi. This distinction between the material substances invites deeper exploration, raising questions about when the human soul is formed and suggesting the possibility of its immortality. Given this potential, a close reading of the sections regarding the use of chrysanthemum flowers and the dragon bones could potentially reveal how the mind-body dualism can exist paradoxically within a monist metaphysical framework, and enlighten us about the ancient Chinese's belief concerning the nature of human's body and soul. In this project, I will examine the ancient Chinese interpretation of the mind-body problem through the lens of medicine, aiming to reconcile these views with contemporary philosophical perspectives, such as those of Daoist thinkers and the Yin-Yang school.

Joseph Gongaware

PA - Westmoreland County Community College

Discipline: Social Work and Human Services

Authors:

Abstract Name: Banning the Best Practice: The Dangers of Restricting Gender-Affirming Care For Youth.

Gender-affirming care (GAC) has become a target for many laws and restrictions in the United States notwithstanding GAC's proven positive outcomes in reducing depression and suicidality levels as well as its endorsements by leading world and national health associations and organizations like the World Health Organization and the American Academy of Pediatrics. Although transgender and nonbinary (TGNB) children make up such a small portion of the population, they often face extraordinary stigma which has manifested itself in laws restricting their rights and the rights of their families across the country, as well as disparities in mental health when compared to their cisgender peers. This literature review will examine the stigma TGNB and other queer children experience by examining pieces published by leading health organizations, peer reviewed-research, and primary queer sources. It will illustrate how the stigma TGNB people experience manifests itself in our current legal system and will explore the topic of GAC to demonstrate how it is life-saving supportive care for those who need it. I will demonstrate that these laws are not made to protect children, as many leading politicians and voices in favor of restricting this form of healthcare would purport that they do. Instead, they are designed and implemented to limit the rights of the LGBTQ+ population and their families by making life-saving healthcare more difficult or impossible to access.

Victor Gonzalez

FL - Miami Dade College

Discipline: Mathematics

Authors:

Abstract Name: On the isomorphisms and representations of geometric lattices.

Geometric lattices have been extensively studied over recent decades, with two prominent examples being the lattice of partitions of a finite set and the lattice of subspaces of a finite-dimensional vector space over a finite field. This paper investigates the conditions under which these two lattices may be isomorphic. To explore this, we begin by examining the cardinalities of the respective sets and comparing them as a preliminary step towards verifying potential isomorphisms. Leveraging the well-known result that every finite lattice can be embedded into a partition lattice of a nonempty set, we further analyze the structure of the lattice of subspaces and the characteristics of their representations. We also discuss some practical applications of our results.

Victor Gonzalez

FL - Miami Dade College

Discipline: Mathematics

Authors:

#1 Felix Gotti

#2 Ishan Panpaliya

Abstract Name: ON THE ASCENT OF ALMOST AND QUASI-ATOMICITY TO MONOID SEMIDOMAINS

A commutative cancellative monoid is atomic if every non-invertible element factors into irreducibles (also called atoms), while an integral domain is atomic if its multiplicative monoid is atomic. Notions weaker than atomicity have been introduced and studied during the past decade, including almost atomicity and quasi-atomicity, which were coined and first investigated by Boynton and Coykendall in their study of graphs of divisibility of integral domains. The ascent of atomicity to polynomial extensions was settled by Roitman back in 1993 while the ascent of atomicity to monoid domains was settled by Coykendall and the second author in 2019 (in both cases the answer was negative). The main purpose of this paper is to study the ascent of almost atomicity and quasi-atomicity to polynomial extensions and monoid domains. Under certain reasonable conditions, we prove the ascent of both properties to polynomial extensions (over semidomains). Then we construct an explicit example illustrating that, with no extra condition, quasi-atomicity does not ascend to polynomial extensions. Finally, we show that, in general, neither almost atomicity nor quasi-atomicity ascend to monoid domains, improving upon a construction first provided by Coykendall and the second author for the non-ascent of atomicity.

Victor Gonzalez

FL - Miami Dade College

Discipline: Mathematics

Authors:
#1 Harold Polo
#2 Pedro Rodriguez

Abstract Name: LOCALIZATION OF UNIQUE FACTORIZATION SEMIDOMAINS

A semidomain is a subsemiring of an integral domain. Within this class, a unique factorization semidomain (UFS) is characterized by the property that every nonzero, nonunit element can be factored into a product of finitely many prime elements. In this paper, we investigate the localization of semidomains, focusing specifically on UFSs. We demonstrate that the localization of a UFS remains a UFS, leading to the conclusion that a UFS is either a unique factorization domain or is additively reduced. In addition, we provide an example of a subsemiring S of the reals numbers such that $(S, \cdot)$ and $(S, +)$ are both half-factorial, shedding light on a conjecture posed by Baeth, Chapman, and Gotti.

Daniel Gonzalez-Arevalo

KS - Bethel College

Discipline: Psychology

Authors:

Abstract Name: Connections between empathy and the feeling of beauty elicited by sad songs

Music can evoke a variety of emotions. A study by Eerola et. al. (2021) indicated that unfamiliar sad and low-arousal music can potentially give rise to pleasurable experiences. The Interpersonal Reactivity Index was used to analyze how empathy levels can predict feelings related to the feeling of beauty (Eerola et al., 2021). Eerola et al. (2021) found that high-empathy individuals reported increased positive mood and higher ratings of being moved in response to sad music. Concerning these findings, a study was conducted at Bethel College where participants analyzed 13 excerpts of sad music. The IRI was used to assess the different levels of empathy of the participants. An analysis of the data highlighted a moderately positive relationship between feelings of sadness and the feeling of beauty. However, further research was needed to examine how other factors, such as different lengths of music excerpts, influence the relationship between beauty and sadness in response to sad music. The present, between-groups study, investigates the effects different lengths of sad music excerpts have on aesthetic emotions relating to beauty and how empathy levels can be used to predict these feelings. Participants are first asked to complete the IRI to collect information regarding empathy levels. Following this, participants are randomly assigned to a survey that has them listen to four sad music excerpts that are either 5 or 60 seconds in length. Aesthetic emotional response to the music is measured using AESTHEMOS (Schindler et al., 2017). Familiarity with the song is also measured along with demographic information such as age, gender, and ethnicity/race. Based on previous work from Eerola et al. (2021) feelings related to the concept of beauty and being moved are likely to be better predicted by empathy levels in the longer songs than the shorter song excerpts.

Tessah Good

MD - Salisbury University

Discipline: Communications

Authors:
#1 Viktoria Basham

Abstract Name: Picture-Perfect Pain: Educating Tattoo Artists about the Overlaps between Self-Harm and Tattooing among Women

Research shows that there is a lack of education for tattoo artists on how to properly help women who obtain tattoos as a form of self-harm. Although some tattoo artists might be aware of these correlations, many are not or do not know what conversation needs to be held, how to recognize signs, and what resources to recommend to struggling women. The research conducted for this project indicated that there are alarming similarities between engaging in self-harm and obtaining a tattoo among women. Both of these acts can make women feel powerful, allow them to draw satisfaction from a painful experience, help them cope with emotional distress, and provide an outlet for underlying psychiatric disorders. The survey conducted as a part of this project was distributed to tattoo artists and studied their familiarity with the correlation between getting tattoos and engaging in self-harm among women. Based on the results 44.4% of tattoo artists responded “not very well” when asked how well they understand the similarities between tattoos and self-harm among women. The survey also indicated that 88.9% of the tattoo artists would be willing to have an educational pamphlet on this topic in their shops. Research shows that pamphlets can be an effective way to display information. The goal of this project is to create a pamphlet that will familiarize tattoo artists with the similarities between self-harm and tattoos among women. In addition, the pamphlet will provide guidelines to tattoo artists on how to communicate with women about such sensitive topics and a list of helpful resources that they can share with women. In this way, the pamphlet will serve as a valuable resource for both tattoo artists and women. It will help protect the artists’ reputation and career and will provide much-needed help for females struggling with self-harm.

Killian Goodale-Porter

VA - Virginia Commonwealth University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: 1970s & Modern-Day Sitcoms: The Evolution of a Stagnant Genre

Situational comedies have addressed social and women’s rights issues in their content for decades. U.S. sitcoms often reflect the political climate of the time, but how have previous decades of social conservatism and liberalism affected women in the modern-day sitcom? The research explored the connection between 1970s sitcoms as well as second-wave feminism and analyzed their effects on modern-day sitcom female representation. The research also analyzed feminist critiques of modern sitcoms to understand the multiple ways in which current situational comedies have progressed or remained stagnant compared to their 1970s counterparts. Previous research and history revealed that modern sitcoms are similarly confident in discussing and exploring women’s rights as 1970s sitcoms. The contemporary sitcom has, however, fallen into regressive tropes such as childfree women ending up pregnant, women being belittled by male coworkers, and the inability to acknowledge the social dynamics that allow workplace misogyny. Most of these tropes are found in shows with generally progressive premises, which may relate to the theory of post-feminism and the concept of feminism being no longer needed. Stagnant female representation in sitcoms may also relate to the current rise in American conservatism, specifically the conservative rights revolution. This may have influence on how sitcoms often frame systemic issues relating to misogyny as individual problems rather than systemic. The research suggests that a lot of work still needs to be done for sitcoms to accurately depict the lives and struggles of modern-day women and could be helped by creating more narratives where women’s lives are not immediately or automatically changed because of the inclusion of men. Female representation could also be improved through the acknowledgement of larger societal problems when it comes to narratives addressing misogyny, sexism, and other struggles affecting women.

Sophia Goodin

KY - University of Kentucky

Discipline: Nursing and Public Health

Authors:

#1 Sophia Goodin

#2 Sophie Ciaverelli

#3 Keeghan Dunn

#4 Anne E. Ray

Sophie Ciaverelli

Abstract Name: Comparing Alcohol Use Questions in National Questionnaires Through Compiling an Alcohol Use Repository

Objective/ Background: The aim of this study was to create a repository of alcohol use measures from national epidemiologic studies, identify key characteristics of the measures, and organize the repository by characteristics. Compiling measures into a single, easy-to-use repository can make it easier for individuals who are interested in future alcohol-related measurement and/or use of survey results (e.g., students, researchers, local public health officials) to find the information they need. Methods: Alcohol-specific measures were collected from 5 national surveys and put into a database. Three members of the research team reviewed the database to identify measure characteristics. Once key domains and subdomains were agreed upon, items were individually coded by each team member. The team met to discuss and reconcile any coding discrepancies. Results: Measures were organized within two primary domains: time and content. For time, four subdomains were identified: most recent, past month, past year, and lifetime use. For content, eight subdomains were identified: any use, age of onset, frequency, quantity, peak drinking, heavy drinking, drinking context, and other drinking-related behaviors. The past month was the most commonly measured timeframe (4 out of 5 surveys). Frequency of use and other drinking-related behaviors were the most commonly covered content areas (4 out of 5 surveys). Conclusion: As an undergraduate student, the experience of compiling a measures repository helped us to gain research experience including: searching for information; entering data; and qualitative data analysis. Our next step will be to document details related to the accessibility of data from these surveys.

Nicole Gordon

IN - Indiana University Indianapolis

Discipline: Biology

Authors:

#1 Elysabeth Otte

#2 Andrew Folz

#3 Charles Goodlett

#4 Randall Roper

Abstract Name: Neurodevelopmental Characterization of the TcMAC21 Mouse Model of Down Syndrome

Down syndrome (DS) is caused by the triplication of human chromosome 21 (Hsa21). DS affects approximately 1 out of every 700 live births and causes neurodevelopmental and cognitive deficits. Individuals with DS are affected by alterations in motor coordination, spatial learning, and memory, which impact their daily functioning. Commonly used DS mouse models show similar phenotypes as individuals with DS but contain non-orthologous triplicated genes. TcMAC21 mice carry a freely segregating Hsa21q arm to establish trisomy in that model without non-orthologous genes. Neurodevelopmental deficits seen in

TcMAC21 mice have not been widely studied, and characterizing these deficits may further substantiate this DS mouse model. Using TcMAC21 and control female and male mice, we performed a series of behavioral tests sensitive to altered hippocampal and cerebellar function, beginning at postnatal day 45 (P45) through P70. We hypothesize that trisomic TcMAC21 mice would exhibit increased activity levels during locomotion testing and impaired spatial learning and memory, along with altered motor coordination and gait, when compared to euploid mice. For locomotor testing, preliminary results show differences between euploid and trisomic mice when examining total time spent in the center, but there are no differences seen in total distance traveled. Gait analysis shows trends of increased step width and distance but a decrease in step angle in female and male trisomic mice. Deficits in spatial learning and memory are observed with both male and female trisomic mice combined. These preliminary results indicate that the TcMAC21 mice exhibit genotypic deficits and potentially exhibit differences due to sex.

Hannah Gordon

FL - Florida Gulf Coast University

Discipline: Biology

Authors:

#1 Kerry Lee

#2 Robert Gabordi

Abstract Name: The Significance of the Concurrent Expression of Rare Pathogenic Variants ATM and CHEK2: A Case Report on Double-Negative Breast Cancer.

Ataxia-telangiectasia (ATM) and Checkpoint Kinase 2 (CHEK2) are the most common non-BRCA pathogenic or likely pathogenic variants. A 51 year old female patient with a unique history was referred to a breast oncologist for the purposes of exploring the clinicopathologic characteristics of breast cancer developed by ATM and CHEK2. The patient previously underwent genetic testing and was confirmed ATM and CHEK2 positive, although not having breast cancer. The patient's sister tested positive for ATM and is undergoing treatment for breast cancer. The patient's children were advised to undergo genetic testing, after which it was confirmed that the three children individually tested uniquely for each variant. A double mastectomy and breast reconstruction was performed on the patient to decrease the risk of breast cancer in the future due to the presence of ATM and CHEK2 variants. This case report illustrates the potential for genetic testing playing a preventative role in health enabling individuals to adopt tailored health strategies and preemptive interventions. The objective of this clinical case report is to highlight the clinical aspects of breast cancer and underscore the importance of genetic testing, mastectomies, breast reconstruction, nipple sparing, and mammograms.

Kieran Gorman

PA - Community College of Allegheny County

Discipline: Political Science

Authors:

#1 Ashleigh Fox

Abstract Name: The Intersections of American Empire: MINUSTAH, GILEE, and AFRICOM

The United States of America is one of the wealthiest countries in the world. Occupying much of the landmass of North America, it is also one of the largest- yet its true size does not end there, as in order to accumulate and safeguard this economic prosperity it has its reach in each hemisphere. This oral presentation pursues to exemplify the reality of this situation through the case studies of the United Nations peacekeeping missions to Haiti (known as MINUSTAH); the Georgia International Law Enforcement Exchange (GILEE), otherwise known in the left-wing activist lexicon as "Cop City"; and the U.S. Department of Defense's Africa Command (AFRICOM). The presentation focuses on the critical role America plays in the lives of Africans- whether in the first black republic, within the United States itself, or in their home continent. The racist framework of colonialism and neocolonialism will be explored through a deeper understanding of how the executive force of states continues to perpetuate the practice of domination and exploitation against a diverse people. The implications of these three institutions cannot be downplayed for their volatile impact on the success of America, destabilizing developing countries and further impoverishing economically downtrodden communities. Their history, maintenance, goals, and future must be understood for the creation of a more just and equitable world in which all individuals can truly have a role.

Ismaray Govea

FL - Florida International University

Discipline: Biology

Authors:

#1 Ismaray Govea

#2 Brandon Fernandez

#3 Joseph Souchak

#4 Charles Dimitroff

Abstract Name: Analysis of pro-melanoma metastasis factor, galectin-8, as a promoter of melanoma cell adhesion to vascular endothelium

Melanoma is a deadly skin cancer responsible for most skin cancer-related deaths, with over 300,000 new cases diagnosed annually worldwide. The prognosis for advanced melanoma (Stage 4) remains poor, with a 5-year survival rate of about 30%, highlighting the need to better understand melanoma metastasis and find curative treatments. Our laboratory focuses on uncovering the molecular mechanisms of melanoma metastasis and has identified that metastatic melanoma cells lack pro-metastatic endothelial (E)-selectin-binding glycans, sialyl Lewis X and A (sLeX/A), commonly found on circulating tumor cells. Instead, melanoma cells exhibit elevated levels of linear poly-N-acetyllactosaminyl glycans that bind with galectin-8 (Gal-8), a glycan-binding protein elevated in metastatic melanoma patients. To explore Gal-8's role in melanoma cell attachment, we performed parallel-plate flow chamber assays under physiologic shear stress conditions. Human A375 melanoma cells were exposed to recombinant Gal-8, control buffer, or Gal-8 inhibitor lactose, then tested for adhesion to vascular endothelial cells (ECs) under shear stress conditions mimicking post-capillary venules. The results showed significantly increased melanoma cell adhesion in the presence of Gal-8 compared to controls or Gal-8 inhibition ($p < 0.001$), indicating Gal-8 enhances adhesion and shear resistance of melanoma cells to ECs. Our findings suggest Gal-8 acts as an adhesion molecule promoting melanoma cell retention in blood vessels, identifying Gal-8 as a potential anti-metastatic therapeutic target.

Sarina Govindaiah

DC - American University

Discipline: Interdisciplinary

Authors:

#1 Robert Adcock

Abstract Name: Screening Partition: Violence Against Women in Partition Films and Its Intersection with Communal Violence (1970-1999)

This research aims to answer the question of “whether and how violence against women in films on the Partition play impacts the movement of Hindu Nationalism in India from 1970-1999?” Most of the previous literature concerning films on the Partition as it connects to Hindu Nationalism see the idea of film as historical remembrance, where nationalism impacts Indian films, or Indian films creating Hindu nationalism, where film impacts nationalism. My research explores this as a mutually constitutive relationship where Hindu nationalism impacts film and vice versa. The way I do this is by looking at violence against women as a lens to examine film and changes in newspaper coverage from the corresponding period. I am looking if this maps onto changes in coverage of Hindu nationalism over time. The Partition of 1947 was the single largest displacement of people in history, forcing approximately 15 million people from their homes during the creation of modern-day India and Pakistan. The taboo around the Partition has led to limited memorialization, reinforced by self-censorship. One-way that narratives from the Partition have been represented is through fictional cinema. With this research I employ a narrative analysis of films on the Partition to examine the portrayals of violence against women in Indian films on the Partition from 1970-1999 and connect it to changing perception of Hindu nationalism in the country by using historical newspapers to examine changing rhetoric. The timeframe of 1970-1999 is used because that is before India had a globalized film industry, and when Hindu nationalism was on the rise. These findings are then put into the larger historical context to examine the beginning of the rise of Hindu Nationalism in India.

Asavari Gowda

NY - Siena College

Discipline: Interdisciplinary

Authors:

#1 Jesse Moya

Abstract Name: Exploring the Factors that Shape Refugee Adolescents' Perspectives and Experiences with Substance Use

Adolescent substance misuse is a prevalent issue within refugee communities and has been attributed to the traumatic experiences associated with forcible displacement. Current research has drawn a syndemic correlation between the post-traumatic effects of forcible displacement and risk factors for substance misuse. Accessibility to substances, pre- and post-migration experiences, and socialization with peers have been identified as the main risk factors for refugee adolescent substance misuse. The heavy reliance of refugee services on the nonprofit sector due to financial limitations has created an ineffective treatment model. Community resources have been reported to be unorganized, repetitive, and fragmented due to multiple independent organizations and the separation not only between mainstream and refugee-specific services but also between mental health and substance misuse services. This fragmented model is overwhelming to navigate and prevents individuals from receiving holistic treatment. Language barriers and cultural stigma around seeking support are other reported prominent barriers. This study sought to learn more about the experiences and perceptions of refugee adolescents in order to propose how prevention and treatment programming can be better catered to newcomer populations. An anonymous, intentionally open-ended questionnaire was given to students within a local refugee youth mentoring program in Albany, NY, asking them about their perceptions of substances, views on substance misuse within their communities, and thoughts on the resources provided by their schools. Current literature emphasizes how traumatic experiences and cultural factors promote substance use and prevent adolescents from seeking treatment. Not only does this framing place the blame for substance misuse within refugee communities, but it also causes programming to be more reactionary than preventative. Resources for refugee adolescents must shift their focus to positive youth development and address substance misuse not as a solo experience but rather within the context of one's community.

Priyal Goyal

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

#1 Gemma DeSanzo

#2 Amogh Vellore

#3 Ria Vangala

#4 Travis Mindel

#5 Prajeet Santra

#6 Eleni Moschonas, PhD

#7 Corina Bondi, PhD

#8 Anthony Kline, PhD

Abstract Name: Environmental enrichment is not a prophylactic for traumatic brain injury

Environmental enrichment (EE) reliably produces behavioral and histological benefits when initiated after experimental traumatic brain injury (TBI). However, no benefit or prophylactic effect was revealed in a recent study where EE was provided for 2-weeks before a single controlled cortical impact (CCI) impact to the right hemisphere. The lack of protection with Pre-TBI EE may have been due to limited exposure and thus to verify this possibility, the current study utilized a 4-week Pre-TBI EE paradigm to test the hypothesis that pre-TBI EE can exert a prophylactic effect. A group receiving EE before and after TBI was included to determine whether Pre-TBI EE affects the robust effectiveness of Post-TBI EE. After 4 weeks of EE or standard (STD) housing, anesthetized adult male rats were subjected to a right hemisphere CCI injury (2.8 mm deformation at 4 m/s) or sham surgery and then randomly assigned to post-operative EE or STD conditions. Beam-walk agility and acquisition of spatial learning were assessed on post-operative days 1-5 and 14-19, respectively. The Post-TBI EE groups performed better than the Post-TBI STD groups ($p < 0.05$) but did not differ from each other ($p > 0.05$). However, despite 4 weeks of EE prior to TBI, no prophylactic effect was observed as there were no differences between the STD-housed TBI groups regardless of whether they received EE or STD housing before surgery ($p > 0.05$). These data reproduce previous findings showing that EE post-TBI is effective and replicate a recent report that providing EE prior to TBI does not confer protection.

David Goymer

AL - Auburn University

Discipline: Physics and Astronomy

Authors:

#1 Brooks Howe

#2 Bradley Andrew

#3 Luca Guazzotto

#4 Lorin Matthews
#5 Truell Hyde
#6 Evdokiya Kostadinova

Abstract Name: Structure Formation in PK-4 Microgravity Experiments

Complex plasmas can self-organize into various crystalline and liquid structural states, providing an exceptional platform for modeling fundamental processes relevant to materials science. Recent experiments conducted aboard the International Space Station in the Plasmakristall-4 (PK-4) facility have revealed that dusty plasmas in microgravity can form filamentary structures resembling electrorheological materials or liquid crystals resulting from an anisotropic interaction potential. Here we analyze video data from two PK-4 experiments. In the first we observe changes in the filamentary structure as we manipulate pressure and current. In the second we analyze the changes in large-scale structure for fixed plasma conditions but changing dust densities through compression. The goal is to assess the coexistence of structural states in microgravity dusty plasma – simultaneous existence of a hexagonal lattice, square lattice, and a disordered (liquid-like state). The existence of a triple point in dusty plasma was reported in 2023 through ground-based experiments [1]. To determine the structure types, we use the bond-order parameter for different symmetries. Also employed is disorganization concentration, which allows us to assess the rigidity of the domains.

Elena Graf

VA - Virginia Commonwealth University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Faye Prichard

Abstract Name: From Pearl Necklaces and Picket Fences to Bell-Bottoms and Briefcases: Fashion Movements of the Housewife to the Working Woman in Mid-20th Century Sitcoms

The American feminist legacy is one that spans nearly two centuries of dynamic history. From early feminist leaders Elizabeth Cady Stanton and Lucretia Mott, who first declared the call for feminine equality, to modern activist bell hooks, the portrayal of the ideal woman has been a subject of much controversy and evolution. The divide between the historical image of the pristine housewife and the modern working woman have further driven this discussion. These two distinct, but common perceptions of the perfect American woman have been only exacerbated by the media presented to consumers. This study analyzes the differences in the portrayal of the ideal woman in two mid-20th century television productions: The Donna Reed Show and The Mary Tyler Moore Show. The use of costume design to convey the ideal woman was analyzed in tandem with the cultural developments of the second and third feminism waves. Donna Reed, a product of the 1960s, was largely influenced by post-WWII regression to traditionalism. In contrast, Mary Tyler Moore made strides in the path of 1970s sexual liberation and work-place independence for women. From pearl necklaces and picket fences to bell-bottoms and briefcases, the evolution of the concept and presentation of ideal women undoubtedly shifted with time. Now more than ever, in a world where the rights and position of women are in constant flux, this research shines a light on the lessons of the past and the promises of the future. History has manifested a tendency for media to shift between one ideal and the next without consideration for the reality of womanhood. It is important for this research to inspire modern feminists to take charge of their own story, so that one day a world may exist in which they can be any version of themselves that they aspire to be.

Sarah Graham

PA - Grove City College

Discipline: Psychology

Authors:

#1 Lucian Conway
Nathan Wright

Abstract Name: Thinking Under Stressful Conditions: Multi-National Research on the Influence of Social Ecology on Cognitive Complexity

Does social-ecological context influence individual thought complexity? While cognitive complexity has been a highly studied construct since the 1950s, little is known of the connection between cognitive complexity and social-ecological stress. Previous studies have found relationships between harsh distal environmental factors and preference for authoritarian leadership structures, but no work directly evaluates the degree that the surrounding features of the local environment influence individual thought complexity. Thus, the social and environmental mechanisms that contribute to individual thought complexity remain largely speculation. The present two studies fill in this gap by examining the relationship between social-ecological factors as measured at the cultural level (e.g., resource scarcity and diversity/inequality) and integrative complexity in political speeches as measured at the individual level (with the highly validated Natural Language Processing tool AutoIC). Study 1 used state-level markers of resource scarcity (e.g., poverty) and inequality (e.g., GINI Index) from US states to predict the integrative complexity of individual governor speeches for State of the State and Inaugural addresses over a 20-year period. Study 2 used similar nation-level markers of resource scarcity and inequality to predict the integrative complexity of individual political leader speeches for State of the Union-style speeches in eight nations over a 30-year period. Results from both studies revealed that state/national resource scarcity and income inequality produced individual leaders with lower integrative complexity. This complexity-reduction effect was larger and more robust for resource scarcity across US states, whereas it was larger and more robust for inequality across nations. Additional analyses on complexity subtypes further suggested that difficult ecological environments reduced individual thought complexity due to a stress reduction effect. Taken together, these results importantly reveal the connection between the social-ecological contexts within which humans live and the individual cognitions they produce.

Isabell Granillo

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: Equilibria. - Student & Young Professional Connection Center

This study explores the growing mental health challenges among young adults and examines how thoughtful design can support self-care, academic success, and overall well-being among rising academic and financial pressures, social challenges, and the impact of technology. The research focuses on designing a Student Wellness Center that fosters a supportive and restorative environment for mental and physical health. Data collection includes surveys of college students on stress levels, coping mechanisms, self-care practices, and preferences for study and social spaces. Findings reveal a preference for private study rooms and collaborative lounges, emphasizing the importance of constructive feedback in shaping self-image. A literature review underscores the correlation between mental health, social support, and academic persistence, highlighting the role of community and personal growth initiatives. The design incorporates principles of accessibility, community, comfort, physical fitness, and mental health while integrating modern wabi-sabi aesthetics through natural materials and textures. Accessibility is ensured with features like wheelchair-accessible facilities, Braille signage, and inclusive restrooms to create a welcoming space for all users. Community is encouraged through collaborative study areas, lounges, and informal gathering spaces that promote social interaction and peer support. Comfort is prioritized with ergonomic furniture, WELL Building Standard principles, and the use of natural materials like wood, stone, and organic textiles to create a serene, harmonious environment. The wabi-sabi influence embraces imperfection and authenticity, creating spaces with textured finishes, muted tones, and organic forms to promote mindfulness and balance. Physical fitness amenities include a gym, yoga studio, and meditation rooms to encourage activity, while counseling offices, group therapy rooms, and quiet spaces provide essential mental health support. By integrating these elements, the Wellness Center aims to enhance well-being, resilience, and academic success in a modern and nurturing setting.

Mary Jane Granito

PA - Moravian University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Mary Jane Granito

#2 Sanika Desai

Abstract Name: Enhancing Cultural Competence Through an International Collaborative Project Exploring the Experiences of Asian Indian Immigrants in Patient-Centered Rehabilitation

Changing demographic profiles of the US necessitate that speech-language pathology (SLP) students be aware of the perspectives of immigrants regarding disability, rehabilitation, and family/patient-centered practices. International inter-university projects allow students to collaborate with peers from various cultural and linguistic backgrounds. These initiatives enable students from each country to serve as cultural informants, helping their counterparts gain insights into the socio-culturally informed perspectives on disability and rehabilitation prevalent in their local context. Such collaboration enhances understanding of how these perspectives influence family roles and expectations regarding rehabilitation services, including speech-language therapy. It also provides an excellent opportunity for SLP students to develop cultural sensitivity about the local culture and contributes to their journey of developing cross-cultural competence. An undergraduate SLP student at Moravian University, US, and another at Manipal University, India, conducted a collaborative autoethnography on their development of cross-cultural awareness through participation in an advocacy video project focused on highlighting the unmet rehabilitation support needs of Asian Indian immigrants and the necessity for a more diverse rehabilitation workforce. For the advocacy video project, the students performed a thorough literature review on immigration trends and the racial and ethnic diversity within the rehabilitation workforce. They also interviewed a first-generation Asian Indian individual with disabilities, who is a disability studies scholar, a family member of a child with disability, and an SLP to gather insights on the necessary changes to ensure equitable services. Throughout the project, the students maintained detailed reflection notes. Their independent reflections, WhatsApp group chat messages, and group discussions served as the primary data set for the collaborative autoethnography. Analysis and coding of these reflections and discussions reveal that this inter-university international project provided a valuable learning opportunity. The results underscore exposure, observation, and critical reflection are essential to one's cultural competence and humility journey.

Emma Grant

PA - Duquesne University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

Abstract Name: Promoting Early Identification of Speech Motor Delays in Autistic Toddlers Using a Novel Clinical Assessment

Motor impairments have been increasingly identified as common, persistent, and as having cascading impacts on other domains of development in people living with autism; yet they often go undiagnosed. Additionally, speech motor delays often occur in autistic children. These delays not only impact speech sound production skills, but also phonological memory and awareness, which are directly related to learning and literacy. Delays in speech motor development may be evident in the first two years of life. Therefore, it is vital that speech-language pathologists assess for delays in motor control. However, observational measures of early motor control are currently unavailable. This study examines the diagnostic utility of the Early Motor Control Scales (EMCS) a novel observational measure of speech motor, arm, and hand control that is designed to be scored during a standardized assessment of communication and play. Two trained student researchers scored the EMCS from video recordings of 40 autistic toddlers, toddlers with developmental delays, and toddlers with typical development at a mean age of 20 months.

Flynn Gray

DC - American University

Discipline: Political Science

Authors:

Abstract Name: Refugee Resettlement Responses: Explaining Discrepancies in U.S. States' Refugee Resettlement Funding

In analyzing U.S. refugee policy, there are discrepancies in the refugee resettlement funding amounts each state receives. Each additional refugee that resettles in a state isn't correlated with a uniform increase in refugee resettlement funding to assist that refugee. This paper will document these discrepancies and explore why differences in refugee resettlement funding amounts between states exist. While refugee resettlement is initialized on a federal level through collaboration done with one of ten Voluntary Agencies (Volags), most refugee resettlement funding and services is actualized on a state level. Past literature examines state-level geographic distributions of refugees as well as the impact of social services on refugees' lives and outcomes, but there's yet to have been a state-level analysis of refugee resettlement funding and infrastructure. In a large-scale, quantitative analysis of 50 states from the years 2013-2022, this research tests four different independent

variables representing state refugee resettlement infrastructure; the number of unique Volag affiliate partners, the number of refugees and asylees eligible for resettlement funding, the average hourly wage of translators, and the number of people served by refugee resettlement funding from the prior year. The analysis will control for the refugee cap, the limit on the number of refugees that can enter the country each fiscal year, and political affiliations of U.S. states. Through work in cross-tabulation and linear regression, this analysis will interrogate why some states receive more funding than others and how each state utilizes its funding. The findings from this research will help policymakers make informed decisions about the best routes for refugee resettlement in the United States. This study could also provide a window into the lobbying interests that Volags hold and the ways in which refugee resettlement funding is influenced by capitalist interests.

Abbi Green

VA - Radford University

Discipline: Biology

Authors:

#1 Tara Pelletier

Abstract Name: Assessing Species Delimitation Performance with Metabarcoding Data

This study aims to increase efficiency and accuracy of metabarcoding for use in worldwide biodiversity documentation. Biodiversity supports our society through medicinal breakthroughs, ecotourism, mental health benefits, and more. To conserve biodiversity, we must understand what species exist and their distributions across the globe. One tool used for biodiversity assessment is metabarcoding where species information is recovered from DNA sequenced from environmental samples like soil or water. Species delimitation methods that computationally decide the cutoff between interspecific and intraspecific diversity based on DNA sequence data are often used to assign DNA sequences to species. While these methods are widely used with DNA barcoding data (single species sequencing), knowledge of their performance with metabarcoding data is limited. We will assess the accuracy of four common molecular species delimitation methods in estimating species from these types of data. First, the current literature was used to define simulation parameters for 1000 metabarcoding DNA sequence datasets. Next, we will subset the simulated data to model various scenarios including different taxonomic ranks, different patterns of missing data, and data skewed towards a few common species. We will then apply the species delimitation methods to each dataset and compare the expected species richness to the species richness estimated by the method. This will allow us to assess the strengths and weaknesses of each method under the different scenarios and determine what is the best protocol for using species delimitation with metabarcoding data. Pinpointing the advantages and disadvantages of the different species delimitation methods will allow for a better use of metabarcoding data and in turn increase the efficiency of biodiversity documentation across the globe.

Brylie Green

TX - Midwestern State University

Discipline: Education

Authors:

#1 April Crutcher

#2 Beth Barnard

Lauren Conner

Abstract Name: Factors Impacting Education Students' Choice To Attend MSU

The purpose and aim of this research project is to investigate the factors that influence education students' decision to choose Midwestern State University. This research will be beneficial because it will identify ways to attract more people to MSU and possibly keep the students who are already here. The recruitment and retention rate data collected through MSU shows that there is a 14% decrease in enrollment in West College of Education. Many students have no interest in becoming teachers which leads to a teacher shortage. Through this study, we can see the factors that bring students who want to major in education to MSU. From this, we will be able to adjust the factors that can lead to an increase in retention and recruitment for not only West College of Education but also for the college of MSU. We are using a Quantitative methodology for this research study. This research seeks to identify the factors influencing students who attend Midwestern State University. To do this, an online form will be constructed and completed by students enrolled in education classes. We will survey students using questions from Borst Conti (2022). Participants will include students of different classifications enrolled in education classes. The expected findings of this research will include the identification of the factors that influence students to choose Midwestern State University. This research can be useful for future recruitment strategies to increase student enrollment at Midwestern State University.

Mykah Green

NC - Western Carolina University

Discipline: Linguistics and World Languages

Authors:

Abstract Name: Girl Math, Girl Dinner; "Girl" as A Modifier in Noun Phrases

The feature selected for this study is the conversion of the noun "girl" into a modifier, as in phrases such as #girlmath and #girlmath. Samples were collected from Tik Tok posts during 20xx-20xx from twelve speakers, all female, the majority U.S. speakers of American English and aged 18-30. The specific research question investigated was what constraints (grammatical and semantic) best predict "girl" acting as a modifier rather than a standard noun phrase (NP). Methods of data analysis included constructing a table of phrases collected from social media, then sorting them based upon the function of "girl" as either a modifier or part of an NP. The cases in which "girl" behaved as a modifier were confirmed by means of a qualifier test (Lobeck & Denham 2014). Results indicate that common and countable NPs are most likely to be modified by "girl", and that in these cases, girl ____ becomes an NP that can further receive other modifiers.

Victoria Greene

MN - Minnesota State University - Mankato

Discipline: Biochemistry

Authors:

#1 Victoria Greene
#2 Jessica Heinsch
#3 Keone Anderson
#4 Samantha Katner

Abstract Name: CRISPR editing Human Glioblastoma Cells for Glypican 1 removal

Glioblastoma (GBM) is an aggressive type of brain cancer with an incident rate of 3.19 cases per 100,000 people per year. Due to its location in the brain, GBM has limited treatment options like chemoradiation, immunotherapy, and surgery. Interestingly, glypican-1 specifically plays a role in multiple cellular pathways of the GBM tumor cells. There are six glypican members of the heparan sulfate proteoglycan family that are all present on the cell surface and are involved in cell proliferation, cell motility, and cell signaling. Since treatment options for GBM patients do not consider glypican levels on the GBM tumor cells, we have used clustered regularly interspaced short palindromic repeats (CRISPR) technology and clonal expansion to create a functional knockout of glypican-1 in human GBM cells. Briefly, we designed a single guide RNA (sgRNA) molecule to guide the Cas9 endonuclease to target the glypican-1 gene in the GBM cells. Then we employed cell culture for clonal expansion to achieve a clonal cell line harboring the CRISPR edit for glypican-1 knockout. The genomic DNA was isolated from the GBM cells and sent for Sanger Sequencing to determine the knockout score (glypican-1 removal) of the clonal cell lines. With the glypican-1 knockout cell line, we plan to investigate how glypican-1 impacts GBM tumor progression as well as treatment approaches.

Jarette Greene

TX - Midwestern State University

Discipline: Interdisciplinary

Authors:

#1 Rowann Remie
#2 Kashif Mahmud

Abstract Name: Classification of subsurface water flow paths using cave drip time series clustering

Cave drip water response to surface meteorological conditions is complex due to the heterogeneous nature of water movement in the karst unsaturated zone. Therefore, we aim to understand infiltration water hydrology in the Cretaceous karst formation of south-central Texas. This project utilizes the spatial survey of 20 automated cave drip loggers installed in Natural Bridge Caverns. Drip loggers were set up in approximate transects throughout the cavern from higher to lower elevations and have been monitored since May 2023. We analyzed drip time series for one hydrological year from all 20 sites taking advantage of an ensemble of drip loggers to extract common properties by clustering. A combination of multidimensional scaling and clustering by k means was utilized to classify similar drip types based on time series analysis. We used the coefficient of variation (COV) across different sampling frequencies (15 minutes to monthly) to determine the optimum sampling frequency that minimizes sampling artifacts while maximizing the capture of natural variability. The clustering reveals four unique drip regimes for better characterization of the limestone environment where flow occurs via fractures and storage. We found COV decreases with lower sampling frequency for all four cluster groups. We concluded that both daily and weekly sampling frequencies give the minimum COV, which does not change significantly with a finer sampling frequency and therefore we used one day as the optimum sampling frequency. By analyzing COV and cluster groupings, we discovered that age of limestone formation affects infiltration water flow pathways in heterogeneous karst formation.

Skyllar Greenslade

WI - University of Wisconsin-Whitewater

Discipline: Biology

Authors:

Abstract Name: Taphonomy of the Gastropods, *E. acuta* and *E. livescens* from the Mukwonago River, Wisconsin

During the 48-day summer collection period, the gastropods *E. acuta* and *E. livescens* were gathered from the Mukwonago River at WSNA #417. We aimed to answer how anthropogenic impacts shape the live-dead composition of gastropods in the Mukwonago River and what insights this provided into the vulnerability of Pleurocerid gastropods. In the current study, dead and live specimens of all gastropods were sampled with 20-minute timed collections of surface-exposed live specimens plus ~2500 cm³ of sediment in the Taphonomically Active Zone (TAZ). The mean stream temperature, pH, and electrical conductivity are; 23.3°C, 8.80, and 578.3 µS, respectively. In preparation, all sediment and organisms were immersed and saturated in ethanol to preserve their shells during euthanization, then sieved using 4 mm and 2 mm mesh sizes. All specimens were classified into preservation categories, ranging from 1 (live with no skeletal damage) to 4 (only the central columella remaining). Shell length (mm) was measured for categories 1, 2, and 3. Size data was used to determine biomass (B); utilizing the equation $B = 0.331 \cdot \text{Length}^{2.851}$. Histograms of size frequencies were produced for *E. acuta* and *E. livescens* through live (1), and dead (2, 3) samples based on numerical abundance, with the same being calculated with biomass. Preliminary results on *E. acuta* include: 1) dead specimens were more abundant than live for all data, with only one exception, confirming published taphonomic studies of mollusks; and 2) more biomass was preserved than numerical abundance for both live and dead specimens because larger specimens preserve better in the TAZ. Future research on the Mukwonago project will incorporate tumbling fresh shells of *E. acuta* and sediment to provide an experimental study of the order of shell degradation related to time.

Chloe Greenwood

WI - University of Wisconsin-Eau Claire

Discipline: Psychology

Authors:

#1 Jennifer Muehlenkamp

Abstract Name: Perceived Effectiveness of NSSI in Predicting Next Day Ability to Resist Suicide

Non-suicidal self-injury (NSSI) is a significant health concern among college students, that is characterized by the intentional act of harming oneself without the intent to die. Many individuals report using NSSI as a coping mechanism to manage suicidal thoughts and urges. Research suggests that an individual's belief in NSSI's effectiveness in achieving these functions is associated to the severity of their self-injury and suicidal ideation, which may increase the likelihood of suicide attempts. This study aimed to examine individuals' perceived effectiveness of NSSI on the ability to resist suicidal thoughts and urges concurrently and the next day. A total of 132 participants (Mean age = 19.44, SD = 1.43, 88% White, 70% female) with a recent history of NSSI and suicidal ideation completed a 28-day daily diary protocol assessed engagement in NSSI, perceived effectiveness of the NSSI, suicidal urges and the ability to resist suicide attempts. Multi-level dynamic structural equation analyses will be conducted with individual responses mean-centered to capture within-person differences across days. Data analyses are underway and will be completed in time for the conference. It is anticipated that on days participants perceive their NSSI as effective, they will report lower concurrent suicide urges and greater ability to resist attempting suicide the next day. This would support the role of NSSI as a coping mechanism and suggest that suicide risk may increase if NSSI effectiveness lessens over time and may become a potential marker for proximal risk. Additional clinical implications of the results will be discussed.

Kelly Gregoire

PA - Duquesne University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Kelly Gregoire
#2 Halie Mayfield
#3 Jeryl Benson
#4 Johnna Estep
Halie Mayfield
Jeryl Benson

Abstract Name: A Qualitative Study of the Experiences of Parents Navigating the Educational System During Transition

PURPOSE: Under IDEA parents must be involved in the transition process from early intervention (EI) to school-based services. The process includes families, service providers, and agencies working together to decide the best course of action for the child. This study explored the perspectives of parents of children transitioning from EI to an educational setting. This study addressed the underrepresentation of this group in the literature answering 1. What are the experiences, perceptions, and needs of parents and their families as they transition to school-based services? 2. What actions do parents identify as being needed as they enter and navigate the system? DESIGN: This phenomenological study utilized purposive sampling. Inclusion criteria were parents of children ages 2.5-6 currently in the transition process. METHOD: Semi-structured interviews were conducted with 14 participants. Interviews were recorded and transcribed. Open and axial coding was completed by 4 researchers supported by MAXQDA® software. RESULTS: Eight themes emerged: 1. Navigating the System 2. "You're the expert" 3. Are we connected? 4. Making it happen 5. The parent's educational journey 6. Family Centered Care 7. "It's kind of like starting over" 8. There is no crystal ball. CONCLUSION: Results indicate that parents experience a range of emotions during the process. The impact of collaboration, the parents learning curve, and navigating the system were key indicators of success. Current literature supports these findings describing a successful transition as a process of development and parental empowerment. Teams should address collaboration, emotional support, communication, and education on the transition continuum. Impact Statement: An understanding of the parent perspective provides occupational therapists the tools to support family centered care during the transition process.

Sophie Gregoretti

GA - Agnes Scott College

Discipline: Biology

Authors:

#1 Jennifer Larimore
#2 Anjali Kunnatha
#3 Laila James

Abstract Name: How is excitatory/inhibitory balance impacted in the Shank3B heterozygote mouse model of Autism?

Shank3B mouse models tend to show autism spectrum disorder (ASD)-like behaviors that are compulsive, repetitive and aggressive, including: self-injurious, repetitive grooming, abnormal social interactions, deficits in recognizing social novelty, anxiety-like behaviors at juvenile age, atypical auditory processing and robust learning impairments. The SHANK family of proteins are responsible for synapse formation and synaptic plasticity at glutamatergic synapses. Shank3B codes for key post-synaptic density proteins that are part of the glutamate receptor protein complex that physically links ionotropic NMDA receptors to metabotropic mGlu5 receptors, a linkage necessary for induction of plasticity. Based on this, our research explores the behavioral impact of heterozygosity of SHANK3B in a sex dependent manner. We also use immunohistochemistry to describe the protein expression of ion channels regulated by glutamate and associated with neurodevelopment in the heterozygote. This research will further our understanding of the role of SHANK3B in development.

Madelyn Gregory

NC - Western Carolina University

Discipline: Chemistry

Authors:

#1 Madelyn Gregory
#2 Channa De Silva

Abstract Name: Tuning Optical and Structural Properties of Lanthanide-Doped Calcium-Fluoride Nanocrystals

Lanthanide-based nanoparticles have potential applications in biomedical imaging, drug delivery, optoelectronics, and catalysis. Our research focuses on developing synthetic methods for producing high-quality Europium-doped calcium fluoride nanoparticles in aqueous phase using a previously optimized, closed-vessel microwave reaction. This synthetic method introduces high quality and reproducible nanoparticles. In this work, Europium-doped Calcium Fluoride nanoparticles were prepared using ethylenediaminetetraacetic acid (EDTA) as the surface coating agent, ensuring an environmentally safe synthetic method, as well as varying lanthanide-doping percentages. Among the parameters affecting performance, doping percentages play a pivotal role in tailoring the photophysical and structural characteristics of these nanomaterials. Comprehensive characterization techniques, including photoluminescence spectroscopy, X-ray diffraction (XRD), and transmission electron microscopy (TEM), were used to analyze the structural and optical properties of the synthesized nanoparticles. By optimizing doping percentages, we demonstrate significant enhancements in quantum yield and tunable emission profiles for advanced application.

Julia Gregory

VA - Virginia Tech

Discipline: Biology

Authors:

#1 Mackenzie Woolls

#2 Irving Allen

Abstract Name: Antagonism of Inflammatory Signaling by NLRX1 During SARS-CoV-2 Infection

During the SARS-CoV-2 infection, there is an overactivation of the innate immune response due to uncontrolled production of cytokines otherwise known as the cytokine storm. These unchecked cytokines cause increases of inflammation and damage host tissue leading to a more severe disease progression. Prior studies have shown NLRX1, a PRR involved in innate immunity, is able to modulate NF- κ B and interferon signaling during an influenza infection. These pathways are involved in inflammation signaling and regulation of cytokine production, impacting the cytokine storm. Notably, preliminary data shows NLRX1 to be downregulated in patients during a SARS-CoV-2 infection indicating that NLRX1 is involved in modulation of the cytokine storm. We hypothesize that NLRX1 acts to antagonize inflammatory signaling to dampen the immune response and reduce damage to the host during SARS-CoV-2 infection. Using patient derived data, Nlr1^{-/-} mice, and transduced human airway epithelial cells, we worked to profile NLRX1's role in the cytokine storm. We found a positive correlation between upregulation of inflammatory cytokine expression and viral replication in SARS-CoV-2 positive patients. In murine models devoid of NLRX1, we saw a prolonged production of pro-inflammatory cytokines following SARS-CoV-2 infection, compared to WT mice. To further understand this phenotype, Calu3 cells transduced to overexpress NLRX1 were challenged with SARS-CoV-2 proteins and decreased expression of proinflammatory cytokines were observed. We also observed a protective nature of NLRX1 against the SARS-CoV-2 infection with increases in viral titer and inflammation of airways in Nlr1^{-/-} mice. However viral titer decreases in NLRX1 overexpressed Calu3 challenged with SARS-CoV-2 (MOI 0.05, 0.1). Our data indicates that NLRX1 is acting against inflammatory signaling to prevent the cytokine storm and has a protective nature against SARS-CoV-2 infection. Examination of the differentiation of cytokine expression due to NLRX1 could indicate a potential drug target.

Megan Gregory

WI - University of Wisconsin-La Crosse

Discipline: Biochemistry

Authors:

#1 Todd Weaver

Abstract Name: Connecting Clinically Observed Metabolic Deficiencies to Protein Structure and Function

Human fumarase (FH), an enzyme in the citric acid cycle, is an essential component in this metabolic pathway that fuels cell throughout the human body. Previous research indicates that mutated FH enzyme (R444G) results in a decreased quality of life likely caused by the deficiency of FH function. The relationship between the structure and function of this mutation and how this impacts the decreased FH activity observed is not well understood. Circular dichroism, non-denaturing gels, and Michaelis-Menten kinetics were utilized to better understand the specific impacts that this mutation has on the structure and function of FH. These experiments demonstrated that this variant had quaternary structure, which is crucial to enzyme functionality. However, exploring several additive screens, which encompass chemical compounds that are similar to FH substrate in shape and size, showed there were observed structural changes in the R444G mutation compared to the normal FH. Additionally, kinetic experiments showed this variant also had a 47.3-fold decrease in overall catalytic ability in comparison to the normal FH enzyme. This decreased catalytic ability results in a buildup of fumarate in cells which may cause decrease cellular functions such as DNA repair. Overall, this demonstrates the importance of conserved structure and function for essential metabolic enzymes in the human body and these mutations compromise this structure.

Andrew Griffin

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Andrew Griffin

#2 Yogesh Dwivedi

Abstract Name: Unfolded Protein Response in Early-life stress Mediated Depressive Behavior

Early-life stress (ELS) has been implicated in the onset of major depressive disorder later in adulthood. Recent studies suggest that the unfolded protein response (UPR), a cellular response to stress, could be a precipitating factor in depression and depressive symptoms. The present study examined the expression of genes commonly associated with UPR in the prefrontal cortex and the hippocampus. The male rodent model of depression (ELS model), specifically maternal separation (MS) was utilized with or without the inclusion environmental enrichment (MS-E). Altered expression of UPR genes was determined through quantitative polymerase chain reaction (qPCR). Of six UPR genes (Atf4, Atf6, Chop, Grp94, Xbp-1, and its spliced variant sXbp-1), Atf6 was significantly upregulated in the prefrontal cortices of MS male rats and drastically downregulated in MS-E male rats. In the hippocampi, Atf6 and sXbp-1 exhibited significant changes between control and MS male rats. In contrast, a drastic change in Atf6 and sXbp-1 was identified when comparing MS and MS-E male rats. Since Atf6 and sXbp-1 are transcription factors that execute a critical role in the regulation of genes involved in inflammatory pathways, especially the UPR, the present data suggests the

possible involvement of Atf6 and sXbp-1 in the inflammatory regulation of depression. Further examination of the regulatory factors for Atf6 and sXbp-1 would allow for a greater understanding of the activation of the UPR and its role in ELS-mediated depressive behavior.

Beatrice Griffin

GA - Georgia State University

Discipline: Engineering

Authors:

#1 Soe Yan

#2 Ayaan Pujani

#3 Jonathan Gan

#4 Pranav Raju

Andrew Kim

Abstract Name: Developing a Low-Cost Arduino-Based Colorimetric Soil Tester for Precise Nutrient Analysis

Precise fertilization based on accurate soil testing is crucial to mitigate nutrient runoff. Several soil test methods and tools targeting the fundamental macronutrients (Nitrogen, Phosphorus, and Potassium - NPK) have been introduced, but most of them are from laboratory environments and require a certain amount of time and budget. A few recently introduced portable commercial electric current sensors return estimated values by referring to pH-based equations without providing actual nutrient levels for each NPK. We discovered a commercial colorimetric digital tester (in short, CCDT) capable of evaluating nutrient levels and assigning them to one of five categories: Surplus, Sufficient, Adequate, Deficient, or Depleted. However, the letter-based grading system cannot provide precise quantitative data regarding fertilizer needs or nutrient surpluses. To overcome these challenges, this study introduces an Arduino colorimetric soil tester that utilizes the AS7431 Spectral Color Sensor with 8 visible spectrum channels (in short, ASDT). Since the CCDT's chemical reagent represents the phosphorus level with a primary color (blue), we first calibrated ASDT to classify the wavelength readings of phosphorus into the five grades (e.g., $\lambda < 1188$: surplus; $\lambda < 1510$: sufficient; etc.) by referring to CCDT's color panels. We prepared solutions of the soil-distilled water mixture (pH 7.0, 70°F) to have different levels of richness according to CCDT's guide (e.g., 100 ppm: surplus, 50 ppm: sufficient; etc.). We also designed a 3D-printed test tube container to prevent external light interference and reflections from the test tube's surface. ASDT returned the expected wavelengths (e.g., $\lambda \sim 900$; $\lambda \sim 1400$; etc.), while CCDT provided unexpected grades (e.g., all adequate or alternating between two grades over time), confirming ASDT's better accuracy. CCDT's representing colors of the other two nutrients are not primary colors, and our next goal is to calibrate the multiple wavelengths for these nutrients' grades.

Shannon Griffiths

WV - West Virginia University

Discipline: Art History

Authors:

#1 Shannon Griffiths

Abstract Name: The Fabrication and History of Bowl with Scenes of the Four Seasons

Imperial workshops in China produced decorative porcelain wares throughout the Ming and Qing dynasties. The Imperial kilns of Jingdezhen, located in southeastern China, are some of the most famous and robust areas for the production of these goods, made in the thousands. As such, many pieces in museums display similar styles and decorative coloration. This paper investigates one Qing dynasty tea bowl entitled Bowl with Scenes of the Four Seasons created in the Imperial porcelain factory in Jingdezhen between 1821-1850. Once used in the palace of the Forbidden City by the Imperial court, this work is part of the Asian Art museum in San Francisco, California (Object #: B60P1450). Research on this project includes a detailed visual analysis of the Peking bowl's four medallions, small landscape vignettes depicting the seasonality of China. The paper will also explore the methods used to produce the object including the use of petunse and kaolin, techniques associated with incision, overglaze, and enamel, and an understanding of the famille jaune and rose red color preferences in these types of enamel wares. The paper will investigate the social context of the vessel, including a discussion of the use of the Daoguang mark on the bottom of the vessel, and a deeper consideration of the lifecycle of the work from its production in Jingdezhen, the enamel decoration work completed in Beijing, and finally, its delivery to the Forbidden City and use during the Qing dynasty. Bowl with Scenes of the Four Seasons contains specific details indicating its importance and status that are representative of the Qing dynasty's ceramic production methods and aesthetic preferences during the 19th century.

Aliyah Grijalva

UT - Weber State University

Discipline: Biology

Authors:

#1 Jim Hutchins

Abstract Name: Acoustic Startle Response in a Zebrafish Model of Human Autism

Synapses are sites of information transfer between nerve cells. Less-effective or unneeded synapses should be removed through synaptic pruning. Studies have shown that individuals with the autistic phenotype have impaired synaptic pruning mechanisms relative to the "neurotypical" phenotype. Auditory sensitivity is commonly seen in the human autistic phenotype. Individuals often seek to remove sources of auditory stimuli. We hypothesize that this is because of an excess number of synaptic contacts in the parts of the brain processing auditory information. Normally, complement proteins of the innate immune system such as C3 and C4 help in synaptic pruning. Drugs and/or genetic variations may alter the function of C3 and C4 proteins. Valproic acid (VPA) controls epileptic seizures, but if taken during pregnancy increases the incidence of the autistic phenotype. It has been hypothesized that this is (at least in part) because of the effect of VPA on C3 and C4. Our lab has used the VPA-treated zebrafish model of autism, which should reveal universal synaptic pruning mechanisms that operate across all vertebrate species. Zebrafish are treated from 0-48 hours post fertilization with 50 μ M VPA. Control fish are raised in a medium without VPA. Both groups are then raised using normal animal husbandry procedures. Once zebrafish are 30 days old, they will have developed their Weberian apparatus, which detects vibrations (sounds). At this age, the fish can be tested using a 1000 Hz auditory stimulus. This frequency evokes the so-called "C-startle response" in which fish curl into a "C" shape as an instinctual reaction to an aversive stimulus. We will measure differences in the C-startle response at 30 days post-fertilization, comparing VPA-treated to untreated control fish. We expect to see a higher number of C-startle responses in the VPA-treated fish group.

Asriel Grimmage

PA - Commonwealth University - Bloomsburg

Discipline: Interdisciplinary

Authors:

#1 Carolyn Reid-Brown

Raphael Grimmage

Zaliyah Rayford

Abstract Name: Strength in Numbers: Investigating the Role of Peer-to-Peer Motivation in First-Year Student Success

The transition to college represents a critical juncture in students' academic journeys, often accompanied by challenges that can impact their overall success. This proposal investigates the research question: 'Why is peer-to-peer motivation important to first-year student success?' Recent literature highlights the significance of social support and peer interactions in fostering academic engagement and persistence among first-year students (Tinto, 2017; Gopalan & Brady, 2020). Studies suggest that peer relationships can enhance motivation, reduce feelings of isolation, and promote a sense of belonging, which are essential for academic achievement (Astin, 2018; Wilcox et al., 2019). To explore this phenomenon, a mixed-methods research design will be employed. Quantitative data will be collected through surveys administered to first-year students at a mid-sized university, measuring levels of peer motivation, academic engagement, and self-reported success indicators. Additionally, qualitative interviews will be conducted with a subset of participants to gain deeper insights into their experiences and perceptions of peer influence on their academic journeys. This dual approach will allow for a comprehensive understanding of the dynamics at play. The intended outcomes of this research include identifying key factors of peer-to-peer motivation that contribute to first-year student success and providing actionable recommendations for institutions to enhance peer support programs. By emphasizing the importance of peer relationships in academic settings, this study aims to inform strategies that foster a supportive learning environment, ultimately improving retention rates and student satisfaction.

Ava Grisetti

PA - Mercyhurst University

Discipline: Psychology

Authors:

Abstract Name: The HEXACO and Five-Factor Models of Personality in Relation to Intention to Use Artificial Intelligence to Commit Academic Dishonesty

Over the last few years, ChatGPT and AI have advanced tremendously in both academic spaces and the public. The misuse of these technological advancements in academic settings, such as on projects or papers, has been questioned. Previous studies have been conducted on how the influence of personality traits predicts the possibility of academic dishonesty. Some studies have used the trait models from the Five-Factor Model (FFM) of personality, which includes the five factors of Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Although the FFM has showed significant utility, recent research has revealed support for a six-factor alternative model of personality trait structure known as the HEXACO model (Ashton & Lee, 2007). This structure of personality contains the six factors of Honesty-Humility (H), Emotionality (E), Extraversion (X), Agreeableness (A), and Openness (O). The more impressive feature of this structure is the domain of Honesty-Humility or the so-called "H factor." This factor is unique to the HEXACO model and does not correspond directly to any factors of the FFM. The HEXACO model was used in a recent study by Greitemeyer & Kastemuller (2023), who explored the relationship between personality traits and the intention to use chatbot generated texts to commit academic dishonesty. However, sole use of the HEXACO model in this study is limiting. The purpose of this study, therefore, is to revisit the association between the intention to cheat and personality by relating intention to cheat using ChatGPT/AI to the six personality traits of the HEXACO model and the FFM. We expect the HEXACO model to account for more variance than the FFM in the prediction of academic dishonesty using these technological advancements.

Jade Groble

IL - Governors State University Honors College

Discipline: Psychology

Authors:

#1 Hayley Stewart

#2 Will Ravetto

#3 Jade Groble

Abstract Name: Unlocking Potential: Exploring the Question of Mental Freedom on Wellbeing

A. Problem: This study examines the effectiveness of the Mental Freedom coaching framework, designed to teach six cognitive heuristics with the intention of increased emotional resilience, coping skills, and personal autonomy (Olver, 2024). Mental Freedom centers around the application of William Glasser's Choice Theory to a proposed set of Basic Needs over six sessions (Olver, 2024; Marlatt, 2013; Wubbolding, 2011). Each session focuses on a different principle, beginning with an elaboration of Stephen Covey's writings on proactivity (Covey, 2004), reframed as Responsibility vs. Response-ability. The second principle introduces The Unconditional Trust Challenge, rooted in Choice Theory's assertion that behavior is purposeful (Christensen & Gray, 2002). The third principle explores the positive implications of selectively empowering self-talk, while the fourth poses the subjectivity of memory (Buchanan, 2007) as an opportunity re-write traumatic episodic memories (Wheeler, 1997). The next principle differentiates the discomfort of pain from its evolutionary purpose to prevent further harm. The final principal asks clients to recognize and appreciate life's gifts, lessons, opportunities, and wisdom (G.L.O.W.) (Demartini, 2002). B. Method: 23 Mental Freedom-certified counselors and life coaches will administer the Mental Freedom program to clients as the experimental condition, whereas clients in the control condition will attend six weeks of their pre-existing counseling. Each provider will administer the Scales of Psychological Wellbeing (Ryff, 1989) and Ways of Coping Questionnaire (Folkman & Lazarus, 1984) before and after the program. C. Results: We expect to find a significant difference between existing methods of coaching/counseling and Mental Freedom conditions upon comparing participant pre and post scores. D. Conclusions We expect that the present study will demonstrate a positive growth in self-acceptance and autonomy within the experimental condition, consistent with the Mental Freedom program's focus. Further research on the efficacy of Mental Freedom across levels of imminence for stress/trauma may shed light on its effectivity in various contexts.

Sophia Gronczewski

PA - Point Park University

Discipline: Dance

Authors:

#1 Sophia Gronczewski

Abstract Name: Collaboration in Process: Making the Dancer Visible

While creating my piece “Maximum Occupancy” for our conservatory’s Student Choreography Project, I chose to research ways in which a creative process in dance could be collaborative with the dancers so I could implement them more into my own choreographic process. The concept of my piece was heavily based on expression and individuality. I wanted to find a way to incorporate this concept not just in my choreography, but in how I worked with the dancers and included them in the space and the creation of the piece. In short, I wanted to find out how the dancers could be integrated into the work rather than just be a vessel for it. I reviewed multiple journal articles and found that tasking the dancers and utilizing improvisation would yield the desired results of giving the dancer autonomy in implementing their own perspectives on the concept of the piece, all while demanding engagement and presence from them. These methods will be demonstrated through videos of the process and performance during my presentation. After my process was over, I interviewed professional directors and choreographers who also facilitate collaborative processes to see how these compare to how I facilitated my own. I then interviewed dancers they have worked with, as well as the dancers I worked with, to gauge how effective these processes were at fostering collaboration. Overall, I will demonstrate how inciting collaboration is much more than the compositional methods used, but requires constant conversation with the dancers and the maintenance of an environment that encourages acceptance, exploration, discovery, and understanding.

Lauren Gross

PA - Westminster College

Discipline: Biology

Authors:

#1 Marosh Furimsky

Abstract Name: Ethanol Exposure Impacts Cardiac Development and Function in Zebrafish

Ethanol is commonly used for sterilization and disinfection in the clinical setting, and is present in alcoholic beverages when diluted. Chronic ethanol consumption has detrimental effects on organ systems such as the cardiovascular system, nervous system, and digestive system. This study focused on both the timing and concentration of exposure to experimental ethanol groups. We hypothesized that when compared to a control, higher ethanol exposure groups will show more extreme changes in cardiovascular morphology and have compromised cardiac function. Furthermore, we hypothesized that when zebrafish are exposed to ethanol early in their life cycle, they will be unable to overcome developmental and physiological deficits when compared to those exposed later in their life cycle. Zebrafish (*Danio rerio*) were placed at random into ethanol concentration groups (0.0%, 1.0%, 1.5%, 2.0%, and 2.5%) and timing groups (12-24hpf, 24-48 hpf, and 48-72 hpf). Development, morphology, and physiology of the cardiovascular system were assessed. Through observations over seven days, it was seen that ethanol causes concentration-dependent morphological abnormalities. It was determined that there was a significant difference in the average body length of embryos exposed during 12-24hpf and 24-48 hpf exposure periods. Pericardial diameter and heart rate were also significant across exposure periods at certain experimental concentrations. Further research will need to be conducted to properly analyze time as a variable to assess cardiac development during exposure to experimental ethanol concentrations.

Ethan Grossberg

NC - Elon University

Discipline: Biology

Authors:

#1 Efraín Rivera-Serrano

Abstract Name: Exploring the versatility of viral evolution and immune evasion through selective pressure

Viruses are small subcellular agents categorized as strict intracellular parasites that can only multiply when inside of a susceptible host cell. Viruses use attachment proteins to gain access into the host cell, an event that can be blocked in presence of neutralizing antibodies generated by our immune system through natural exposure or immunization. The ability of viruses to quickly alter the composition of their attachment protein through mutations allows them to escape from antibodies—creating a major public health problem as oftentimes these mutations limit the effectiveness of immunizations over time. Notably, viral evolution has limitations as genetic flexibility is limited to biochemical constraints and, accordingly, certain genetic viral sequences remain relatively constant for viruses to maintain their fitness and thus represent ideal therapeutic targets. My research focuses on analyzing the genetic and protein sequences of mammalian Reoviruses that are or become insensitive to antibody-mediated neutralization. For this, we infected human cells grown in vitro with different reoviral strains in presence or absence of a neutralizing antibody and assessed their sensitivity to this antibody through immunofluorescence microscopy and immunoblotting approaches. We have successfully determined the sensitivity of some, but not all, strains to this antibody. In addition, we are promoting the emergence of novel Reovirus variants through serial passaging in presence of antibodies to identify novel acquired mutations that allow them to evade this selective pressure. These so-called “escape mutants” will soon be analyzed through genetic sequencing of their attachment protein to ultimately determine a consensus sequence amongst the mutant progeny. Our results will provide insights into the balance between flexibility versus constraints of viral evolution.

Ethan Grossberg

NC - Elon University

Discipline: Interdisciplinary

Authors:

Abstract Name: Brushstrokes of Insight: Improving Patient Care Through the Lens of Art

There has been a growing interest in integrating art education into healthcare academic programs. This literature review analyzes scholarly articles on the relationship between art history and its integration with medical and scientific practices, examining how the integration of art creation and analysis can enhance the study of science. The hypothesis is that this integration will enhance researchers' and students' medical and scientific skills, ultimately leading to improved patient care. During the Renaissance period, the fields of medicine and art progressed together through methods centered on meticulous observation of the human body. Artists, anatomists, and doctors shared curiosity and passion that led to innovative advancements. A significant development in Renaissance art was the use of aerial perspective and realism, which inspired artists to engage in detailed observation and studies of the human body, often in collaboration with the pioneering anatomists of the time. This visual scrutiny in art was linked to medical breakthroughs during the Renaissance. Artists often portrayed physical conditions before medical science had identified the corresponding diseases, highlighting the important role of observation for clinicians. Research has shown that integrating art, both in analysis and creation, into the health sciences curriculum has been highly advantageous for clinicians, enhancing observation skills, critical thinking, and a more comprehensive understanding of the patient. These improvements are facilitated by the neural connectivity that develops through engaging with art and refining one's discerning eye. The frontal lobe, crucial for decision-making in patient care, has been shown to develop improved connectivity as a result of engaging with art. It becomes evident that engagement with art offers significant advantages to clinicians today. It is crucial to maintain the connection between art and medicine, as seen during the Renaissance.

Owen Grubbs

PA - Pennsylvania State University

Discipline: Mathematics

Authors:

#1 Thomas Cameron

Abstract Name: Minimal Forts of Cartesian Products of Graphs

Zero forcing is a color change game played on the vertices of a graph. It has applications in the study of quantum systems, power grids, linear algebra, and various other fields. Graph forts are an important subject in the study of zero forcing. A fort F of a graph G is defined to be a nonempty subset of the vertices of G such that no vertex not in F is adjacent to exactly one vertex in F . It has been shown that a fort of a graph is the complement of a failed zero forcing set, making it interesting to study the minimal forts of graphs. Previous research in this area has placed bounds on the cardinality of the minimum fort of a Cartesian product of graphs based on the Cartesian product's factors. This presentation will prove and demonstrate new techniques for constructing minimal forts of a Cartesian product of graphs using minimal forts of its factors. It will focus on how these techniques can be used to generate minimal forts of large hypercubes from minimal forts of smaller hypercubes.

Ben Gu

PA - Carnegie Mellon University

Discipline: Engineering

Authors:

#1 Aaron Johnson

#2 Sarah Bergbreiter

#3 Steven Man

#4 Naomi Oke

Abstract Name: Control of Minimally Actuated Quasi-Passive Bipedal Walker

This research project aims to explore and enhance the control systems of quasi-passive dynamic bipedal walkers at different scales, focusing on improving their robustness and agility in varied terrains. At small scales, motor scaling laws and mechanical design constraints necessitate fewer actuators, which limits both torque output and controllability. Each actuator must consequently be precisely controlled by adaptable algorithms. We present a Proportional-Integral-Derivative (PID) control strategy for Mugatu, a single degree of freedom (DOF) hip-actuated bipedal robot, designed to achieve straight-line walking while maintaining stability and maximizing velocity. In our robot, the single DOF is an actuated joint at the hip, the only control input into the system. Our approach integrates proprioceptive joint feedback with an Inertial Measurement Unit (IMU) to measure body state and the robot's spatial awareness. The sensory integration enables real-time monitoring of the robot's orientation and acceleration, allowing adjustment during various phases of the gait cycle. The research aims to provide a comprehensive analysis of underactuated biped dynamics, examining how physical parameters such as mass distribution and spherical foot profile influence the system's behavior. This work explores gait optimization strategies maximizing walking stability and speed of quasi-passive dynamic walkers across different terrain types, including slippery surfaces and inclines. These findings have implications for applications requiring efficient bipedal locomotion in confined or intricate spaces, such as industrial inspection, and disaster recovery tasks. The developed control framework provides a foundation for designing more capable small-scale walking robots that can operate effectively in real-world environments while maintaining simplicity in mechanical design.

Alexis Guajardo

TX - Laredo College

Discipline: Education

Authors:

#1 Alexis Guajardo

#2 Axel Garcia

#3 Antonio Carranza III

Abstract Name: Cross-Border Stem Education: Evaluating The Role Of Technology In Supporting Border-Residing Students In South Texas

Transborder students, also known as cross-border students, commute daily from Mexico to the United States to pursue higher education. This research examines the

unique challenges faced by transborder students commuting from Nuevo Laredo to colleges in South Texas, focusing on transportation issues, academic performance, and technological support. Surveys of both transborder and local students revealed significant commuting challenges, including long border wait times, unpredictable transportation schedules, and language barriers. A literature review was conducted to explore potential technological solutions to enhance academic support for all students. Transborder students reported longer commutes and higher stress levels compared to local students, with 35.8% always experiencing stress due to border delays and 31.3% occasionally feeling stressed. These challenges negatively impacted academic performance, with 47.7% reporting adverse effects. Additionally, 95.5% of transborder students felt disadvantaged compared to local peers, citing limited campus resource access, inflexible schedules, social integration difficulties, and insufficient academic support. The study underscores the need for institutions to provide targeted support for transborder students. Survey responses indicated that 26 students believed their college offered inadequate support, and 18 felt only partially supported. Suggested improvements include dedicated bus services, flexible schedules, and faculty accommodations for border delays. Technological solutions such as Cross-Cultural Intelligent Language Learning Systems (CILS), speech-enabled language translation, collaboration platforms, and video conferencing tools were identified as promising enhancements. These findings highlight the importance of implementing dedicated transportation, streamlined border-crossing procedures, and expanded academic resources to better support transborder students.

Dylan Guardo

TN - Trevecca Nazarene University

Discipline: History

Authors:

#1 Dylan Guardo

Abstract Name: Erasmus: The Radical Reformer in the Protestant Revolution

This paper hopes to better understand the place of Desiderus Erasmus in the Protestant Reformation by redefining many aspects of the Reformation and the Reformation itself. Drawing on current scholarship and analyzing the works of Erasmus, alongside those of prominent reformers such as Martin Luther, this paper will argue that Erasmus should be recognized as a radical reformer within the context of the Reformation. While differing in approach from Luther, Erasmus' critiques of the Catholic Church and advocacy for a return to the authentic teachings of Christianity demonstrate his significant impact on religious reform during this period. Furthermore, this paper will redefine reformers such as Calvin, Luther, and Zwingli as revolutionaries instead of reformers as well as the Protestant Reformation may be more aptly named as the Protestant Revolution due to the impact of the previously named individuals. This paper will analyze Erasmus' character as described by himself through his *Compendium Vitae* (1524). Coinciding with Erasmus' *Vitae* there are four of his main works that this paper will analyze, *The Handbook of the Militant Christian* (1503), *The Praise of Folly* (1511), and *On Mending the Peace of the Church* (1533). These works will express Erasmus' beliefs and his stance on the papacy while further expressing Erasmus' characteristics that are established in his *Vitae*. Furthermore, Erasmus' *On Free Will* in 1524 will be contrasted with Luther's *The Bondage of Will* 1525 to exemplify the differences between the two scholars and why Luther is a revolutionary and Erasmus is a radical reformer. Overall, the contrasting focus of Erasmus' works compared to revolutionary works like Luther's will show how Erasmus is a radical reformer not a revolutionary. Since Erasmus was a reformer during a revolution this hopes to discern Erasmus' impact during his time and his legacy on modern theology and education.

Antonio Guarino

NJ - William Patterson University

Discipline: Biology

Authors:

#1 Antonio Guarino

#2 Emily Monroe

Abstract Name: Cloning, Overexpression, and Functional Analysis of a *Karenia brevis* Caspase 3-like Gene in *E. coli* using an Alternate Start Codon

Blooms of the toxic dinoflagellate *Karenia brevis* can persist in the Gulf of Mexico for months before their sudden termination. Although the mechanism remains unknown, programmed cell death (PCD) is one hypothesis for *K. brevis* bloom termination. Previous work has shown that *K. brevis* displays hallmarks of PCD, including DNA fragmentation and caspase activity. Caspases play a critical role in PCD by breaking down polypeptides and facilitating cell destruction. Recent work has identified a potential caspase candidate (Kb-cas3) that contains all functional components of a true caspase, including P10 and P20 domains, conserved active sites, and proteolytic cleavage sites. Previous work did not yield strong overexpression of Kb-cas3 in *E. coli* to determine gene function. This project aims to clone Kb-cas3 into a different expression vector to improve overexpression in *E. coli* for future functional characterization of this gene. Kb-cas3 was amplified using PCR, inserted into a pET46 Ek/LIC vector, and transformed into NovaBlue-competent *E. coli*. Plasmid DNA was isolated, and a restriction digest confirmed the inserts. BL21 competent *E. coli* cells with pLysS were transformed with the pET46/Kb-cas3 plasmid. Cultures were grown to mid-log phase at 37°C with shaking. Prior to induction, samples were taken, centrifuged, and pellets were stored at -80°C. Protein expression was induced with IPTG and cultures were incubated overnight at 20°C with shaking. Samples were taken again after the overnight incubation. Cells were lysed and proteins were visualized using SDS-PAGE. No bands of the expected protein sizes were observed in the induced samples. Currently, the expression protocol is being optimized and alternative hosts optimized for expressing eukaryotic genes are being tested. Results of this work will also be presented. Robust protein expression is the first step in characterizing Kb-cas3 function and understanding its potential role in bloom termination.

Victoria Guerrero

TX - St. Edward's University

Discipline: Political Science

Authors:

#1 Victoria Guerrero

#2 Jooyoun Lee

Abstract Name: Cultural Diplomacy: K-Pop Artists' Role in South Korea's Global Strategy

The country of South Korea has risen on the global stage due to its push for soft power. Soft power refers to a country's ability to persuade or attract others through its cultural and political values, rather than coercion or military power, which would be considered hard power. One aspect of South Korean soft power that has

gained international recognition is South Korean popular music, also known as K-Pop. Since its rise in the early-2010's, K-Pop has captured the hearts and minds of people world-wide, and it is because of this popularity that has led it to become a frequent subject of interest in the field of global studies and international relations. The globalization of K-Pop and its expansion of Korean culture to the entire world has had an impact on improvements in diplomatic relations between South Korea and other countries. The purpose of this study is to understand how K-Pop artists have contributed to helping South Korea create diplomatic relations with other countries by analyzing three case studies in which K-Pop artists have either performed in different countries to showcase their music and culture or have attended/spoken at international events to represent South Korea and speak on important issues. Through the analysis of these three case studies, we found that the Korean Wave defines South Korean soft power which is why South Korea's current diplomatic standing is at an all-time high. Furthermore, we found that all foreign engagements made by K-Pop idols will always be imbued with political significance. In conclusion, this study demonstrates how South Korea uses its cultural power, such as K-Pop artists, as a means of building positive international perceptions and strengthening its diplomatic relationships with other nations.

Nicolette Guido

PA - Moravian University

Discipline: Chemistry

Authors:

Abstract Name: Do Rewards Matter for Student Participation in Optional Laboratory Skills Assessments?

Students can come to an introductory General Chemistry course with little to no experience with hands-on laboratory skills. This difference in prior experience can be exacerbated when introductory laboratory experiments are done in pairs or groups where each student may not perform each hands-on skill for completion of the experiment. To probe student prior experience and assess their achievement of basic hands-on laboratory skills, we designed and modified authentic skills assessments. These assignments (with rubrics) require students to record and submit a narrated video of themselves properly performing that skill. Students were queried about their experience and confidence level with each skill prior to the course and following the video assignment. A pilot study with a small (n=11) summer section of General Chemistry 1 and 2 was used to develop and test these authentic skills assessments. Following the pilot study, four new laboratory skill assessment modules were deployed in a large (n=103) General Chemistry 1 course in the fall of 2024 to investigate student motivation for completing these assignments. Throughout the fall semester, students in each laboratory section of the course earned laboratory credit and some earned an additional reward for successful completion of each module. Additional rewards included a digital badge or a physical sticker. Upon completion of the fall semester, student data on participation, successful completion of modules, and pre/post survey responses will be analyzed. Changes in student confidence and experience with each laboratory skill will be presented, and any impact of rewards on student completion will be discussed.

Christopher Guillory

OK - University of Central Oklahoma

Discipline: Engineering

Authors:

#1 Kirk Guillory

Abstract Name: Investigating Nitinol Flow Diverters for Aneurysm Treatment Using Laser Precision Machining

Flow diverters have established themselves as a highly effective endovascular technique for treating brain aneurysms, traditionally employing braided designs made from materials like nitinol and chromium-cobalt alloys. However, the structural flexibility of these braided flow diverters (FDs) remains constrained. This study investigates the feasibility of fabricating finely meshed, non-braided nitinol FDs using precision laser machining, aiming to optimize laser parameters to enhance the fabrication quality and design versatility of these devices. A precision fiber laser machine was utilized to create fine pores, with systematic adjustments to laser power, focal distances, horizontal speed, passes, and cooling media (air and water). Post-fabrication, the FDs underwent polishing in a custom-built tumbler, and their surface quality was analyzed using a scanning electron microscope (SEM) and high-resolution imaging. Surface burning was quantitatively assessed on a 1-to-10 scale based on visual inspection. The findings revealed that laser power and focal distance were pivotal in minimizing surface burning and bulge formation. While water cooling provided additional flexibility, its frequent evaporation required continual refills, making air cooling—with carefully calibrated power and passes—a practical alternative for achieving burn-free, high-quality FDs. This investigation offers critical insights into the production of non-braided nitinol FDs, paving the way for advancements in aneurysm treatment by enabling greater design precision and control in the fabrication process.

Kalyssa Guillory

OK - University of Central Oklahoma

Discipline: Nursing and Public Health

Authors:

#1 Kalyssa Guillory

Abstract Name: The Implications of Latent Toxoplasmosis

Background: *Toxoplasma Gondii* (TG) is a widespread protozoan parasite that remains dormant within its host for life, leading to asymptomatic presentation with a high seroprevalence. Infection with TG in an individual is called Toxoplasmosis (TP). Horizontal transmission commonly occurs through the fecal oral route via exposure to undercooked meat, unwashed produce, contact to contaminated soil or water, and consumption of unpasteurized milk. Additionally, cats are the definitive hosts where sexual reproduction of TG occurs and exposure to cat fecal matter can be infectious. It is estimated that worldwide infection is approximately 30%. Growing literature suggests that latent infection, which exists as tissue cysts particularly within the brain, can be linked to increased rates of numerous psychiatric conditions such as depression, anxiety, schizophrenia, Dementia, Parkinson's, epilepsy, bipolar disorder, and migraines. The parasite's effects on dopamine and serotonin are believed to exacerbate mental health conditions, depleting key nutrients. This points towards the benefits of supplementation with folic acid and vitamin B-12. Purpose: This project aims to provide an educational campaign to nurses and mid-level providers about latent TP and its association to psychiatric disorders and neurodegenerative diseases. Lifestyle interventions and the benefits of promoting supplementation of folic acid and B-12 will be included in the education. Methods: A seminar will be held for health care science professionals. A survey and knowledge check will be conducted afterwards. Conclusion: Evidence suggests a strong association between latent TG infection and various psychiatric disorders. Seroprevalence is high, and vulnerable populations are especially at risk. Public health interventions that promote education, hygiene, food safety, and supplementation are expected to improve health outcomes. Keywords: *Toxoplasma gondii*, Toxoplasmosis, Seroprevalence, Cognition, Folate

Heather Guiney

W1 - University of Wisconsin-Whitewater

Discipline: Psychology

Authors:

#1 Iliana Aviles

#2 Hailey Fish

#3 Heather Niemeier

Abstract Name: Exploring the Relationships among Nicotine Use Expectancies and Disordered Eating Attitudes and Behaviors in College Students

Introduction: Nicotine use among young adults is a relevant health concern. Recent studies have shown an increase in alternative nicotine devices such as vapes and nicotine pouches. Also relevant in this population, are disordered eating behaviors such as bingeing, purging, and calorie restriction. The current study will examine the motives underlying nicotine use and the relationship to disordered eating attitudes and behaviors. Methods: Data collection is ongoing with over 300 college students at the University of Wisconsin – Whitewater. Participants completed a survey assessing frequency of nicotine use, four types of nicotine use expectancies such as negative smoking consequences, positive reinforcement, negative reinforcement, and appetite/weight control as measured by the Short Form Smoking Consequences Questionnaire and modified versions for vaping and nicotine pouches respectfully, and disordered eating attitudes and behaviors as measured by the Eating Pathology Symptoms Inventory. Results: Although results will not be available until the spring of 2025, it is expected that higher scores in subscales of disordered eating attitudes and behaviors related to cognitive restraint, binge eating, purging, and negative attitudes towards obesity will predict higher prevalence of nicotine use. It is also hypothesized that there will be a correlation between nicotine use as an effort of weight and appetite control and these aforementioned disordered eating attitudes and behaviors subscales. Results gathered from this study will help to understand potential motives for nicotine use within the population of young adults exhibiting disordered eating attitudes and behaviors. This research aims to provide insight into the relationship between these two health harming behaviors to inform potential prevention and intervention strategies.

Melissa Guinn

TN - Middle Tennessee State University

Discipline: Criminology/Criminal Justice

Authors:

#1 Melissa Guinn

Abstract Name: Law Enforcement Perceptions of Sexual Assault and Sex Trafficking.

Understanding law enforcement perceptions of sexual assault and sex trafficking victims is essential for improving victim advocacy and case outcomes. This study explores how Tennessee law enforcement officers assign blame, interpret victim and perpetrator demographics, and assess scenarios of sexual assault and trafficking. Misconceptions, such as rape myths and trafficking stereotypes, can undermine investigations, exacerbate victim trauma, and limit arrests and convictions. This research contributes to the growing body of literature on victim-centered approaches by addressing gaps in understanding how law enforcement biases impact case outcomes. The research seeks to identify these biases and their impact, offering insights to improve training and victim-centered approaches. This study utilizes a mixed-methods approach, by using a Qualtrics survey distributed to law enforcement agencies across all Tennessee counties. The survey includes vignettes varying by factors such as victim and perpetrator demographics, type of non-consent, and contextual circumstances of the incident. Respondents also provide demographic information and report whether they have received related training. Quantitative data will be analyzed using R to examine patterns in perceptions, while qualitative responses will be coded in NVIVO to identify themes reflecting acceptance or rejection of myths. The study hypothesizes that female officers will show lower rates of myth acceptance and that minority and low-income victims will receive differential treatment in responses. Results are expected to highlight the prevalence of misconceptions and areas for improvement in law enforcement training. Findings will be discussed in the context of enhancing training programs and shaping policies to mitigate misconceptions and promote equitable justice. By addressing these issues, the study aims to advance victim advocacy and inform policy changes that promote equitable and effective handling of sexual assault and trafficking cases.

Abigail Guiste

PA - Westminster College

Discipline: Psychology

Authors:

Abstract Name: Co-abuse of Nicotine and Ethanol: Effects on Working and Long-Term Memory Driven by Appetitive vs Aversive Stimuli

Nicotine and ethanol are two of the most commonly used drugs in society and are often co-abused. Despite this common use, there is little information known about the combined interactions of nicotine and ethanol in the brain. Therefore, this current study analyzed the combined actions of nicotine and ethanol in the brain and how this use affects working and long-term memory in the presence of an appetitive versus aversive stimulus. Two commonly used measures of working and long-term memory in rodents are the radial arm maze (RAM) and passive avoidance. Rats were trained on the radial arm maze for 2 weeks to ensure their learning of the maze. Half of the arms were baited in the 8-arm RAM to serve as the appetitive stimulus. A working memory error was counted if the rat entered an arm that was already entered during that trial. Meanwhile, long-term memory errors were counted if the rat entered an arm that was not baited. The passive avoidance test occurred in a 3-compartment conditioning chamber in which one side was paired with a shock (aversive stimulus) and the amount of time the rats avoided the shock-paired chamber in the following session was recorded to test for long-term memory. The control group consisted of an injection of saline + saline. Meanwhile the experimental groups consisted of saline + nicotine, saline + ethanol, and nicotine + ethanol in a within-subject experimental design to account for any possible differences in the subjects. Both drugs act on the meso-dopaminergic system and nicotine is predicted to reduce the alcohol-induced memory impairments that occur during co-use. If nicotine can reduce the memory impairments caused from alcohol use through interactions in the reward system, then memory performance in the RAM will be enhanced and latency to enter the shock-paired chamber will be longer.

Sophia Guitar

PA - Lafayette College

Discipline: Biology

Authors:

#1 Ezra Lencer

Abstract Name: Role of *klf17* in lateral line development of Zebrafish

How genes regulate pattern development during development is a fundamental question in biology. Our laboratory is researching the function of *klf17* during lateral line development in Zebrafish. The lateral line is a sensory organ, unique to fishes and amphibians, that allows individuals to sense vibrational movements in water. Proper development of the lateral line involves specifying individual sensory organs, known as neuromasts, at specific locations in the embryo. This highly stereotyped pattern is regulated by a lateral line primordium that migrates from anterior to posterior on the body depositing neuromasts as it moves. My undergraduate thesis work has shown that *klf17* mutations result in striking defects to neuromast patterning during embryogenesis. The first 3 neuromasts in *klf17* mutants are completely lost, however, more posterior neuromasts are variably present across embryos. Furthermore, I have shown that loss of *klf17* leads to fewer differentiated sensory hair cells and fewer stem cells within neuromasts suggesting *klf17* affects either deposition of neuromasts and/or stem cell differentiation and neuromast fate. To further explore the mechanisms of *klf17*, I used HCR to show that the lateral line primordium loses polarity and may exhibit migration and/or deposition defects. This would mechanistically explain why *klf17* mutants have fewer lateral line neuromast. Understanding the role of *klf17* in development of sensory organs will inform research in cancer biology, immune system functioning, and multiple diseases.

Micah Gundale

MN - Gustavus Adolphus College

Discipline: Exercise Science and Nutrition

Authors:

#1 Micah Gundale

#2 Justin Guzzo

#3 Kyle Heffron

Kyle Heffron

Justin Guzzo

Abstract Name: Effects of Wim Hof's Breathing Technique on Aerobic Capacity

Traditionally, the sympathetic nervous system has been considered beyond conscious control. However, evidence suggests that certain individuals, through specialized training techniques and mental focus, can exert voluntary control over sympathetic responses (Cryer, et al., 1980). Research has primarily focused on meditation, biofeedback, and specific breathing techniques. The Wim Hof breathing technique claims to influence the sympathetic and parasympathetic branches (Kox, et al., 2014). Despite the growing interest in the potential health benefits of the Wim Hof Breathing Technique (WHBT), there is a lack of research examining its effects on aerobic performance as measured by VO2 max. The purpose of this study is to investigate the effects of WHBT on VO2 max in healthy adults. Participants will include men and women ages 19-23. A one-sample design will be used. A baseline Balkeware Submax treadmill test will be conducted using a gas analyzer mask to allow participants to gain comfort with procedures before any experimental treatments are applied. The independent variable will be the breathing method which includes box breathing and WHBT. The order of the breathing methods administered will be randomized. The dependent variables will be VO2 max estimation and heart rate recovery time. A Repeated Measures ANOVA analysis ($p < .05$) will be used to detect significant differences between each trial. It is hypothesized that WHBT will result in a significant increase in estimated VO2 max in healthy adults compared to the box breathing and control conditions. In conclusion, this study may suggest that utilization of the WHBT before engaging in aerobic exercise may improve performance. Future research might look at specific athletic applications of the WHBT as an ergogenic aid. Data is currently being collected. IRB Protocol Number: #471735

Crystal Guo

MI - Northern Michigan University

Discipline: Environmental Science and Sustainability

Authors:

Abstract Name: Analysis of U.S. Colleges and Universities to Assess the Feasibility of Heating with Wood at Northern Michigan University

In the past few decades, there has been an emphasis on trying to mitigate the amount of greenhouse gas (GHG) emissions. At Northern Michigan University (NMU), the Ripley Heating Plant contributes about 60% of GHG altogether from burning natural gas. NMU has a sustainability goal of reducing their GHG emissions 25% by 2030 and 50% by 2040. There is consideration to make a switch from natural gas to wood chips. Natural gas is a cleaner fuel source when comparing to coal and petroleum, but it does not mean it is sustainable. A more sustainable resource is wood; this has been an important resource in cooking food, building homes, and heating homes for centuries. The goal of this project was to identify the benefits and challenges in using wood and reviewing journal articles on other universities that have switched to wood as biofuel. U.S. colleges and universities were found via Google, and the Sustainability Tracking Assessment and Rating System (STARS). Institutions were categorized into those who currently use wood, those that formerly used wood, and those who considered using wood. Interviews were set up, interview protocols were created, and information was analyzed into common themes and trends. Similarities and differences in wood implementations and document analyses were discussed. Collecting information on the use of local wood will allow future decision makers in choosing the most sustainable option for heating at NMU. This report aims to assist in research for conducting a feasibility study on wood-based heating systems.

Omozusi Guobadia

AZ - University of Arizona

Discipline: Nursing and Public Health

Authors:

#1 Omozusi Guobadia

#2 Jill Castek

#3 Kacey Ernst

Abstract Name: Misinformation and Public Health: A Framework to Address Issues and Challenges

Literacy is a vital skill necessary to successfully navigate healthcare systems and, more broadly, the new digital landscape we inhabit. Healthcare systems in place require advance digital literacies, yet many individuals lack a basic understanding of how to improve their literacies (digital, media, health, critical thinking, etc.). Compounding issues have arisen as a result of illiteracy and subsequent exacerbated inequities (e.g., mis/disinformation, the Loneliness Epidemic, challenges navigating healthcare systems). These issues threaten to destabilize core societal functions of institutions and social systems. Building on prior frameworks that connect digital literacies and eHealth, the research will build out a comprehensive framework conceptualizing new connections relevant to the modern digital age. An updated version of the eHealth Lily Model, a comprehensive, multifaceted overview of multiple literacies, will be developed under the guidance of experts in digital health literacy and epidemiology. A synthesis of the literature will lead to the creation of an adapted model that includes important concepts such as inclusion, equity, & accessibility. Next, a focus group of experts will be established via mentor-guided purposive sampling and their feedback will be used to make improvements throughout each iteration of the model. The resulting expanded framework will

demonstrate to researchers and experts of all fields the role that literacy plays in our growing understanding of how to address these challenges. In the process, this research may improve interventions, encourage educational efforts, and empower citizens with the literacy skills they need to resolve problems.

Aarushi Gupta

TX - The University of Texas at Dallas

Discipline: Engineering

Authors:

#1 Adam Shebindu

#2 Dr. Michael Burton

#3 Dr. Caroline Jones

Abstract Name: A Microphysiological System to Quantify Astrocytes and Microglia Communication

Neuroinflammation plays a critical role in cognitive decline and the progression of neurodegenerative diseases, such as Alzheimer's disease. In the central nervous system (CNS), microglia and astrocytes regulate immune responses, mediating neuroinflammation. This study presents a microphysiological system designed to investigate astrocyte-microglia communication under inflammatory conditions. Using microfabrication techniques, such as photolithography and soft lithography, we developed a microfluidic device to quantify communication between immortalized human astrocyte and microglial cell lines. The microfluidic device was designed with a microglia cell chamber and an astrocyte cell chamber that were interconnected by a series of 10 micrometers by 10 micrometers migration channels. The system enabled real-time observation of cellular interactions under controlled inflammatory conditions, addressing the limitations of traditional cell culturing techniques. It reduced costs associated with culturing large quantities of human cells and reliance on animal models, while also improving experimental precision. Validation of the device demonstrated its ability to replicate the dynamic interactions between astrocytes and microglia under inflammatory conditions. Using time-lapse imaging with a Nikon TiE2 microscope and biochamber, we quantified migration velocities, acceleration, and directionality of both human astrocytes and microglia. The system allowed for precise observation of cellular migration, morphological changes, and responses to cytokine (IL-4) exposure in a controlled microenvironment, confirming its ability to model neuroinflammatory processes. Future applications include the use of digital droplet PCR (ddPCR) to quantify inflammatory markers and further explore signaling pathways involved in neuroimmune interactions. By bridging the gap between standard cell cultures and murine models and human clinical trials, this microphysiological system advances preclinical research in CNS diseases and offers a platform for identifying therapeutic targets to address neuroinflammatory processes.

Rianna Gupta

MI - University of Michigan - Ann Arbor

Discipline: Engineering

Authors:

#1 Mark Hammig

#2 Gabrielle Grey

Abstract Name: Aqueous Synthesis of Copper Nanoparticles for Lightweight Semiconductors

This research investigates a novel, aqueous synthesis procedure to create copper nanoparticles that can be

used in the development of lightweight semiconductors. The study explores how different variations of ligand type, ligand amount, and temperature affect the morphology and properties of synthesized nanoparticles. Previous research that follows a similar approach to copper synthesis has primarily relied on organic solvents, a comparatively more costly and unsustainable process when scaled up for commercial application. The synthesis employs a bottom-up methodology, starting with copper ions in aqueous solution and creating nanoparticles through a controlled experiment in a nitrogen environment. In order to optimize the procedure to produce pure copper as opposed to copper oxides, UV-Vis spectroscopy is utilized to systematically determine subsequent variations in the molecular weight and amount of the ligand polyvinylpyrrolidone (PVP). Samples are then prepared for more detailed characterization and analysis through centrifugation and sonication of the solution prior to vacuum filtration. Preliminary findings suggest that PVP of a higher molecular weight will produce pure copper, however it is anticipated that the longer ligand also inhibits conductivity. Thus, larger amounts of lower-weight PVP may be required to prevent oxidation while demonstrating other properties characteristic of copper. Pure copper nanoparticles can ultimately lead to the development of lightweight semiconductors that allow for the replacement of other materials. An optimized aqueous synthesis procedure can therefore enable eventual sustainable production and potential cost savings for a wide breadth of industries, including aerospace and automotive fields.

Sanjana Gupta

VA - Virginia Commonwealth University

Discipline: Psychology

Authors:

Abstract Name: Early Technology Exposure and Academic Performance in Generation Alpha: Reduced Attention Span and Impact on Handwriting

The increasing prevalence of handheld devices in the lives of young children inspired this research, particularly regarding their potential impact on attention spans and cognitive development in Generation Alpha. Early exposure to tablets and smartphones before the age of seven coincides with critical periods of neuroplasticity, during which the brain is highly receptive to environmental influences. This matters because attention and cognitive skills formed in childhood lay the foundation for academic success and long-term personal development, and the shift toward digital learning platforms in schools may have significant consequences. This study aimed to investigate whether early exposure to handheld devices influences attention spans and classroom engagement in young children. To explore this, I examined existing research on early childhood screen time, analyzed developmental studies on neuroplasticity, and reviewed educational trends highlighting the integration of digital platforms in learning environments. Preliminary findings suggest that excessive early exposure to handheld devices may be linked to shorter attention spans and challenges in maintaining focus during traditional classroom tasks. Conversely, moderate and purposeful use of digital tools can enhance cognitive skills like problem-solving and adaptability. These findings suggest a nuanced relationship between screen time and cognitive development that depends on factors such as the type and amount of digital interaction. As handheld devices continue to shape educational practices, it is essential to strike a balance that leverages the benefits of digital learning while mitigating its potential drawbacks. Future research should focus on developing guidelines for healthy digital engagement in early childhood and further exploring how technology can support, rather than disrupt, attention and learning processes.

Aashman Gupta

FL - Embry - Riddle Aeronautical University

Discipline: Engineering

Authors:

#1 Rahul Kumar Arram

#2 Aashman Gupta

Abstract Name: Asteroid Mining: The Next Big Thing or a Gimmick?

Asteroid mining, a sci-fi concept that is rapidly emerging as a potential cornerstone for humanity's expansion into space. This paper explores the economic, technological, and legal challenges of asteroid mining, by examining its feasibility, potential benefits, and other challenges that could hinder its development. Some argue that mining asteroids could provide essential resources and reduce dependency on Earth leading to sustainable space colonization, but critical challenges still remain. Through a review and rational comparison of recent advancements and setbacks, this paper presents an analysis of the potential of asteroid mining; findings suggest that while asteroid mining holds significant potential for the future of space exploration, it is hindered by unresolved challenges in technology, economics, and international law, which require further research and innovation.

Ignacio Gutierrez Ramirez

CA - University of California - Merced

Discipline: Psychology

Authors:

#1 Elisa Gomez

#2 Emely Covarrubias

#3 Mayra Bamaca

Abstract Name: The Moderating Role of Coping Strategies Between Work-Family-School Conflict and Academic Stress in Latinx Students

A growing number of Latinx college students are reporting lower GPAs and higher dropout rates (Fernandez et al., 2023). Stressors, specifically academic stress, are associated with poor academic outcomes (Fernandez et al., 2023). Limited research has examined the impact of work-family-school conflict on academic outcomes. Latinx college students face unique challenges that exacerbate stress experienced at school (Burgos-Cienfuegos et al., 2015). For example, family obligation values, defined as attitudes toward respecting and assisting families, contradict individualistic academic expectations from schools (Burgos-Cienfuegos et al., 2015). Given the importance placed on family, Latinx college students deal with various roles and demands that conflict and heighten stress (Bellare et al., 2023). Additionally, work and school demands contribute to college students' work-school conflict (Wan et al., 2022). Role strain theory posits that individuals allocate finite resources, including time and energy, across roles; however, a lack of these resources may increase role strain (Goode, 1960). Role strain theory explains how individuals seek mechanisms to reduce role strain, like coping, to reduce stress. The current study aims to examine the association between work-family-school conflict and academic stress and whether adaptive and maladaptive coping methods exacerbate or buffer this association. Latinx college students (N=323) were recruited from a university in central California. Participants were primarily US-born (85.9%) and female (77.3%). Work-family-school conflict was separated into the following subscales: work-to-school conflict, school-to-work conflict, family-to-school conflict, and school-to-family conflict. Correlation and moderation analyses were conducted. All work-family-school conflict subscales were positively associated with academic stress. Only maladaptive coping moderated the association between work-to-school conflict and academic stress. Latinx college students often face work-family-school conflict and targeting maladaptive coping may inform interventions that aim to reduce academic stress. Considering Latinx college students report worse academic outcomes, understanding how work-family-school conflict impacts academic outcomes is necessary to address educational disparities.

olivia guyette

CA - Chapman University

Discipline: Chemistry

Authors:

#1 Brianna Zamora

#2 Stephanie Hoang

#3 D'Angelo Alvarez

#4 Jerry LaRue

Brianna Zamora

Abstract Name: Hot Electron Chemistry on Bimetallic Gold Core-Shell Nanoparticles

With the rise of CO₂ emissions, a significant global climate challenge has emerged such as global warming, driving the need for innovative solutions. One approach to reducing CO pollution involves converting CO or CO₂ into methanol (CH₃OH) using catalysts, which lower the reaction barrier for the reaction and increase efficiency. Plasmonic photocatalysts offer a promising method for producing green fuels, including methanol, by enhancing light-driven reactions that convert CO₂ into valuable chemicals. Our plasmonic photocatalysts are composed of bimetallic transition metal core-shell nanoparticles, which have unique optical properties, such as enhanced light absorption and localized surface plasmon resonance (LSPR), as well as catalytic properties like increased reaction rates and stability. These properties potentially boost their photocatalytic efficiency compared to traditional catalysts. We focus on bimetallic core-shell nanoparticles with Gold (Au) as the core metal. As of current, rhodium (Rh) and Ruthenium (Ru) have been used as the shell metal, and within this upcoming year the goal is to also incorporate nickel (Ni). These shell metals were selected because of their catalytic properties. Both Au/Rh and Au/Ru nanoparticles are synthesized through reflux reactions, followed by washing via centrifugation, and characterized using Scanning Electron Microscopy (SEM), Energy-dispersive x-ray spectroscopy (EDS), and Ultraviolet Absorption Spectroscopy (UV-Vis). To assess their photocatalytic efficiency, we plan to perform CO oxidation, as well as hydrogenation reactions, as these processes are crucial for understanding the nanoparticles' potential in green fuel applications. By studying these bimetallic core-shell nanoparticles, we aim to gain insights into their catalytic properties and assess their effectiveness in advancing green fuel technology.

Ramon Guzman

CA - University of the Pacific

Discipline: Engineering

Authors:

#1 Ramon Felix Guzman III

Abstract Name: Advanced Chemical Vapor Deposition System for Silicon Nanostructure Fabrication in Lithium-Ion Battery Anodes

Developing silicon-based anodes for lithium-ion batteries (LIBs) represents a promising pathway to significantly enhance energy storage performance. Silicon, with its high theoretical capacity, has the potential to store up to ten times more lithium ions compared to traditional graphite anodes. However, the inherent challenges associated with silicon's large volume expansions (up to 400%) during lithiation and delithiation, which lead to mechanical degradation and reduced cycle life, have hindered its widespread adoption. This

study presents the design and implementation of an innovative Chemical Vapor Deposition (CVD) process aimed at overcoming these challenges by synthesizing silicon nanostructures. The custom-built CVD system, 'Evil Octopus,' enables precise control over gas flow, temperature, and pressure, utilizing a fully automated programmable logic controller (PLC) and human-machine interface (HMI). The synthesis involves reducing silicon dioxide (SiO₂) using magnesium (Mg) at elevated temperatures, followed by a carbon deposition phase to create a protective layer. The resulting silicon nanostructures are incorporated into a porous and mechanically strong matrix, which helps mitigate the effects of volumetric expansion during battery operation. Characterization techniques, including X-ray diffraction (XRD), scanning electron microscopy (SEM), and energy-dispersive spectroscopy (EDS), were employed to validate the morphology and phase composition of the synthesized nanostructures. The CVD system's automation capabilities provided uniform nanoparticle coatings, optimizing first-cycle efficiency and reducing first-cycle losses. This approach contributes to the advancement of next-generation lithium-ion batteries by improving energy density, essential for the widespread adoption of electric vehicles (EVs) in addressing climate challenges. Future work will focus on scaling the CVD process for industrial applications, ensuring consistent quality and cost-effectiveness for advanced energy storage technologies. By addressing the limitations of current LIB technologies, this work aims to pave the way for more sustainable and high-performing energy solutions, which are crucial for the future of clean energy and the universal adoption of electric vehicles.

Elizabeth Guzman

TX - St. Edward's University

Discipline: Psychology

Authors:

#1 Elizabeth Guzman

Abstract Name: The Developments and Outcomes of Childhood Trauma

Childhood trauma is a significant issue associated with adverse mental, physical, and life outcomes, highlighting the urgent need for effective interventions and a deeper understanding of resilient factors. Although research has established its connection to long-term health challenges and maladaptive behaviors, gaps remain in tailoring interventions to diverse cultural, socioeconomic, and developmental contexts for optimal recovery. This study examines the relationship between childhood trauma and subsequent life outcomes by analyzing archival data from the Texas Department of Family and Protective Services (DFPS), Texas Government Dataset, and Statista. These datasets provided comprehensive insights into child welfare, foster care, and Prevention and Early Intervention (PEI) programs. The methodology of this study included an extensive literature review of scholarly articles and an analysis of the Texas Government Datasets. According to the Texas Government Dataset, 41,409 youth and 24,692 families benefited through programs such as Community Youth Development, Healthy Outcomes through Prevention and Early Support, Texas Home Visiting, and Nurse-Family Partnerships. Findings indicate that children who experienced trauma and participated in PEI programs demonstrated improved mental and physical health outcomes compared to those who did not receive such interventions. These results have significant implications for mental health professionals, policymakers, and educators. For practitioners, understanding the nuanced effects of trauma can inform personalized therapeutic approaches. Policymakers can leverage these findings to design interventions to create supportive environments for at-risk children. Lastly, educators, through targeted training, can better identify and support traumatized children, fostering resilience and recovery. This underscores the critical role of targeted, trauma-informed interventions in improving long-term outcomes for children and addressing key gaps in care strategies.

Citlaly Guzmán De La Rosa

UT - Westminster University

Discipline: Interdisciplinary

Authors:

#1 Carolina Bloem

Abstract Name: Complexities of Claiming Indigeneity as Chican*s and US-born Mexicans

Does being Chican* or a US-born Mexican mean you are inherently indigenous? These communities' unique histories are one of the reasons behind an assertive answer to this question. This literature review examines the different arguments surrounding the complexity of claiming indigeneity as Chican*s and US-born Mexicans. The argument is that claiming indigeneity as Chican*s and US-born Mexicans can unintentionally contribute to the neglect of Indigenous struggles and experiences. US-born Mexicans (commonly called Mexican Americans) were included due to their similarities with Chican*s. To critically analyze this issue, the literary focus was placed on the historical junctions of the analyzed literature and the general arguments relating to Chican* Indigeneity and Indigenism. The historical junctures chosen were the Spanish conquest, Modern Nation-State Mexico, the Anglo conquest, and the Chicano movement. Then, both supporting and critiquing stances were examined for two questions: are Chican*s Indigenous? And is a potential claim beneficial? The gap found was that the content surrounding this discussion, primarily written in English, restricts perspectives critical to this conversation. As the final point, the stance taken is that counterarguments about policing or validating identity fail to include Indigenous frameworks, which is when claimed indigeneity could perpetuate settler colonialism.

Jahayra Guzman-Rivas

VA - George Mason University

Discipline: Engineering

Authors:

#1 Qi Wei

#2 Amad Qureshi

Abstract Name: Using AI to Quantitatively Analyze Extraocular Muscle Pulley Morphology from MRI

Strabismus is the misalignment of the eyes, which can be caused by abnormalities in the pulley connective tissues. Magnetic Resonance Imaging (MRI) is used to study the structural and biomechanical features of strabismus. Recently, artificial intelligence (AI) techniques, specifically deep learning, have been implemented in segmenting the images obtained by MRI. However, these techniques need improvements for more accurate depictions of the structures. MRI images from patients with strabismus containing the extraocular muscle pulley morphology were obtained. Deep learning techniques will be used to locate the muscles using pixel-based labeling. Then, segmentation masks will be created containing the muscles with various colors. These locations will be analyzed through two F-measure-based metrics. These metrics are the Intersection of Union (IoU) and the Dice coefficient. While results have not yet been determined, the techniques are expected to accurately show the location of each extraocular muscle through different colors representing each muscle. These techniques are also expected to obtain IoU and Dice scores of close to 1 to show a complete overlap between the original MRI image and the image of the predicted locations. These refinements in the segmentation process will significantly enhance the performance of AI segmentation used for studying strabismus in medical imaging.

Nancy Gyimah

OK - University of Central Oklahoma

Discipline: Nursing and Public Health

Authors:

Abstract Name: The Effects of Regular Physical Exercise Programs on Behavior and Cognition in Early Alzheimer's Disease

Background: Alzheimer's Disease (AD) is a debilitating neurodegenerative disorder that causes progressive cognitive decline, behavioral and executive function decline, and reduced independence in activities of daily living (ADLs), diminishing quality of life and imposing a heavy burden on caregivers. Research suggests that physical exercise can positively influence cognitive, behavioral, and executive function in individuals with AD. Purpose: This proposal will investigate the effectiveness of a structured physical exercise program in improving cognitive, executive, and behavioral functions and enhancing quality of life. Method: This project will evaluate a teaching program focused on the benefits of physical exercise programs on cognitive, behavioral, and quality of life in AD Standardized tools, including the Mini-Mental State Examination, Montreal Cognitive Assessment, Quality of Life in AD, Behavior Pathology in AD, Cornell Scale for Depression in AD, and Caregiver Strain Index, will be utilized. Conclusion: This project will provide valuable insight into the effectiveness of structured physical exercise as a non-pharmacological approach to slowing AD progression, promoting cognitive and behavioral resilience, and improving the quality of life. Keywords: Alzheimer's, exercise, behavior, and cognition.

Katie Gyring

OK - Cameron University

Discipline: English and Literature

Authors:

Abstract Name: "Inside They Are Ravenous Wolves": Hypocrisy as a Moral Vice in Charles Dickens' Bleak House

In Charles Dickens' Bleak House, hypocrisy stands out as perhaps the greatest of all evils in Victorian society. A grown man calling himself a helpless infant to whom money is incomprehensible is revealed to be a calculating sell-out. A mother is so devoted to charity across the sea that she has no devotion to spare for her own miserable and neglected family. Lawyers purport to serve the best interests of their clients while feeding off of their protracted suffering like so many leeches. Much of the scholarship concerning the novel focuses on the legal system of the court of Chancery but, as McClure (2003) suggests, the work deals in no small part with individual moral failures. Ballenger (2008) sees elements of the Gothic in the novel, especially when considering how the characters practice a grotesque sort of hypocrisy within the legal system. Of all the societal faults highlighted by Charles Dickens in Bleak House, it is clear that he regards hypocrisy as the most reprehensible. The court of Chancery serves as a reflection of human moral failure rather than the cause of it. Indeed, Mota (1994) suggests that the work may be best understood in relation to the Christian community. This presentation attempts to reclaim the discussion of Bleak House as a book concerned primarily with human hypocrisy and immorality, for while the story itself is quite complex with its dual narration and discussion of the London legal system, like much of Dickens' work it is essentially a story about morality. While no small amount of suffering is perpetuated by the interminable deferment of the judicial system, Chancery is not itself the primary font of badness in Bleak House, but is rather a side effect of the true moral villain of society, hypocrisy.

Jessica Ha

MN - University of Minnesota - Rochester

Discipline: Biology

Authors:

#1 Alisia Hull

#2 Aalunya Teso

#3 Jessica Ha

#4 Micaela Haas

#5 Michael Hunsberger

#6 Jennifer Wollschlager

Abstract Name: Investigating the Effects Electronic Dance Music Has on Heart Rate

Music elicits a parasympathetic response and activates multiple parts of the brain, decreasing heart rate and anxiety levels. Previous studies between music and heart rate showed many inconsistencies in researchers' findings, most likely due to the lack of a clear and reported methodology. As a result of these many variables, studies have not been consistent enough to make a proper conclusion. Random beat drops in music, which often occur in electronic dance music (EDM), activate one's stress response. Because of this, we hypothesize that electronic dance music increases the heart rate of individuals. 39 undergraduate students were randomly selected to participate in our experiment. Students sat in silence with their eyes closed for an initial heart rate. The song was then played for three minutes and the final heart rate was recorded after the song. From the data collected, a bar graph was created depicting the initial and final heart rates of the participants. The final heart rate after listening to EDM is higher than the initial heart rate ($p=0.04$). With our alpha value of 0.05, the null hypothesis is rejected, showing that there is a significant change in heart rate when listening to EDM. With this in mind, public locations, such as healthcare facilities, should avoid playing EDM music to avoid high-stress levels. For future studies, more participants should be tested to ensure a larger sample size and more diversity.

Arya Haala

MN - Minnesota State University - Mankato

Discipline: Biology

Authors:

#1 Rachel Cohen

Elenore Milde

Abstract Name: Identifying ADAM9 and BHLHE40 gene expression in green anole lizards (*Anolis carolinensis*)

Green anole lizards (*Anolis carolinensis*) have distinct breeding and nonbreeding seasons in which they display different behaviors and morphological changes, such as changes in dewlap displays, pushup-like movements, territorial behaviors, and gonad size. Our question is to determine the role of gene expression in these seasonal changes. Implications of our research on gene expression could lead us to better understand the relationship between behavior changes and gene expression. We are examining genes ADAM9 and BHLHE40 for their expression level in the breeding and nonbreeding seasons between males and females. ADAM9 regulates angiogenesis/neurogenesis and cell-to-cell interactions. BHLHE40 regulates circadian rhythm and is a DNA-binding transcription factor. We predicted that ADAM9 would be upregulated in the nonbreeding season while BHLHE40 would be upregulated in the breeding season based on their functionalities. We designed three primers for each gene, testing each to determine the effectiveness in

amplifying the correct sequence. We chose one primer set each to move on with. We prepped samples through RNA isolation and cDNA synthesis to be used later in the experiments. We are currently working on qPCR to determine expression in breeding and non-breeding seasons between sexes. This study will help us to understand the impact of gene expression on behavioral changes, which could provide insight into the human genome and its influences on our behaviors.

Brielle Hachey

WI - University of Wisconsin-La Crosse

Discipline: Biology

Authors:

#1 Dylan Motschenbacher

#2 Cord Brundage

Abstract Name: Developmental impact of neonicotinoid or nicotine exposure in chicken embryos

Imidacloprid is a neonicotinoid designed to target the nicotinic acetylcholine receptors of invertebrate insects but may affect the development of vertebrates. Nicotine is known to alter vertebrate development. Avian species may also be of particular risk of exposure to neonicotinoids from environmental pesticides and ingestion of contaminated insects and freshwater species. We evaluated the impact of environmentally relevant imidacloprid (10 µg/mL) exposure on vertebrate embryo development using a chicken egg assay and compared that with the effects of saline or nicotine exposure (0, 10 and 100 µg/mL). Research grade, specific-pathogen-free (SPF) eggs were injected on day 0 and harvested on day 14 of development. Egg weight, embryo weight and body morphometrics were compared between the treatment groups. Eggs treated with nicotine had an overall (10 - 20%) lower survival rate ($P < 0.05$). Embryos exposed to 10 µg/mL nicotine that remained viable at 14 days did not differ significantly from controls. Embryos exposed to 100 µg/mL exhibited reductions in limb development ($P < 0.01$) and altered head circumference ($P < 0.009$). Reductions in limb length were noted in imidacloprid exposed embryos although not significant ($P = 0.086$). Embryo weight was significantly reduced in the imidacloprid exposed embryos relative to controls ($P = 0.034$). Tissues were harvested to determine histological changes as a result of imidacloprid. Use of the chicken embryo assay highlights the potential effects of developmental neonicotinoid exposure in vertebrates.

Jesse Haefner

PA - University of Pittsburgh

Discipline: Psychology

Authors:

Abstract Name: The Tenuous Relationship Between Psychology and Diversity

Diversity and psychology are closely related in a variety of ways. The purpose of this research was to assess the current state of the relationship between diversity and the field of psychology. Similarly to many scientific fields modern psychology has its roots in predominantly white and Eurocentric origins. This has caused many problems in how the field interacts with cultures and peoples that come from outside of the aforementioned group. From false diagnosis to mistreatment during research, diverse and especially marginalized communities have a history of being mistreated by the field. While there have been efforts to diversify the industry and improve treatments, issues still persist into the modern day. Examples can be seen in the largely white workforce and the still prevalent misdiagnosis. In order to gain an understanding of the field as it exists

currently I have conducted research into the statistics of the modern day industry related to the workforce, and I have examined a local psychological practice to see what measures they have in place to ensure fair and effective treatment. Finally, I have conducted interviews with current clinical psychologists to not only ask how they account for diversity in their careers, but also what their personal experience in the field has been like. The findings of my research were largely positive. They showed a field in the process of moving away from its homogenous past, however there is still improvement to be made. My presentation of the findings is not only meant to inform on the inner workings of an industry, but also call attention to the importance of striving to create a more diverse workforce and understanding in health fields.

Paiton Hagen

SC - Coastal Carolina University

Discipline: History

Authors:

Amelia Bonner

Gabriella Seebode

Abstract Name: From Grand Strand to Center Stage: Myrtle Beach in the Rise of Rhythm and Blues Music

Beginning in the early twentieth century, American music scenes and audiences grew more inclusive and diverse. Specifically in urban centers like New York and Chicago, new popular styles attracted artists and listeners across demographic divides. Consequently, previous scholarship has tended to overlook the role that remote areas played. One example is Myrtle Beach, a resort town on South Carolina's coast. In the 1950s and 1960s, when African American musical innovations like rhythm and blues increasingly influenced mainstream culture, Myrtle Beach attracted visitors from different parts of the country. People from Southern states, where segregation shaped public and cultural life, as well as the Northeast, where traditional standards of propriety prevailed, first encountered rhythm and blues and other fresh styles in Myrtle Beach. Even big-name performers like Little Richard and Ray Charles played local music venues to the amazement of mixed audiences. Representing a student-led research undertaking at Coastal Carolina University's Center for Inclusive Excellence, this project investigates how the Grand Strand region catalyzed the rise of new popular music forms. Using oral histories provided by contemporary witnesses, news sources from media archives, and information gathered at historical sites, it examines what roles the relatively remote Grand Strand played in the evolution of American pop culture. Interviewees shared unique personal perspectives that offered valuable insights into the period's social, political, and cultural climates. The cast of witnesses included figures from the circuit of commercial entertainment, local residents who saw the area evolve into a hotspot of popular culture, and individuals who vacationed in Myrtle Beach as teenagers looking for new excitements. Aspiring to close a persistent gap in research on the dissemination of popular culture, this project explores how Myrtle Beach expedited the development of all-American musical and cultural experiences that reflect the nation's inclusive and diverse character.

Alexander Hager

OH - Case Western Reserve University

Discipline: Biochemistry

Authors:

#1 Eric Gibbs

#2 Sudha Chakrapani

Abstract Name: Optimizing Fab Production for Glycine Receptor Analysis

Glycine receptors (GlyRs) are a class of membrane ion channel receptors that inhibit neural excitation. They are mainly found in brain stem and spinal cord neurons. Their significant impact on motor coordination and sensory processing makes GlyRs a promising therapeutic target for pain, anxiety, drug addiction, and other neurological diseases. For this reason, there is substantial interest in understanding GlyR behavior at the single-molecule level, both in purified systems and in native cellular conditions. GlyRs belong to a large family of receptors called pentameric ligand-gated ion channels (pLGICs) that assemble as a pentamer of homologous subunits. There are multiple GlyR subtypes, each varying on the types of subunits that compose the pentamer. One subtype called homomeric GlyR α 1 is composed of five identical α 1 subunits. To help distinguish between GlyR subtypes, it is essential to characterize tools that can recognize specific subunits. One such tool is a Fragment Antigen Binding (Fab) region of an antibody that has been established as a biomarker in protein characterization. Structurally, the Fab consists of one heavy and one light chain, bound by a disulfide bond, with the chains each consisting of a constant and variable domain. With a relatively smaller molecular weight of 55 kDa, Fab adequately serves as a fiducial marker for larger proteins with homologous subunits, such as GlyR α 1. A GlyR α 1-Fab complex has previously been developed for this purpose, however, its effects on channel structure and function have not been fully characterized. Here, we present our protocol for purifying this Fab along with size-exclusion chromatography data of purified GlyR α 1-Fab complex. We plan to further experiment with this complex using cryo-electron microscopy.

Fuka Hagiwara

JPN - Musashino University

Discipline: Engineering

Authors:

#1 Fuka Hagiwara

#2 Kyo Ikegaya

Abstract Name: AMEFURU - A rainfall sensor useful for daily life -

To address accurate and flexible wake-up time adjustments, we have developed "Amefuru Alarm," an application that adjusts the alarm time according to the weather forecast. The purpose of this app is to provide users with an environment where they can adapt to weather changes by acquiring real-time weather data and automatically adjusting the alarm time based on accurate forecasts. This system is intended for use on iPhones and iPads and was developed on Playgrounds using the Swift language. This app acquires real-time weather data from the Japan Meteorological Agency for a designated area and sets an alarm for the usual wake-up time. Based on the probability of precipitation and rainfall amount, it determines the intensity of rain as a "rain level" and automatically advances the alarm time according to this "rain level." The alarm then sounds at the set time. For example, users can customize settings such as "wake up 20 minutes earlier than usual on rainy days" or "change the wake-up time only during heavy rain." Furthermore, even if the weather changes while the user is asleep, the app reflects the information in real-time and sets the optimal alarm time. To realize this system, we utilized the data provided by the Japan Meteorological Agency and built a mechanism to accurately acquire the probability of precipitation and rainfall amount simply by entering the name of a city or region. In particular, we incorporated logic that enables flexible alarm time adjustment according to rainfall conditions by analyzing precipitation data in detail. The advantages of this application are improved accuracy, simplified operation, and enhanced quality of life. By reflecting weather changes in real time, it helps prevent unnecessary early wake-ups and sudden schedule changes, and significantly improves convenience by eliminating the need for users to manually set alarms.

Kevin Hahn

CA - University of the Pacific

Discipline: Biochemistry

Authors:

#1 Kalee Thao

#2 Kevin Hahn

#3 Chenfei Wu

#4 Nghia Tran

#5 Tiffanie Jiang

#6 Liang Xue

Abstract Name: Study of binding of triplex DNA with flavone derivatives using fluorescent intercalator displacement

Targeting duplex DNA using a triplex-forming oligonucleotide (TFO) in a sequence-specific manner is an attractive approach for antigene strategy. A TFO binds into the major groove of duplex DNA via Hoogsteen H-bonding. The formed non-canonical triplex structure can serve as a padlock on duplex DNA to regulate gene expression and replication and induce DNA damage and genomic instability. However, the triplex formation is thermodynamically unstable and kinetically unfavorable due to the repulsions between three negatively charged DNA strands. Antigene enhancers are small molecules that bind to triplex DNA specifically while having little effect on duplex DNA. Our lab has recently discovered and developed several classes of triplex binding ligands based on the flavone scaffold. These molecules bind to triplex DNA with high affinities via intercalation. In the present work, we investigated the relative binding specificity of these ligands with triplex DNA using a fluorescent intercalator displacement (FID). When thiazole orange (TO) binds to DNA, it fluoresces significantly. Adding a ligand into the TO-DNA solution can displace TO out of DNA and subsequently reduce the fluorescence of bound TO. Comparing the fluorescence signals as a function of ligand concentrations allows us to determine the relative binding strength of ligands. In this presentation, we will discuss the experimental setup and FID results.

Elroe Hailu

WI - University of Wisconsin-Superior

Discipline: Computer Science

Authors:

#1 Elroe Hailu

Abstract Name: Real-Time Solar-Event Calculation Device

The aim of this project is to develop a silicon-labs microcontroller-based system that calculates sunrise and sunset times using geographical positioning data from a GPS module. This device is the assembly of a Silicon Labs EFR32BG22 development board and Interface Ublox Neo-6M GPS Module. It operates independently of internet connectivity and is programmed with C language, in Simplicity IDE, to retrieve GPS data through UART communication. Critical data such as time, latitude, longitude, direction indicator and date are received, parsed then converted into information that is useful to the system. This information is then used to find unix time, time zone, and apply Daylight Savings Time adjustments. A mathematical model with parameters like Julian Day, Solar Mean Anomaly, Local Apparent Time, Solar Declination, etc. is then used to calculate the solar events. The results are finally displayed, in a readable format for humans, on a Simplicity Studio terminal. Applications of this device include automating garage porch lights, integrating smart home systems to control blinds or shades and, in larger sectors, optimizing lighting and ventilation schedules in agricultural settings enhancing efficiency and reducing manual effort.

Tey Hairston-Chase

CO - University of Northern Colorado

Discipline: Sociology

Authors:

Abstract Name: I'm the "Alpha;" Negotiating Black Manhood Under the Aegis of Hosting Podcasts: A Systematic Media Analysis

Although podcasting has become a pervasive platform for expressing and constructing identities, podcasting as a tool for identity construction is understudied, particularly in the context of Alpha male identity and its intersection with the Black experience. Some popular podcast hosts advocate for an Alpha male ideology, where masculine dominance is framed as natural and necessary, and they present exaggerated gender performances to assert control. For Black men, systemic racial oppression reinforces the need for strict adherence to hegemonic masculinity as a way to gain the capital and privilege of manhood lost through their marginalization. These two social forces raise questions about how Black men negotiate their masculine identity (considering systemic oppression and stereotype) as "Alpha Male" podcast hosts and what then is the relationship between "Alpha male" identity and the effects of systemic oppression. In this study, I identified three video podcasts using the search terms "High-Value Black Man" and "Black Alpha male podcast." Utilizing thematic analysis, I examine verbal and visual cues to glean how the host's racialized experiences impact their self-presentation and the justifications of their identity. I expect that systemic oppression and stereotypes will shape/impact how Black male podcast hosts talk about and understand their masculinity, by aligning with white dominant hegemonic standards while paradoxically championing their Blackness. Understanding identity construction as both a reflection and a creation of societal/cultural norms is essential to dismantling oppressive systems that limit and restrict the human experience.

Joud Haj Sakor

MN - University of Minnesota - Rochester

Discipline: Biology

Authors:

#1 Harmeet Malhi

#2 Amy Mauer

#3 Vineeth Poovannalil

Abstract Name: Lipotoxicity Mediates Annexin A2 Enrichment in Extracellular Vesicles from Hepatocytes

Introduction: Metabolic dysfunction-associated steatotic liver disease (MASLD), and its progressive subset metabolic dysfunction-associated steatohepatitis (MASH), are the most prevalent liver diseases globally; yet there is a lack of approved therapies for MASH. In the context of MASH, extracellular vesicles (EVs) have emerged as potential biomarkers and carriers of disease-related information. The damage associated molecular pattern (DAMP), S100A11, is enriched on EVs in MASH. However, the mechanisms underlying S100A11-EV enrichment remain unclear. Aim: Our aim is to elucidate the role of Annexin A2 (AnxA2) in mediating S100A11 enrichment on EVs from lipotoxic hepatocytes. Methods: Utilizing gain-of-function and loss-of-function genetic approaches, pharmacological inhibitors, human and mouse cell lines, and primary hepatocytes, we will investigate the regulation of AnxA2 by the endoplasmic reticulum stress-induced transcription factor XBP1. Additionally, we will explore the binding of AnxA2 to S100A11 in the endosomal

membrane compartment, demonstrating the necessity of AnxA2 for selecting S100A11 as EV cargo. Results: Preliminary data indicates the enrichment of AnxA2 and S100A11 on EVs from palmitate-treated hepatocytes. Co-immunoprecipitation experiments reveal the binding of AnxA2 to S100A11, with upregulated expression observed in human MASH livers and mouse models. Our study will provide detailed insights into the regulatory mechanisms governing these interactions. Conclusion: This research holds the potential to uncover novel therapeutic targets for MASH by understanding the intricate signaling processes involving AnxA2 and S100A11. Insights gained may lead to the identification of diagnostic and prognostic biomarkers, contributing to the development of interventions that alleviate or reverse metabolic dysfunction-associated steatohepatitis.

Ghaleeb Hakim

VA - Virginia Tech

Discipline: Engineering

Authors:

#1 Ghaleeb Hakim

#2 Ty Stephens

#3 Jonathan Bach

#4 Mia Wolfe

Mia Wolfe

Jonathan Bach

Abstract Name: The Three-Tab Keyguard: A Novel, Low-Cost Device to Help Special Needs Students Communicate

Autism affects approximately 1 in 36 children in the U.S., with 30% considered “minimally verbal.” Young students often use aids such as text-to-speech apps to communicate in schools, though this can be difficult when paired with motor control impairments like dyspraxia or cerebral palsy. Approximately 7% of U.S. children in special education are classified as having multiple disabilities, highlighting a need for accessible solutions for communication. The purpose of this project is to address this challenge by developing low-cost tactile aid devices for iPad text-to-speech apps to assist special needs students in communication. These devices, known as iPad keyguards, are physical plates with holes to guide users’ fingers to the correct text-to-speech buttons, which typically cost \$25 - \$100 and rely on attachment mechanisms such as velcro, suction cups, and magnets. Our team worked to lower this cost by employing a design-based research approach. We iterated five prototypes through CAD, laser cutting, and 3D printing, and testing each for durability and usability. Our final “three-tab keyguard” design features strategically placed tabs that leverage the iPad’s existing physical structure - including the headphone jack, power button, and charger port slots - for secure attachment. Unlike traditional attachment methods, this design eliminates reliance on external adhesives or magnetic attachments, enhancing durability and ease of use in classroom environments. By utilizing this simple approach, we reduced the production cost to \$3.30 per unit while enhancing stability. This work highlights the potential for collegiate design teams to address unmet needs in assistive technology by creating scalable, cost-effective solutions. Our three-tab keyguards are currently being tested in Virginia elementary schools. Feedback from these trials will guide adaptations for broader iPad case compatibility, making the device more accessible to students with disabilities and demonstrating the impact of student-driven innovations in creating inclusive educational environments.

Lucas Halbadier

TX - San Jacinto College

Discipline: Education

Authors:
#1 Lucas Halbadier

Abstract Name: Exceptional Sounds: How Elementary Music Teachers Support Students with Exceptionalities & Their Impact

Music education has long been recognized as a powerful tool for fostering cognitive, social, and emotional development in typically developing children. However, its potential to positively impact students with exceptionalities, such as autism spectrum disorder, intellectual disabilities, learning disabilities, and giftedness, has only recently gained significant attention. This literature review explores two central research questions: (1) How do elementary music educators adapt their teaching strategies to support students with exceptionalities, and what impact does music education have on these students' engagement and learning in inclusive classrooms? (2) How does music education impact the development of a child with exceptionalities, and what can educators do to facilitate this? By synthesizing existing research, this review examines the specific ways in which music education enhances the cognitive, social, and emotional development of students with exceptionalities. It highlights strategies music educators use to adapt lessons, such as leveraging mnemonic devices for cognitive development, fostering social-emotional learning through collaborative musical activities, and using music to refine motor skills in students with physical disabilities. These findings underscore the profound impact music can have on engagement, emotional regulation, and interpersonal skills in inclusive classroom settings. This review also identifies significant gaps in the literature, calling for further research to inform best practices and strengthen the evidence base. By advocating for the integration of music education into special education programs, this study aims to highlight music's transformative potential to improve the quality of life for students with diverse needs, ensuring their holistic development and academic success.

Dalton Hale

KY - University of Kentucky

Discipline: Engineering

Authors:
#1 Rick Honaker
#2 Yucel Ozsoy

Abstract Name: Enhancing Coarse Particle Flotation Efficiency on Metal Sulfides: A Comprehensive Adsorption Study on Novel Collectors

Coarse particle flotation has emerged as a breakthrough innovation in the mineral processing industry. Coarse particle flotation saves energy by reducing the need for extensive grinding, allowing for the recovery of valuable minerals at a larger particle size, which lowers overall energy consumption in the mineral processing cycle. A key factor in realizing its full potential lies in optimizing the chemical interactions involved in the flotation process, particularly the fundamental principles of adsorption, which directly influence recovery rates. As part of a comprehensive project aimed at refining the performance of coarse particle flotation, this study investigates the adsorption mechanisms and underlying principles for both novel and commercially available collectors, with a focus on dithiocarbonate (DTC) and dithiophosphate (DTP). These collectors are commonly used in sulfide mineral flotation, but their behavior in the context of coarse particle recovery remains an area of active research. Understanding their adsorption dynamics is essential for improving flotation efficiency. The experimental work was carried out on a range of particle size fractions with low surface area exposure of metal sulfides (less than 20%), including +850, -850, +600, -600+300, -300+212, and -212+150 microns, with varying collector dosages to investigate the adsorption behavior of the collectors. These measurements provided critical insights into how the collectors interact with coarse particles, helping to identify the optimal conditions for maximizing recovery and selectivity. The results of this research are

expected to contribute significantly to the understanding of collector adsorption in coarse particle flotation, offering a scientific basis for the development of more effective collector designs. By tailoring collector chemistry to specific particle sizes and conditions, this study aims to further enhance the capabilities of coarse particle flotation and push the limits of mineral recovery.

Brenton Hall

GA - Georgia Southern University

Discipline: Engineering

Authors:

#1 Sevki Cesmeci

#2 Tyrus Carter

Abstract Name: Experimental Study of an Elastohydrodynamic Seal for Supercritical Carbon Dioxide Turbomachinery

Supercritical carbon dioxide (sCO₂) power cycle shows great promise to emerge as the next-level technology in power generation industries. Current sCO₂ turbomachinery experiences high leakage rates, which is a major obstruction for the full realization of sCO₂ power technology. The high leakage rates not only penalize the efficiencies but also create environmental concerns due to greenhouse effects caused by increased CO₂ discharge to the atmosphere. As a potential solution, we propose an elastohydrodynamic (EHD) shaft end seal. In this study, we experimentally carried out a proof-of-concept study for the proposed seal design and proved that the EHD seal restricts the leakage to minimal values at high pressures. A test rig was fabricated for a 2-in stainless steel static shaft. Three different test seals made of virgin PEEK and bearing grade PEEK were used for this study. The trials were run with an inlet pressure of up to 13.5 MPa and an initial clearance as low as 0.001-in. A total of 27 individual tests were conducted and investigated. The maximum leakage rates recorded for virgin PEEK and bearing PEEK seals were 3.6 g/s and 8.15 g/s at 5.5 MPa. Following then, leakage rates began to drop down to 0.96 g/s and 3.37 g/s as the pressure increased to 13.5 MPa. All three seals showed throttling effect by generating a bell-shaped mass flow rate. These preliminary findings suggest that the proposed EHD seal design can potentially be applied to sCO₂ turbomachinery.

Nicole Hall

TX - The University of Texas at San Antonio

Discipline: Biology

Authors:

#1 Zoya Nazir

#2 Marina Silveira

Abstract Name: The Role of Neuropeptide Y Signaling in the Auditory Thalamus

The auditory thalamus, or medial geniculate body (MGB), is a critical relay center for auditory information before it reaches the auditory cortex. Dysfunction in neuronal circuits in the MGB are associated with hearing loss and tinnitus. Most neurons in the MGB are glutamatergic (excitatory), and ascending inhibitory inputs, including a significant projection from the inferior colliculus, primarily modulate their activity. A previous study from our group showed that a class of inhibitory neurons in the inferior colliculus that express neuropeptide Y (NPY) projects to the MGB. NPY is an evolutionarily ancient signaling molecule that has been shown to modulate fear responses, feeding behavior, and epilepsy. Since NPY neurons produce NPY,

and neuropeptides can act over longer distances, we hypothesized that NPY signaling might affect the activity of MGB neurons. To test this hypothesis, we performed in situ hybridization using probes against the NPY Y1 receptor (Npy1r), NPY Y2 receptor (Npy2r), and synaptophysin in MGB slices. Next, we performed whole-cell current clamp recordings targeted to MGB neurons and exogenously applied NPY to test how NPY signaling alters the activity of MGB neurons. Our data shows that nearly all neurons in the MGB express the Npy1r, positing NPY as a significant regulator of the activity of MGB neurons. Surprisingly, Npy2r was not present in the MGB. Our electrophysiology data show that applying NPY in a whole-cell current clamp decreases the activity of MGB neurons, suggesting an inhibitory effect. Together, our data indicates that NPY plays a significant role in regulating the excitability of MGB neurons. In our next steps, we will perform intracranial injections using retrograde tracing in the NPY-hrGFP mouse to determine the sources of NPY to the MGB and combine electrophysiology and pharmacology to determine the signaling pathway by which NPY modulates the activity of MGB neurons.

Nadisha Hall

NY - CUNY Medgar Evers College

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Gendered Pathways to Smoking Initiation Among African Americans

This research investigates the relationship between age and smoking initiation among African American males and females. Utilizing an intersectionality theory framework, this study hypothesizes that Black males are more likely to initiate smoking at an earlier age compared to Black females. Leveraging the CDC 2021 Adolescent Behaviors and Experiences Survey and employing SPSS software for statistical analysis, this research project examines disparities in smoking initiation among Black Americans, with a particular emphasis on the distinct experiences of gender. Preliminary findings challenge prevailing cultural assumptions and social norms, suggesting that Black males do not initiate smoking at earlier ages than their female counterparts. These results underscore the necessity of re-evaluating our understanding of the complex interplay of factors, including racial inequality and cultural norms, that contribute to tobacco use among African American adolescents. This study highlights how deeply ingrained cultural assumptions can obscure the realities of adolescent behavior and hinder effective tobacco prevention and cessation efforts within the Black community.

Olivia Hall

MN - Minnesota State University - Mankato

Discipline: Health and Human Development

Authors:

#1 Dan Moen

Abstract Name: Family stories: A light in the darkness

Family narratives play a critical role in processing experiences, fostering meaning-making, and offering hope during crises. Storytelling, a universal practice across cultures, serves as a means of sharing struggles, beliefs, and healing processes. This research investigates the role of family stories in coping with difficult life events through qualitative narratives, informed by narrative theory, which suggests that storytelling helps individuals make sense of their experiences and environments. A systematic review of literature (2015–2025) on the use

of family narratives in understanding trauma and stress reveals a gap in research specifically focused on family processes during crises. This cross-sectional qualitative study explores how families narrate their experiences of overcoming challenges and adapting to adversity. Through inductive reasoning, the study analyzes thematic patterns in family stories and evaluates the therapeutic impact of shared narratives. Sociodemographic data are collected to provide a comprehensive view of the participants' backgrounds, ensuring diverse representation across various family structures, life stages, and crises. The study recruits 50+ families through undergraduate and graduate courses, as well as social media, with participants completing a survey on their family's story. Findings are expected to provide new insights into family resilience and contribute to the academic understanding of therapeutic storytelling. This research has implications for enhancing family-centered care and supporting resilience-building strategies within clinical settings, offering valuable knowledge for future studies and practical applications in the field of family life education.

Katelyn Hall

LA - Louisiana State University, Baton Rouge

Discipline: Chemistry

Authors:

#1 Erin Tsai

Abstract Name: Characterizing Critical Micelle Concentrations in Mixed Peptoid Oligomer Systems: Insights into Composition-Dependent Self-Assembly for Nano-medicine

Electrostatic interactions play a crucial role in biological systems, influencing processes like protein folding, cellular signaling, and molecular recognition. Although the significance of electrostatics in biological systems is well understood, their impact in synthetic systems remains less clear. Mixed micelle systems may be difficult to study because there is much difficulty in modeling and understanding the formation and solute partitioning in such systems. Composition-dependent behaviors of mixed micelles and the deviations from ideal mixing models complicates their characterization and application as nanoscale drug carriers. Recent advancements in polymer design have made progress, but studies focusing on mixed micelle systems are less reported due to their complex behavior and interactions. Mixed micelle systems offer several advantages over homogeneous systems, including enhanced stability, tunable properties, and improved functionality for specific applications. Determining the critical micelle concentration (CMC) is vital in designing mixed micelle systems, as it provides insights into their self-assembly and stability. In this study, we characterized the CMC of various binary mixtures of sequence-defined peptoid oligomers. Our findings revealed that the CMC values of the binary micelles varied significantly depending on the composition and sequence of the peptoid mixtures. By demonstrating that the CMC can be fine-tuned through composition control, this study opens up a wide range of potential applications in calorimetric analysis of mixed micelle and mixed copolymer micelles for Nanomedicine.

Madison Ham

OK - East Central University

Discipline: English and Literature

Authors:

Abstract Name: Voices of #MeToo: Analyzing a New Genre

This undergraduate Honors thesis identifies a genre of literature, film, television series, and other forms of

media that emerged after the #MeToo movement in October 2017. The first chapter briefly discusses the #MeToo movement and the resulting discourse, which includes many new works that deal with rape and sexual abuse. The following sections analyze three pieces of media that I attribute to the "#MeToo genre" to identify perspectives on sexual assault or the #MeToo movement itself, including how these works understand sexual assault as a gendered cultural issue. The media that I analyze include the film *Cuties* (2020), the novel *My Dark Vanessa* (2020), and the Netflix docuseries *American Nightmare* (2024). I try to understand the opinions of the writers/directors by close reading and bringing in relevant outside sources, including *Down Girl* (2017) and *The Lolita Effect* (2008). Lastly, the final chapter discusses takeaways from my analysis and suggests applications from this research, such as using the #MeToo genre in secondary and postsecondary education to teach about systems of misogyny and rape culture.

Madison Ham

OK - East Central University

Discipline: English and Literature

Authors:

Abstract Name: Hear Our Stories: Research in Native American Rhetoric and Storytelling

“Let us form one body, one heart, and defend to the last warrior our country, our liberty, and the graves of our fathers.” -Tecumseh In his speech to the Choctaws and the Chickasaws in 1811, Tecumseh rallied his people together with his words (Fixico 13). According to scholar Donald Fixico, stories are a powerful component of many Native American cultures, affecting both the speaker and listener emotionally and spiritually. My research explores creation stories, oral histories, Native American philosophy, and environmental values, all discussed by Donald Fixico, Robin Wall Kimmerer, and other prominent Native American scholars. For the second portion of my paper, I use Native American rhetorical strategies identified by Karen Redfield to create my own story about a granddaughter and her garden. My story's theme is Indigenous food sovereignty, which is a hot topic in tribal politics right now. In my proposed presentation, I will discuss the significance of storytelling and oral tradition to Native American cultures, giving a brief overview of my research. I will then attempt to tell my story, practicing the methods of oral storytelling I have learned. Lastly, I will end with a reflection on challenges and learning curves while creating my story, and what this has taught me about Native American rhetorical strategies, oral tradition, and cultures.

Fridarose Hamad

WI - University of Wisconsin-Milwaukee

Discipline: Nursing and Public Health

Authors:

#1 Linnea Laestadius

Abstract Name: Griefbots and the Digital Afterlife: Ethical and Cultural Implications of AI in Mourning

The Digital Afterlife Industry (DAI) has evolved significantly since its early roots in the mid-2000s, when platforms like Facebook began memorializing deceased users' accounts instead of deleting them. This marked a shift in how death and digital presence interact. With the advent of Artificial Intelligence (AI) and Large Language Models (LLMs), currently, the DAI extends beyond static memorialization into dynamic, interactive recreations of deceased individuals. Known as AI griefbots or deathbots, these LLMs, similar to other AI chatbots look to build a “personality” of a deceased loved one, while continuing to learn from user

interaction to become increasingly more adept at revitalizing the deceased. This project explores the intersection of LLMs and the DAI, focusing on the ethical, social, and cultural implications of these technologies in two avenues. Firstly, we aim to examine the concerns surrounding the newest avenue for profit-driven and exploitative grieving strategies as a personal data concern. We additionally look to the hyper-individualizing and isolating processes of grief that these griefbots promote. Through an in-depth theory-driven analysis, the aim is to provide a nuanced understanding of how AI-driven tools are reshaping the deeply personal and cultural experience of grief, contributing to broader discussions in digital ethics and the future of AI in human-centered domains.

Hatte Hamilton

CA - Chapman University

Discipline: Chemistry

Authors:

#1 Andrew Lyon

#2 Elif Narbay

#3 Daniel Cárdenas-Vásquez

#4 Anne Marie Santich

Abstract Name: Exploring the Mechanical and Physical Properties of Ultra-Soft Colloidal Microgels

Soft colloidal particles have garnered significant attention due to their broad range of applications in material science and bioengineering. Among these, ultra-low cross-linked (ULC) microgels form a distinct category defined by their exceptional softness. These particles display unique characteristics, such as high compressibility and sensitivity to external stimuli like temperature and ion concentration. Our study focuses on the highly packed colloidal assemblies of ULC microgels in the form of microgel pastes, where the microgels are significantly compressed, leading to unique mechanical behaviors. Through detailed investigations into their rheological properties, dissolution stability, and internal structure—utilizing techniques such as rheometry, optical and atomic force microscopy, and dynamic light scattering—we have discovered that the mechanical and swelling/dissolution behaviors of these pastes are closely linked to the softness of the microgel particles and their interactions, which are influenced by charge-compensating counterions. Understanding these physical and mechanical properties is vital for optimizing the material's potential in various biological applications.

Diamond Hamilton

NY - SUNY Buffalo State College

Discipline: Engineering

Authors:

#1 Diamond Hamilton

Abstract Name: MOSFET: P-typed...Silicon

The current research study will dive deeper into understanding the inner workings of logic circuits as well as their packaging. The project is expected to show the mechanical and electrical makeup of the MOSFET transistor. Specifically, I will discuss information regarding its materials' conductivity, oxidation and its other aspects that prove its effectiveness. I will be researching by using the traditional method of reading articles and textbooks to gather knowledge as well as observing the transistor itself. I will be able to demonstrate

these findings by recording them as I observe the usage of the transistor within a circuit in two different ways: one including the AND gate and one utilizing the OR-gate; which both are made with the MOSFET transistors from the CMOS family. The results and the investigative observations discovered during this project will explain how the components and materials used to produce the MOSFET transistors affect its functionality and effectiveness. This project will go in depth about the reasons why this type of transistor is so commonly used and more specifically, how these transistors are manufactured. The significance of this project goes beyond this generation's prototypes and inventions. Alas, by using the concepts and technical information found in this study, future generations will be able to enhance the smart grid, improving the quality and speed of electrical tools and resources. Understanding the proper materials and methods of utilization, future engineers and others who work in the industry will be able to produce better transistors in the future, furthering the advancement of modern technology.

Trevor Hamm

PA - Pennsylvania State University

Discipline: Chemistry

Authors:

#1 Trevor Hamm

#2 Todd Eckroat

Abstract Name: Synthesis of isatin-linked 4,4-dimethyl-5-methylene-4,5-dihydrothiazole-2-thiols (IT2Ts) and determination of their cholinesterase inhibition activity.

Alzheimer's Disease (AD) is one of the most prominently known neurodegenerative diseases for its relatively high frequency and severe affliction to cognitive processes mainly seen in older demographics. A primary mode of treatment for AD has been and continues to be acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) inhibitors with high potency and safe biological activity. Previous investigation in our lab has been concerned with synthesizing isatin and indole dimers, as well as N-alkyl isatins, and determining AChE and BChE inhibition. Recent study into the synthesis of isatin-linked 4,4-dimethyl-5-methylene-4,5-dihydrothiazole-2-thiols (IT2Ts) has shown promising AChE inhibition activity for the trimethylene-linked IT2T, whereas BChE inhibition was preferred with octamethylene-linked IT2Ts. In this study, a series of trimethylene-linked IT2Ts with aromatic substituents, ranging from halogens to simple alkyl groups, was prepared and tested to expand the structure-activity relationship (SAR) for AChE inhibition. Furthermore, two additional IT2Ts with nonamethylene and decamethylene linkers were synthesized and tested for AChE and BChE inhibition to explore the effect of longer linkers on BChE inhibition. Preliminary results suggest the aromatic substituents enhanced AChE inhibition with IC₅₀ values in the low micromolar range. Additionally, the nonamethylene-linked IT2T seemed to improve BChE inhibition, but the effect was diminished with the decamethylene linker. Full results of these ongoing investigation will be presented. Confirmation of the optimal IT2T aromatic substituent and alkyl linker length for AChE and BChE inhibition allows for further investigation of SAR of these compounds that have the potential to increase inhibitor viability for potential AD treatment.

Charity Hammond

VA - Old Dominion University

Discipline: Health and Human Development

Authors:

#1 Angela Wilson

#2 Denise McKinney

Abstract Name: A Novel Method to Investigate the Association Between Maternal Oral Health Status During Pregnancy and Bacteria Identified in Dental Caries of their Children's Exfoliated Primary Teeth.

Research has suggested that birth order or environmental factors affect siblings' oral health status during childhood. However, more recent research indicates that the strongest predictor of children's oral health status is the mother's oral health status. This project investigated the association between the oral health status of the mother during pregnancy and bacteria (biofilms) identified in cavitated lesions (dental caries) of their children's exfoliated primary teeth. Five consenting maternal participants anonymously donated their children's primary teeth and completed a questionnaire about their oral health status during each pregnancy. After visually identifying the exfoliated teeth with dental caries, the biofilms were disrupted using a novel method of vortexing, sonicating, and vortexing before culturing and biochemically identifying the isolated bacteria. Six different bacteria species were isolated from the siblings' exfoliated teeth with dental caries, including one predominant genus/species. However, no direct association between maternal oral health status and the bacteria identified could be drawn because of the small sample size. Here, we establish a new method to recover bacteria (biofilm) in dental caries; however, this research requires additional maternal participants/donors to understand an association between maternal oral health status and bacteria isolated in children's dental caries.

Joshua Hammond

UT - Utah Valley University

Discipline: Biology

Authors:

#1 Joshua Hammond

#2 Brad Theel

#3 Mohammad Islam

#4 Ruhul Kuddus

Brad Theel

Abstract Name: Impact of the opt-in and opt-out organ donation policies on recovery of organ transplantation after the decline during the COVID-19 pandemic

Background: About 90% of the global annual demand for donor organs is left unmet, causing a long wait and significant morbidity and mortality. The opt-in (formally consented to post-brain-death organ donation) and opt-out (consent implied if not formally rejected post-brain-death organ donation) policies of a country may affect the procurement of organs of brain-dead donors. The COVID-19 pandemic (C19P) exacerbated the donor organ shortage. This study investigates the effects of consent policies on the average transplantation rate (ATR) per million population (PMP) before, during, and after the C19P. Methods: Transplantation data (2015-2023) of ten solid organs in 64 countries was obtained from GODT and IRODaT databases. The countries were divided into four clusters based on WHO/World Bank data on six key health/economic variables. The ATR for the pre-C19P (2015-2019), during C19P (2020), and post-C19P (2021-2023) were analyzed to find the adjusted effect of consent policies using longitudinal multilevel modeling. Results: Of the 66 countries, 39 implemented the opt-in, and 27 implemented the opt-out system. Opt-out countries had higher ATRs in all periods: pre-pandemic (52.7 vs. 35.9 PMP), during the pandemic (43.0 vs. 29.7 PMP), and post-pandemic (49.5 vs. 34.8 PMP). The opt-out countries had a significantly higher ATR in six of the ten transplant types. Deceased donor kidney transplantations were 10.60 PMP higher in opt-out countries (p -value= <0.01 , 95%CI: 4.57 to 16.63), while live donor kidney transplantations were 5.48 PMP higher in opt-in countries (p -value= <0.01 , 95% CI: -8.88 to -2.07). Adjusted analyses showed opt-out countries performed 12.95 PMP more transplants overall ($p = 0.04$, 95% CI: 1.11 to 24.79). Conclusions: Opt-out

policies were associated with higher transplant rates before, during, and after the pandemic, with smaller pandemic-related declines, suggesting universal transitioning to the opt-out policy.

Aya Hamza

IL - University of Chicago

Discipline: Law and Legal Studies

Authors:

#1 Aya Hamza

Abstract Name: From Umm Al Dunya's Bench: The Pitfall of Judicial Attitudes in Egyptian Investment Treaty Arbitration and Foreign Direct Investment

In 2023, Egypt secured its position as Africa's leading foreign direct investment (FDI) destination, attracting \$13.46 billion. However, the success of "Egypt 2030," a national agenda aimed at doubling FDI's GDP contribution to \$100 billion within five years, is hindered by inconsistent state adherence to bilateral investment treaties (BITs)—a cornerstone of investor confidence. Treaty interpretation falls to Egypt's national courts, yet judicial inconsistencies in recognizing foreign judgments and the absence of a formal precedent system generate significant uncertainty. Institutional lapses in transparency further obscure mechanisms intended to uphold agreed-upon human rights protections, including property rights enshrined in BITs, and contribute to delays, exposing the state to claims of fair and equitable treatment clause violations. This study employs a mixed-methods approach to explore relationships between Egypt's domestic judicial practices, compliance with in-force BITs, adjudication timelines, FDI inflow percentages, and rule of law indices across countries. The methodology combines analysis of BIT texts, statistical evaluations of judicial terms, stakeholder insights on investor-state dispute settlement (ISDS) bottlenecks, and reviews of landmark ISDS cases involving Egypt as the respondent state. This integrated approach identifies patterns and connects judicial practices, treaty compliance, and investment outcomes. Findings reveal domestic judicial inconsistencies, exacerbated by executive actions compromising the rule of law, deny justice, jeopardize investor confidence, and deter FDI inflows. The lack of an established precedent system erodes fair and equitable treatment, impeding national economic development while neglecting broader human rights safeguards embedded within BITs as *lex specialis*. Governance challenges to achieving uniformity are not exclusive to Egypt but underscore critical gaps, raising external concerns about the MENA region's commitment to customary international law. Judicial and institutional reforms aligning domestic practices with international legal obligations are crucial to restoring Egypt's position as a dependable ally in sustainable business partnerships founded in mutual dignity.

Emilee Handy

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: A High School Design for Social Sustainability

Classen High School: A High School Design Rooted in Connection and Growth explores adaptive reuse as a sustainable solution for creating a high school designed around social sustainability. This thesis reimagines the abandoned Oklahoma City Public School Administration Building, inspired by the concept of mycelium, which is a natural network symbolizing collaboration, resilience, and regeneration. This metaphor shapes a

design focused on fostering meaningful connections among students, staff, and the broader community. The project is informed by research conducted through a focus group with high school students from across Oklahoma. Participants shared their views on how schools can better support students, emphasizing the need for improved mental health resources, safe outdoor spaces, and greater access to essential support systems. These insights are directly reflected in the design's priorities, ensuring a supportive and inclusive environment. Incorporating WELL and LEED standards, the project emphasizes environmental sustainability alongside occupant health. Biophilic elements, efficient resource use, and adaptable spaces create an environment that mirrors nature's interconnectedness and adaptability. Flexible learning zones cater to diverse needs, providing collaborative spaces for engagement and quiet areas for focus. The design extends beyond academics, integrating communal hubs and multipurpose spaces to encourage interaction and community involvement. Outdoor green spaces provide safe, welcoming environments for recreation and connection, addressing students' calls for spaces that nurture both physical and mental well-being. By weaving together focus group research, sustainable practices, and innovative design inspired by mycelium, this thesis reimagines a neglected structure as a thriving educational environment. Classen High School embodies connection, growth, and resilience, empowering students and the surrounding community to embrace sustainability and thrive together.

Kylee Hanks

MN - Minnesota State University - Mankato

Discipline: Biology

Authors:

Sarah VanRyswyk

Abstract Name: Ozark Region: the difference in varying oaks in the same environment based on proline quantification and leaf area.

The ecosystem of the Ozark region in North America has a large, diverse population of varying oak species all while being located within a close region. While the species richness of oaks present in the Ozarks is large, it is unknown how many different species can all occur and thrive within the same ecological niche. Examining different stress tolerance and morphological adaptations was done by measuring 8 different species within the Ozarks. We further examined the relationship between leaf areas and proline concentration in the differing species to see how each species has adapted to living in the same ecological niche. Because all 8 species live in the same area, we hypothesize that they will have different leaf area and proline concentration levels to better differentiate competition against surrounding species. To test this hypothesis, we took 8 species leaf samples (3 leaves from each specimen) and measured their leaf area index and their proline concentration values. We expect that the smaller the leaf area, the higher the proline concentration will be as the results will correlate to drought tolerance. This research enhances our understanding of the relationship between leaf area index and proline quantification levels, further enhancing our knowledge of plants adaptations to high stress levels. RISEbio has given us the opportunity to better understand plant stress and adaptations through allowing us to pursue this research and gain research method knowledge. Six keywords: Ozark region, oaks, proline quantification, leaf area index, plant competition, morphological adaptations

Tyler Hanlan

IL - Eastern Illinois University

Discipline: Biochemistry

Authors:

Abstract Name: Development of Cell Permeable Peptide-Based PROTACS to Study Peroxisomal Biochemistry

Peroxisomes are organelles with various metabolic functions that have significant roles in eukaryotes due to its role in cellular metabolism, redox balance, and other essential processes. The dysregulation of peroxisomal function has been involved in neurodegenerative diseases, metabolic disorders, and cancer, making them interesting targets for therapeutic development and further exploration. Here, we report efforts to develop a Proteolysis Targeting Chimera (PROTAC) that degrades, Pex5, the key receptor controlling import of proteins into the peroxisomes, based on the natural substrate trimer peptide for Pex5, Peroxisome Targeting Signal 1 (PTS-1). PTS-1 sequences tend to be quite polar preventing efficient passive cellular uptake. To overcome this, we are working on incorporating a medium-chain lipid to increase cell permeability while maintaining the natural amino acid sequence. This medium-chain lipid is then attached to a natural PTS-1 sequence and combined with a peptide-based E3 ligase cereblon (CRBN) recruiting moiety to create a cell permeable and completely peptide-based Pex5 PROTAC. The ability of this PROTAC to enter cells and degrade Pex5 will be determined by Western blotting and fluorescence microscopy. Overall, our efforts will produce new chemical tools to study peroxisomes enabling a better understanding of their function in cellular metabolism.

Isabelle Hanning

OH - Capital University

Discipline: History

Authors:

#1 Andrew Carlson

Abstract Name: The Unsung Heroes of the Underground Railroad: The Role of Free Black Communities and Leaders

The Underground Railroad (UGRR) has long been celebrated as the bravest example of resistance against slavery. Unfortunately, the contributions of Black communities and their leaders have long been overshadowed by white liberal narratives. My research demonstrates the significant role of Black communities in Ohio's Underground Railroad. By analyzing census data from the years 1820-1860, this research finds counties where Black populations grew significantly over the decades of high UGRR activity. Displaying the migration patterns of Black persons as they joined the communities within Ohio. A formidable force of resistance against slavery came from within the Black churches, which would create associations and conventions to join the flight publicly as well as be the center of change in the background within the UGRR. Black communities provided critical support for freedom seekers, giving them shelter, education, and providing them with what they needed to live a free and fulfilled life. Cincinnati's "Little Africa" provided food, shelter, and education to freedom seekers as they crossed the Ohio border. Similar settlements like the Gist and Greenville communities also welcomed and provided resources for freedom seekers in Ohio risking their freedom and lives to help others. One strong example of this bravery is Joshua McCarter Simpson. He was active in Zanesville and within the church he helped create. Simpson also authored multiple works of anti-slavery songs and speeches dedicating his whole life to helping achieve freedom for all American citizens. The contributions of Black communities and their leaders must not be forgotten as they were the bravest example of American heroes.

Anna Hanratty

MN - St. Catherine University

Discipline: Exercise Science and Nutrition

Authors:

#1 Ambria Crusan

Abstract Name: Identifying Key Facilitators and Barriers for Urban Native American Families' Use of Traditional Foods to Support Nutrition-Based, Community Interventions

The traditional diet of Native Americans is nutrient dense and sourced from foods naturally abundant in local environments. Centuries of colonization and forced assimilation have led to a decrease in knowledge of Indigenous foodways. Concurrently, urban Native Americans face a significant burden of food insecurity, which is a well documented contributor to chronic disease risk. Rates of cardiometabolic diseases are more frequent for Native Americans which coincides with the highest mortality rates from diabetes in the United States. The objective of this research is to comprehend the state of urban Native American food sovereignty within the context of identifying barriers and facilitators to the use of culturally relevant foods for cardiometabolic health. A team of three researchers reviewed the existing literature using keywords: urban Native American nutrition, Indigenous food sovereignty, and Indigenous foodways. Articles in Pubmed, Academic Search Premier, and Google Scholar were reviewed for content related to our objective. Twenty-two articles were selected, reviewed, then common themes and admissible data were discussed. Key findings suggest the following facilitators to increased consumption of Indigenous foods are: ensuring the intergenerational sharing of traditions; establishing strong connections with tribal members within the community; promoting sustainable practices; expressing reciprocity with Creation. Barriers identified are: limited access to cultural networks; lack of physical space for communal gardens and gathering spaces; decline in generational knowledge of traditional practices; disproportionate rates of poverty. With these key findings we are able to further support community-based initiatives to reduce health inequities in Native American populations. A paucity in the research was observed with regard to nutrition-related health disparities in urban Native American communities along with effective interventions in order to advance health equity. More work is needed to identify and advocate for future interventions that are effective at reducing health disparities in urban Native American communities in Minnesota.

Adam Hanselman

PA - Bucknell University

Discipline: Economics

Authors:

#1 Adam Hanselman

#2 Kate Suslava

#3 Dominic Gonzalez

Kate Suslava

Abstract Name: CEO Verbal Behavior on Earnings Calls Using Natural Language Techniques

CEOs are central to corporate decision-making and the primary voices in earnings calls—critical moments that shape investor sentiment and market reactions. These calls are more than routine updates; they are strategic performances where language, tone, and clarity can signal confidence or caution. This research applies advanced natural language processing (NLP) techniques to analyze thousands of earnings call transcripts, aiming to uncover how the linguistic choices of CEOs and CFOs influence market behavior. We focus on key textual measures—such as tone, fog (based on the Gunning Fog Index) and words—capturing the sentiment, complexity, and verbosity of leadership communication. Do CEOs who maintain a positive tone generate better market reactions? Does the complexity of language signal competence or equivocation? How does the length of responses in Q&A sessions affect investor confidence? These are the questions

driving our exploration. By analyzing communication patterns across a dataset comprising thousands of earnings calls, we seek to illuminate the relationship between what is said—or unsaid—and how the market responds. More specifically, are subtle shifts in tone enough to sway investor sentiment, or do investors still seek more clarity and precision? Does the density of word usage convey expertise, or does it obscure key insights? Beyond seeking definitive answers, this research elucidates key patterns in how financial markets digest and respond to language, assess leadership, and evaluate corporate performance. Further, this study offers a fresh perspective and framework for examining the intricate nuance between corporate communication and market perception, with implications for investors, analysts, and academics alike. By decoding the language of earnings calls, we aim to provide a richer understanding of how corporate leaders wield words to navigate market expectations—an endeavor as complex and dynamic as the markets themselves.

Michael Hansen

WI - University of Wisconsin-Eau Claire

Discipline: Political Science

Authors:

#1 Damir Kovacevic

Abstract Name: A Changing Tide Shifts Only Some Boats: Examining Political and Ideological Trends In Liberal Democracies After Major Economic Dislocations

This project aims to discover whether there were any trends in the politics of five subject countries—the United States, United Kingdom, Canada, Australia, and New Zealand—during elections that took place after periods of economic dislocation that challenged dominant economic orthodoxies at the time, the two periods being the Great Depression and the “Stagflation Crisis”. This trend would be a change in ideology, not just in terms of political party. To complete this study, I conducted a large review of literature not only about certain elections, but about the individuals those elections elevated, and the proper way of studying shifts in politics during economic events. I also read literature related to certain key terms that would help me in my studies, like those of ideology (modern liberalism, neoliberalism) and of political history (the history of all major parties in studied countries). After conducting this research, I found that following the Great Depression, there was only a slight shift to the left across the five countries, as while the United States and New Zealand elected strong “modern liberal” governments, Australia and the United Kingdom did not (although the United Kingdom did join the leftward shift in the Depression-focused 1945 election), and Canada was restrained from doing so by a leader who only took limited steps towards modern liberalism. In the case of the Stagflation Crisis, there was a more definitive shift to the right, as the United States, United Kingdom, and New Zealand all elected neoliberal governments following the crisis. Australia and Canada, meanwhile, ended up with modern liberal governments, although ones that were beginning to embrace some tenets of neoliberalism as well. However, governments were less stable during this crisis, and government shifts came late, after less reactionary alternatives had been attempted, a hesitancy not found in the post-Depression electoral period.

Shane Hansen

PA - University of Pittsburgh

Discipline: Psychology

Authors:

#1 Natasha Tokowicz

Abstract Name: Exploring the Neurolinguistic Processing of Nonbinary Pronouns in First vs Second Languages

The present study sought to investigate potential differences in how people process nonbinary pronoun constructions (NBPCs, e.g. singular ‘they’) in their first versus second language (L1 vs L2). Research on NBPC processing to date has primarily only focused on L1 with only some literature investigating L2 English processing. Participants (right-handed, native English speakers) were first taught a limited set of French vocabulary and grammar. They then completed an acceptability judgement task (AJT) while undergoing electroencephalography (EEG) recording. During the AJT, participants determined the acceptability of sentences in French and English containing a variety of pronoun constructions. From the EEG recording, event-related brain potentials (ERPs) were extracted to probe the neurocognitive processes active when encountering the NBPCs. The ERPs were compared across conditions within and across languages to understand the effects of a second language on processing. Participants also completed behavioral tasks to measure their political attitudes, implicit biases against transgender people, and their working memory updating ability. ERP effects are predicted to be observed in the P600 component, consistent with L1 literature, suggesting grammatical processing difficulty. N400 effects, suggesting semantic processing difficulty, will also be tested for as these are more common in early L2 learners. Finally, the Nref component will be probed, which indicates referential processing failure in pronouns. It is hypothesized that individual differences in ERP response will be observed that may correlate with the behavioral metrics. Statistics from linear mixed effects models and significant differences in ERP waveforms will be reported. Implications of the results may elucidate deeper reasoning for reported NBPC interpretation and processing difficulty and suggest ways for overcoming this sociolinguistic issue from a second language acquisition standpoint.

Grace Hansen

PA - Villanova University

Discipline: Environmental Science and Sustainability

Authors:

#1 Steven Goldsmith

Abstract Name: Sowing the Seeds of Pollution: How Agricultural Plastics are Shaping Soil Chemistry

Plastic mulching has become commonplace in both large- and small-scale agriculture. Despite this widespread use, the practice is of concern to human health as it may be introducing metals into soil. The metals contained within plastics are potentially leaching into soil, destabilizing the environment and leaving humans vulnerable to metal contamination exposure, often without their knowledge. This exposure can have severe health effects including, anemia, organ damage, and increased cancer risk. It is due to these exposure effects that plastics with a thickness of 20-50 μm have been banned in several countries, yet the practice of plastic mulching continues to spread. This study assesses four types of weed suppressant materials for metal leaching potential and physical degradation: polyethylene plastic sheeting, a blue all-purpose tarp, coconut husk, and burlap. Materials were placed in mason jar microcosms consisting of 4 cm of small rocks, overlain with 5 cm of planting soil with the weed suppressant placed on top to imitate agricultural conditions. All microcosms were deployed in the Villanova University's greenhouse with 5 samples of each material collected at the 30- and 90-day time intervals. Each microcosm was watered weekly with 40 mL of deionized water to replicate a 1-inch rainfall event further emulating field conditions. Before deployment and following collection, materials were measured for total and exchangeable heavy metal concentrations using the x-ray fluorescence spectrometer and the inductively coupled plasma mass spectrometer. The physical degradation of samples was evaluated through measurements of weight change. The hypothesized results are that plastic mulching materials will exhibit higher metal leaching and lower physical degradation under field conditions than nature-based alternatives. With these results, this study aims to offer potential alternatives to the widespread use of agricultural plastics and therefore minimize the impact of such plastics on human health.

Justin Hansen

WI - University of Wisconsin-Eau Claire

Discipline: Linguistics and World Languages

Authors:

#1 David Jones

#2 Tomomi Kakegawa

Abstract Name: Censorship within the Change from Manga to Anime, its Effects in Society, and what it Represents About Japanese Society

In this paper I will be discussing the relation between Japanese manga and anime, and the changes from the transition from manga to anime due to censorship laws within the contemporary period. Continuing, I will discuss what these laws and changes within Japan are meant to accomplish and what their application/results could have on their media as a whole. Next, I will be discussing what changes are made to media when exported to other countries to adhere to their censorship, rating, etc laws. The definition of censorship that I will be using for this paper is: "Places where media that has been changed to limit the themes, concepts, or actions that are deemed unsensible or unwanted by a large (usually government) body." This definition is meant to include things that are commonplace such as blurring, using black boxes or similar, or even censorship that's more transformative via cutting out parts of original material completely. This research will

make people aware of how media can be changed to convey a certain culture's beliefs on what is “appropriate” for a certain group of people. To take it to a more extreme level, this research will also convey how strict/effective censorship can be at a non-concerning level (not censoring certain content to prevent learning about certain information). And how potentially concerning censorship could be put in place with similar laws.

James Hao

KY - University of Kentucky

Discipline: Biochemistry

Authors:

#1 Aaron Chacon

#2 Joe Liu

#3 Ashton McMonigal

#4 Wen Su

#5 Ming Gong

#6 Zhenheng Guo

Abstract Name: Does Time of Administration Matter? Effects of Exenatide, a GLP-1 Receptor Agonist, on Clock Gene Expression in the Brain of Type 2 Diabetic Mice

Objective: Type 2 diabetes is one of the most prevalent chronic diseases worldwide, and diabetic vascular complication is a major cause of morbidity and mortality in diabetic patients. Our labs have shown that exenatide, the first glucagon-like peptide-1 receptor agonist (GLP-1RA) drug approved by the FDA for treating diabetes, restored normal daily rhythm of blood pressure, sleep, and feeding behavior in type 2 diabetic db/db mice when administered at ZT0 (zeitgeber time 0 = light on) but not ZT12 (light off). However, the underlying mechanism is unknown. This study aims to explore whether clock genes are involved in the timing effect of exenatide in db/b mice. Approach & Results: Thirty-two 14-week-old male diabetic db/db and nondiabetic control (db/+) mice were split into four groups (4-6 mice/group): db/+ control, db/db control, ZT0 db/db, and ZT12 db/db. The mice were injected with normal saline or exenatide (20 µg/kg, IP) at ZT0 or ZT12. The mice were sacrificed at either ZT5 or ZT17 five days later. The brain cortex, hypothalamus, and hippocampus were collected and processed for total RNA extraction, reverse transcription, and real-time PCR to determine clock gene (Bmal1, Clock, Per1, Per2, Cry1, Cry2, Rev-erba, and Rorc) mRNA expression. Compared to db/+ control mice, the clock gene was disrupted in db/db mice. Interestingly, exenatide administration at ZT0 but not ZT12 restored the normal daily clock gene expression pattern in the brain cortex but not the hypothalamus and hippocampus of diabetic db/db mice. Significance: Our results demonstrate that administering the same dose of exenatide to diabetic db/db mice at different times has different effects on clock gene expression in the brain in a tissue-dependent manner and suggest that exenatide can potentially be used as a chronomedicine against type 2 diabetes and its complications.

Tianyuan Hao

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Mark Corkins

#2 Lance Davidson

#3 Tianyuan Hao

Abstract Name: Searching for Pathways Responsible for Hydrostatic Pressure Resistance in Deep Sea Extremophiles

A piezophile is a classification of organisms that thrive under high hydrostatic pressure. They are found in the deepest seafloors and oceanic trenches and have evolved many adaptation mechanisms to grow in hydrostatic pressures exceeding tens of megapascals. These adaptations helped them to overcome cellular stress, including an increased rate of protein misfolding, increased cytoplasmic viscosity, and cellular membrane deformation. To investigate possible genetic adaptations responsible for their pressure resistance, we utilized a shallow dwelling from *Xenopus laevis*. By submitting frog embryos to high hydrostatic pressure, we identified genes whose transcriptional profiles had been altered. By expressing and knocking down these genes, We aim to recreate similar pressure resistance properties in frog embryos. So far, my project is centered on the AP1 complex, whose central genes are Jun and Fos. Both of these genes are induced under high environmental pressure. Jun and Fos are transcription factors that can interact with each other upon activation and regulate a diverse array of cellular activities, including cellular differentiation, proliferation, and apoptosis. Our next step is to overexpress these genes in *Xenopus* embryos via microinjection and test their effects on granting embryos resistance to high pressures.

Beaux Hardin

KY - University of Kentucky

Discipline: English and Literature

Authors:

Abstract Name: Translation and Literacy as Resistance

Translating a novel from one language to another does not create text exactly the same as the original but instead involves an intricate rewriting process that places the translator's influences and perspectives at the forefront of the viewer's reading. This research intends to explore the context, phrasing choices, and possible intentions behind the French translation of *The life and most surprising adventures of Robinson Crusoe of York Mariner* by Daniel Defoe, which was translated by Duchesse de Luynes during the French Revolution. The Duchesse not only translated 16 additional novels, but also printed them on her private printing press, ostensibly to teach her son English. With a sharper eye, one might look at the novels she selected and her choices in translation to determine if she had other motives. Research will first explore Robinson Crusoe through an abolitionist lens of potential reading that contextualizes it as anti-slavery. The Duchess translating and publishing a text such as Robinson Crusoe is thought-provoking when considering why she translated this specific text. She benefits from the French's forcible enslavement, a tool for French imperialism, but is translating a novel satirizing and critiquing slavery to teach her son English during the French Revolution and then following Napoleon Bonaparte's reign. Her translation could be a form of resistance against the French authority, and her translation for the literacy of her child could also be resistance in itself as Napoleon bans private printing presses. This research is significant to the argument that literacy is powerful and influential; without literacy, knowledge is not imparted, resistance then has no soil to take root in and change cannot happen.

Autumn Hardin

TN - Trevecca Nazarene University

Discipline: Psychology

Authors:

Abstract Name: The Correlation between Helicopter Parenting, Academic Motivation and Fear of Failure

This study sought to identify how helicopter parenting correlates to fear of failure and academic motivation in undergraduate students. Excessive involvement in decision-making, conflict resolution, and deficits in knowing when to withdraw are all factors discovered as important in determining overparenting behaviors seen in children. Regarding fear of failure, several studies defined it in terms of motive disposition to avoid failure. Academic motivation has been shown to influence one's goals, past experiences, cultural background, and opinions of teachers and peers. With consideration of the previous literature, the following hypotheses were proposed. Overparenting scores will be positively correlated with fear of failure scores and overparenting scores will be positively correlated with academic performance scores. The Helicopter Parenting Instrument (HPI) was used in this study to assess the excessive involvement, direction, control, monitoring, and support of an overparenting style. To test these hypotheses, the Helicopter Parenting Instrument (HPI), Performance Failure Appraisal Inventory (PFAI), and Academic Motivation Scale (AMS) were administered. Seventy-seven ($N = 77$) undergraduate students participated in this study. The participants consisted of students from a science class and three psychology classes. Upon IRB approval, consent forms and instrument packets were administered in classrooms with the permission of the professor. Participation was voluntary and confidential. The collected data was analyzed by a correlational analysis using SPSS software. It was found that both fear of failure and academic motivation scores were predictors of helicopter parenting. There was a significant relationship between helicopter parenting and fear of failure; specifically, a weak, positive correlation was found between both variables, $r = .269$, $p = .009$ one-tailed. Additionally, helicopter parenting was shown to have a weak, positive correlation with academic motivation, $r = .295$, $p = .005$ one-tailed. Limitations included the homogeneity of the sample, and future research was advised to include more sample diversity.

Jackson Hardy

UT - Weber State University

Discipline: Computer Science

Authors:

Abstract Name: APP-GUIDED COLONOSCOPY PREPARATION INSTRUCTIONS COMPARED TO TRADITIONAL PAPER HANDOUTS: A RANDOMIZED CONTROLLED TRIAL

Colorectal cancer is one of the leading causes of cancer-related deaths worldwide, and colonoscopy plays a vital role in its prevention and early detection. The success of a colonoscopy heavily depends on the quality of bowel preparation, yet adherence to preparation protocols remains a significant challenge, with non-compliance rates as high as 25%. This study aims to evaluate the effectiveness of a mobile application designed to guide patients through the colonoscopy preparation process compared to traditional paper-based instructions. The mobile app integrates step-by-step guidance, automated reminders, and visual aids to enhance patient engagement and understanding of preparation protocols. Participants will be randomly assigned to two groups: one using the mobile app and the other receiving standard paper instructions. The study will measure adherence to dietary and medication instructions, bowel preparation quality (using the Boston Bowel Preparation Scale), and patient satisfaction through surveys. Additionally, app usage data, such as task completion rates and login frequency, will be analyzed to assess engagement. It is anticipated that patients using the mobile app will demonstrate higher adherence to preparation protocols, resulting in improved bowel cleanliness scores and fewer incomplete procedures. The app is also expected to enhance patient satisfaction by providing real-time guidance and reducing confusion associated with traditional handouts. These findings could have a transformative impact on clinical practices by supporting the integration of digital health tools to improve patient compliance, reduce procedural inefficiencies, and

enhance overall healthcare outcomes. This study will provide evidence for the feasibility and potential benefits of app-guided colonoscopy preparation, paving the way for broader adoption of mobile technology in patient care.

Hades Hardy

VA - Christopher Newport University

Discipline: History

Authors:

Abstract Name: Livia Drusilla: Perception, Power, and Biases

In most ancient sources, there is a common theme of strong women being demonized. Livia Drusilla, wife of Rome's first emperor Augustus, is no exception. I looked beyond that and dived deeper into who she was. Through a comprehensive study of primary and secondary sources, I believe I continued an ongoing discussion about the misogyny surrounding strong women in ancient times. By diving into these sources, I've uncovered the biases that may have influenced historical accounts and have highlighted the extent of her influence and power. I used several primary sources, such as Cassius Dio, Suetonius, Plutarch, and many more. This exploration will show her agency and its impact on her portrayal. I demonstrate her significance to Rome and her vital role in the Principate. This discussion is essential as it challenges and fights misogynistic interpretations of powerful women, allowing us to appreciate and understand the nature of feminine power in ancient civilizations. Through this deeper examination, we can better understand the historical treatment of strong women and the societal structures that shaped these narratives.

Malini Harinath

PA - University of Pittsburgh

Discipline: Communications

Authors:

#1 Alaina Smith

#2 Judy Chang

Abstract Name: Examining Conversations on Diet and Nutrition between Obstetric Care Providers and their Patients at Initial Prenatal Care Visits

The ACOG emphasizes eating well and maintaining nutritional goals during pregnancy to promote healthy maternal and fetal weight outcomes. Few studies have examined the frequency and way obstetric (OB) providers speak with pregnant patients about eating, food, and nutrition. This study aims to characterize how often OB clinicians address food and eating with their pregnant patients and the focus during these discussions. We examined data from an IRB approved observational study that recorded initial prenatal care visits with patient and provider consent. 180 randomly selected, transcribed audio recordings were thematically analyzed for discussions surrounding diet, nutrition, and weight. Out of 180 qualitatively analyzed initial prenatal care visits, 111 visits (62%) included a mention of prenatal diet/nutrition. Of these 111 visits, 104 (94%) included some form of counselling regarding eating from the provider (e.g. "we want to keep it as healthy as possible, so not a whole lot of fats but you want to keep it balanced between like healthy grains and cereals"). Forty of the 111 visits (36%) that mentioned prenatal diet included specific, numeric weight gain and/or caloric intake recommendations from the provider. Sixty-four of the 111 visits (58%) mentioned foods to eat while 69 of the 111 visits (62%) mentioned foods to avoid. Water intake was

mentioned at 64 of the 180 total visits (38%). Sixty-eight of the 104 visits (65%) with diet counseling included a discussion on weight. Discussions regarding food and eating were inconsistent in our observed obstetric visit conversations. The importance of prenatal nutrition warrants more research to investigate the specifics behind how providers address diet and nutrition at initial care visits.

Terisa Harlow

CA - California State University - Fullerton

Discipline: Mathematics

Authors:

#1 Amelia Stone-Johnstone

Samuel Pacheco

Abstract Name: The Integral is the Area: A Study on Students' Conceptions of Integration

Students pursuing science, technology, engineering, and mathematics (STEM) degrees require some proficiency in Calculus. However, the Calculus sequence has historically been a roadblock for students intending on pursuing STEM. The Fundamental Theorem of Calculus (FTC) is arguably the most important theorem taught in a Calculus I course, yet it is not covered until the last weeks of the semester. As a result, students tend to not hold deep conceptual understandings around integrals, and the conceptions that they do hold are very procedural based. Prior research on student conceptions on integration reveal that students cling to procedural methods for working integrals. In addition students primarily conceptualize integration as two different ideas; a process for finding the area under the curve or finding an antiderivative. In this project, we engage Calculus III students in cognitive interviews around traditional, yet diverse, integral tasks in order to determine whether the conceptions they developed in Calculus I persist through Calculus III. Our focusing research question is, what is the nature of student conceptions around integration? Our preliminary findings confirm prior research, suggesting that students have concept images of integrals that involve procedures such as integration by parts, the substitution rule, and the evaluation theorem. Students were able to apply these anti-derivative procedures, but appeared unconfident in their explanations. The predominant conception was that definite integrals coincide with computing the area under the curve. Findings from this work can inform instructors at our institution (and potentially other postsecondary institutions) about student conceptions and misconceptions. This work can support the development of mathematical tasks to help prevent unproductive ways of interpreting integrals and to instill confidence.

Stevie Harper

WI - University of Wisconsin-Eau Claire

Discipline: Economics

Authors:

Abstract Name: Examining a Farmers' Market Match Incentive Program - Using Administrative Transaction Data from 2018-2024

Food insecurity is a significant issue facing many American households. The Supplemental Nutrition Assistance Program (SNAP) provides increased access to food for families in need. Additionally, fruit and vegetable (FV) consumption has been shown to improve health and reduce the risk of chronic disease. However, poor nutrition among children and adults, including low FV intake have contributed to rising rates of obesity in America. It is particularly challenging for low-income households to purchase/eat the

recommended amount of FV. Farmers' markets (FM) offer a wide variety of fresh, local and healthy foods, especially FV, but data show that low-income households are much less likely to shop at FM. The Eau Claire Downtown Farmers' Market (ECDFM) sponsors a Market Match Program (MMP) incentivizing SNAP households to shop at the ECDFM. This presentation uses administrative transaction data to tell the story and describe trends in both utilization and spending by SNAP shoppers using ECDFM MMP from 2018 – 2024. Our findings show that program utilization increased significantly over the two years during COVID, and then subsequently fell coming out of COVID, with the level of utilization stabilizing at a higher level than pre-COVID. Our data also reveal the average SNAP shopper visits the market 2.5 to 3 times per season representing 9% to 10% of SNAP Households in Eau Claire County. However, it is also the case, that nearly 70% of SNAP shoppers visit the market only one to two times per season. This presentation flows into an analysis of 2023 - 2024 survey data from SNAP shoppers using the ECDFM MMP (same community partner, same mentors).

Candyce Harrell

VA - Christopher Newport University

Discipline: English and Literature

Authors:

Lilian Haney

Abstract Name: "The Beating of His Hideous Heart": The Incessant Draw of Horror Fiction

The cultural obsession with horror has always been a paradox. Telling ghost stories and creating monsters disturbs and frightens us while simultaneously bringing joy and pleasure. This contradiction raises many questions as to why certain audiences cannot get enough. Our research asks: What about horror makes it so captivating? How does literary theory contribute to our understanding of the psychological factors involved in the enjoyment of horror? We first present perspectives from motivational and evolutionary psychology. Horror media activates an addictive pattern of arousal and relief via excitation transfer. This experience is then appraised by the individual as pleasant or unpleasant and subsequently sought out or avoided. Even though this facet of the human psyche has been manipulated for centuries, horror media truly gained notoriety with the first Gothic revival. Edgar Allen Poe, a pioneer of the Southern Gothic genre, reveals why horror is so captivating. A close reading of "The Raven" and "The Tell-Tale Heart," shows how Poe contributes to affect theory. While this theory is not acknowledged extensively amongst Gothic literature scholars, we argue that the purpose of horror is to produce an effect, which is then used to spur the emotions we seek out in horror media. This effect permeates all aspects of horror, from older texts like Frankenstein and Dracula, to more modern films and video games such as The Ring (2002) and the Five Nights at Freddy's franchise (2014-2024). These depictions experiment with point of view, jumpscars, and existentialism to unsettle and fascinate audiences. By examining both the psychological effect of horror and how it impacts audiences, our research exposes the interdependence of these fields, proving exactly why this genre is so prolific.

Susannah Harrell

AL - Auburn University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Susannah Harrell

#2 Brandon Peoples

#3 Keven Santamaria-Guzman

#4 Kenneth Harrison
#5 Jaimie Roper

Abstract Name: Examining the Effects of Visual Feedback on Gait Adaptation in Young Adults with Runway Model Training

Gait adaptation represents our ability to adjust walking patterns to safely navigate environment demands. For example, our ability to walk on a slippery surface by taking shorter, controlled steps or shifting our bodies to avoid obstacles reflects the remarkable adaptability of human gait. Traditional research has used split-belt treadmill walking (SBT) to study how different brain regions respond to novel walking patterns, revealing age-related differences in adaptation strategies. Similarly, runway models develop a deliberate mastery over their walking patterns, implementing adaptations for aesthetic precision, spatial awareness, and temporal control. Current research suggests that with aging, people shift from using spatial adjustments (where they step) to temporal adjustments (when they step) when learning novel walking pattern, revealing age-related differences in adaptation strategies. The controlled movement in runway walking training (RWT) could enhance older adults' gait adaptability, offering structured practice in spatial and temporal control that may help them better navigate challenging environments despite age-related changes. Therefore, this study examines the impact of visual feedback on gait adaptation in young adults with RWT compared to young adults without training. Fourteen age and sex-matched participants between 18 - 27 were recruited for this study. Participants in the RWT group had more than one year of runway walk training. A 17-camera motion capture system tracked our lower-body marker set that measured participants as they walked overground (pre/post-SBT) and during SBT. Participants received external visual feedback during SBT with the coupled (each belt moving at the same speed) and decoupled (belts moving at different speeds). We hypothesize that participants with RWT can adapt faster to a novel walking pattern with visual feedback and greater accuracy. By examining the role of RWT in gait adaptation with external visual feedback, we may identify a new method of gait training for adaptability in older adults.

Shaun Harrington

WI - University of Wisconsin-Milwaukee

Discipline: Chemistry

Authors:

#1 Shaun Harrington
#2 Maya Fernando
#3 Alexander Arnold
#4 Alexander Vincent
#5 Ethan Kowalczyk
#6 Kayode Medubi

Abstract Name: Efficient Palladium-Catalyzed Buchwald-Hartwig Amination of Brominated Heterocycles using Pd₂(dba)₃ and Xphos Ligand

Palladium catalyzed reactions have become prominent reactions for creating C-N bonds and are widely used in the synthesis of pharmaceuticals. The reaction progress is substrate specific and supported using specific phosphine ligands with unique electronic and steric properties. In this study, multiple phosphine ligands were investigated in the palladium catalyzed coupling of aliphatic and aromatic amines to a bromine containing benzodiazepine. Our results showed of 5% Pd₂(dba)₃ in conjunction with 10% Xphos was the best catalytic system when carried out in toluene. Full conversion with aniline was observed within 2 h at 90°C. The addition of THF increased the solubility of some products and improved their yields. In general, yields ranged from 26% to 89%. For ortho substituted aromatic amines, we did not observe reduced product formation due to steric hinderance. All products were analyzed and characterized using liquid chromatography-mass spectrometry and NMR spectroscopy.

Katie Harris

MO - Missouri State University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

Abstract Name: Quality of Life Impacts in Young Adult Prosthetic Users: Assessing Mental Health, Financial Challenges, and Sexual Well-Being by Literary Analysis

In the United States, millions of people live with limb loss (LL) or limb difference (LD). There are several documented studies focusing on the quality of life (QoL) issues in many age demographics of the amputee community, yet no research solely centralizes on young adults 18- to 25-years-old. As well, young adults are congregated with the adolescent or adult age groups in the majority of the studies being done. This paper focuses on QoL aspects specifically in these three areas: mental health, financial challenges, and sexual well-being to emphasize the young adult population as they are impacted the most by these realms. A call for research will be made specifically on 18- to 25-year-olds using an artificial limb as their prosthesis to identify areas of need and improve QoL for this age group.

Amira Harris

GA - Clark Atlanta University

Discipline: Psychology

Authors:

Abstract Name: Exploration of the Psychosocial Consequences Due to Parental Loss .pdf

This exploratory study investigates the lived experiences of parental loss among adolescents, examining the psychosocial consequences of loss through death, divorce, or separation abandonment. Recognizing past research that African American children experience parental loss disproportionately in early life stages, this research acknowledges the unique experiences based on the nature of loss and seeks to answer: How do adolescents experience parental loss, and how do the psychological impacts differ based on the type of loss? Using diversity purposive sampling, nine participants were recruited from a historically black university, representing varied demographics and loss types (three through death, five through divorce, and one through separation/abandonment). Data collection involved semi-structured interviews exploring behavioral, emotional, and social impacts, analyzed through phenomenological coding. A total of seven open-ended questions were posed during interviews. Sample questions include, "How has the loss of your parent impacted you in terms of (a) behaviors, (b) thoughts, and (c) emotions?" and "Has this loss affected your social and interpersonal relationships?" Preliminary results indicate that the type of loss influences psychosocial consequences. Coded interview data were expressed as Grief and Loss, Resilience, Family legacy, Emotional support, Community support, Social Relationships, Education and Career, Growth and Reflection, Identity Formation, Coping Mechanisms, Comparison, and Aspiration. Codes were further themed by individual impact, external sources for paternal loss, and mitigating loss. Results indicated that loss was uniformly oriented to an 'unfilled void.' Implications of the results for future studies include having more knowledge on how to treat the differences in grief and understanding that the void due to parental loss would not be filled. Additionally, results can contribute to the field of counseling, specifically childhood trauma and grief, and help initiate positive change for individuals, families, and communities to heal and move on in life amidst the void of a missing parent.

Carmyn Harrison

TN - Belmont University

Discipline: Environmental Science and Sustainability

Authors:

#1 Mathew Heard

Abstract Name: Assessing the Impacts of Historic Redlining In The United States On Lichen Species

Historic redlining, a prejudicial loan practice that began in the 1930s, greatly impacted human health and the environment. However, we are just now beginning to understand the full extent of these impacts. In this study, we examined how lichens, which are commonly used as bioindicators to assess pollution impacts and environmental change, have been impacted by historic redlining. To assess this question, we overlaid research grade observations of 2,327 lichens from iNaturalist, the largest citizen science biodiversity database, on to 10,151 maps of Home Owners' Loan Corporation (HOLC) graded areas across the United States. We then assessed whether lichen presence, abundance varied in redlined versus non-redlined areas. Using this approach, we found that there were significant variation in lichen presence in different HOLC areas. In addition, we did find that lichen functional groups that are thought to be most sensitive to pollution (i.e., fruticose lichens) were less commonly found in redlined areas. Collectively, our findings suggest that historic redlining has had lasting impacts on biodiversity and that more research is needed to continue to address this issue.

Melanie Hart

MD - Bowie State University

Discipline: Physics and Astronomy

Authors:

Cornell Williams

Trinity Mizelle

Abstract Name: 3-Point Shot of Ray Allen Video Analysis

The Tracker video analysis program analyzes motion by embedding it in a video clip. We have found a video of Ray Allen shooting a basketball into a hoop and will be analyzing the motion of the basketball as it is thrown and passes through the hoop. Finally, we use the Tracker to find velocity and acceleration.

Melanie Hart

MD - Bowie State University

Discipline: Physics and Astronomy

Authors:

#1 Destiny Lewis

#2 Maria Pottillo

#3 Autumn Ford
#4 Melanie Hart
#5 Megan Shirley
#6 Trinity Mizelle
#7 Hermann Fokou Chendjou
Nina Rhames
Travis Hymes

Abstract Name: Comparative Analysis of Radiation Emissions: Apple Products v. Major Competitor

This study investigates the electromagnetic radiation emitted by various electronic devices, including cell phones (both iPhone and Android), laptops, tablets, and earbuds, with a primary focus on radiofrequency (RF) radiation—a type of non-ionizing radiation. RF radiation is commonly emitted by these devices during usage, and this study specifically examines how different scenarios of device operation contribute to exposure levels. Using RF meters to measure average power density (in $\mu\text{W}/\text{m}^2$), the experiment analyzed radiation levels across different usage patterns, such as making phone calls, texting, browsing, and streaming media. The measurement process varied the distance between the device and the participant, ranging from 3 cm to 20 cm, to understand how proximity impacts radiation exposure. To ensure accurate/reliable results, background RF levels in the testing environment were recorded, and variables such as device type, model, and usage location were controlled, minimizing external factors that might influence radiation readings. In addition, measurements were taken across multiple devices, providing a comprehensive understanding of how different electronic gadgets emit RF radiation under normal usage conditions. The findings of this study aim to assess the potential health risks associated with RF exposure, particularly in relation to long-term effects such as the development of brain cancer. Both children and adults are included in the analysis, with an emphasis on how younger individuals may be more vulnerable to radiation due to factors such as thinner skulls and developing tissue. By evaluating the effects of different usage scenarios and distances, the study underscores the importance of maintaining safe distances from electronic devices, particularly during extended use, to minimize RF radiation exposure. This research serves as a reminder of the need for greater awareness and precautionary measures when using electronic devices, especially for prolonged periods, in order to reduce potential health risks associated with RF radiation.

William Hartman

FL - The University of Tampa

Discipline: Business

Authors:

#1 Mark Bender

Abstract Name: Understanding Consumer Response to Polarizing Promotions: An Eye-Tracking Analysis

In this research, I use neuromarketing techniques to study how consumers respond to polarizing, and often controversial, topics and figures referenced in marketing promotions and advertisements. This study utilizes eye-tracking to see how consumers visually react to controversial advertisements conspicuously embedded in an article by tracking participants' eye movements and fixations. After reading the article with these advertisements, participants were asked questions about the article, the advertisements, and their viewpoints on particular (polarizing) topics and figures, such as gun ownership, drag as an art form, Colin Kaepernick, and Joe Rogan, all of which are referenced within the controversial advertisements. I hypothesized that if participants agreed with the advertisement's content, they would look at the ad for longer than if they disagreed. However, I found the reverse effect. Using a correlation analysis, correlation coefficients were slightly negative for all four advertisements (ranging from -0.12 to -0.36), indicating that people are likelier to look at a controversial ad for longer if they disagree with the content than if they agree with it. While these results signal to marketers that highly disliked topics and figures could benefit advertisers who seek attention

and recall amongst consumers, their use is limited because they are more likely to capture the attention of those who disagree with the particular topic or figure and likely have a negative perception of the use. Further research is needed to show how this tactic would impact a company's overall sales in both the short and long run.

Margaret Hartman

MI - Hope College

Discipline: Education

Authors:

#1 Margaret Hartman

Abstract Name: The Taxonomy of Evidence-Based Practices for United States History Education

Teaching the next generation of leaders, thinkers, and American citizens is the role of Social Studies teachers. This is especially true for those instructors who teach United States history. To help in this endeavor, this study has done a systematic review of the literature on Evidence-Based Practices used in teaching United States history. After an exhaustive search, 17 articles were compiled showing practices that have been proven beneficial in various history classes across the United States. A taxonomy was created with arms related to (1) effective technology use, (2) place-based learning, (3) primary document sourcing, and (4) culturally relevant teaching practices. This paper will discuss this taxonomy in-depth and discuss how social studies teachers can improve their teaching using these necessary evidence-based practices.

Ashlee Harwood

FL - Jacksonville University

Discipline: Chemistry

Authors:

#1 Ashlee Harwood

#2 Mary Grace Galinato

Abstract Name: Probing the Formation of [HSA-MnIIIPPIX-N(ligand)] Intermediates in Solution and Silica Sol-Gel Using Optical Spectroscopy

Manganese(III) porphyrins ([MnIII(PPIX)]) catalysts are capable of removing sulfur impurities from molecules that mimic compounds present in petroleum, using a relatively mild process called oxidative desulfurization (ODS). In ODS, the sulfur compound is converted to sulfur oxides in the presence of the catalyst and an oxidant such as meta-chloroperoxybenzoic acid (mCPBA). [MnIII(PPIX)] are more effective in the presence of co-catalysts, such as nitrogen-donating ligands (N-ligand). In this work, an artificial [MnIII(PPIX)-N(ligand)] complex encapsulated in a protein matrix, human serum albumin (HSA), is constructed to generate [HSA-MnIIIPPIX-N(ligand)]. The N-ligands that were tested for the formation and stability of the [HSA-MnIIIPPIX-N(ligand)] intermediate are amines (methylamine (MeAm), ethylamine (EtAm), and trimethylamine (TEtAm)), imidazoles (imidazole (Im), 1-methylimidazole (1-MeIm), 2-methylimidazole (2-MeIm), and 4-methylimidazole (4-MeIm)), pyridines (pyridine (Pyr), and 2-methylpyridine (2-MePyr)), and pyrrolidine (Pyr). UV-vis absorption spectroscopy shows that in solution, [HSA-MnIIIPPIX-N(amines)] generate the most stable Mn=O intermediate in the presence of mCPBA, causing the peak at 370 nm to red-shift. Imidazoles are also promising ligands, but the intermediate is not as stable. Pyridines and pyrrolidine have yielded little to no evidence of clear and stable [HSA-MnPPIX-

N(ligand)] oxo intermediates. The [HSA-MnIIIPPIX-N(ligand)] complexes are currently being tested for their stability in silica sol-gel, a matrix that might potentially extend the lifetime of the catalyst, therefore contributing to a more sustainable and efficient process for ODS reactions.

Zoya Hasan

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Alexander Meadway

#2 Lawrence Sincich

Abstract Name: Dynamic interference effects in reflected light from cone photoreceptors in the living human eye

Cone photoreceptor cells in the retina, responsible for light capture, are dynamic structures that undergo dimensional changes at the micron level when visually stimulated. These changes can alter the position between reflective surfaces within cones, potentially modulating how much light they reflect during retinal imaging. With multiple reflective surfaces, there can be interference effects if the surfaces move relative to each other when visual stimuli are delivered, resulting in increased or decreased reflected light intensity depending on whether constructive or destructive interference occurs. These phase-dependent interactions will shift cyclically as the distance changes, oscillating between bright and dark states to create different reflected intensities. Using a novel optoretinography technique, we investigated whether such interference effects can be seen in the human living eye. Differential coherence imaging at 840 nm was used to image cone reflectivity following stimulation with 543 or 710 nm light flashes. Cone reflectivity was tracked with an adaptive optics ophthalmoscope, measured at 30 Hz. Average reflectivity values were quantified for 243 stimulated cones and 210 unstimulated control cones. For each condition, we determined the frame at which the reflective signal exceeded a standard deviation threshold, the frame where the signal reached its maximum or minimum (depending on if the reflectivity increased or decreased), and the amplitude of the reflectivity change. Among stimulated cones, ~40% had measureable responses (both increasing or decreasing reflectivity) while ~25% of the unstimulated cones also registered responses, but these were 40% lower in amplitude. The response latency for the stimulated cones varied from 0.58 to 2.2 sec to reach the largest interference effects. Our results suggest that visual stimuli can drive reflectivity changes in cones that can be measured in the interference domain, which enables objective testing of cone photoreceptor function, with potential implications for a new diagnostic tool for retinal disorders.

Layla Hasanazadah

VA - George Mason University

Discipline: Biology

Authors:

#1 Purva Gade

#2 Marissa Howard

Abstract Name: PINK-1-Associated Extracellular Vesicle Export of Tumor Suppressors in Cancer Cells Undergoing Oxidative Stress

Mitochondrial dysfunction is associated with many life-threatening illnesses, from Parkinson's disease to

malignant cancers. Cells remove damaged, aged, or stressed mitochondria through a process called mitophagy. Our team is investigating a potential pro-tumor survival mechanism cancer cells enact with the help of mitophagy initiation and subsequent export. Mitophagy initiation is sensed by the molecule PINK1, triggering the isolation and packaging of the damaged mitochondrial segment for degradation through the lysosome. Cancer cell mitophagy is triggered by elevated oxidative stress and mitochondrial DNA damage caused by hypoxia, chemotherapy, radiotherapy, and immunotherapy. In our recent study, we discovered a secretory form of mitophagy in which damaged mitochondrial segments are packaged and exported outside of the cell within PINK1+ extracellular vesicles (EV). Additionally, we found that these PINK1+ EVs export tumor suppressors (TS) phospho-P53 and Merlin along with mitochondrial segments outside the tumor cell. It has been discovered that p53 is phosphorylated by PINK1, ultimately enhancing mitophagy. We also found that Merlin, an unappreciated TS associated with neurofibromatosis, interacts with p53 through the MDM2 mediator. We hypothesize that secretory mitophagy export of TS and other mitophagy-related proteins is an adaptive mechanism of cancer cells to withstand oxidative stress and avoid apoptosis. The export of TS p53 and Merlin were analyzed in 4T1 & IOMM-Lee cells. We isolated EVs via differential ultracentrifugation, followed by immunoprecipitation of purified EV samples with PINK1 and phospho-p53 to identify protein-protein interactions. Western blotting and mass spectrometry were performed to validate immunoprecipitation results and PINK1 and p53 association. Understanding the role of EV-mediated export of TS in secretory mitophagy can reveal novel mechanisms aiding cancer cells' survival under oxidative stress caused by chemotherapy or other treatments, offering potential therapeutic targets for various cancers.

Adna Hassan

MN - University of Minnesota - Rochester

Discipline: Health and Human Development

Authors:

#1 Adna Hassan

Abstract Name: Pre- and Post-Intervention Blood Pressure Analysis: A Statistical Approach

Hypertension remains a critical global health concern, necessitating effective interventions to manage and reduce blood pressure. This study seeks to evaluate the effectiveness of a specified intervention in reducing systolic and diastolic blood pressure. The central research question is: "Does the intervention significantly reduce blood pressure among participants?" To address this question, data will be obtained from the SPRINT database, an established source of high-quality clinical trial data. Pre- and post-intervention blood pressure readings will be downloaded in CSV format for analysis. The dataset includes paired measurements for participants before and after the intervention, enabling a robust within-subject comparison. The methodological framework involves organizing the data into two columns representing pre- and post-intervention blood pressure readings. The normality of the differences will be assessed using the Shapiro-Wilk test. If the differences are normally distributed, a Paired Sample t-test will be conducted to compare the means. If normality is violated, the Wilcoxon Signed-Rank test will be used as a non-parametric alternative. Statistical outputs, including t-values and p-values, will determine the significance of the findings. The anticipated results will include a comparison of mean blood pressure before and after the intervention, with a focus on the effectiveness of the intervention in achieving statistically and clinically significant reductions. These findings will be discussed in the context of their implications for hypertension management and future research. This study aims to contribute to the growing body of evidence on blood pressure interventions by employing rigorous statistical analysis to evaluate efficacy. The results are expected to provide valuable insights for healthcare practitioners and researchers in the field of cardiovascular health.

Adna Hassan

MN - University of Minnesota - Rochester

Discipline: Chemistry

Authors:

#1 Adna Hassan

Abstract Name: A Thorough Comprehension of the Chemical Properties of *Salvadora Persica*

One main risk factor for unpredictable diseases that limit the lives of many individuals is the lack of proper oral hygiene. The most common treatment for oral infections is antibiotics and it was found that around 142,155 antibiotics were prescribed per 1,000 dentists per year. While antibiotics do a great job of treating infections overall, there are also many other associated risks, such as treating chronic periodontitis with antibiotics, which can lead to tooth loss and microbial resistance. The increasing use of antibiotics calls for understanding other preferable alternatives to preventing oral infections. A potential practice for dental care that has been around for ages is using herbal products such as cloves as an analgesic, rosemary oil as an antitoxin, and miswak, *Salvadora Persica*, as an antimicrobial agent [8]. Miswak has been shown to reduce bacterial count by 80% after 45 seconds of washing the mouth with miswak. Common compounds extracted include alkaloids, flavonoids, glycosides, vitamins, essential oils, minerals, sterols, and terpenes. Nevertheless, the chemical properties of miswak have yet to be investigated throughout. It is essential to understand the chemical properties of miswak to allow further investigation of its potential use as a widely known product or to comprehend any side effects or risks associated with it. In this study we aim to 1) extract compounds from miswak to investigate its chemical composition and 2) comprehend the importance of the chemical composition of Miswak and its critical role. To conduct this study, I extracted miswak in methanol and performed Thin Layer Chromatography and Column Chromatography. I hypothesize that the chemical composition of Miswak will contain diverse compounds beneficial for dental and overall health.

Adna Hassan

MN - University of Minnesota - Rochester

Discipline: Biology

Authors:

#1 Adna Hassan

Abstract Name: Immunophenotyping of Circulating CD4 T cells in murine Steatohepatitis

Metabolic dysfunction-associated steatohepatitis (MASH) is a growing concern affecting about 6% of the US population. MASH is associated with an accumulation of fat in the liver which can lead to inflammation and fibrosis. It is gradually becoming evident that T lymphocytes contribute to the pathogenic immune response in MASH. Our unpublished data reveals heterogeneity within the liver CD4 T cell compartment when comparing healthy and MASH mice. Previously, we identified that there is a distinction among the CD4 T cell populations, particularly, the pro-inflammatory Th1 subtype of CD4 T cell was upregulated in the MASH liver. It is essential to understand whether the changes in the CD4 T cell landscape are systemic or localized just to the liver. Therefore, we sought to investigate the CD4 T cell landscape in the blood using a murine MASH model. Wild-type mice were fed either a MASH-inducing diet high in Fat, Fructose, and Cholesterol (FFC) or chow for 24 weeks. Thereafter, CD4 T cells were isolated from the peripheral blood and were subjected to mass cytometry by time-of-flight (CyTOF). An unsupervised clustering algorithm identified 18 unique CD4 T cell clusters. We observed that MASH peripheral CD4 T cells had a lower frequency of clusters of central memory T cells, and naïve T cells when compared to chow-fed mice. Additionally, Th1 and Treg subtypes were more abundant in clusters only in FFC-fed mice. Here, we demonstrate that the changes in CD4 T cell homeostasis in MASH mouse livers are replicated in the blood, and we speculate that the changes in CD4 T cells are systematic.

Lillian Hassan Thomas

WI - University of Wisconsin-Milwaukee

Discipline: Psychology

Authors:

Abstract Name: The Influence of Practice Effects during Neuropsychological Testing of Cancer-Related Cognitive Impairment

As the cancer survival rate continues to increase, a larger number of patients are experiencing changes in cognition associated with cancer treatment, referred to as Cancer-Related Cognitive Impairment (CRCI). We recently conducted a longitudinal CRCI study which employed a battery of neuropsychological tests given both pre-chemotherapy and post-chemotherapy. Study results showed an unexpected trend: patients self-reported worsening experiences of CRCI after receiving chemotherapy, but their neuropsychological test scores improved across this same period. Here, we aim to determine whether this unexpected trend was an artifact of the methods being susceptible to artificial score improvement over time: a practice effect. To achieve this, we calculated Reliable Change Indices (RCIs) to determine how many patients displayed meaningful score changes across timepoints. We then corrected for any practice effect using a Standard Regression-Based Change model (SRB). After applying the SRB, we calculated another RCI for the corrected data. We found that prior to correcting for practice effects, 15% of our sample displayed a reliable score change; however, after correcting for practice effects, the proportion of patients displaying reliable score change decreased to 9%. This decrease in the number of patients displaying reliable change indicates that some amount of the score improvement observed was the result of practice effects rather than true cognitive improvement in the patients. Currently, we are using the same methods on a sample of healthy subjects whose scores we plan to compare to our preliminary data. We expect the healthy individuals to show improvement on the neuropsychological tests over time, but to a significantly greater degree than the CRCI patients. We expect that the difference obtained from subtracting the healthy volunteer improvement from the CRCI patient improvement will indicate the true amount of underlying cognitive decline experienced by the CRCI patients that may have been masked by practice effects.

Amanda Hatch

PA - Messiah University

Discipline: Computer Science

Authors:

#1 A. Carolina Hatch

Abstract Name: Synthetic vs Real-World Data: A Study in Data Poisoning and its Effects

As new Artificial Intelligence (AI) models are released seemingly every day, cybersecurity experts are growing increasingly concerned with the data used to train these models. As the pace to develop new models quickens, many are turning to AI-generated, synthetic data to increase efficiency. The use of synthetic data significantly reduces the time spent on data collection and cleaning, allowing for faster creation of new models. However, emerging research suggests that these techniques may be creating insecure, unstable models. To address this growing concern, we created two separate AI models, one trained on synthetic data, the other trained using real-world data, and conducted data poisoning campaigns against each model. Our real-world data collection process focused on movie reviews published in newspapers from 1970-1999. The

use of movie reviews allowed us to establish a baseline of truth from which to develop our poisoning campaign, and the period helped ensure each article was written by a human. The synthetic data was generated using GPT-3.5. By training two models trained on the same topic, we were able to directly compare the results of data poisoning in synthetic and real-world data. We anticipate our findings will show that the synthetic model was more susceptible to data poisoning than the real-world model. Further research can examine the stability of hybrid models as well as determine the long-term effects of using synthetic data.

Abigail Hatcher

SC - Coastal Carolina University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Edurne Beltran de Heredia Carmona

Abstract Name: Failed Maternal Healthcare Within Prison Systems in Latin America

Between 2000 and 2017, the female incarceration rate worldwide increased by 53.3%, whereas the male incarceration rate increased by only 19.6%. Thus showing a rapid incline of maternal inmates, but a lack of resources for them. Latin America has among the highest female prison population rates in the world, relative to the national population (Walmsley, 2017). Maternal healthcare in Latin American prisons face significant issues due to overcrowding, unsanitary facilities, and limited access to medical care. Female inmates construct a minority group in prison, while discrimination within the system is frequent as they do not cater to their vulnerability. Their own special needs and characteristics are not taken into account, and there are unfavorable differences in terms of structure, treatment, and maternal health care (Esteban-Febres S et. Al, 2019). This study primarily focuses on countries with greater risk of increase to their infant mortality rate. Children are often incarcerated with mothers during their term served. These environments create an unsanitary and dangerous way of life for developing children, and will later result in child malnourishment, inadequate socialization, early onset communal disease, as well as shared punishment from their mother (Friedman-Rudovsky, 2009). Risk of death and severe injuries to children are very prevalent in these prisons as gang violence and attacks are frequent and rarely prevented from guards. An occurrence of this happened in Honduras where 46 inmates were killed in a women's prison when a fight broke out between rival gangs, attacking each other with guns, machetes, grenades, and flammable liquid (Spitznagel, 2023). The purpose of this study is to examine maternal health issues, childcare, and maternal deaths inside Latin American prison systems, while advocating for a change and policy influence.

Melinda Hauda

VA - George Mason University

Discipline: Environmental Science and Sustainability

Authors:

#1 Rosalina Stancheva Christova

#2 Kate LeVering

Mackenzie Allen

Abstract Name: Pilot Laboratory Test of Interactions Between River Snails and Cyanobacteria Microcoleus

Benthic harmful cyanobacterial mat proliferations in rivers are a recent environmental problem threatening aquatic ecosystem health and human society by producing potent neurotoxins. Aquatic snails graze on algae,

but it is unclear whether they may consume toxin-producing filamentous cyanobacteria and the effect of cyanotoxins on their behavior. This pilot experiment aimed to expose native aquatic snails to strains of the cyanobacterial genus *Microcoleus*, which may produce neurotoxin anatoxin-a. The Shenandoah River in Virginia currently experiences benthic cyanobacterial harmful blooms in addition to historical proliferations of filamentous green algae. In October 2024 we collected aquatic snails, *Leptoxis carinata*, from the Shenandoah River. *Leptoxis carinata* are native to Virginia, very common and abundant, and feed primarily on diatoms. We acclimated the snails in laboratory tanks, at standard lab room temperature, and fed them for 20 days with commercial pure *Spirulina* (Cyanobacteria) Algae wafers. For the triplication experiment, we exposed a single snail to anatoxin-producing and non-toxic unialgal strains of *Microcoleus*, isolated from the Shenandoah River. The experiment was conducted in petri dishes to better observe the snail movements. We made observations on the movement behavior and trajectories of the snails for two hours. All three snails were attracted by the toxic filaments and moved to the filament clump but did not consume it. In contrast, one of the snails exposed to the non-toxic *Microcoleus* filaments actively grazed it. Our preliminary data indicated that the toxicity of cyanobacteria may play a protective role against snail grazing. To better understand the feeding preferences of aquatic snails we plan to extend the experiments with more snail and cyanobacterial species. Aquatic snails are well known regulators of diatom species composition in streams, but more data is needed on their effect on benthic algae.

Celia Haupt

PA - Duquesne University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 David Ford

#2 Taryn Shutika

Penny Schreffler

Caitlin Spadone

Abstract Name: Occupational Risk Associated with Voice Use Amongst Professional Wrestlers

Main Argument: Throughout the years, there has been a wealth of literature investigating the prevalence of voice disorders in occupational voice users (e.g. teachers, singers, actors). Increased risk factors of voice difficulty have also been identified in athletes during sports performance. The purpose of this study is to identify the demographic trends, vocal habits, and occupational risk factors for voice disorders in a novel population: professional wrestlers. This pioneering work aims to provide insight to build context around preventative measures and to inform medical, surgical, and behavioral voice treatments in this population. **Method/Procedures:** An online survey was disseminated to professional wrestlers through various outlets. To encourage uninhibited responses, grass-roots recruitment was used primarily through wrestling journalists and pundits who agreed to disperse the survey through their contacts in professional wrestling. The survey included forced choice questions about demographics (e.g. years of experience, years at current/previous company, roster activity) and personal vocal habits. It also included Likert scales and ordinal rankings of job-related tasks to identify vocal demand and occupational risk factors. Respondents were also asked about their perception of their own voice (e.g. Voice Handicap Index-10 and Voice-Related Quality of Life) and of voice disorders in the profession of professional wrestling, more generally. **Results:** The results of the survey revealed a genuine need for additional investigation of this population. The overall objective of a professional wrestler is to obtain a strong emotional reaction from the audience. To achieve this goal, performers encounter several job-related risk factors contributing to increased vocal demand: impassioned “promos” (speeches) sometimes using character voices, unamplified yelling/shouting at fans in attendance in the presence of excessive background noise inside an arena with 15-100K audience members, whispering “called spots” (reminders about upcoming choreographed moves) while wrestling in the same acoustically-challenging environment, and a grueling travel schedule.

Abigail Haveman

MN - St. Catherine University

Discipline: Health and Human Development

Authors:

#1 Amanda Herrmann

#2 Steven Jackson

#3 Ella Chrenka

#4 Ricky Lopez

#5 Andrew Rapacz

#6 Ingrid Bentley

#7 Samantha Sherman

#8 Aleta Svitak

#9 Clarissa Howe

#10 Samuel Swanson

#11 Samuel Swanson

#12 Leah Hanson

Abstract Name: Understanding Participation in Adaptive Exercise Programs for Spinal Cord Injury

Spinal Cord Injury (SCI) trials often face challenges with recruiting and retaining participants in clinical trials. This poses a challenge to research and slows the therapeutic process, possibly preventing or delaying the development of new treatments. This study examines the barriers to enrollment and retention in a 12-week adaptive exercise program for people with SCI. This program randomized participants into immediate or delayed-start groups, providing blood samples and completing physical assessments pre- and post-program. The main barriers to participation included transportation issues, scheduling conflicts, illness or injury, and a desire to be in the immediate-start group. In contrast with previous research, no potential participants declined due to concerns about possible exercise-related side effects. Some possible solutions based on these barriers include reimbursement of transportation costs for participants, expanding program locations to be closer to the participant's home, and providing alternative treatments for potential participants who only want to be in the immediate-start group. These findings highlight the importance of accessible studies designed with SCI participants in mind. They also suggest that addressing these barriers can enhance recruitment and increase retention of participants. Which would make for a more inclusive and complete research process for a major condition like SCI.

Fares Hawas

EGY - The American University in Cairo

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: Beyond the Ward: Exploring Interpersonal Dynamics in Psychiatric Confinement

This autoethnographic study investigates the intricate relationships and experiences at a psychiatric hospital in Cairo, where I was admitted for 20 days. It aims to comprehend the institutional social framework, staff-patient relations, and mental health care procedures involved. I had visited the same hospital as a psychology student as part of my coursework, but my view of the place dramatically shifted when I was a patient. I encountered unexpected relationships, surprising events, and complex power dynamics. These encounters consequently revealed ethical concerns and reflected social structures that prompted questions comparing the institution to the "outside world." I employ participant observation, informal interviews, and document

analysis focusing on the interactions within the different wards, including addiction, gendered units, and common spaces. I use my access to the hospital facilities, personal journals, and other people's experiences as a significant part of the research. The research explores the negative and positive relationships developed among patients, the ethical dilemmas the staff faces, and the bureaucratic aspect of care. It examines the similarities between psychiatric confinement and imprisonment, considering the stigmatized view of mental health care and the effects on patient well-being. Ethical considerations were crucial to ensure the sensitivity to the vulnerability of the participants and the informed consent throughout the process. The research supports community-based mental health care takes into account and advances our knowledge of the unique social structure of psychiatric institutions. It recommends more research on how mental health facilities could achieve a balance between protecting patient well-being and growth in interpersonal relationships.

Chozzyn Hayes

NC - Winston-Salem State University

Discipline: Health and Human Development

Authors:

#1 Chozzyn Hayes

Tylia Hall

Abstract Name: Reviewing The Mental, Physical, And Societal Impacts of COVID-19 On Communities of Color

Although cases of COVID-19 have drastically declined, the symptoms and results it caused did not. COVID-19 has produced physical, mental, economic, and societal impacts affecting individuals worldwide. Communities of color continue to be disproportionately impacted by the pandemic. Thus, the current study attempts to shed light on the challenges minorities face due to COVID-19. In our previous research, the North Carolina (NC) Department of Health and Human Services developed the HBCU Health Equity Data Consortium (HEDC) to assess the differential impacts of COVID-19 on communities of color. The HEDC collected over 11,000 surveys across NC, with our specific geographic region (Region 2- Western, NC) collecting over 3,000 survey responses, with over 1,711 eligible for analysis. Survey responses indicated that 30-35% of our participants reported experiencing mental health impacts as a result of COVID-19, including an increase in anxiety and stress. The survey responses also revealed that some participants experienced decreased income, lost their jobs, and lost property. To further expand on our findings, we are conducting focus groups to gather additional information on the continuous impacts of COVID-19. The purpose of the qualitative study is to identify the long-term and/or ongoing impacts of COVID-19. The focus groups were conducted with 96 participants from eight (8) community-based organizations (CBOs). Our findings highlight the post-pandemic impacts and challenges experienced by participants, with an emphasis on bringing awareness to the resources needed to mediate these impacts.

Alexis Hayes

PA - Community College of Allegheny County

Discipline: Education

Authors:

Abstract Name: Higher Education's Paywall: The Impact of Privatized Academic Resources on Students

Currently, in the United States, accessible postsecondary education is not a reality for many citizens, as

numerous expenses hinder students' pursuits of higher education. One of the most insidious expenses tied to postsecondary costs is academic materials. Most college students do not have the expendable income to incur these costs, as most of their limited income is going toward tuition and living expenses. The additional cost of academic materials can create another financial barrier for students to overcome, which can lead to poor grades, reduced program options, course load restrictions, and withdrawal from courses. These impacts injure postsecondary students' educational autonomy and exacerbate the inaccessibility of equitable and affordable higher education. However, this does not have to continue to be the reality of postsecondary students. Open-access publication of academic resources and research could alleviate this financial burden and make higher education more equitable. This can be seen through the increase in open-access programs, ZTC programs, and student-led solutions that circumvent the price of academic materials. Privatization of academic materials does nothing but harm students by creating more economic barriers. I hypothesize that if accessible postsecondary education is ever to be achieved, open access must replace privatization in the higher education sector. My poster highlights research relating to the economic burdens college students experience due to expensive academic materials and how open-access materials can ease such burdens. The poster will shed light on the ill effects of the privatization of academic materials and some of the concerns raised regarding the credibility of open educational resources.

Nidra Hayes

MD - Bowie State University

Discipline: Chemistry

Authors:

#1 Jasmarie Civil

#2 Damona Daniels

#3 Iman Wright

#4 Calvin-Caleb Amiolemen

#5 Beatrice Obenewaa

Abstract Name: Vitamin C Content in Different Parts of an Orange and Lemon

This study thoroughly investigates the determination of ascorbic acid (vitamin C) content in commercially available products and food items using titration techniques. The main goal is to establish a reliable and efficient method for determining the ultimate storage conditions that result in the highest concentration of vitamin C, a crucial antioxidant that plays a vital role in human health. The experimental approach involves titrating the samples, employing 2,6-dichloroindophenol (DCIP) as the titrant, chosen for its ability to exclusively oxidize ascorbic acid without affecting other potential substances. Additionally, DCIP serves as a self-indicator in the titration process. For a substance to function as a self-indicator, it should exhibit one color when in the presence of excess analyte (i.e., ascorbic acid) and a different color when the analyte has completely reacted, which allows for the calculation of the amount of ascorbic acid present in the sample. The study explores the optimization of storage conditions, to enhance the amount of vitamin C concentration. Citrus fruits such as oranges and lemons are known to contain high levels of Vitamin C. The purpose of this experiment is to determine which parts of these fruits contains the highest concentration of Vitamin C. Specific cuts of the fruit and its flesh were harvested for analysis. Samples were collected at regular intervals over some time, and the vitamin C content was analyzed using a standardized titration method.

Damla Haymanali

UAE - Dubai College

Discipline: Biology

Authors:
#1 Damla Naz Haymanali

Abstract Name: Tetrahedral DNA Nanostructures for the Targeted Delivery of Cisplatin to Treat Non-Small-Cell Lung Cancer

This study explores whether Tetrahedral DNA Nanostructures (TDNs) can improve cisplatin delivery to non-small-cell lung cancer (NSCLC) cells, enhancing therapeutic efficacy while reducing toxicity. NSCLC, the most common type of lung cancer, carries high mortality rates despite cisplatin-based chemotherapy, a standard treatment. However, cisplatin's clinical application is limited by severe side effects and multidrug resistance (MDR), which diminishes its effectiveness. Recent advancements in DNA nanostructures, like TDNs, offer promising drug delivery solutions, as TDNs are biocompatible, stable, and capable of penetrating biological barriers, potentially bypassing MDR by delivering drugs directly to cancer cells. In this study, optimal DNA nucleotide sequences were designed for structural integrity through multiple trials using NUPACK, and a 3D TDN model was constructed in OxView to simulate effective cisplatin binding to guanine residues within the DNA strands. Cetuximab, an EGFR-specific antibody, was conjugated to the vertices of the TDN to target EGFR-overexpressing NSCLC cells, while a pH-sensitive linker was incorporated to release cisplatin selectively within the acidic tumor microenvironment, preventing damage to healthy tissue. OxView simulations confirmed the TDN's structural stability and degradation behavior, maintaining integrity until reaching the tumor site. This approach is expected to increase cisplatin accumulation specifically at tumor sites, overcoming MDR and minimizing toxic side effects on healthy cells. The findings will discuss TDNs' potential as a targeted therapeutic tool for NSCLC, centring on how this nanotechnology can enhance cisplatin's effectiveness and contribute to more effective cancer treatment strategies.

Destiny haywood

OK - Langston University

Discipline: Environmental Science and Sustainability

Authors:

Abstract Name: In Vitro Anthelmintic Activity of Hydro-Ethanollic Extracts of *Syzygium aromaticum* and *Panax notoginseng* on Ova of *Haemonchus contortus* from Spanish goats.

The threat of anthelmintic resistance in haemonchosis-infected goats has become a global concern, prompting trials with traditional medicinal plants claimed to have anti-parasitic properties against worm-stages, with the added advantage of being 'natural'. This study investigated the in vitro anti-parasitic potential of two plants, *Syzygium aromaticum* (clove) and *Panax notoginseng* (black pepper), using *Haemonchus contortus* eggs harvested from Spanish goats with a FAMACHA score of 3 or above. Ovicidal activity (OA) was evaluated using 100 eggs/well/in 96-well flat-bottom plates, suspended in 100 µl distilled water. All preparations were conducted in triplicate. A 50 mg/ml solution of each hydro-ethanollic plant extraction was serially diluted and added at 2 µl per well to final concentrations of 10000, 5000, 2500, 1250, 625, 313 and 156 µg/mL. There was a negative control of 1.5% ethanol, and a treatment positive control comprising of levamisole hydrochloride with concentrations of 1, 0.5, 0.25, 0.125, 0.625, 0.3125 and 0.0078µg/mL were included. All plates were incubated (27°C, 24 Hr.) where after the hatched larvae (HL) were counted under a light microscope. The ova hatching inhibition (OHI) capacity was calculated as: % OHI = (100 – HL of treatment group) – (100 – mean HL of the negative control). The effect of plant extract on the ova of *H. contortus* was concentration dependent as %OHI decreased with reduced concentration. At the highest concentration (10000µg/ml), the mean %OHI was significantly higher ($p < 0.0001$) in *S. aromaticum* (82.2±2.3) compared to *P. notoginseng* (53.9±1.6). The proportion of *H. contortus* OHI percentages were seen to be concentration

related. In conclusion, the hydro-ethanolic extract of *S. aromaticum* exhibited better potential at hatching inhibition against *H. contortus* than *P. notoginseng*.

Corinne Hazel

WV - West Virginia University

Discipline: Biology

Authors:

#1 Corinne Hazel

#2 Daniel Panaccione

Abstract Name: Secretion of symbiotic fungus-derived ergot alkaloids from the morning glory *Ipomoea tricolor*

Ergot alkaloids are pharmaceutically and ecologically important chemicals produced by fungi, including the *Periglandula* species symbiotic with the common morning glory *Ipomoea tricolor*. Previous work indicates that the ergot alkaloids produced by *Periglandula* species occur in high concentrations in *I. tricolor* and suppress parasitic nematode populations. We hypothesize that ergot alkaloids are secreted from roots into the surrounding medium. To test this hypothesis, we devised a hydroponic system featuring 3D-printed net pots and Hoagland's solution to facilitate sampling of roots and the associated growth medium. Half of the plants were treated with the systemic fungicide tebuconazole to suppress the contribution of the symbiotic fungus. Plant tissues and growth medium were sampled regularly over six weeks, and ergot alkaloids were detected and quantified by high-performance liquid chromatography with fluorescence detection. Our data demonstrate that ergot alkaloids, including lysergic acid α -hydroxyethylamide, ergine, and ergonovine, were secreted from roots. These alkaloids were secreted in two phases: an initial flush of seed-inherited alkaloids, in both non-treated and fungicide-treated plants, followed by distribution and secretion of newly synthesized ergot alkaloids in non-treated plants only. Of seed-inherited ergot alkaloids transported to roots, approximately 12% were secreted from non-treated plants as opposed to only 4% in fungicide-treated plants. These data indicate a role for the symbiotic *Periglandula* species in secretion or perhaps an unintended consequence of fungicide treatment. Newly synthesized ergot alkaloids were detected only in non-treated plants, where they increased in all tissues from week two through week six. Hypocotyls contained the highest concentrations followed by roots. These newly synthesized ergot alkaloids also were secreted from roots at a rate similar to that of seed-inherited alkaloids. Since ergot alkaloids are present in very high concentrations in morning glory roots, secretion of even 12% may have significant ecological effects on the rhizosphere.

Creehan Healy

TX - The University of Texas at San Antonio

Discipline: Biology

Authors:

#1 Creehan Healy

#2 Lorena Roa-de la Cruz

#3 Lacy Barton

Abstract Name: A Targeted Genetic Screen to Determine Calcium Signaling Requirements in *Drosophila* Primordial Germ Cell Migration

The survival of many species hinges on the proper development and fidelity of the germline. The germline is

formed from primordial germ cells (PGCs), which are the precursors of egg and sperm. Across the animal kingdom, PGCs are specified early in embryogenesis and must migrate through the embryo to reach the developing gonad. Our lab uses the fruit fly, *Drosophila melanogaster*, model to uncover the mechanisms of PGC migration. Previous research has shown active calcium signaling in zebrafish and chicken PGCs during migration. Our lab has identified periodic calcium pulses in migratory and post-migratory *Drosophila* PGCs, suggesting that active calcium signaling is conserved among *Drosophila*, zebrafish, and chickens. We aim to characterize the calcium source, signaling components, and subcellular dynamics required for PGC migration using genetic manipulations of calcium channels in *Drosophila*. We first wanted to determine which calcium signaling factors were necessary by targeting Phospholipase Cs (PLCs), a class of enzyme that causes the release of calcium from the endoplasmic reticulum. Of the three *Drosophila* PLCs, we found that only one, *Plc21c*, is required for proper PGC migration. Depletion of *Plc21c* in the surrounding tissue did not compromise migration, suggesting that it is required within the PGCs themselves. We are now assessing the requirements of other calcium signaling factors through targeted genetic screens. Thus far, our screens suggest that IP3 release from the endoplasmic reticulum is required within PGCs for their migration in vivo. Current work includes live imaging of calcium dynamics in vitro of isolated *Drosophila* and mouse PGCs from wildtype and mutant lines, as well as pharmacological perturbations of calcium stores. By using a diversity of experimental approaches and model organisms, we hope to uncover deeply conserved features of PGC migration and development.

J'Taelii Heath

OK - Langston University

Discipline: Environmental Science and Sustainability

Authors:

#1 Robert Axtell

#2 Emma Newton

Abstract Name: Role of Exosomes on the Detrimental Effect of Tobacco Smoke in Multiple Sclerosis

Multiple sclerosis (MS) is a relapsing-remitting inflammatory demyelinating disease of the central nervous system that affects over 2.5 million people worldwide. There is significant heterogeneity in the prognosis of patients, where some experience severe disease with frequent relapses, while others have mild disease with fewer relapses. We have curated clinical information from patients at the OMRF MS Center and found that tobacco smoke is a major demographic variable significantly associated with poor prognosis. Smokers are three-times more likely to have relapses while on therapies compared to non-smokers. Here, we used proteomic assays to determine biological differences between patients who were smokers and non-smokers. We found that smokers had elevated levels of proteins associated with inflammation compared to non-smokers. Strikingly, many of these proteins were involved in the release of exosomes, extracellular vesicles, that function in cellular communication. Here, our goal was to quantify and molecularly characterize exosomes from the blood of smoking and non-smoking patients and healthy controls. We show that MS patients who smoke have an elevated number of extracellular vesicles in their blood compared to non-smokers and healthy individuals. Based on their size (30-150 nm) and the presence of Syntenin, CD9, CD63, and CD81, we identified these extracellular vesicles as exosomes. Our data demonstrate that MS patients who smoke have elevated levels of exosomes in their circulation compared to non-smokers. Our future goals will focus on determining whether tobacco smoke alters the molecular cargo of exosomes to contain inflammatory molecules, potentially driving increased disease activity in patients.

Julianne Heath

LA - Louisiana State University

Discipline: Engineering

Authors:

#1 Todd Monroe

#2 Jorge Belgodere

Abstract Name: Evaluation of Common Xurographic Materials for Rapid Prototyping of Microfluidic Devices

Organ-on-a-Chip microfluidic devices, which simulate 3D cellular interactions, offer significant potential for replicating complex biological systems. However, their adoption is hindered by the high costs, labor-intensive fabrication, and material limitations associated with conventional photolithography. Photolithography, a technique that patterns micron-level features onto a photosensitive resin to create precise molds, is expensive and time-consuming, often requiring specialized equipment and expensive supplies. Devices are cast from resulting molds using polydimethylsiloxane (PDMS) and permanently bonded to glass, through plasma oxidation. Xurography, a fabrication method using commercially available cutter plotter machines (e.g., Cricut® Maker 3) has emerged as a promising alternative. This process employs computer numerical control (CNC) subtractive manufacturing to cut precise patterns out of thin substrates. It achieves a precision comparable to photolithography while being cost-effective, reusable, and accessible. One such substrate, adhesive tapes, has demonstrated the ability to plasma bond to PDMS, forming enclosed devices. This study explored the capabilities of a commercially available cutter-plotter (Cricut® Maker 3), adhesive tape, and PDMS in the manufacturing of a microfluidic device. Tape - PDMS was evaluated for X-, Y-, Z- dimensional accuracy, leakage, burst pressure, flow quality using particle image velocimetry (PIV), production cost, and time efficiency. Results demonstrated that microfluidic tape PDMS devices achieve comparable dimensional accuracy with minimal leakage and high burst pressure thresholds. Flow quality was consistent and reliable, while fabrication time and costs will be significantly reduced compared to conventional methods. This approach has the potential to lower barriers to microfluidic device development by significantly reducing cost and fabrication time. Broader adoption of such methods could improve access to advanced biomedical research tools and accelerate discoveries.

Nathaniel Heaton

MD - Frederick Community College

Discipline: Health and Human Development

Authors:

#1 Nathaniel Heaton

#2 Bruce Thompson

Abstract Name: Assessing the Correlation Between Spatial Access to Primary Care Physicians and Health Outcomes Using the 3SFCA Method: A Maryland Case Study

It is well understood that not everyone has equal access to healthcare. Spatial access to healthcare, often evaluated by driving distance, plays a significant role in this disparity. However, despite its commonality and computational efficiency, driving distance falls short of providing a holistic analysis of spatial access. As a result, scholars have identified a more accurate method of measuring spatial access to healthcare known as the three-step floating catchment area (3SFCA) method. Using Maryland as a case study, this research sought to understand the nature of the relationship between a population's spatial access to primary care physicians (PCPs) measured by 3SFCA and consequent health outcomes. At a census tract-level of observation, spatial access was defined by a tract's spatial access ratio (SPAR) given by 3SFCA, health outcomes were evaluated via all-cause mortality data, and the confounding effects of socioeconomic factors on health outcomes were controlled for through the introduction of the Neighborhood Deprivation Index (NDI) as a covariate. Additionally, adjusted spatial access (ASPA) values were used to identify PCP shortage areas within the state.

Following the analysis of all census tracts within Maryland, spatial access to PCPs was observed to have a negative correlation with all-cause mortality rates. Equally important, rural tracts were generally observed to yield lesser ASPA values than non-rural tracts. These findings suggest that evaluating the SPAR of a population is an effective method for predicting health outcomes and that, with regard to PCPs, rural populations are underserved compared to their urban counterparts. Due to this, further investigation into using 3SFCA's results as an indicator for health outcomes could play a pivotal role in the equitable allocation of healthcare resources across populations.

amelia hebert

VA - Virginia Commonwealth University

Discipline: History

Authors:

Abstract Name: Highway Removal and Urban Revitalization: Reconciliation Efforts to Ameliorate Economic and Social Disruption

Predominantly Black neighborhoods around the United States are still experiencing the effects of the construction of highways through their communities. Highways can form physical and social barriers between communities, which leads to neighborhoods facing social and economic isolation, higher poverty rates, and lack of economic opportunities. This comprehensive literature review investigates how these affected communities might be revitalized through highway removal. This analysis of peer-reviewed studies on urban revitalization through highway removal finds that highway removal can improve neighborhood connectivity and business development. Social cohesion in the previously divided communities can also increase if highway removal is implemented. Findings suggest that due to the success of highway removal in Rochester, NY, these same highway removal efforts may be beneficial if applied to other cities. The goal of this research paper is to propose a revitalization plan through highway removal for neighborhoods that have been divided by the construction of highways. Due to the lack of research and studies centered around Jackson Ward in Richmond, VA, more research is needed regarding solutions to connect the community after the construction of Highway 95. Divided Black communities are still adversely affected by highways through their homes, which is why it is important to understand and acknowledge the detrimental consequences of the highways and encourage highway removal efforts. This will hopefully be the first step to ameliorating some of the damage done to these communities.

Nora Heeney

AL - Auburn University

Discipline: Nursing and Public Health

Authors:

#1 Seth Perry

Abstract Name: Safe Space at Auburn

Experiencing multiple psychosocial stressors such as academic performance pressure, time-management challenges, and work-life balance demands, many nursing students are susceptible to high-stress levels. A nursing student's inability to process stressors can cause issues in a future workplace where the nurse must manage multiple needs. Different methods have been conducted to identify ways to develop stress management skills, including having a designated area for stressor identification and relief. The purpose of

Safe Space at Auburn is to determine whether a room created for stress management allows students to recognize stressors and develop techniques to manage them. Safe Space at Auburn contains evidence-based tools, such as dim lighting, cushioned furniture, pleasant aroma, weighted objects, guided relaxation posters, etc. To measure the efficacy of how the space's capacity to encourage student stress management, third and fourth-semester nursing students at Auburn University College of Nursing will have access to the space and its tools. It is anticipated that students will most often use the room on test days, clinical simulation practices, and quiz days. Before entering the room, students will rate their level of stress using the Subjective Unit of Distress Scale (SUDS). Multiple activities will be provided such as silent reflection, journaling, sensory modulation, muscle relaxation, etc. They will then use SUDS to rate their stress level after using the room. The expected outcome of the project is that students will have a decreased stress level after using the room and will learn strategies to process stress that they can take with them in the future.

Lily Hefner

PA - Westminster College

Discipline: Biology

Authors:

#1 M Marosh Furimsky

#2 Joshua Corrette-Bennett

Abstract Name: Investigating the Role of the enzyme Monoamine Oxidase in Aggression

This research project studied the role of the enzyme monoamine oxidase (MAO) on aggressive and anti-social behavior in zebrafish. MAO plays an important role in the regulation of neurotransmitters; normal production helps to stabilize mood, regulate emotion and control outbursts. However, low MAO expression is correlated with trouble concentrating, high impulsivity and poor emotional control. Gaining traction as the "warrior gene", low MAO expression was hypothesized to cause violent behavior in humans. Although this proposition is likely untrue, there remains some merit to the premise. For further study, this project introduced the pharmacological inhibitor clorgyline to zebrafish, chosen for their high homology to humans. Clorgyline specifically and irreversibly binds to MAO at the active site. The effect of the disrupted pathway was quantified in two ways: zebrafish behavior and gene expression. Tracking software quantified behavioral patterns in a novel tank, in a mirror test, and in shoals; increased boldness and aggression, as well as declined sociability, were measured in treated zebrafish. Relative gene expression was measured by PCR and gel electrophoresis to confirm the effect of the clorgyline on both the target gene MAO and other genes in the pathway. This project contributes to a growing body of research on the biological, and especially molecular, influences of aggressive behavior.

Ethan Heide

MN - Hamline University

Discipline: Biology

Authors:

#1 Bridget Jacques-Fricke

#2 Alan Escalante

Abstract Name: CaMKII Involvement in Neural Crest Cell Migration

Neural crest cells (NCCs) are a multipotent embryonic cell population unique to vertebrate organisms. During

development, NCCs undergo collective migration from the neural folds throughout the embryo and contribute to various cell types. This research specifically investigates the role of the multifunctional enzyme calcium/calmodulin-dependent protein kinase II (CaMKII) in migratory NCCs. Previous research has shown that CaMKII is expressed in the neural crest and promotes migration in other cell types, leading us to hypothesize that CaMKII is essential for NCC migration. Using chick (*G. gallus*) embryos as a model organism, neural folds containing premigratory NCCs were isolated from the organism and plated in a culture so that cells would emerge and disperse from the tissue upon reincubation. Neural crest cells either migrated in a culture media treated with the CaMKII inhibitory reagent myr-AIP, or a control culture media with no added reagents. These cultures were then stained and imaged under fluorescence microscopy. Two quantitative analyses were performed based on these images. Dispersion quantifies the area of an entire field of migratory cells relative to the size of the explanted fold, and a morphological analysis measures the characteristics of cell shape in each culture. A two-sample t-test was conducted for both analyses to determine statistical significance. CaMKII-inhibited cultures showed some decrease in migration dispersion, though not statistically significant, and the morphological analysis showed no coherent patterns. The results of this study can neither support nor rule out any conclusion on the role of CaMKII in NCC migration, and more work needs to be done to collect more samples and find more definitive results. This research will ultimately provide a useful precedent for future investigations into the molecular basis of neural crest cell migration.

Gwenyth Heidinger

WI - University of Wisconsin-Whitewater

Discipline: Geography/Geology

Authors:

#1 Prajukti Bhattacharyya

#2 Peter Jacobs

Dean Wink

Abstract Name: Processes of Soil Formation from Basaltic Bedrock in Reykjanes Peninsula in Iceland

Iceland's Reykjanes Peninsula has experienced many eruptive events. Current volcanic activity began there in 2021 with the Fagradalsfjall eruption and is still continuing at Sundhnukur. Eye-witness accounts date the previous eruptive phase to 1211, known as the Reykjanes Fires. Recent studies show that the basalt at Fagradalsfjall most likely came from the mantle plume and the Sundhnukur eruption released magma from a shallower source. This might create differences in chemistry in the basaltic bedrock which in turn might influence soil formation. Due to Iceland's unique geographical location, soil formation processes there are more dependent on original and altered bedrock chemistry, rather than biological activities. Our goal is to learn how soil forms from Icelandic basalt. For this project we collected seemingly unaltered and weathered basalt samples that erupted during the Reykjanes Fires. We selected samples based on their alteration colors for powder X-ray diffraction (pXRD) analysis to compare the mineralogy of unaltered and altered basalt. Preliminary results indicate presence of olivine, pyroxene and calcium-rich plagioclase in the unaltered basalt. X-ray fluorescence data show depletion of calcium, magnesium, aluminum and silicon as weathering occurs. The existence of maghemite in the weathered product might have formed from magnetite in the original basalt as part of the soil forming process. These results will be complemented by petrographic analysis and chemical analysis using Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES). These results provide insight into the first steps of soil production from basaltic rock in Iceland. This is important for agriculture and soil management. This poster will present our data, analytical methods, and implications of our findings.

Daylen Heidt

TX - Lone Star College

Discipline: Sociology

Authors:

Abstract Name: The Border Crossing Boogeyman: A Content Analysis Investigating Implicit Bias Perpetuated by Language

This research investigates the role socially learned bias plays regarding attitudes towards immigrants through an examination of the language used in news outlets discussing national security. First, an exploration of the Immigration Control and Financial Responsibility Act of 1996 provides a definition for “illegal immigration” and connects the use of “alien” to describe immigrants in official documents, language that sets the tone for attitudes towards immigrants. Then, a content analysis was conducted between two Instagram posts that each sparked a conversation about immigration, one posted by the Houston Chronicle and one posted by an international news outlet, Reform UK. These news outlets were selected because they are located in places impacted by immigration issues. Using the lens of Henri Tajfel’s “ingroups and outgroups,” which identifies the idea of prejudice and discrimination at a group level, a coding of the comments on these articles suggests that while each sample contains its own individual themes, both sets of comments find an overwhelming commonality in the overlapping themes of nationalism and othering. This analysis found that the language used to create and maintain outgroups (immigrants) separated from ingroups (nationals) not only has an assumed racial component but also shows implicit bias and attitudes of the ingroup. According to the comments, anyone who is perceived to be an immigrant therefore “deserves” the treatment they are receiving. This research is significant because it reinforces Tajfel’s theory that language reflects ingroup and outgroup bias. By furthering the use of language that expresses inherent bias, the perception of who is an immigrant becomes reinforced through imagined boundaries between themselves and others and can promote ethnocentrism.

Olivia Heinecke

WI - University of Wisconsin-Eau Claire

Discipline: Biology

Authors:

#1 Derek Gingerich

Abstract Name: Analysis of *Arabidopsis thaliana* Phytochrome Mutants Identified in a Red-Light Genetic Screen

Light is important for plants as an energy source for photosynthesis, as a measure of day/night and seasonal cycles, and as information about the surrounding environment. For this reason, plants have evolved a sophisticated set of pathways to detect and respond to light, which allows them to adjust their development in response to changing conditions. The plant *Arabidopsis thaliana* contains the genes LRB1 and LRB2 (Light-Response BTB 1 and 2) that encode proteins functioning as target adaptors in E3 ubiquitin-ligase complexes that initiate degradation of the phytochrome red/far-red-light receptors. Plants containing mutations of both LRB1 and 2 are hypersensitive to red light due to increased levels of phytochromes. Previously the laboratory of Dr. Gingerich performed genetic screens to identify enhancer mutations which exaggerate the effect of the LRB1/LRB2 mutations; here I describe analyses of two of these. These enhancer mutations are both in the PHYB gene (which encodes the major phytochrome involved in red-light response) and each is predicted to alter a single amino acid in the phytochrome B protein. Each of the mutations increases plant sensitivity to red light and in each case this hypersensitivity is increased when the LRB1 and LRB2 genes are disrupted. Study of these mutations may provide information as to how the phytochrome B photoreceptor functions to detect and transmit light signals. In addition, the line that contains one of these mutations also shows increased sensitivity to blue light. Analyses thus far suggest that it is the mutation in the PHYB gene that is responsible for this blue hypersensitivity. A mutation in phytochrome B that alters sensitivity to blue light is very intriguing and may reveal new insights in to how the red and blue-light response pathways interact with each other.

Emma Heinert

WI - University of Wisconsin-La Crosse

Discipline: Exercise Science and Nutrition

Authors:

#1 Grace Rudek

#2 Drew Rutherford

Abstract Name: Use of visual, auditory, and tactile cues to influence cadence and Achilles Tendon loading in running

Running has a high incidence of Achilles tendon (AT) injuries that may be due to high forces and repetitive loading. Running cadence may influence AT loading. To promote a 10% cadence increase, auditory, visual, and tactile cues were used. Thirty-four male and female runners ran on an instrumented treadmill at 7.5 mph where kinetic and kinematic data were obtained. AT cross-sectional area was measured with ultrasound imaging. Inverse dynamics then static optimization were used to calculate muscle forces and AT loading. All cued conditions increased cadence from the baseline run condition. Auditory and visual cues yielded a cadence increase closest to 10%. There was no difference between auditory and visual cues to increase cadence ($p < 0.05$). AT-related loading variables such as peaks in ground reaction force, AT force, and soleus muscle force were lower when cadence increased to near 10%. Visual and auditory cues reduced AT loading

most compared to the run (baseline) condition. Understanding the relationship between the use of cues and increasing cadence may aid in the treatment and prevention of AT injuries.

Jessica Heinsch

MN - Minnesota State University - Mankato

Discipline: Chemistry

Authors:

#1 Victoria Greene

#2 Keone Anderson

#3 Samantha Katner

Abstract Name: Creating CRISPR edited glypican-2 knockouts in human Glioblastoma cells

Glioblastoma (GBM) is a highly predominant and very aggressive form of brain cancer, constituting approximately 45.2% of all tumors affecting the brain and central nervous system. Although there are limited treatment options available to patients with glioblastoma, including surgery, radiation, and chemotherapy, the success rate for these options remains poor due to the efficient growth of the tumor and the location of glioblastoma in the brain. The few current treatment options for glioblastoma do not consider glypicans, a family of heparan sulfate proteoglycans that are involved in the progression of tumor growth and the signaling of cells. In this study, we specifically focused on glypican-2 (GPC2), one of the six glypicans, and the effect it has on the growth of glioblastoma tumor cells. We used CRISPR technology by designing a single guide RNA to specifically target the GPC-2 gene in the GBM tumor cells. Then we employed cell culture to conduct a clonal expansion to obtain a clonal cell line with the GPC-2 knockout. We then isolated the DNA for Sanger sequencing to confirm the knockout. The removal of GPC2 in these cell lines allows for future investigations of its contribution to cell proliferation, tumor invasion, and treatment options that could provide awareness of new therapeutic approaches for GBM patients.

Mackenzie Heisser

TX - Texas Woman's University

Discipline: Education

Authors:

#1 Adam Jones

Abstract Name: How Do Boys' and Girls' Perceptions of Their Own Academic Success Differ in Highschool?

Internalizing gender stereotypes during development can give adolescents a preconceived notion of what they are capable of achieving academically. These stereotypes influence the gender gaps within career fields and play a role in the career and academic choices adolescents make in correspondence to their self-perceptions. More research is needed to determine how these attitudes toward academic achievement develop during childhood and adolescence. Academically successful students have been found to have a positive outlook on their abilities and have strong academic motivation. In this study, I aim to focus on how boys' and girls' attitudes toward academic achievement change as they progress through their education. My research is a quantitative analysis of secondary data from 15,362 high school students who participated in the National Center for Education Statistics' Education Longitudinal Study (NCES, 2002). Within my research, I explore whether boys' and girls' perceptions of their own academic success differ in high school. I am conducting a MANOVA analysis to identify gender differences in multiple measures of perceived academic success. I

hypothesize that the identified variables will differ based on the student's gender. This study will provide a foundation for future research on how student motivation is influenced by other factors (e.g., teacher motivation, insufficient student support, or curriculum insufficiencies). This study aims to contribute knowledge to educational practices, helping educators, childcare workers, and parents understand how they can contribute to positive academic achievement. I anticipate that the findings of my research will give me a better understanding of effective strategies for supporting adolescent academic development.

Zarindokht Helforouh

FL - Florida International University

Discipline: Mathematics

Authors:

Abstract Name: Ensemble Learning for Survival Analysis of Lung Cancer Patients using Random Survival Forest

Lung cancer is the leading cause of cancer-related deaths worldwide among both men and women [1]. In 2024, an estimated 234,580 people will be diagnosed with lung cancer in the United States [2]. Overall, one in 16 men and 1 in 17 women will be diagnosed with lung cancer in their lifetime, and approximately 125,000 die annually from lung cancer in the US. The primary objective of this research is to implement multivariate machine learning methods to improve the accuracy of patient outcome prediction. Patients' clinical and demographic information are integrated along with quantitative features about the tumor characteristics extracted from patients' lung CT scans. Univariate Cox proportional hazard (Cox PH) and multivariate models are utilized to identify significant features within the combined collection of data in the integrated dataset. A reduced feature set is created using identified factors. A reduced feature set is then employed in an ensemble learning algorithm for survival analysis, the so-called Random Survival Forest (RSF). RSF model can capture non-linear complex relationships within survival data. It is a nonparametric alternative method to conventional linear survival models [3]. Lung 1, a publicly available dataset of lung cancer patients, is used in this study. The dataset was split into training and testing sets, with 80% allocated to the training set and 20% allocated to the testing set. RSF was trained using the reduced feature set created from patients' information in Lung 1. The probability of 5-year survival for the patients in the test set was predicted. Lastly, Kaplan-Meier [4] curves were generated to compare the observed survival probabilities with the predicted ones by the proposed method. The outcomes are promising and encourage us to extend the proposed method and apply it to larger datasets of lung cancer patients.

Khalil Henderson

MA - Boston University

Discipline: Education

Authors:

Khalil Henderson

Jaime Rodriguez-Estrada

Abstract Name: Inspiring Excellence: The Interplay of Family and Teacher Support for Rural High Achieving African American Adolescent Males

This study investigates the academic achievement of African American adolescents, specifically African American males. Our research revolves around two questions: How do the relationships between African

American adolescent males and their teachers foster academic resilience, and how do familial relationships shape their academic achievement. This research is drawn from a larger study focusing on high-achieving rural African American students. Underscored by academic resilience, this qualitative study examines the perspectives of 7 high achieving males from a rural high school, “Allegheny High School” (a pseudonym), located in the southern region of the United States. Students earned an average GPA of 3.55. To understand the components that shape student achievement, the students participated in audio-recorded semi-structured interviews that lasted 45-60 minutes, with questions centering around family, teachers, and peer influence. Sample interview questions include: What does it mean to be a high-achieving student? How do your peers in the school view you? Teachers? What do your friends/parents/teachers/family members say about education and doing well in school? The interviews were analyzed using thematic analysis. Six crucial themes were generated, including but not limited to building and uplifting their community by using their education, the intersection of their determination to be academically high-achieving within an under-resourced school, and the desire to have a family. Despite the institutional adversity these students face, such as high poverty, low teacher retention, and a low graduation rate, they continue to persevere and show remarkable resilience. Dominant in the literature, deficit theoretical perspectives regarding African American student achievement erode efforts to better understand factors that support positive school performance among African American adolescent males. This study advocates for a shift in the research that emphasizes the diverse avenues of success and suggests the need for more research on rural African American males.

Jayda Hendrickson

GA - Spelman College

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Girls In the Hood: Analyzing the Experiences of Black Girls through Afro Pessimism

My research examines Afro-pessimism through a Black feminist lens, focusing on its implications for Black girlhood and the positionality of Black girls in the United States. Initially coined by David Rieff to analyze African policy, Afro-pessimism gained new relevance in Black Studies, particularly through Frank Wilderson's work. Wilderson redefined it as a framework to understand contemporary violence against Black bodies and the societal perception of Blackness. Afro-pessimism argues that Black individuals occupy the position of slaves despite legal emancipation. However, Afro-pessimism has significant gaps, especially in its treatment of gender and its neglect of Black adolescents, particularly Black girls, who are often not seen as fully conscious or sentient beings within academic discourse. My research aims to explore how Afro-pessimism can be used to analyze Black girlhood, carving out space in the framework to center the experiences of Black girls. My methodology will include the work of Robin Boylorn, who advocates for Blackgirl autoethnography as a research praxis. I will conduct a content analysis of social media platforms like TikTok, exploring how Black girls are depicted and ridiculed in the comments. Additionally, I will perform a textual analysis to explore how Black intellectuals incorporate or overlook Black girlhood. I will engage with the concept of ontological plasticity, as conceptualized by Zakiyyah Iman Jackson, to examine the existence and positionality of Black girls. In what ways is their existence malleable? How can the violence directed at Black girls be understood, given that they experience both racialized and de-racialized forms of transgression?

Rachel Hennessey

NJ - Kean University

Discipline: Business

Authors:

#1 Rachel Hennessey

#2 Aaron Van Klyton

Abstract Name: The Success of Sustainability Marketing Among Generation Z

This study aims to examine the effectiveness of sustainability marketing among Generation Z through four key hypotheses: (H1) Generation Z consumers understand and are aware of sustainability practices in business marketing, (H2) they perceive brands that prioritize sustainability as more trustworthy, (H3) sustainability influences their purchasing decisions, and (H4) they are willing to pay a premium for sustainable products. The goal is to help marketers understand the relationship between sustainability practices and the purchasing behaviors of Generation Z, particularly college-aged individuals (18-25 years old). This research is significant due to the limited understanding of Generation Z's habits/feelings towards sustainable products. Understanding the newest generation of consumers' attitudes toward sustainability can help brands improve customer retention and brand recognition. The study uses a quantitative online survey with 16 questions across four categories: (1) awareness of sustainability practices, (2) brand trustworthiness, (3) importance of sustainability in purchasing decisions, and (4) willingness to pay more for sustainable products. The definition of sustainability is provided for respondents along with preliminary questions. Attached below is a copy of the Hypothesised Model for this study based on the research hypotheses' and survey categories. A Five-Point Likert scale will measure participants' agreement with each statement. Target respondents are Generation Z (ages 18-25) in the metropolitan areas of New Jersey, New York, and Pennsylvania, aiming for 900 responses. Data will be analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS4.1. The findings will reveal insights into Generation Z's preferences and behaviors, providing valuable information for marketers to align their practices with this generation's values. It is expected that the findings will show a clear relation between Generation Z consumer spending and marketing that highlights sustainable initiatives.

Felix Henry

PA - University of Pittsburgh

Discipline: Biochemistry

Authors:

#1 Maria Jimenez-Vizcarra

#2 Sophie Bazydola

#3 Meng Wang

Abstract Name: Laccase-Mimicking Bionanozyme for Sustainable Removal of Water Contaminants

Chlorophenols are a widespread class of carcinogenic environmental contaminant found in various water sources, including tap water. Laccase is an enzyme has demonstrated the ability to degrade chlorophenols by reducing the hydroxyl group from the phenol molecule enabling further oxidized and breakdown into carbon dioxide and water. However laccase faces significant challenges for practical applications, due to its complex and expensive synthesis, poor stability to variable environmental conditions such as pH, Temperature, solute concentration, and tendency to denature over time, reducing its effectiveness. A promising alternative to harness laccase catalytic potential but overcome the downfalls of natural laccase we propose the use of bionanozymes. Bionanozymes are engineered artificial enzymes to closely mimic the active site of laccase. Bionanozymes are more cost- and resource-efficient to produce than natural enzymes and because of their artificial nature they show potential to improve the stability issues. Therefore, this study focuses on developing and implementing a methodology using a laccase-mimicking bionanozyme to degrade two chlorophenols, 2,4-dichlorophenol and 2,4,6-trichlorophenol, under varying pH and temperature conditions. Results demonstrate that the bionanozyme successfully achieved over 50% degradation of both chlorophenols

within two days. Furthermore, stability experiments confirmed that the bionanozyme outperforms natural laccase across a broad range of pH and temperature conditions, underscoring its potential as a robust and sustainable solution for chlorophenol degradation. These findings highlight the viability of bionanozymes as an effective alternative to natural laccase for chlorophenol degradation. By addressing key limitations associated with enzyme-based treatment, this study provides a promising pathway for the development of cost-effective, stable, and environmentally resilient solutions for water contaminant remediation.

Grace Henry

FL - Embry - Riddle Aeronautical University

Discipline: Physics and Astronomy

Authors:

#1 Ted von Hippel

Abstract Name: Aging Popular Exoplanet Host Stars; A Bayesian Analysis of Stellar Evolution

The discovery of exoplanets beyond our Solar System has transformed our understanding of planetary science and the potential for life elsewhere in the Universe. This project analyzes stellar ages and properties for a sample of stars hosting exoplanets in their habitable zones, utilizing the BASE-9 (Bayesian Analysis of Stellar Evolution) software suite. BASE-9 employs a Bayesian framework to model stellar parameters by integrating photometric, spectroscopic, and astrometric observations. This method provides posterior probability distributions for stellar parameters, offering robust estimations that account for uncertainties and correlations. The primary goal of this study is to refine the age estimates of exoplanet host stars, a crucial factor in assessing the long-term habitability of their exoplanets. The sample includes five well-characterized stars—Mu Arae, Upsilon Andromedae, HD 11964, HD 4732, and HD 73534—all of which host exoplanets within their respective habitable zones. The resulting stellar age estimates are 7.02, 3.60, 8.23, 3.31, and 4.06 billion years, respectively. These findings are analyzed in the context of exoplanet habitability and stellar evolution. By improving the precision of stellar age estimates, this research advances our understanding of the evolutionary history of stars with potentially habitable exoplanets. The study highlights the importance of sophisticated modeling tools like BASE-9 in exoplanet research, demonstrating how Bayesian techniques can yield more accurate and nuanced insights. Ultimately, this work contributes to a broader comprehension of the conditions that may support life in other star systems and informs future studies in planetary science and astrobiology.

Tess Herberg

MN - Minnesota State University - Mankato

Discipline: Engineering

Authors:

#1 Lukas Peterson

#2 Tess Herberg

Lukas Peterson

Abstract Name: Generative Versus Traditional Design in a 3d Printed Robotic Arm

This research seeks to find if a generatively designed robotic arm can outperform a traditionally designed robotic arm. For this research, a functional robot was used. A section of the robot's arm was picked out and its design constraints were recreated in CREO, a modeling software. The design constraints were then put

through a generative design function within the program. Both the traditional design and generative design were then tested for deflection while holding 10 pounds of force, with one end fastened. The arm section was tested alone without the rest of the robot, but both pieces met the criteria of being a functional arm piece. The pieces were also tested for theoretical deflection on the computer. The hypothesis was that generative design can outperform the traditional design at the same weight. It was found that the generatively designed part had less deflection than the traditional design. Generative design could continue to be used for higher optimized part design. 3D printing makes generative designs more viable in the manufacturing industry.

Isabela Herckes

AZ - Northern Arizona University

Discipline: Social Work and Human Services

Authors:

#1 Isabela Herckes

#2 Beth McManis

Abstract Name: What Do I Do? The Development of an Education Program for the Improvement of Interdisciplinary Collaboration in Child Welfare

Child maltreatment (i.e., abuse, neglect, trafficking, etc.) is a national epidemic and Coconino County, Arizona is no exception. Cases of suspected child maltreatment identified by medical staff and/or mandated reporters are referred to law enforcement and child protective services, with potential final resolution through the legal system. The first phase of the project aimed to identify potential issues in the child welfare system in Coconino County by interviewing current professionals involved in child maltreatment cases. Ten professionals from Flagstaff Medical Center, Flagstaff Police Department, Arizona Department of Child Services, and the Coconino County Attorney's Office were interviewed. The interviews were transcribed, and broad concepts were identified and then refined and developed into more narrow themes. The results from these interviews found that when collaborating with other departments and organizations, professionals working in child welfare experience frustration when fundamental miscommunications occur, particularly about the roles and responsibilities of each entity involved. This could include wrongful assumptions about the training or expertise of another entity or misunderstandings about the protocols or regulations that govern that other entity. The second phase of the project is the development of an online education program that provides essential background information about the role of each entity involved in a potential child welfare case, as well as basic information about child maltreatment and mandated reporting. This program will allow professionals working with child maltreatment cases, as well as non-medical mandated reporters such as teachers or clergy members, to better understand their role in a case, how and when to share information with other entities, and best practices for collaboration with others. The content validity of the education program will be evaluated through quantitative and qualitative feedback from child welfare professionals in Coconino County.

Amy Herd

NY - Fordham University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Amy Herd

Abstract Name: Dumy and the Nation: How Folk Songs Helped Compose a Distinct Ukrainian Narrative

Historiography and ethnography have played a critical role in the development of modern Slavic nationalisms, particularly in Ukraine. As these studies became increasingly popular in the nineteenth century, scholars and members of the bourgeoisie identified folk culture as the key component for the making of the modern nation. Viewed as an authentic window into national history and tradition due to their limited interaction with the modernizing world, rural folk offered the perfect opportunity to illustrate how Ukraine had always been distinct from Russia. As folk culture fervor gripped the intellectual elite of Eastern Europe, however, the focus quickly turned to what specific aspects of rural culture could prove most helpful in combating Russian imperial narratives. As a result, history, national mythology, and language all became critical components of Ukrainian nation-building. One aspect of rural culture, however, managed to combine all three: folk songs, known in Ukraine as *dumy*. Unfortunately, little scholarly attention has been paid to these pieces in Western academia, leaving most non-Ukrainians unaware of the critical factors that distinguish Ukraine and Russia. This paper seeks to remedy that deficit and its consequences by providing an accessible history and analysis of *dumy*. After contextualizing the need to define a distinct Ukrainian nation, it analyzes the intricate role that *dumy* have played in the making of Ukraine's national identity, using the songs themselves—as well as their popular interpretations—as primary sources. It proceeds to examine the differences in *dumy* preferred by Ukraine's folk versus elite. Then, fulfilling its main purpose, it showcases how folk culture was ultimately translated into patriotic songs that glorified and affirmed a distinct Ukrainian identity. Lastly, it explores the resurgence of *dumy* in light of Russia's 2022 full-scale invasion of Ukraine, illustrating how these pieces have taken on new life in Ukraine and the Ukrainian diaspora.

Andersen Herman

MD - Salisbury University

Discipline: Chemistry

Authors:

#1 Joshua Sokoloski

Abstract Name: Developing Ribonucleic Acid (RNA) Thermometers and Fluorescence Spectroscopy for Enzymatic Reactions in *Plasmodium falciparum*

This study investigates RNA thermometers in *Plasmodium falciparum* to understand how the parasite adapts to temperature changes. Using bioinformatics tools and NUPACK, we identified potential RNA sequences that change structure with temperature. These findings were validated through FRET experiments using a Cy3-Cy5 fluorophore pair, revealing RNA structural changes at different conditions. Our approach highlights the effectiveness of combining computational and experimental methods to study *Plasmodium* RNA. Future work will examine the effects of additional environmental factors and explore new therapeutic targets for malaria treatment.

Andrew Herman

IL - Eastern Illinois University

Discipline: Engineering

Authors:

#1 Eric Dongheon Ha

Abstract Name: Advancing high-efficiency solar cells through materials and structural design engineering

Developing next-generation energy sources is essential to meet the growing demands for electricity, especially with the rise of artificial intelligence (AI) technologies that require significantly higher electricity consumption for rapid computational processes. Consequently, the development of renewable, alternative energy sources has become more crucial than ever. In this study, we demonstrate a method to develop high-efficiency single-junction gallium arsenide (GaAs) solar cells using performance engineering. Specifically, we examine how the material properties of each solar cell layer and the structural design of the cells influence their power conversion efficiency. First, we optimize the thickness of each layer, considering key aspects of carrier dynamics, such as doping concentrations, diffusion lengths, and recombination rates. This optimization process, which determines the optoelectronic properties of the cells, is based on analytical calculations and simulations that solve Poisson's and Maxwell's equations. Next, we aim to further improve performance under optimized conditions by exploring methods to reduce sunlight-induced electron loss near the cell electrodes. To achieve this, we incorporate aluminum gallium arsenide ($\text{Al}_x\text{GaAs}_{1-x}$) window layers and adjust the aluminum content (x) to find the optimal conditions for minimizing carrier loss near the electrodes. Our results demonstrate that the quantum efficiency of the optimized GaAs solar cells can reach nearly 90% within the visible spectrum of sunlight. Further enhancements in performance are anticipated with the addition of lossless optical layers on top of the cells. This study presents a pathway to developing high-efficiency, renewable solar cells, addressing the world's increasing electricity needs.

Renae Hernandez

CO - University of Colorado at Boulder

Discipline: Environmental Science and Sustainability

Authors:

#1 Dr. Joanna Lambert

Abstract Name: Interpreting Human-Coyote Coexistence Through the Lens of Indigenous Peoples' Scholarship, Traditional Wisdom, and Scientific Knowledge

Anthropogenic impacts on wildlife habitat and populations are increasing the frequency and severity of human-wildlife conflict, suggesting a need for understanding how humans and wildlife have interacted in the historical past and ecological present. While many populations of wildlife species are declining, coyotes (*Canis latrans*) are increasing in distribution and population density. The highly adaptable nature and behavioral plasticity of coyotes render them an excellent case study for providing insight into larger apex predators who also experience human interaction. This work aims to evaluate whether there are lessons from Indigenous peoples' traditional wisdom and scientific knowledge for coexisting with coyotes. There is a gap in the understanding of "temporal and spatial patterns of human-coyote conflicts, despite that such information can be an important step in developing and optimizing management efforts." This work seeks to identify historical evidence of human-coyote relationships through temporal and spatial patterns of existing scholarly work and through oral histories of historical Indigenous peoples including the Cheyenne, Arapaho, Ute peoples and the many communities that have stewarded modern-day Colorado. The methodology of this paper will include a narrative review and interviews with local Indigenous keepers of traditional ecological knowledge. Throughout these interviews, I hope to garner oral histories on human and coyote relationships. I expect to find historical examples of coexistence with coyotes in the literature and through oral histories that can be applied to the current and future management of relationships. This research will contribute to our understanding of coyotes and provide critical insight into the ways in which Indigenous peoples navigated relationships with them historically. The findings could be valuable across interdisciplinary fields seeking to have a respectful relationship with coyotes. Coyotes cannot improve our relationship and interactions with them; it is our responsibility to do so as neighbors, scientists, and residents of this land.

Maria Hernandez

TX - Lone Star College

Discipline: Film/Photography Studies

Authors:

Abstract Name: Beyond The Event Horizon: Exploring Black Holes in Science, Film, and Society

This study investigates the potential of cinema in shaping public perceptions of astronomical phenomena by analyzing *The Black Hole* (1979) and *Interstellar* (2014), with an aim to explore the films' impact on popular scientific understanding and public engagement with black holes. Although black holes began capturing theatergoers' attention in the 1970s, evoking both fascination and fear, particularly with the release of Disney's *The Black Hole* (1979), such responses resulted in the limited knowledge available. Few studies compare the ways in which scientific accuracy in film influences public perceptions of astronomical phenomena. To address the impact of film on popular knowledge, this research integrates a comparative content analysis, drawing on the perspectives of physicist Kip Thorne, film scholar David Kirby, philosopher David Johnson, and historian Bina Nir. A synthesis of the films' visual effects, scientific dialogue, narrative accuracy, and statistical data on audience preferences for realism versus entertainment suggests that films are not only vital tools for confirming the existence of scientific phenomena but also for communicating complex scientific ideas to a broad audience. Disney's *The Black Hole* illustrates how even inaccurate scientific depictions can provoke interest and debate, suggesting that representations, regardless of fidelity, contribute to scientific dialogue and curiosity. Conversely, *Interstellar*, which involved collaboration with scientists to achieve higher accuracy in its interpretation, demonstrates the potential of films to profoundly influence public understanding and attitudes toward science. Future research could expand this study by exploring fictional depictions of other astronomical phenomena beyond black holes, such as the portrayal of wormholes in Carl Sagan's *Contact* and Dan Simmons' novel series *Hyperion Cantos*.

Jasmin Hernandez

CA - University of the Pacific

Discipline: Psychology

Authors:

#1 Rammy Salem

Abstract Name: The Effects of Racial/Ethnic Categorizations on Feelings of Belonging

Racial/ethnic minorities may at times be inadequately classified or denied the opportunity to self-identify with their preferred racial/ethnic groups. This misrepresentation can undermine their sense of belonging as members of societies that fail to recognize these identities. As a fundamental human need, belonging affects people's well-being and societal participation. This study explores whether inadequate representation of preferred racial/ethnic identities leads to social identity threat and whether such threats reduce feelings of belonging as U.S. Americans. Using a sample of Hispanic or Latino/a Americans, we employed an experimental design to manipulate how participants' preferred races/ethnicities were represented. Participants were randomly assigned to conditions that either adequately or inadequately represented their self-identified racial/ethnic groups. We hypothesized that inadequate representation would heighten feelings of social identity threat, characterized by concerns about exclusion, devaluation, and distinctiveness. Furthermore, we predicted that increased social identity threat would mediate a reduction in participants' sense of belonging as U.S. Americans. To test this model, a serial mediation analysis was conducted, with social identity threat as the mediator and belonging as the outcome variable. The results aligned with our hypotheses: participants in the inadequate representation condition reported greater social identity threat, which significantly predicted lower levels of belonging. This research highlights the importance of providing psychologically satisfying representations for fostering belonging for racial/ethnic minorities.

Emily Hernandez

FL - Florida International University

Discipline: Health and Human Development

Authors:

#1 Katherine Semidey

#2 Amilcar Castellano-Sánchez

#3 Doured Daghistani

Abstract Name: Acute Leukemia in Hispanic Children and Health Disparities in South Florida

Research has demonstrated various health disparities affecting the outcomes of Hispanic patients with leukemia including access to healthcare, socioeconomic status, incidence, and mortality. These disparities have indicated a significant negative impact on health outcomes including decreased survival, higher incidence rates, as well as treatment-related mortality of Hispanics within the United States. The objective of this study is to assess the extent of health disparities that affect the health outcomes of Hispanic pediatric patients with AL in South Florida. The researcher intends to retrospectively analyze patient medical records from the oncologist group at XYZ Children's Hospital from 2012 to 2022 by investigating the participants and their health outcomes through 5-year survival, incident, and mortality rates in terms of treatment-related mortality. This study will be observing health disparities including insurance status, type of insurance, access to treatment as well as preventative medicine through primary care visits and socioeconomic status based on place of residence. The researcher hypothesizes that health disparities will have a negative impact on health outcomes for Hispanic pediatric patients with AL within South Florida. This study can help providers understand how health disparities affect their patients and work towards the improvement of healthcare policy to alleviate the effects that occur within the Hispanic population. Providers can also create treatment plans considering the evaluation and management of the patient's needs. These findings can serve to help shape health policies that prevent barriers caused by social determinants of health.

Sayla Hernandez

WI - University of Wisconsin-La Crosse

Discipline: Psychology

Authors:

Abstract Name: Managing and Minimizing Racism and Diversity Resistance in the Workplace

Combating systemic racism in the workplace involves addressing deeply rooted institutional biases and discriminatory practices that disadvantage certain groups. However, these efforts often face challenges due to diversity resistance within organizations. Overcoming this resistance requires fostering a culture of openness, education on the benefits of diversity, and creating accountability structures to ensure that equity and inclusion goals are met. Drawing on the work of Daniels (2022), the current research presents a framework to guide companies seeking to enhance inclusivity and deepen their understanding of diversity. This framework is supported by qualitative research that sampled business organizations as to their current diversity, equity and inclusion policies and practices. It serves as a starting point for driving meaningful and measurable change.

Diego Hernandez Barreras

FL - Miami Dade College

Discipline: Chemistry

Authors:

Abstract Name: Chemical Graph Theory and Machine Learning for Predicting Physicochemical Properties of Organic Compounds

Chemical graph theory uses discrete mathematics to model the physical and biological properties of chemical compounds by representing molecular structures as graphs, where vertices denote atoms and edges represent bonds. Once represented in graph form, topological indices—such as atom-bond connectivity, geometric-arithmetic indices, and distance-based indices—are used to characterize molecular geometry and correlate with experimental properties. This study applies these indices to predict key physicochemical properties, including boiling and melting points and solubility, for various organic compounds (e.g., hydrocarbons and those with nitrogen, oxygen, and halogens). Using Quantitative Structure-Property Relationship (QSPR) analysis, we examine correlations between topological indices and these properties, leveraging machine learning techniques like nonlinear regression and deep learning algorithms to capture complex relationships. Model refinement incorporates the Neos Server Filter for generating equations and Wolfram Mathematica for computing mathematical descriptors, with TensorFlow and scikit-learn supporting model development. The resulting predictive models aim to estimate physical properties for compounds lacking experimental data, advancing compound design and optimization in drug discovery, materials science, and environmental chemistry.

Oscar Hernandez Reyes

TX - The University of Texas at San Antonio

Discipline: Biology

Authors:

#1 Andre Felton

#2 Jose Bruno Del Rio-Malewski

#3 Daniela Cortez

#4 Cristina Mendez

#5 Meredith Slimp

#6 Briaunna Zamarripa

#7 Jeffrey Hutchinson

Abstract Name: Effects of Microplastic Uptake on Amphibian Growth & Development

Microplastic pollution has been shown to be ubiquitous across freshwater systems, yet our understanding of exposure routes and effects on concurrent biota is limited. In this study, the effects of chronic microplastic exposure on amphibian growth and development throughout larval and metamorphic stages were examined using *Xenopus laevis*. Tadpoles across four different treatment concentrations were exposed to polyethylene microplastic fragments throughout larval and metamorphic development. Exposed tadpoles were smaller throughout metamorphosis and developed faster toward metamorphic climax. Microplastics were found in the tissues of exposed individuals during and following metamorphic climax.

Katherine Herrera

CA - University of California - Merced

Discipline: Psychology

Authors:

#1 Colin Holbrook

Abstract Name: Eliciting Moral Elevation with a Humanoid Robot

Elevation is a unique emotion that occurs when a person witnesses a prosocial act and feels inspired to also act prosocially. It is characterized by feelings of warmth in the chest, being uplifted, moved, and optimistic about humanity. While research has shown that prosocial acts by humans can increase feelings of elevation, none to date have examined whether highly altruistic robots can also evoke the positive emotion. This online study investigated whether Engineered Arts' Ameca, an advanced humanoid robot, could elicit moral elevation by recounting a heroic story in which it saves a little girl from a fire. Participants were randomly assigned to either the highly altruistic first responder Ameca survey or the amused restaurant server Ameca survey (our control). Both conditions included a video where the corresponding Ameca told a memorable story from its job in an interview. We predicted that participants would report higher levels of elevation in the experimental condition compared to the control condition, as measured by Sparks et al.'s elevation scale. We also believed idealism, the belief that humans are generally cooperative, to be a potential moderator for elevation. Our findings support these predictions, with the effect of condition on elevation being moderated by whether participants believed that the story was real and idealism predicting greater elevation in the first responder condition when participants believed that the story was real. As robots become more integrated into society, it is important to understand whether people are able to view them as capable moral agents and be positively influenced by their prosocial behavior.

Cheyenne Herrmann

OK - University of Central Oklahoma

Discipline: Nursing and Public Health

Authors:

Abstract Name: Educating Parents on Safe Sleep Practices for Newborns

Background: Sudden infant death syndrome has become a more common cause of death in infants, due to the lack of education about the topic. The review of literature showed a gap in knowledge regarding healthcare workers not following all the required hospital guidelines, parents and families are not being educated properly, underserved populations are unable to access all information quickly and easily, and a lack of up-to-date studies being available to everyone are the main concerns regarding safe sleep. Since this issue is becoming more common, more education and information on safe sleep can help parents make sure their child is safe during sleep. The increased awareness for safe sleep practices for newborns is a crucial step in reducing the risk of SIDS and other sleep related issues. Purpose: The purpose of this project is to effectively educate parents on useful strategies and proper recommendations to ensure a safe sleeping environment for their infants. Method: Providing informational material such as pamphlets or a presentation to the community at a local hospital or clinic to mothers to address these concerns in the gaps in knowledge to allow for more access to the information. Pregnant women, new mothers and caregivers need adequate information to be able to care for their babies the best, and with this information, complications such as SIDS can be prevented or reduced significant by enhancing infant safety during sleep. Conclusion: Providing parents safe sleep practice material is essential in helping reduce the risk of SIDS. Evidence-based practices, such as back sleeping, using a firm and separate sleep surface, and avoiding soft bedding, remain the cornerstone of safe sleep

guidelines. A safe sleep environment contributes to the overall health and well-being of an infant. Keywords: safe sleep, newborns, SIDS, infant safety, parental education

Lauren HerrNeckar

OK - East Central University

Discipline: Biology

Authors:

#1 Alisha Howard

Abstract Name: EXPERIMENTAL INVESTIGATION OF GENETIC EVIDENCE TO DETERMINE THE MOLECULAR ETIOLOGY OF CANINE ANASARCA

Fetal anasarca is a homeostatic imbalance of the subcutaneous fluids of the body, resulting in the bodily swelling of a fetus.¹ When present in canines, this condition results in offspring born as “water puppies.” Water puppies are characterized by generalized edema and are often stillborn or die soon after birth. The exact cause of fetal anasarca has not been identified, but the etiology is likely multifactorial. Recent studies demonstrate an increased prevalence of canine anasarca and other harmful genetic conditions in brachycephalic dog breeds, such as bulldogs.² This is likely due to a lack of genetic diversity in the breed, resulting from many generations of selective breeding. Noting the increase in mutations among the brachycephalic breeds found in previous studies, it can be hypothesized that there is a genetic link to canine anasarca found in the bulldog genome.² Genes of interest have been identified, but the determination of the presence of a genetic mutation with possible linkage to canine anasarca is ongoing. This thesis aims to examine and explain the tested target genes of interest and to help progress studies investigating a genetic linkage to the condition. This was done through trait identification through literature review followed by bioinformatic analysis of submitted bulldog genomes, loci amplification primer design and preliminary proof-of-concept analysis. Several genes of interest were identified due to their connection to other conditions common in brachycephalic breeds, as well as associations with the circulatory and urinary systems believed to play a role in anasarca development.

Amelia Herron

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Amelia Herron

Abstract Name: The Role of Calcium Sensitive GAPs in Endocytic Trafficking Pathway

Rab GTPases are master regulators of endocytic and secretory pathways. The activity of Rab GTPases is a tightly regulated cascade depending on guanine nucleotide exchange factors (GEFs) and GTPase-activating proteins (GAPs). Rab GAPs facilitate Rab dissociation from membranes, ensuring proper boundaries and transition of different membrane compartments during trafficking. Dysregulation of Rab-GAP activity has been shown to disrupt the Rab-cascades and cause impairment of endocytic and secretory pathways. A fundamental yet unresolved question is how the precise spatial and temporal activation of Rab GAPs is regulated. In this study, we identified a novel RabGAP, namely TBC1D9B, which contains an EF-hand calcium-sensing domain. Of note, calcium flux, regulated by calcium channels, has been implicated in various membrane trafficking pathways, including endocytosis, exocytosis, and endolysosomal fusion. To

evaluate whether TBC1D9B functions as a bona fide Rab10 GAP and whether its GAP activity is dependent on Ca^{2+} , we performed a GTP hydrolysis assay using purified recombinant TBC1D9B and Rab10 proteins. Our findings demonstrated that TBC1D9B exhibited robust GAP activity toward Rab10 only in the presence of calcium. Additional immunofluorescence staining suggests that TBC1D9B is primarily localized on endolysosomes in neurons and macrophages, indicating that TBC1D9 may sense calcium signal on these subcellular organelles to control downstream Rabs. Importantly, EF-hand-containing Rab GAPs are implicated in diseases such as nephrotic syndrome, breast cancer, and Alzheimer's disease, underscoring the broad disease-relevance of these pathways. This research could shed light on how dysregulation of calcium-dependent GAP activity contributes to the pathogenesis of a variety of diseases.

Hank Herzfeld

AR - University of Arkansas

Discipline: History

Authors:

#1 Hank Herzfeld

Abstract Name: The Stasi Remembered as the Face of GDR Disappointment

The East German Ministry for State Security (Stasi) holds an incredibly complex place in German historical memory because of its connections to grand cultural debates about the legacy and history of Germany. Their depiction in films has been a dynamic tool for commenting on the human condition, the state of life in the GDR, and individual complicity in government abuse. The Stasi have featured in mega-hits like *Das Leben der Anderen* (2006), *Good Bye, Lenin!* (2004), and *Sonnenallee* (1999) and a revival in pop culture with *Kleo* (2022-2024). These and many other films comment on life as it was in the GDR through both dramatic and comedic approaches, and in so doing rely on the Stasi to embody a majority of the most negative elements that people hated about living behind the iron curtain: a vindictive government, a lack of autonomy, and a dominating anxiety. This research exposes this film trope along with its complexity in dealing with questions of German historical memory as a whole and connects these trends back to the Stasi's film representation in GDR-era films. This research is designed to address the development of the East German Ministry for State Security's historical memory as represented and understood through films both in and after the GDR's rule over East Germany. This research is based in primary source analysis to determine trends in film personifications of the Stasi. These films consist of solely German productions with Stasi representation ranging from primary protagonist and antagonist roles to absence in the film altogether. After several screenings of each film, common trends and associations to contexts in historical memory are drawn to conclude the state of memory at the production of that film and connections to previous and future trends in memory.

Alana Hess

CA - Cuesta College

Discipline: Physics and Astronomy

Authors:

Abstract Name: Investigation of the Orbital History of a Double Star (Binary Pair)

The purpose of conducting this research was to examine binary star systems based on certain criteria that allow for the LCO telescope to successfully photograph a binary pair. The selected system, WDS 06243-

2801, was further examined by taking seven telescope photos and interpreting the data. The use of advanced telescopes and programs like Afterglow allows for precise astronomical data analysis. After uploading those photographs into the Afterglow program, calculations were done to determine the distance between stars and the angular position of the secondary star relative to the primary star. However, the research remains inconclusive, as a solved parallax is required for a more accurate understanding of the system's dynamics. Future telescopic observations will help refine this study and will reveal more about binary behavior. The objective for this phase of the research was to add a new orbital point to the plot, incorporating all available data from 1879. This goal was successfully achieved using the current data for 2024, laying the groundwork for continued research into this binary star system. The analysis of the measurements was conducted by Astr 299 students at Cuesta College, California, USA. Observing binary systems allows scientists to investigate how gravitational interactions and orbital dynamics shape the behavior and evolution of stars.

Ellen Heunisch

WI - University of Wisconsin-Eau Claire

Discipline: History

Authors:

#1 Ellen Heunisch

#2 Dana Anderson

#3 Jaden Olski

#4 Tylor Rocha

#5 Reed Ziemer

#6 Faith Fogarty

#7 Harry Jol

#8 Philip Reeder

#9 Martin Goettl

Abstract Name: The Search for Jungfernhof Work Camp Prisoner Barracks Riga, Latvia Using Ground Penetrating Radar

Mazjumpramuizha, a park along the Daugava River sitting 10 kilometers outside of Riga provides space for a variety of leisure activities. The site however lacks substantial acknowledgment of the history of the land, Jungfernhof Work Camp. After WWII, only three buildings remained from the Nazi-controlled camp. The members of the Jews in Latvia Museum requested ground penetrating radar (GPR) technology on the site to confirm the true history of the area. The goal of this project is to locate the prisoner barracks described by survivor testimonies and geospatial evidence. GRP is a non-invasive scanning methodology that transmits electromagnetic pulses into the subsurface which reflects off features and horizons to the receiving antenna. The GPR utilized was a Sensor and Software pulseEKKO Pro with a 500MHz antenna, collecting traces every 2.0 cm by an odometer wheel. Three grids were laid, 20x10 m, 20x18 m, and 18x22 m, and elevation inside the grid was recorded with a Topcon-RL-H4C self-leveling laser that was georeferenced with the GPR data. In the subsurface of these grids, disturbances were observed from 0.0-2.5 m of what is interpreted to be the external walls of the barracks. After performing "ground truthing", a process that confirms findings by excavation, a rock base foundation, and barbed wire were discovered 0.5 m below the surface at latitude 56°53'29.279"N and longitude 24°12'4.449"E. These interceptions gave strong evidence of where the Jungfernhof barracks were located, allowing the site to be memorialized by the Jews in Latvia Museum with a statue called "The Locker of Memory".

Sithmi Hewage

IA - Iowa State University

Discipline: Engineering

Authors:

#1 Siddhant Bhardwaj

#2 Michael Forrester

#3 Eric Cochran

Abstract Name: Functionalization of Biobased Nylon-6,6 Copolymers to Enhance Thermomechanical Properties

Nylon 6,6 is a highly versatile thermoplastic known for its use in various applications such as clothing, footwear, automotive parts, and fishnets. Its exceptional mechanical properties and abrasion resistance make it an important material across multiple industries. However, conventional synthesis of such ubiquitous materials heavily depends on finite petrochemical sources. These processes result in greenhouse gas emissions that adversely affect the environment by accelerating global climate change. Renewable sources such as biomass offer a sustainable pathway for producing green nylon 6,6. Biomass is a promising source of bio-privileged molecules that offer the potential to develop alternatives to conventional petrochemical-based plastics such as nylon 6,6. Moreover, when introduced as comonomers, the unique chemistry of these molecules can introduce valuable new properties that justify their initially high manufacturing cost. This work investigates the post-polymerization functionalization of such a “bio-privileged” nylon, focusing on crosslinking to dramatically improve its thermomechanical characteristics. The degree of crosslinking was varied, allowing adjustments to the material’s properties. Experimental results demonstrated an increase in decomposition temperature from 340 °C to 400 °C after treatment. The storage modulus of functionalized nylon increased significantly, from 2400 MPa to 8200 MPa. These enhancements are directly linked to the specific treatment conditions. Results show that bio-privileged monomers, combined with innovative functionalization strategies, can yield eco-friendly high-performance polymer resins.

Kendall Hewitt

VA - James Madison University

Discipline: Psychology

Authors:

#1 Kendall Hewitt

#2 Chris Johnson

#3 David Szwedo

Abstract Name: Associations between Adolescent Attachment, Gender Identity, and Young Adult Romantic Relationships

Research has shown that parental relationships influence children's attachment styles. This study aims to extend this research by using extensive longitudinal data to understand how one’s attachment relationship with their parents in early adolescence may predict their attachment within romantic relationships in early adulthood. It was predicted that attachment style at 14 would be positively predictive of the same attachment style within teens’ later romantic relationships at age 24. The study further aimed to help explain such associations by examining whether or not specific attachment-related behaviors may help account for them. Finally, this study explored the potential role of gender identity for shaping one’s attachment style. It was hypothesized that male gender identity would predict more insecure attachment styles in adolescence and in later romantic relationships, and that female gender identity would predict more secure attachment styles in childhood and romantic relationships. Regression analyses were used to assess attachment at age 14 as a predictor of young adult romantic attachment quality at 24, and then attachment related behaviors at age 22 were examined as potential mediators. Analyses revealed a negative association between dismissive attachment quality to parents at age 14 and avoidant attachment to romantic partners at age 24. However, this

association was mediated by dismissive romantic intimacy behaviors in adulthood. Furthermore, gender was identified as a predictor of attachment quality, as male gender identity predicted dismissive and deactivated attachment quality to parents at age 14 and avoidant attachment to romantic partners at age 24, while female gender identity predicted secure and preoccupied attachment quality to parents at age 14. Results show that gender does impact attachment quality in both adolescence and in romantic relationships, and that attachment quality to parents in adolescence is monumental to an individual's quality of attachment in romantic relationships in emerging adulthood.

Hannah Heyse

WI - University of Wisconsin-Whitewater

Discipline: Environmental Science and Sustainability

Authors:

#1 Dale Splinter

Alexandra Kiesler

Abstract Name: Water Quality Analysis of a Trout Stream in Southeast Wisconsin

The analysis of water quality metrics is important to indicate stream health. This is especially important in trout streams where many invertebrates and other organisms rely on specific water quality measures to support a healthy ecosystem. In this project, we examined changes in multiple water quality metric levels along Bluff Creek. Bluff Creek is a spring-fed stream and is a tributary to Whitewater Creek in southeast Wisconsin. The ultimate purpose of the project is to examine temporal and seasonal changes in a high-quality stream system. Once a month, beginning in June 2024, water quality metrics were recorded every two hours from sunrise to sunset at a sampling point along Bluff Creek. These measurements were collected using a YSI meter including dissolved oxygen, water temperature, pH, conductivity, and total dissolved solids. Water clarity was measured using a turbidity tube. A relationship exists among many of these metrics. Dissolved oxygen levels peak around mid-afternoon, often aligning with air and water temperature peaks. From June to November, peak dissolved oxygen at noon changed from 124% to 104%. The photosynthesis of aquatic plants best explains this. Upstream of the sampling point submerged aquatic vegetation provides high amounts of oxygen to the stream system. As atmospheric temperature decreases, the range of dissolved oxygen declines. In addition, a noticeable decrease in pH and conductivity occurs. Water clarity is exceptionally high, measuring over 120 cm on all days sampled. An attempt to map headwater springs was initiated in October 2024 and will continue into the spring. Mapping springs allows for understanding upstream-to-downstream fluctuations in dissolved oxygen. Monthly sampling will continue throughout 2025 to examine patterns of water quality relationships as daylight and photosynthesis change.

Melissa Hicks

NY - SUNY Onondaga Community College

Discipline:

Authors:

Colleen Stevens

Abstract Name: Equitable, Accessible, Short-Term Science Research for Community College Students

The Council for Undergraduate Research (CUR) defines undergraduate research as “a mentored investigation or creative inquiry conducted by undergraduates that seeks to make a scholarly or artistic contribution to

knowledge.” Undergraduate STEM students who are unable to complete the “traditional” full summer, 8–10-week research programs are left out of enriching experiences that impact their sense of belonging in STEM, knowledge of STEM career paths, growth mindset, and transfer goals. Thus, to support community college students with an interest in STEM, adoption of a high-impact undergraduate research experience is needed. This project creates equitable, accessible, paid, non-credit research opportunities in STEM for community college students through the implementation of a 1–2-week authentic science research experience at a local partner four-year institution. The broad goal of this program is to increase the number of community college STEM students participating in science research before transferring to their bachelor program, firmly placing them amongst other experienced undergraduate science researchers. Pre-and post-survey results of participating undergraduate students have shown increases in sense of belonging in science, confidence, and technical skills. Semester to semester retention along with graduation and transfer numbers have been favorable amongst our participants. Several students have continued researching in their host labs beyond the initial program. Research professor mentors have reported having a productive working relationship with student mentees and that our students have contributed to their ongoing research. Our presentation will further describe the history, growth, and implementation details of the project demonstrating that other colleges can replicate this model at their own schools.

Morgan Hicks

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Michelle Gray

Abstract Name: Striatal astrocytes and their morphological changes in Huntington’s disease

Huntington's disease (HD) is a fatal neurodegenerative disease caused by a CAG repeat expansion in the gene encoding the huntingtin (HTT) protein, leading to an expanded polyglutamine repeat in the protein. The mutation causes motor, cognitive, and psychiatric deficits in HD patients. Currently, there is no treatment to prevent the development and progression of this disease. This disease causes significant degeneration of medium spiny neurons (MSNs) in the striatum; a region subdivided into patch and matrix compartments that are critically involved in deficits seen in HD. Research regarding astrocytes has demonstrated their important roles in this disease. Interestingly, astrocytes undergo morphological changes that may indicate their dysfunction in HD. Furthermore, using the mutant HTT (mHTT) expressing and slowly progressing BACHD mouse model that has motor, psychiatric-like and cognitive deficits that worsen with age, we have demonstrated the contribution of mHTT expressing astrocytes to the progression of HD phenotypes. However, it is unclear if astrocytes in the striatum have abnormal morphology in the BACHD mice. We first studied the cellular volume of striatal astrocytes in young BACHD and WT mice. We found that astrocyte volume in young BACHD mice was not different from WT mice. Further studies will be performed in striatal subregions and on aged BACHD mice when overall striatal volume is decreased. These results indicate that morphological changes in astrocytes as demonstrated by cell volume alterations are not present at this early age in BACHD mice and suggest that any volume changes may progress as disease becomes more severe.

Megan Hicks

CA - Chapman University

Discipline: Biochemistry

Authors:

#1 Andrew Lyons
#2 E. Daniel Cardenas-Vasquez

Abstract Name: Rheological Insights into Microgel Behavior: Modeling Velocity Profiles and Flow Characteristics

The velocity profile of a fluid is characteristic of most essential processes and is determined by factors such as flow geometry, the properties of the fluid itself and the pressure it undergoes. Understanding microgels' physical principles and statistical relationships is crucial to the success and advancement of biomedical and pharmaceutical applications. Viscosity measurements across multiple temperatures (20°, 27°, 32°, and 37 ° C) and microgel concentrations (50, 100, and 150 mg/mL) in 100 mM NaCl and water allows for the determination of the velocity profile at each concentration. The experimental data obtained were fitted to a Herschely-Bulkley model, an effective model for representing the behavior of a non-Newtonian fluid like microgels. The rheological analysis of microgels provided crucial insights into the concentration-dependent flow behavior and may aid in optimizing various biomedical applications such as drug delivery.

Darryl Higgins

LA - Louisiana State University, Baton Rouge

Discipline: Biochemistry

Authors:

#1 Nathaniel Gilbert

Abstract Name: Using Artificial Intelligence (AI) to help elucidate functional properties and potential regulatory mechanisms of Tomato LOXA activity

Lipoxygenases (LOXs) are enzymes that are widely conserved in many plant and animal species. These enzymes oxidize polyunsaturated fatty acids, forming hydroperoxides as products. The products of LOXs are vital precursors to inflammatory regulatory molecules in humans, and molecules that dictate seed germination and responses to stress in plants. The enzymatic activity of many vertebrate LOXs is regulated by the presence and binding of calcium to allosteric sites. In the plant kingdom, few LOXs have been previously shown to be calcium regulated. Using AlphaFold3 (AF3), an AI-powered, protein-folding prediction server, we have uncovered a potentially novel binding site and regulatory mechanism for calcium binding to Tomato LOXA. We predict that the binding of calcium to Tomato LOXA elicits a conformational change that alters the enzyme's ability to acquire and modify substrate. The purpose of this project is to evaluate calcium's potential role as an allosteric regulator. We are utilizing site-directed mutagenesis, kinetics assays, and structural predictions by AF3 to test the role of this novel calcium-binding site. Discovering the potential binding site of calcium to Tomato LOXA and how it alters the enzyme kinetics would present a new form of enzyme regulation for plant LOXs. Future studies could include altering the calcium-binding site in plant LOXs in vivo to better understand how calcium regulation alters the function that LOX products play during stress responses and maturation.

Ella Higgs

OK - University of Central Oklahoma

Discipline: Art History

Authors:

Abstract Name: It's A Barbie World: An Analysis of the Barbie Doll's History, Design, and Impact on the World

This study explores the continuous cultural impact of Barbie, the iconic doll created by Ruth Handler, and examines her evolution from a simple toy to a global symbol of empowerment and controversy. Barbie's design concept was developed in 1959, driven by Handler's desire to provide young girls with a relatable and highly driven figure that differed from traditional baby dolls. The paper traces the development of Barbie from her early designs, shaped by societal influences and Handler's vision, to her modern image that reflects the ideas of diversity, inclusivity, and female empowerment. It highlights Barbie's role in shaping young girls' self-image, her economic significance in the toy industry, and her influence on broader cultural and media trends, including her resurgence following the 2023 Barbie movie. Despite ongoing debates regarding her unrealistic body proportions and the potential impact on body image, Barbie has continuously adapted, promoting creativity and ambition through her vast array of careers and representation. Ultimately, Barbie's legacy serves as a testament to Ruth Handler's innovation and the evolving societal ideals of femininity, proving that Barbie has grown as more than just a doll but is now a complex symbol of possibility and progress. This paper examines the multifaceted impact of Barbie by tracing her evolution from the first doll in 1959 to her status as a symbol of empowerment and controversy. It explores Ruth Handler's vision and the societal influences that shaped Barbie's design and marketing, analyzing how her physical representation reflects and challenges ideals of femininity. Furthermore, this study highlights how Barbie's design has overwhelming influence on the self-image of young girls, her economic impact on the toy industry, and her role in inspiring future media, ultimately positioning her as a complex figure in both play and design.

Jonah Higley

PA - Penn State Behrend

Discipline: Chemistry

Authors:

David Bialas

Derek Hillhouse

Abstract Name: Synthesis and Characterization of Bis(diketopyrrolopyrrole) Dyes

Diketopyrrolopyrrole (DPP) dyes are promising candidates for applications in optoelectronics due to their high thermal and photo-stability as well as their high fluorescence quantum yield. Furthermore, the absorption properties can be tuned over a wide range by the introduction of electron-withdrawing or electron-donating substituents to the DPP core. Within aggregates, the optical features are also affected by interchromophoric interactions. Recent studies have shown that donor-acceptor interactions can be very pronounced in thiophene-functionalized DPP derivatives which lead to drastic changes in the absorption spectra of the dyes. These interactions are very sensitive to structural changes, but systematic studies on this effect are currently missing. In our poster, we will present the synthesis of a series of bis(DPP) dyes in which two thiophene-functionalized DPP chromophores are covalently linked by a triptycene moiety. Various spacers are used to induce different longitudinal displacements between the chromophores as revealed by the geometry-optimized structures. Therefore, different donor-acceptor interactions are present within the different bis(DPP) dyes which should significantly alter the absorption spectra of the dyes. The results obtained from our studies will provide insight into the impact of the donor-acceptor interactions on the optical spectra of DPP derivatives which is crucial to design dye systems with desired optical features.

Ella Hildebrand

Discipline: Biology

Authors:

#1 Ella Hildebrand

#2 Kandarp Dave

#3 Devika Manickam

Abstract Name: The Delivery of Mitochondria-Containing Extracellular Vesicles to the Blood-Brain Barrier as a Treatment of Ischemic Stroke

Following an ischemic stroke, mitochondrial function in blood-brain barrier endothelial cells is impaired. Extracellular vesicles are naturally secreted by all cells in the body. Microvesicles (MVs), a subtype of extracellular vesicles, naturally transfer mitochondrial components between cells, raising ATP levels, therefore increasing bioenergetics and survival under conditions of cell duress. We hypothesize that mouse brain endothelial cell (bEND.3)-derived MVs will increase BEC ATP levels and show neuroprotection and behavioral recovery in a mouse model of stroke. In the present study, we isolated MVs from a mouse brain endothelial (bEND.3) cell line and characterized their particle sizes and protein biomarkers. We tested ATP levels and mitochondrial transfer in MV-treated BECs under ischemic conditions. BEC-derived MVs were found to increase recipient ischemic endothelial ATP levels. Likewise, MVs transferred mitochondria to recipient BECs. Future studies will administer bEND.3 MVs in a mouse model of stroke and determine brain infarct volumes and behavioral recovery.

Tomás Hill

WI - University of Wisconsin-Milwaukee

Discipline: Psychology

Authors:

#1 Tomás Hill

#2 Gabriela Nagy

Abstract Name: Developing Culturally Responsive Research Tools: Assessing Semi-Structured Interview Guides for Native American Communities

Native American communities face disproportionately high rates of mental health challenges due to systemic oppression and intergenerational trauma. A history of unethical research practices targeting this community has fueled mistrust toward research and healthcare systems (Harding et al., 2012), prompting scholars to advocate for methodologies prioritizing cultural responsiveness and community engagement. This is especially important when researching sensitive topics like mental health. To conduct ethical research with Native American communities, this project seeks to compile preliminary feedback from Native American community members on the methods and tools for a qualitative project to ensure cultural relevance. The project will employ community-engaged, iterative design methods to compile feedback on a semi-structured interview guide focused on mental health and resilience within Native American communities. We will conduct key informant interviews (n=3) and prototyping sessions (n=10) with Native American adults and professionals experienced in Indigenous contexts. Participants will be recruited via community outreach and university networks. We will gather feedback on cultural relevance, cultural appropriateness, and clarity. We will analyze data using rapid qualitative analysis methods to refine the semi-structured guide. Preliminary findings from key informant interviews emphasize the value of culturally grounded methodologies. Participants have stressed the importance of inclusive terminology and respecting Indigenous knowledge systems. Additionally, Native data sovereignty emerged as a key priority, underscoring the need for ongoing consent, transparency, and community ownership of research processes. This study provides critical insights

into the acceptability of a semi-structured interview guide for Native American communities, offering a framework to make research methods more culturally responsive. The findings are expected to guide future studies in refining methodologies to better align with Indigenous perspectives and values. Additionally, this work establishes a foundation for a larger qualitative study exploring the resilience and coping mechanisms of Native Americans.

Derek Hillhouse

PA - Pennsylvania State University

Discipline: Chemistry

Authors:

#1 Derek Hillhouse

Abstract Name: Synthesis and Characterization of a Water-Soluble Squaraine Dye

Squaraine dyes have the potential for application in organic photovoltaics, sensors and biomedical applications. Many squaraine derivatives have sharp UV/Vis absorption bands and high fluorescence quantum yields which is beneficial for biomedical applications. Notably, the spectral features of most squaraine dyes depend on the solvent polarity. Furthermore, spectral changes are also obtained upon aggregation which is impacted by an interplay of long- and short-range coupling between the chromophores. These changes can be very significant and are sensitive to structural rearrangements. Hence, it is crucial to establish structure-property relationships for the dye aggregates in order to design materials with tailored spectral properties. We have synthesized a water-soluble squaraine dye and investigated the UV/Vis absorption properties in various solvents. The employed water-solubilizing group enabled us to perform UV/Vis studies in non-polar and polar solvents including water. Interestingly, the monomer absorption spectra differ due to the different solvent polarity which can be attributed to changes of the optimum geometry in the ground and excited state of the chromophore. We will also present our results obtained from UV/Vis aggregation studies in different solvents which reveal spectral changes for the aggregate spectra in comparison to the monomer.

Simon Hinmon

CA - University of the Pacific

Discipline: History

Authors:

Abstract Name: From Vassalization to Colonization: Vietnam's Shift from the Sinophone to Francophone World

Vietnam's cultural and historical identity has been influenced by Chinese and French conquest with both empires impacting culture. The main three cultural aspects that were heavily influenced and analyzed are ceramics, literature, and architecture. This fusion of Chinese and European cultures with the native methods define Vietnam's unique cultural landscape today. A long history of Vassalization and the process of Sinicization is looked over and analyzed alongside the colonization of the region and the process of Francization.

Oscar Hinojosa

MN - Hamline University

Discipline: Biology

Authors:

#1 Betsy Martinez-Vaz

#2 Leif Hembre

#3 Ryan Larson

Abstract Name: A Study on Antimicrobial Producers in a Freshwater Aquatic Environment

A global health crisis is emerging as bacteria become resistant to antibiotics, leading to increased hospital deaths. The purpose of this project was to investigate the antimicrobial properties of bacteria sourced from Como Lake in St. Paul, MN. It was hypothesized that the bacteria would exhibit antimicrobial activity, as they have evolved mechanisms to outcompete other bacterial species and establish themselves in the environment. Samples were collected from swabs of bluegill fish (anal, oral, and sidescale), gastric lavage, and shore sediment. Bacteria were diluted and plated on LB and TSA + cyclohexylamine plates to test their activity against eight safe relatives of antibiotic-resistant pathogens: *E. coli*, *B. subtilis*, *S. epidermidis*, *E. carotovora*, *A. sobria*, *P. putida*, *M. smegmatis*, and *A. baylyi*. Antibiotic production was detected by the appearance of clear inhibition zones around microbial isolates when grown on plates containing superbug relatives. Out of 50 bacterial isolates tested, 13 showed antimicrobial activity against at least one strain. Four isolates underwent 16S rRNA sequence analysis: two from sediment samples that inhibited *A. sobria* and two from gastric lavage showing broad-spectrum activity. Sequencing revealed that the sediment isolates were *Bacillus* species, with one closely matching *B. cereus* (99.67%). One gastric isolate matched *Pseudomonas fluorescens* (99.56%), inhibiting *E. coli*, *S. epidermidis*, *A. sobria*, and *M. smegmatis*. The second gastric isolate matched *Lactococcus lactis* (99.55%), inhibiting *S. epidermidis*, *B. subtilis*, and *A. sobria*. Genome analysis using antiSMASH identified 32 gene clusters potentially involved in antimicrobial production. Future work will focus on isolating and characterizing these compounds. These findings suggest that freshwater bacteria could be a new source of antibiotics, expanding research beyond terrestrial bacteria.

Emilio Rogelio Hinojosa Vazquez

TX - The University of Texas at San Antonio

Discipline: Biology

Authors:

#1 Venus Stanton

#2 Ariel Laub

#3 Karl Klose

Abstract Name: Elucidating Essential Flagellins in the Polar Flagellum of *Vibrio parahaemolyticus*

Vibrio parahaemolyticus (Vp) is a Gram-negative, halophilic, motile bacterium that is ubiquitous in the marine environment. Vp is responsible for seafood-borne illnesses and severe infections can result in sepsis and possibly death in immunocompromised individuals. Vp expresses two different types of flagella, a polar flagellum that is required for swimming motility, and lateral flagella that are required for swarming motility. Other *Vibrio* spp only express polar flagella, and generally polar flagella are involved in *Vibrio*-mediated virulence, so the Vp polar flagellum is the focus of this study. The Vp polar flagellar filament is composed of four flagellin subunits, FlaABCD, with an additional two flagellin subunits FlaEF being secreted outside the cell. To dissect the roles of the individual flagellins to Vp polar flagellar synthesis, we are constructing Vp strains lacking the various flagellin genes, and then evaluating motility of the mutants. A Vp strain was

constructed that lacks three of the six flagellins (DflaEDB), and this strain maintained near wildtype levels of motility. This indicates that FlaACF are sufficient for polar flagellar synthesis and motility. We are currently constructing a deletion of flaF, using PCR, splicing by overlap extension, and Golden Gate assembly. This conjugatable plasmid will be used to construct a DflaF Δ flaEDB Vp mutant strain, and then evaluate its motility. Our goal is to identify the minimum flagellin(s) that are required for Vp polar flagellar synthesis, and then study their localization within the filament. These studies will contribute to understanding flagellar-mediated pathogenicity of *Vibrio* species.

Samantha Hinton

NC - Elon University

Discipline: Nursing and Public Health

Authors:

Abstract Name: Service Provider Perspectives on Impacts of Immigration Policy on the Healthcare Utilization of Latinx Immigrants in Post-ICE Alamance County

Latinx immigrants in the United States face unique barriers to healthcare, including discrimination, lack of health insurance, and difficulty accessing medical support. Disparities in health access/outcomes were amplified by immigration policies established during the first Trump administration, as seen locally in Alamance County, North Carolina with massive expansions of Immigration and Customs Enforcement (ICE) presence. This, combined with documented discriminatory practices by law enforcement, have harmful impacts on the health of Latinx immigrants in Alamance County. This qualitative research project utilizes the perspectives of healthcare and social service providers to understand how immigration policies, fear of discrimination, and other socioeconomic barriers have impacted the utilization of health services by Latinx immigrants in Alamance County. Thematic analysis of inductive and deductive codes from semi-structured in-depth individual interviews with health and social service providers have revealed that engagement with community partners, which fosters trust and rapport between providers and patients, acts as a facilitator towards positive healthcare interactions, while language barriers, lack of education about health conditions and resources, and limited resources among both providers and patients act as barriers to effective and culturally sensitive care. Broadly, providers' utilization of language interpretation services acts as a significant factor in patient interactions. Using these findings, the goal of this project is to support healthcare accessibility in Alamance County by suggesting practices for more effective provider engagement and creating community resources to combat misinformation about available resources.

Katie Ho

CA - Chapman University

Discipline: Computer Science

Authors:

#1 Trudi Qi

#2 Meghna Raswan

#3 Tyler Kay

#4 Franceli Cibrian

#5 Hector Camarillo

Abstract Name: A Comprehensive Analysis of User-Elicited 3D Dual-Hand Gestures in Virtual Reality

Recent advancements in virtual reality (VR) have focused on enhancing intuitive 3D interactions through hand gestures. While gesture elicitation has been extensively researched, the analysis of VR dual-hand motion gestures remains underexplored. Moreover, current 3D VR interfaces often rely on predefined gestures, limiting the potential for truly natural and intuitive user interactions. This study addresses this gap by exploring user-preferred dual-hand gesture interactions with 3D virtual content through a user-elicitation approach. Concentrating on three fundamental VR interactions: pan, rotation, and zoom, we aimed to analyze users' mental models in developing intuitive gestures. The study involved 26 participants using VR headsets and controllers, recording 3D hand position/orientation and gesture metrics as they performed gestures to interact with virtual objects. Using 3D visualizations of user-elicited gestures, we developed a dual-hand gesture codebook from a 10% data subset, identifying patterns in shape, handedness, direction, and symmetry. The codebook was refined, achieving over 80% agreement and a Kappa $p > 0.8$. Key findings showed that 55.4% of pan gestures were unimanual, with 78.8% forming a quarter-circle shape, while 71.04% of rotation gestures were bimanual, typically forming a semi-circle. Aligning with this finding, geometric analysis also revealed that rotation gestures had the highest curvature (6.71 1/m^2) compared to zoom (4.34 1/m^2) and pan (3.40 1/m^2). Rotations also had the longest average length (.66 m), followed by pan (0.57 m) and zoom (0.44 m). This research advances our understanding of dual-hand gestures for 3D interactions in VR, paving the way for developing a natural user interface based on user-elicited gestures, to ensure a supportive, intuitive user experience.

Stephanie Hoang

CA - Chapman University

Discipline: Chemistry

Authors:

D'Angelo Alvarez

Abstract Name: Hot Electron Chemistry on Bimetallic Titanium Nitride Core-shell Nanoparticles

The increase in CO₂ pollution has become a prevalent global climate issue. CO₂ pollution can be mitigated by converting CO₂ into CH₃OH (methanol) or other hydrocarbons to create renewable fuel through a hydrogenation reaction using catalysts. Photocatalysts are a class of catalysis that changes reaction rates when excited and can be used to assist in creating green fuels. Our plasmonic photocatalysts are bimetallic transition metal core-shell nanoparticles composed of a plasmonic core and a chemically active transition metal shell. The core metal displays a phenomenon called localized surface plasmon resonance that generates excited or "hot" electrons when absorbing light. The addition of a transition metal shell enhances the plasmonic core, and the resulting core-shell nanoparticles exhibit unique optical and catalytic properties that contribute to their photocatalytic abilities to efficiently generate hot electrons for use in excited state chemistry. This project focuses on titanium nitride (TiN) as the core metal used for the synthesis of bimetallic core-shell nanoparticles. As of now, ruthenium (Ru), rhodium (Rh), and nickel (Ni) have been used as shell metals in various ratios. The TiN-Ru, TiN-Rh, and TiN-Ni nanoparticles (NPs) are synthesized using reflux reactions, washed using a centrifuge, and characterized using Scanning Electron Microscopy (SEM), Energy-Dispersive X-ray Spectroscopy (EDX), Transmission Electron Microscope (TEM), and Ultraviolet Absorption Spectroscopy (UV-Vis). Characterization of the synthesized bimetallic core-shell nanoparticles depicted favorable size, shape, and elemental distribution for photocatalysis. The photocatalytic efficiency of the bimetallic core-shell nanoparticles was assessed through the hydrogenation of CO₂ using a photoreactor chamber equipped with mass spectrometry and Raman spectroscopy. Through the use of bimetallic core-shell nanoparticles, we aim to understand their photocatalytic properties and use these promising catalysts to assist in creating renewable fuel in order to reduce CO₂ pollution.

Lily Hoard

KY - Morehead State University

Discipline: Biology

Authors:

#1 Deborah Cook

#2 Janelle Hare

McKinnley Martin

Abstract Name: Cell growth phenotypes affected by DNA damage in *Acinetobacter Baumannii* ddrR and umuDAb Mutant Strains

The regulation of cell division during DNA damage response is crucial for bacterial survival. In *Acinetobacter baumannii*, DdrR and UmuDAb are hypothesized to inhibit cell division and regulate growth in response to DNA damage. To investigate their roles, we analyzed the growth of *A. baumannii* 17978 wild-type and mutant strains in LB medium and in the presence and absence of mitomycin C (MMC), a known DNA-damaging agent. The results showed that the umuDAb mutant grew significantly slower than the wild-type and the ddrR mutant. The umuDAb-ddrR double mutant also grew slower than the ddrR mutant strain, suggesting that the umuDAb mutation causes slower growth. Next, we compared the cell lengths of the ddrR and umuDAb mutants to wild-type, using Microbe J. We observed that neither the ddrR nor the ddrR-umuDAb mutant cells differed from the wild-type, and only the umuDAb mutant was longer than the wild-type. This suggested that increased ddrR expression caused by loss of UmuDAb repression might cause cell elongation. Arabinose-induced, plasmid-based expression of UmuDAb restored a wild-type cell length to the mutant cells. Arabinose alone did not significantly influence cell length in any strain. Similar effects of ddrR expression were seen in the responses of the mutant strains to DNA damage: the umuDAb mutant, like the wild-type cells, still became filamented after DNA damage, but not the ddrR or ddrR-umuDAb mutant strains. We will next test varying complementation levels effect on filamentation in the ddrR mutant to continue investigating ddrR's role as a cell division inhibitor.

Fiona Hodge

NC - Elon University

Discipline: Psychology

Authors:

#1 Fiona Hodge

#2 Adam Y. Kim

Abstract Name: Queer Intersectionality: Navigating the intersections between sexuality, gender, and other social identities

Queer people belong to multiple social categories that describe not only their gender and sexuality, but also their race, class, ability, and other identities. These categories intertwine with each other to create unique experiences, a process known as intersectionality (Bowleg, 2012). While the origins of intersectionality focus on oppression, an understanding of multiple social identities must contend with privilege and oppression co-occurring across social categories. Current emerging adults are developing during both increased positive representation in the media and negative political attention. At the same time, White privilege and social class were receiving increased attention. In this context, how do Queer, emerging adults understand their multiple social identities? We conducted a qualitative survey of queer college students. We used thematic analysis and an intersectional lens to analyze the data. We developed six themes: marginalization as opportunity for growth, integration of multiple identities, queer centrality, heteronormative expectations, conflicting social identities, and acknowledgement of privilege. These themes align with and extend the current literature.

Maya Hoffman

MD - University of Maryland College Park

Discipline: Biology

Authors:

#1 Maya Hoffman

#2 Jennifer Kahn

#3 Nicole Hayes

Abstract Name: Linking Wind to Cyanobacterial Spatial Distribution

Cyanobacterial harmful algae blooms (cHABs) are a leading threat to environmental and human health. These freshwater blooms can produce toxins that are harmful to people if found in drinking water or recreational water bodies. Environmental health testing for cHABs often focuses on single points or high traffic areas such as beaches, however blooms are dynamic in space. Previous studies found that *Microcystis* spp., common toxin-producing taxa, are favored under low surface-level wind speeds because large colonies formed and floated to the surface of the lake causing large surface blooms. These large surface blooms are easily pushed around the lake by low winds. Lake Menomin in Menomonie, WI experiences annual cHABs dominated by *Microcystis* spp. with surface blooms. In Lake Menomin, we asked the question of whether wind determines the colony count, colony size, and colony distribution in the water column. We predicted that down-wind sites would have more, smaller colonies, mixed throughout the water column. On three days in the summer of 2024, we collected cyanobacteria samples on a wind-aligned transect. On each sampling date, we collected shallow and deep-water samples at five coordinates across the transect. *Microcystis* spp. levels were measured and counted under the microscope. The analysis found limited evidence (1 of 3 days) that higher wind speeds decreased colony sizes. However, *Microcystis* spp. levels differed spatially across a horizontal transect and throughout the month of July. More research is needed to understand how wind interacts with other factors to cause spatial patterns in cHABs. Additionally, these findings underscore the importance of sampling across waterbody surface areas for cHAB-produced toxins; cHABs do not evenly distribute across a water body, meaning that ecological and health disparities can occur within different regions of one lake.

Addison Holck

WI - University of Wisconsin-Superior

Discipline: Chemistry

Authors:

#1 Addison Holck

Abstract Name: Synthesis of Eugenol Derivatives and Evaluation of their Bioactivity

Both antibiotic and antioxidant properties are vital in the scope of medical research. Studies of the antioxidant and antibiotic properties of these eugenol derivatives are important for addressing pressing global health challenges, such as antibiotic resistance and oxidative stress-related diseases. We looked at a green alternative for synthesizing the epoxide derivatives of eugenol using oxone and compared yields to those obtained using more harmful alternatives. We found increased yields when using acetyl eugenol and allyl anisole as substrates. These results suggest that the oxidation reaction is more effective in the absence of the phenol functional group. After all derivatives were synthesized and purified, their bioactivities were investigated, to determine which derivatives could possibly show either antioxidant or antibiotic properties.

Katherine Holding

MA - Amherst College

Discipline: History

Authors:

#1 Katherine Holding

Abstract Name: The d/Denazification Paradigm: Re-examining postwar Germany according to a differentiated reading of the Potsdam Conference

Denazification was the overarching effort to create a self-sustaining, stable German society free from Nazi influence following World War II and the programs implemented to induce this goal. Having never proffered a strict definition for the term, postwar architects improperly relied upon an implicit usage of the object-model theory to discursively determine the bounds of denazification strategy. However, the lack of consensus surrounding the referential object anchoring these conceptions precluded a universal definition. The 1945 Potsdam Conference set forth the “4Ds of denazification”: demilitarization, decentralization, democratization, and denazification. Pursuant to this outline, “denazification” comprised both the primary goal and one of its key pillars. By applying Y. H. Krikorian’s theory on the composition of organizations, it becomes clear that the primary goal and pillar must be different, for constitutive entities are necessarily distinct from the organization they partially comprise. Therefore, “denazification” contained two separate meanings—1) the capacious definition that encompassed the broader Allied postwar project and 2) the narrow programs to purge Nazi officials from influential positions. This presentation explores how linguistic indeterminism led scholars to falsely conflate two meanings of the term. Importantly, it then introduces what I call the d/Denazification Paradigm, a method of historical writing intended to provide clarity to the field by deploying strategic capitalization to differentiate the two versions of denazification. For the past seventy-five years, scholars have struggled to make sense of the seemingly irreconcilable contradiction of a denazification strategy that simultaneously succeeded and failed after “big fry” Nazis regained suffrage in 1951 following the 1944-1949 purges. By distinguishing Denazification (the overarching rehabilitation project) and denazification (the series purges related to Allied-led, quasi-judicial tribunals), the modern historian proves that the incompatibility dialectic is false because there were two different “denazifications.” The Denazification of Germany succeeded even though targeted denazification purges sometimes failed.

Landon Holley

OK - Cameron University

Discipline: Physics and Astronomy

Authors:

#1 Susmita Hazra

Abstract Name: Measurements of Ionospheric Parameters during Geomagnetic Storms

The ionosphere is a layer of the atmosphere that is filled with plasma, and lies roughly 80 to 600 kilometers above Earth's surface. The ionosphere plays a key role in radio communication systems. Geomagnetic storms cause intense variations in the ionosphere. To better understand and track the effects of geomagnetic storms on the ionosphere, we studied the geomagnetic storm on May 11th, 2024. We are analyzing the data for the drift velocity, Total Electron Content (TEC), and the F2 peak density, and F2 peak height using the GIRO database, SAOExplorer, and DriftExplorer. Our studies began by measuring the variance of the ionosphere at differing latitudes (± 30 degree), where we have found drift speeds up to 150 m/s as we approached the equator. We found that during the 2024 May 11th storm the F2 peak heights and the velocities were both much greater, than during quiet days. With the average peak height for May 11th being 23.32% greater than the average peak heights for the rest of the month. One point of particular interest is the stability of the TEC despite the geomagnetic storm. Further analysis of this data will lead to exploration of the relation between the ionosphere and the thermosphere, specifically during the events of geomagnetic storms.

Grace Holmes

NC - Elon University

Discipline: Psychology

Authors:

#1 Blaine Mollot

#2 Kristina Krasich

Abstract Name: Mind Wandering Impairs Syntactic Processing of Objects in Peripheral Vision

People often struggle to stay focused on immediate task goals and instead mind wander. Mind wandering (MW) is associated with diminished visual and cognitive processing of external stimuli, which has also been linked to increased fixation durations (how long the eyes remain relatively stable looking at a specific location). The current eye tracking study investigated the effects of MW on syntactic processing of objects (recognizing when objects are in unexpected locations). Participants (N=51) viewed images of real-world indoor scenes in preparation for a later memory test. In 50% of the scenes, one object appeared in a syntactically violating location, such as a hairbrush in a sink. Additionally, a gaze-contingent blindspot obscured central vision in 50% of trials, forcing reliance on peripheral vision, which is typically less apt for detailed object recognition. Participants were periodically prompted to report if they had been mind wandering or attentively viewing the scene at that moment. The findings showed that self-reported MW was associated with longer fixation durations compared to self-reported attentive viewing, consistent with past research. Further, with self-reported attentive viewing, fixation durations were longer when central vision was obstructed with the blindspot regardless of whether there was a syntactically violating object within the scene. With self-reported MW, though, this blindspot-related increase in fixation duration was only observed if there was a syntactically violating object. Without a syntactically violating object, MW-related fixation durations

did not differ across the blindspot conditions. This suggests that although MW impairs visual and cognitive processing of external stimuli, at least some syntactic processing of objects is preserved in peripheral vision and can impact fixation durations. These results contribute to our understanding of the cognitive mechanisms underlying visual processing during MW and highlight the impact of attentional states on syntactic processing of objects.

Ian Holmes

MD - Towson University

Discipline: Interdisciplinary

Authors:

#1 Richard Wilson

Abstract Name: The Use of Artificial Intelligence and 3D Bioprinting for Organ Transplantation: Ethical and Anticipated Ethical Issues

Artificial intelligence and 3D printed organs have the potential to advance treatments in the medical industry and healthcare by treating burn victims with 3D printed skin. After looking at case studies of 3D printed organs, an anticipatory ethical analysis will be applied to stakeholder perspectives involved in the development of 3D printed skin. 3D printed skin is developing rapidly, and the stakeholder perspectives of the FDA, researchers, and patients are included in my analysis as they will be some of the first stakeholders involved with this treatment when it becomes available. This ethical investigation focuses on the technology being utilized and the intentions, desires, and actions of the stakeholders involved. The BDI Model was used in the research to apply anticipatory ethics to stakeholder perspectives. Ethical principles employed in the analysis included basic ethical principles, the ACM Code of Ethics, and the biomedical ethical principles of Beauchamp and Childress. With the development of artificial intelligence [AI], the potential for this technology to be combined with 3D printing to 3D print skin with bioinks has many potential benefits for patients, but can introduce ethical issues at multiple stages of the process. The analysis of AI and 3D printing to develop 3D printed skin leads to the recommendation that stakeholders follow Virtue Ethics. The conclusion is that the intentions of stakeholders working on the project to create 3D printed skin as an alternative treatment for burn victims must pursue what is virtuous to uphold the ethical and technical integrity of this potential revolutionary treatment. 3D printed skin created with AI and specialized 3D printers can potentially reduce the cost of treatment for patients, provide aesthetical repairs to severely damaged skin, and save the lives of patients with severe burns that have trouble healing.

Frances Homan

VA - James Madison University

Discipline: Chemistry

Authors:

#1 Shyleigh Good

#2 Mary Sessoms

#3 Carly Hemani

Abstract Name: Induction of Natural Products by Fungal-Fungal Co-culture

Fungal natural products have played a major role in pharmaceutical and agrochemical development. In fungi, natural products are produced by biosynthetic gene clusters (BGCs), which consist of one or more backbone

enzymes, tailoring enzymes, and sometimes transcription factors that regulate their expression. However, the majority of fungal BGCs remain silent under laboratory conditions and their associated natural products are not produced unless induced by an external stressor. The technique of co-culturing, in which two or more fungal strains are grown on the same media to introduce competition for limited space and resources, has been shown to induce the expression of silent BGCs that form natural products not found in monoculture. Nine fungal strains were isolated and grown from soil in Harrisonburg, VA and a tenth strain was collected from Grand Caverns in Grottoes, VA. Fourteen of the 45 possible fungal-fungal co-cultures were pursued for further study due to visual changes in the appearance of the fungi in the co-culture as compared to the monoculture. Target co-cultures were prepared for chemical analysis by growing cultures on rice and subjecting them to chemical extraction and liquid-liquid partitioning. The resulting extracts were analyzed using mass spectrometry-based metabolomics. Abundant chemical changes were witnessed in a subset of five co-cultures; one of the five co-cultures showed consistent reproducibility of upregulated metabolites and has been prioritized for targeted study. Two of the four major upregulated compounds produced by this co-culture have been tentatively identified using mass spectrometry and publicly-available natural products databases. We are currently scaling up growth of this co-culture in pursuit of the four upregulated target metabolites for purification and structure elucidation using existing chemical databases, mass spectrometry, and ¹H NMR.

Wilson Hong

PA - Lafayette College

Discipline: Computer Science

Authors:

Aidan Mathieu

Abstract Name: Creating Adaptable, Game-based Learning Environments for STEM Education

This work introduces the development of Adaptable Game-based, Interactive Learning Environments for STEM Education (AGILE STEM), supported by the National Science Foundation. In collaboration with Penn State University and Carnegie Mellon University, the project focuses on enhancing STEM education, particularly in model-based systems and production engineering, through interactive 3D simulations. The project simulates a bottling facility to be used as a teaching tool in supply chain management, and will incorporate machine learning aspects that react to user's actions for feedback and adaptive gameplay. This reactive environment allows students to explore key concepts like demand forecasting, inventory control, production planning, and the bullwhip effect in supply chains. Learners will interact with different stages of the supply chain, making decisions about production rates, machine utilization, and inventory levels, all while managing constraints and uncertainties similar to real-world challenges. Through these immersive simulations, students will gain a hands-on understanding of system efficiency, workflow optimization, and supply chain dynamics. By iteratively designing and refining the simulation, the AGILE STEM platform seeks to create a versatile educational tool that can adapt to different learning goals, advancing the use of emerging technologies in STEM education. Future work will expand the system's complexity, adding advanced diagnostics, maintenance, and data analysis features. This presentation highlights the development of this water bottling facility simulation, built in Unity, as part of the AGILE STEM environment. The student-led development process began with research on real-world bottling operations, focusing on machinery like blow-molding and filling machines, as well as labeling and buffer systems. The initial build included basic assets for a single production line, which was iteratively expanded to feature multiple lines, raw material and finished product handling with robot arms and forklifts. The simulation models various process steps such as filling, capping, labeling, and packing.

Deenaydra Hood

VA - Norfolk State University

Discipline: Interdisciplinary

Authors:

#1 Ann-Catherine Sullivan

Brandon Matthews

Abstract Name: Transitioning from Mentee to Mentor: An Undergraduate Research Mentorship Experience

This study highlighted the transformative impact of faculty and peer mentorship on undergraduate research development through a structured process designed to build research skills and foster scholarly growth. Faculty mentors guided students through essential research stages, beginning with comprehensive literature reviews and completing Collaborative Institutional Training Initiative (CITI) modules to ensure adherence to ethical research practices. Students, supported by their mentors, successfully secured Institutional Review Board (IRB) approval, demonstrating a commitment to ethical standards in human subjects research. Mentees recruited participants by employing snowball sampling, and expanding the sample size through network referrals. Faculty assisted students in designing informed consent protocols, developing demographic questionnaires, and implementing surveys. Focus groups further enriched data collection, providing diverse perspectives. Peer mentors played a crucial role in monitoring data collection, ensuring accuracy and participant engagement. Under this mentorship framework, students analyzed data using statistical and thematic methods, honing their analytical skills. With faculty feedback, students prepared and submitted peer-reviewed abstracts and manuscripts that adhered to academic publication standards, showcasing their ability to communicate findings effectively. Students presented their research at academic conferences, gaining valuable professional insights and networking opportunities. Participation in Undergraduate Research Mentorship (URM) workshops and conference travel further enhanced their development, equipping them with skills essential for academic and career success. This mentorship model, which emphasized collaboration and guided learning, demonstrated its effectiveness in fostering research excellence and preparing students to thrive as emerging scholars. By combining faculty-led instruction with peer-supported engagement, the program created a nurturing environment where students developed the confidence, knowledge, and skills necessary for success in academic and professional settings.

Jack Hooper

NC - Elon University

Discipline: Chemistry

Authors:

#1 Nicholas Berry

#2 Joel Karty

Abstract Name: Why Do Methyl Groups Attached to C⁺ Stabilize Carbocations? Contributions by Inductive Effects, Hyperconjugation, and Internal Solvation

Carbocations, such as the methyl (CH₃⁺) and ethyl cations (CH₃CH₂⁺), are important high energy intermediates in organic reaction mechanisms. CH₃CH₂⁺ is more stable than CH₃⁺ by about 43 kcal/mol in the gas phase, and that stabilization is provided in three different ways by the methyl group (CH₃) attached to the C⁺ atom. One contribution is from inductive effects, because a methyl group, being electron-donating, will partially cancel the formal +1 charge. The second contribution is from hyperconjugation, because the filled C-H bonding orbitals will mix with the unfilled p orbital of the C⁺ atom. The third contribution is from polarizability effects, because the presence of a methyl group will increase the polarizability of the cation, which provides internal solvation of the +1 charge. All three of these effects take place simultaneously, and the aim of this study is to determine the contribution by each effect separately. To do so, four different valence bond theory (VBT) calculations were carried out for the CH₃CH₂⁺ ion, and differences in resulting

energies were determined. In the first calculation, the electron densities for the CH₃ group and C-C bond of ethane (CH₃CH₃) were mapped onto the CH₃ group and C-C bond of CH₃CH₂⁺, and were frozen. In the second calculation, to determine the inductive effects, the electron density of the C-C bond was optimized. In the third calculation, to determine the effect from polarizability, the electron density of the CH₃ group was optimized. In the fourth calculation, to determine contribution by hyperconjugation, all orbitals were completely delocalized. Results show that the contribution by inductive effects is about 9 kcal/mol, the contribution by hyperconjugation is about 25 kcal/mol, and the contribution by polarizability effects is about 9 kcal/mol. Future studies will be carried out on the isopropyl cation, (CH₃)₂C⁺, and the tert-butyl cation, (CH₃)₃C⁺.

Olivia Hopkins

VA - Longwood University

Discipline: Health and Human Development

Authors:

#1 Jaimie Nix

Jaimie Nix

Abstract Name: The Impact of Feeding and Swallowing Ability From a Traumatic Brain Injury: All Around the World

Traumatic Brain Injury is unique overall, as many parts of the brain can be affected, depending on the injury. Depending on where injury occurs, some patients can lose the ability to eat or swallow, and they will need rehabilitation to relearn these skills that come in first nature. This project discusses the parts of the brain that is impacted in this area, and any signs of injury can impact the ability to eat and swallow food. This study highlights not only the medical aspect of TBI, but dives deeply to the field of feeding/swallowing disorders, and the cultural/social/economical impact it may have on someone's ability to recover. What is discussed is how certain cultures and different parts of the world are impacted by TBI, and have issues such as learning to eat again, like the patient may have before. While there are many ways TBI can impact one's life, this study focuses on losing the ability to chew and swallow a bolus (chewed up food). Some of many examples are that there may be situations with religious celebrations with food, or social aspects of eating, that people of TBIs may struggle with learning to adapt to society. There could be no resources for those who cannot afford it, and what people oversee often is the life after TBI, and how people learn to adapt to their situations. Knowing when to have intervention with Speech Language Pathologists or other specialists can guide someone to regain the ability to eat again specifically. There are many obstacles for TBI recovery, and it is important to give everyone of all cultures and economic status the resources to understand and learn how to gain ability again.

Madeline Hopson

AR - Lyon College

Discipline: Political Science

Authors:

Abstract Name: A Possible Explanation For The Underrepresentation of Women in World Politics

Some voters are more likely to support male candidates than female candidates. Women make up a large portion of the population, yet they are deeply under-represented in executive positions of government.

Although past research identifies the gender biases in politics, research is less clear why these biases exist. I argue that voters are more likely to approve of male candidates than female candidates due to perceptions regarding policymaker competency. This can inhibit female candidates from success because competency is a necessary attribute for political leaders' performance. To demonstrate this, my research asked a survey question and conducted an experiment as part of a comprehensive survey experiment with students and faculty from a small liberal arts college in the Southern U.S. This study first asked respondents a question regarding their opinion on gender and competence. Then, the research gave half of the respondents a scenario asking them to imagine a conflict where a female President sent troops abroad and asked if the respondents agreed or disagreed with her decision. The other half received the same scenario, but their scenario had a male president. The main findings of the experiment were: there is a slight preference for male leaders over female leaders. Specifically, respondents were more likely to disapprove of the decision to withhold troops when they received the female president treatment versus the male president treatment; this difference was 4.9%. This experiment shows there is some evidence of negative perceptions regarding female policymaker competency.

Ryan Horio

CA - University of California - Los Angeles

Discipline: Nursing and Public Health

Authors:

#1 Ryan Horio

Abstract Name: Exploring the Potential Benefit of Mindful Self-Compassion on Women Experiencing Homelessness, Substance-Use Disorder, and PTSD: A Qualitative Study of Coping and Healing

Women experiencing homelessness, substance-use disorder, and post-traumatic stress disorder (PTSD) experience high health disparities yet have been largely unstudied related to their experiences coping with past traumas. Using a community-engaged, mixed methods approach, we sought to explore the potential acceptability and feasibility of a short Mindful Self-Compassion (MSC) course, participants' experiences with self-compassion, and how they can improve coping and self-care as part of trauma recovery. Guided by the recommendations of a Community Advisory Board, we conducted four semi-structured, focus groups with six-to-seven participants each. Focus groups were 1-1.5 hours. In qualitative analyses, deductive codes were created using questions from a semi-structured interview guide. Inductive codes were created by a team of four coders who reviewed the first transcript then met weekly to synthesize further codes. The codebook was then composed of the condensed codes and associated subcodes. The team used the same codebook to code the rest of the transcripts, with two researchers coding each transcript. Findings were synthesized from emerging themes. Themes include 1) Reflections on Self-Compassion Experience, 2) Benefits of Self-Compassion Skills, and 3) Experience of Self-Compassion Associated with Substance-Use Addiction and Trauma. Focus group participants reported that self-compassion techniques and training may be beneficial for recovery from trauma and substance use. Findings elucidated the coping experiences of women experiencing homelessness, substance use, and PTSD as well as their current practices of self-compassion, their struggles with it, and where additional interventions would benefit them.

Ashley Horn

TX - Texas Woman's University

Discipline: History

Authors:

Abstract Name: The Power of Misconception: Understanding the Role of Legal Circumstances in the Salem Witch Trials

The purpose of this paper is to explain how legal circumstances, such as the admittance of spectral evidence during the trials, enabled the Salem Witch Trials to occur in 1692 and 1693. This paper uses an understanding of the development of evidence-based law in England, as described by Orna A Darr in her 2014 article, "Experiments in the Courtroom: Social Dynamics and Spectacles of Proof in Early Modern English Witch Trials," as well as two legal documents outlining the punishment for witchcraft, the Witchcraft Act of 1604 and the Massachusetts Body of Liberties, to explain the significance of legal circumstances to the occurrence and outcome of the Salem Witch Trials. This paper adopts the fresh perspective of looking at the Salem Witch Trials through the lens of legal history, relying on the research of legal scholars, such as Darr. While many notable historians, such as Charles Upham and Mary Beth Norton, cast the blame for the trials on fanatical Puritanism, this paper seeks to challenge this common narrative through emphasizing the effect of allowing spectral evidence to be admitted in a court of law. Through examining primary documents, such as Increase Mather's Cases of Conscience and Thomas Brattle's Letter to an Unnamed Clergyman, it can be seen that some colonists of this period cited the admittance of spectral evidence in the trials to be a disgrace to the integrity of the judiciary and a factor in the execution of innocent people. This paper seeks to be innovative in its approach to understanding how and why the Salem Witch Trials occurred, and while it does not discount the religious-based arguments of previous historians, it does aim to provide an alternative, legal-based argument.

Oliver Horovenko

VA - George Mason University

Discipline: Psychology

Authors:

#1 Oliver Horovenko

#2 Olga Kornienko

Abstract Name: Examining Associations Between Bicultural Orientation and Adolescent Internalizing Symptoms

Bicultural adolescents who are children of immigrants and come from racially and ethnically diverse backgrounds face unique stressors compared to their peers coming from the mainstream culture. Research has shown that discrimination and cultural stressors leave bicultural youth more vulnerable to mental health issues such as internalizing symptoms. Dual-cultural orientation, or integration between heritage and mainstream cultures, serves a protective role for bicultural youth by buffering the adverse effects of acculturation challenges. Presently, there is little research on the connections between dual-cultural orientation and internalizing symptoms, such as anxiety, depression, and loneliness among middle and high-school students. The current study will use OLS regression analysis to test the associations between dual-cultural orientation and internalizing symptoms (loneliness, anxiety, and depression symptoms). The sample included 558 immigrant and ethnic-racial minoritized adolescents from the Southwestern United States (Mage = 13.59 years, SD = 1.58; 46.2% boys; 43.1% had at least one immigrant parent, 41.3% Hispanic/Latinx, 40% Multiethnic/Multiracial, 14.4% other race/ethnicity, and 4.2% White).

Asher Horst

OK - University of Central Oklahoma

Discipline: Computer Science

Authors:

#1 Jicheng Fu

Abstract Name: A Novel Lightweight Approach for Processing Sensor Data Generated by Smart Mobile Devices

Wheelchair-bound individuals often have a sedentary lifestyle. Because of this, wheelchair-bound people are at a significant risk of developing pressure ulcers, which are very painful and dangerous. To alleviate this, the Clinical Practice Guidelines recommend users to perform a selection of exercises, or pressure relief activities, at regular intervals throughout the day. Doing so will reduce the risk of developing pressure ulcers, but users may not be aware of if they are performing the activities correctly, or as often as they should be. We propose a solution to address this challenge. We have developed a framework for recording and categorizing users' pressure relief activities. Our framework involves a machine learning model that resides on the cloud, a program collecting data from an Apple Smart Watch, and a smartphone app to process and send the data. However, we expect it to be very inefficient and wasteful to constantly send all data to the cloud. To address this, we have devised a preprocessor within the smartphone application to alleviate the stress on the machine-learning model in the cloud. Using a set of pre-processed values and four major functions to remove outliers, calculate the differentiation between data points for noise reduction, normalize the data, and reduce it to one dimension, our lightweight approach can determine if there is a pressure relief activity occurring. By isolating instances of pressure relief activities, our approach will only transmit relevant data to the cloud. Hence, the entire framework can run in real-time and cut down on energy waste and cloud storage. We believe this is an effective framework that makes our approach practical to use by wheelchair users.

Taylor Horton

LA - Louisiana State University, Baton Rouge

Discipline: Environmental Science and Sustainability

Authors:

#1 Mark Benfield

Abstract Name: Documenting the Extent of Nurdle Pollution Around Capitol Lake

Nurdles are tiny pellets of raw resin utilized in the production of all plastic materials. They are considered microplastics, and due to their size, are not regulated by the Environmental Protection Agency (EPA). They are not chemically toxic; the issue arises when they enter the ecosystem via railroads or other trading means. A particularly pertinent example of nurdle pollution is Capitol Lake; it is in the perfect location to amass large quantities due to its proximity to a major railroad. Nurdles are the perfect size to be mistaken as food for many marine and mammal species. They are also typically colorless, making it easy to blend in with the ecology and take on its characteristics (i.e., turning the color of the sediment or algae it is residing in). They of course offer no nutritional value; organisms consume them by mistake, and it confuses their body into thinking it is full. As a result, many organisms die of starvation. Due to the growing amount of microplastics in our environment and the lack of EPA regulations, it is believed that documenting nurdle pollution around Capitol Lake will raise awareness and potentially hold companies responsible for the detrimental impact their pollution is having on the environment. The purpose of this study is to explore the extent of nurdle pollution present around Capitol Lake in Baton Rouge, LA. By quantifying the pollution; measuring the polymer composition and morphology of the nurdles; and comparing the nurdles in the lakes to nurdles at nearby rail lines and yards, we hope to identify the specific companies most responsible for pollution. This research is ongoing, and more investigating is required to definitively determine which species are at highest risk from nurdle pollution and which companies are most liable.

Charlotte Hosek

PA - Point Park University

Discipline: English and Literature

Authors:

Abstract Name: Consuming Suffering: The Legacy of Trauma Narratives in Social Activism

This paper examines the complicated intersection of empathy-driven narratives and voyeuristic consumption of suffering in two nineteenth-century texts, *Incidents in the Life of a Slave Girl* by Harriet Jacobs and *The Working Girls of New York* by Rebecca Harding Davis. While these works were intended to inspire social change by exposing the brutal realities faced by marginalized individuals, they also can be viewed as engaging in what has been termed, in the modern era, as “trauma porn.” Trauma porn is defined as an excessive focus on brutal suffering that detracts readers from pursuing systemic reform. In the instance of *Incidents*, Jacobs was encouraged by her editor to amplify suffering to better engage readers, presumed to be mainly Northern white women who could advocate for social change: "My object in writing at this time is to ask you to write what you can recollect of the outrages committed on the colored people, in Nat Turner's time. You say the reader would not believe what you saw 'inflicted on men, women, and children, without the slightest ground of suspicion against them.' [...] Were any tortured to make them confess? and how? Where any killed? Please write down some of the most striking particulars, and let me have them to insert" (Letter, Lydia Maria Child to Harriet Jacobs in 1860). Importantly, Child's troubling method of engaging readers finds parallels in political activism on social media, where graphic videos of violence and suffering circulate widely, often shifting attention from meaningful action to passive consumption. By comparing these historical texts with contemporary practices, this paper will consider how the focus on graphic depictions of trauma run the risk of desensitizing audiences and reducing civic action to consuming spectacle, raising questions about how we should engage with trauma in the pursuit of political and social reform.

Alex Hostmyer

CA - Cuesta College

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: Ethics in Anthropology: Supporting Casts Over Human Remains

This project addresses the ethical issues surrounding using human skeletal remains in anthropological education and proposes the adoption of high-quality casts as a practical and ethical alternative. The continued reliance on human remains often ties education to practices that overlook consent, dehumanize individuals, and ignore the cultural or historical significance of those represented. These concerns demand a shift toward teaching tools that respect human dignity while meeting academic needs. The research evaluates the benefits of using casts, which replicate skeletal features with accuracy and consistency. Unlike human remains, casts eliminate concerns over the provenance of materials, offering an equitable solution free from historical injustices. To test the viability of using casts to learn osteology, a skeletal inventory was completed for both human bones and high-quality casts. Advantages and disadvantages for each are discussed, providing an opportunity to standardize educational resources, and ensuring all students have access to high-quality tools for learning, regardless of institutional resources or geographic location. Beyond providing a substitute for human remains, the project emphasizes how transitioning to casts can enrich the educational experience. By

removing reliance on ethically questionable practices, institutions can open space for discussions on human dignity, informed consent, and the historical treatment of human bodies in scientific fields. This approach integrates ethical reflection with skill-building, enabling students to critically engage with the broader implications of their studies. Ultimately, this project calls for a fundamental change in anthropological education, where casts become the standard for teaching skeletal anatomy. This transition not only ensures compliance with ethical standards but also fosters a culture of respect and accountability, promoting a future where education and ethics are seamlessly aligned.

Daniel Hough

PA - Saint Vincent College

Discipline: Physics and Astronomy

Authors:

#1 Matthew Vanden Berk

#2 Coty Walters

#3 Daniel Vanden Berk

#4 David Grumbine

#5 Michael Antonacci

Abstract Name: Investigating diurnal variation of radiation rates using low-cost CosmicWatch detectors.

The environment is filled with radioactivity. Much of the ambient radiation is due to radon as well as its daughter radionuclides. Student-built CosmicWatch muon detectors were used to monitor the ambient gamma-ray count rate, tracing the relative radon abundance. The detectors were used in coincidence mode to eliminate background cosmic ray muons. We detect a distinct diurnal pattern in gamma-ray count rates as seen in other studies. Count rate variations are correlated to the variations of atmospheric quantities such as temperature and pressure. Our results show that diurnal variations in gamma-ray count rates can be monitored at high frequency using low-cost easily deployable detectors.

Sienna Houle

MN - Bemidji State University

Discipline: Environmental Science and Sustainability

Authors:

#1 Miriam Rios-Sanchez

Parker Young

Abstract Name: Analysis of Aquifer Hydrodynamics in Response to Precipitation Events for Integrated Management of Surface Water in the Shingobee River Watershed, Minnesota

Minnesota's groundwater supplies about 75% of the population with drinking water, along with supporting agriculture, industry, and ecosystems. With over 11,800 lakes, it is crucial for Minnesota to understand the connection between surface and groundwater to find sustainable management strategies. Determining how groundwater flows throughout their aquifers will help understand the location of recharge and discharge areas for the identified aquifers, including the connection of this flow to surface bodies such as streams and lakes. Moreover, the temporal variation of water levels and electrical conductance of these aquifers helps understand the response to precipitation and other external factors. This study was conducted at the Shingobee experimental site, which was originally run by the USGS before being transferred to The

University of Minnesota and Bemidji State University in 2022 to study the 28 square kilometer watershed in physical, chemical, and biological aspects. For the aquifer layers identified in a previous phase of this project, water level and chemistry data were collected from the Minnesota County Well Index and from observation wells at the site, that BSU samples periodically. Using Surfer, groundwater flow maps were created as well as time series of water levels for several aquifer layers and precipitation. Water chemistry lab data was also processed through the creation of stiff diagrams using Rockworks. The results indicate a connection between precipitation and groundwater fluctuations for all aquifer layers, with minor variations between them. These variations do not fluctuate more than five feet over the period of analysis. Researching hydrologic properties such as chemistry, water level changes, hydrodynamics, and the changes in an aquifer over time can provide beneficial information to successfully managing our water resources.

Hayden Houselander

WI - University of Wisconsin-La Crosse

Discipline: Business

Authors:

#1 Hayden Houselander

#2 Braden Uelmen

Braden Uelmen

Abstract Name: Insta-Bets: Social Media and the Rise of Sports Betting

Influencer marketing spending in the United States reached \$4 billion in 2023, with spending on Instagram accounting for more than half. This study focused on a less common, but still significant, category for influencer marketing spending: sports betting. Sports betting continues to be one of the fastest growing industries in the U.S., with an expected annual growth rate of 10 percent through the end of the decade. The authors examined three popular social media platforms—Instagram, X, and Snapchat—and their potential correlations with the digital sports betting apps Underdog, Sleeper, and PrizePicks. A mix of convenience and snowball sampling was used to gather data about social media usage and sports betting consumption. Although voluntary respondents did not know the focus of the study was an investigation for the existence of a correlation, the authors did receive informed consent from each survey taker to request information about social media usage and sports betting behavior. The final dataset was analyzed with a Pearson correlation test. Multiple statistically significant correlations were identified, with the strongest relationship emerging from the positive correlation of Instagram usage with betting on the Underdog digital platform. These findings suggest that social media usage, particularly Instagram, may influence sports betting behaviors. Future research is recommended for this topic, and should aim to replicate these findings, as well as looking further into whether certain identity characteristics of consumers are particularly correlated to sports betting behavior.

Esther Housley

UT - Utah State University

Discipline: Film/Photography Studies

Authors:

#1 Li Guo

Abstract Name: Title: Gaze, Spectatorship, and Sound: The Drama of Class in Bong Joon-Ho's Tragicomedy Parasite (2019)

Bong Joon-ho, South Korean director and screenwriter of 2019's film *Parasite*, is well known for his conscientious directing and melding of different genres to create touching and intense films meant as vessels for his personal social analyses. *Parasite*'s international success can be attributed to a skillful analysis of class differentials and the powerful impact of the genre tragicomedies through genius cinematography manipulation and layering. This presentation explores Bong's cinematic experiment with gaze, spectatorship, and sound editing in establishing characters' relationships and their class backgrounds. Bong establishes the class differentials through context and dialogue, as well as through a variety of subtle cinematic elements and techniques. At the beginning of the film, Ki-woo and his family are consistently at a downward angle from above, showing them below the audience's viewpoint. The manipulation of angle is deployed when Ki-woo walks up a long sloping street towards his job interview. The scene is at a wide view, shot at the crest of the long street looking down at the small body of Ki-woo. The camera flips, now shot at the bottom of the large hill showing Ki-woo's journey upward. Now having been introduced to this critical cinematic technique the full impact is used in arguably the most pivotal scenes for the Kim family. In addition, sound techniques are deployed skillfully to portray characters' underlying motives and heighten the emotions felt by the characters and audience. The sound differences between the two families' houses contain many micro informants into how the director wanted audiences to feel and view these locations and what they symbolize. Film sequencing and editing, setting of the story, and dialogues between characters contribute to the film's tragicomic style. The film's evaluation of class inequity in South Korea through a memorable and brilliant story highlights both sides of the divide.

Hannah Hout

IL - Eastern Illinois University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Angela Anthony

#2 Heidi Ramrattan

Abstract Name: Differentiating Auditory Processing Deficits from Comorbid Diagnoses: A Sibling Case Study

This study explores executive functioning (EF) deficits in two brothers diagnosed with attention-deficit/hyperactivity disorder (ADHD) and suspected auditory processing disorder (APD). The research focuses specifically on inhibitory control, self-monitoring, and metacognitive skills. The presence of additional comorbidities, such as oppositional defiant disorder (ODD) and disruptive mood dysregulation disorder (DMDD), complicates these cases, emphasizing the importance of accurate differential diagnosis. EF deficits, including issues with inhibition, cognitive flexibility, and working memory, are often found in children with language impairments, further complicating the diagnostic landscape. For instance, children with specific language impairment (SLI) typically show weaknesses in inhibitory control, particularly when dealing with tasks that require complex language skills. Additionally, developmental language disorders (DLD) are linked to significant deficits in working memory, affecting overall cognitive functioning. The data for this retrospective case study were collected through clinical assessments, including the Behavioral Rating Inventory of Executive Function (BRIEF), and interviews with the children's parents. The study aims to identify both the shared and unique EF deficits in the two brothers, examining how these difficulties interact with symptoms of APD and ADHD. Prior research indicates overlap among APD, language processing disorders (LPD), and EF impairments, particularly in areas like following verbal instructions and managing distractibility. By comparing the findings to existing research, this study seeks to clarify EF patterns in children with combined auditory, language, and attention challenges. The goal is to better differentiate these conditions, thereby supporting more accurate diagnoses and tailored interventions. While the small sample size is a limitation, the analysis offers valuable insights into the complex relationships between APD, ADHD, and EF deficits, underscoring the need for improved diagnostic and assessment tools.

Alexandrea Howard

TN - Vanderbilt University

Discipline: Psychology

Authors:

#1 Brittany Shoots-Reinhard

Samuel Howard

Gabriella Howard

Abstract Name: Vaccine Hesitancy: The Impact of Social Norms and Scarcity

A scarcity heuristic has been substantiated: if something is hard to find, it must be more valuable (e.g., Folger, 1992; Lee & Jung, 2019; Newsome, 2021). Moreover, studies suggest that negative social norms deter action while positive social norms encourage action. Our research analyzes the impact of both scarcity and social norms on vaccine hesitancy - a top threat to global health (World Health Organization, 2019). Brock's scarcity principle (1968) has been supported in over 40 studies showing that an item's perceived value can be increased by promoting its scarcity (Lynn, 1991). Sprengholz, Betsch, and Böhm (2021) found that vaccination intentions increased under high scarcity conditions. Rabb (2022) found that people's intentions to get vaccinated were predicted by others' intentions to get vaccinated, and Winter, Pummerer, Hornsey, and Sassenberg (2021) found that subjective norms moderate the effect of conspiracy mentality on vaccination intentions. Rozin's (2001) theory of negativity bias suggests that negativity is received more strongly than positivity. We proffer two hypotheses that are in the process of being tested with a large sample using a 2 (scarcity level) x 2 (social norm: friends' & family's approval or disapproval) experiment: 1) family members' and friend's negative vaccine views will negate the reduced vaccine hesitancy caused by vaccine scarcity resulting in higher vaccine hesitancy and lower vaccine intentions and 2) regardless of vaccine scarcity, friends' and families' negative vaccine views will increase vaccine hesitancy more than positive views will decrease vaccine hesitancy. We expect to find that negative vaccine social norms outweigh the impact of scarcity on vaccine hesitancy. These results could inform future vaccine messaging.

Sydney Howard

MN - Hamline University

Discipline: Biology

Authors:

#1 Leif Hembre

Abstract Name: A Hypoxic Aquatic World: Variability in Hemoglobin Production by Daphnia in Lakes of Different Trophic States

Nutrient pollution and climate warming are interacting to worsen the problem of deep-water hypoxia in lakes. Nutrient pollution causes algae blooms, and when those blooms decompose, it decreases dissolved oxygen (DO) in deep water. Strengthened thermal stratification of lakes caused by climate warming further promotes deep-water hypoxia by inhibiting the mixing of oxygenated surface waters into deep water. Hypoxic 'dead zones' can cause mortality for deep-water organisms, and hypoxia may act as a selection pressure promoting adaptation to low oxygen conditions. Daphnia, a freshwater zooplankton, produce hemoglobin (Hb) which improves survival in hypoxic conditions. Hb levels tend to differ within and among populations, but there is uncertainty about how environmental conditions and genetics interact to control hemoglobin levels. For this

study, we determined Hb levels of *Daphnia pulex* sampled from different depths in lakes with varying trophic states (oligo-mesotrophic to meso-eutrophic lakes). In addition, we assessed rates of Hb metabolism and production under controlled DO levels to determine the extent of Hb phenotypic plasticity. We hypothesized that *Daphnia* from mesotrophic to eutrophic lakes that regularly experience deep-water hypoxia would have higher Hb levels. We also expected that *Daphnia* collected from depths with lower DO levels would have higher Hb levels. As expected, Hb levels were highest in mesotrophic *Daphnia* populations. Unexpectedly, Hb levels were highest in *Daphnia* from the metalimnion. Due to *Daphnia* migration and non-linear Hb metabolism, these unexpected results may not be reflective. Overall, our findings indicate that mean Hb levels differ among populations and that the expression of Hb is phenotypically plastic. Future research will involve more sampling from oligotrophic lakes and focus on genotype testing to evaluate genetic impacts of the Hb trait. Findings of this study provide understanding of how *Daphnia* populations will respond to intensified deep-water hypoxia caused by nutrient pollution and climate warming.

Maria Howard

WI - University of Wisconsin-La Crosse

Discipline: Anthropology and Archaeology

Authors:

#1 Amy Nicodemus

Abstract Name: Worked Bone from the Bronze Age in the Carpathian Basin

The Bronze Age, lasting from 3300-1200 BCE, is characterized by the wide usage of bronze. In most places, stone tools were still commonly used in addition to bronze. However, in the plains of the Carpathian Basin, stone was uncommon and bones were often used instead for tools. Bones were more readily available and have a certain workability that stones do not have. My research examines bone tools from several Bronze Age cultures in the Carpathian Basin of Southeastern Europe. The bone tools analyzed in this research project were used for typical daily activities such as carpentry, leatherworking, and pottery creation. While the basic types of bone tool are known, variation across cultures is not well understood. It is not currently known if the raw material used for in their manufacture or the tool kits themselves vary across cultures. Are there cultural differences in worked bone industries? To answer this question, I examined bone tools from four different Bronze Age sites across the Carpathian Basin, including assessing tool type, species of animal used for raw material, and what skeletal element was used. My research demonstrates that the different sites have similar tool kits but will vary in raw material choice across cultures. This shows that while humans utilized similar tools for the same tasks, an element of cultural influence also dictated choices. This can be applied to other studies of the material assemblages of cultures, both in the Bronze Age and beyond.

Alexandria Howard

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Alexandria Howard

#2 Anna Cook

#3 Anna Stoll

#4 Gia Vollmer

#5 Ahmad Hakim

#6 Justin Hall

Abstract Name: Progranulin insufficiency disrupts the immune response to TDP-43 pathology

Progranulin (GRN) is a secreted growth factor that plays an essential role in regulating neuroinflammation and maintaining lysosomal function. Loss-of-function mutations in GRN, leading to progranulin haploinsufficiency, are a major cause of frontotemporal dementia (FTD) with TAR DNA-binding protein-43 (TDP-43) pathology. FTD is characterized by neurodegeneration and neuroinflammation within the frontal and temporal lobes of the brain, resulting in personality changes or language impairments. Progranulin heterozygous knockout (Grn+/-) mice, the genetic model of FTD due to progranulin mutations, do not develop TDP-43 pathology; however, progranulin homozygous knockout mice (Grn-/-) develop subtle pathology in the thalamus and pons. In order to investigate the effects of progranulin on TDP-43 pathology, we crossed Grn+/- mice with transgenic mice that overexpress human TDP-43 (hTDP+). Homozygous hTDP mice (hTDP++) have cortical TDP-43 pathology and neuronal loss in the CA3 region of the hippocampus. hTDP++ mice also exhibit markers of reactive gliosis and neuroinflammation in both cortex and hippocampus, and IgG deposition in CA3, indicating an adaptive immune response. We found that progranulin insufficiency did not affect cortical TDP-43 pathology in hTDP++ mice, but exacerbated gliosis and neuroinflammation in both cortex and CA3. In contrast to Grn+/+:hTDP++ mice, Grn-/-:hTDP++ mice failed to exhibit IgG deposition in CA3, indicating an impaired adaptive immune response. Regardless of Grn genotype, hTDP++ mice do not exhibit MHCII and CD3 immunoreactivity in CA3, suggesting that the IgG deposition of hTDP++ mice is mediated by a peripheral adaptive immune response. We are currently using flow cytometry to investigate peripheral immune responses to hTDP++ expression and how it changes with progranulin genotype.

Jasmine Howard

KY - University of Kentucky

Discipline: Exercise Science and Nutrition

Authors:

Abstract Name: Care, Community, and Cuisine: Visions of Collective Food Justice in Lexington, Kentucky

With her social work career in New York City behind her, Mildred “Mim” Hunt returned to her hometown of Lexington, Kentucky, in 1950 with a newfound understanding of the various social ills that plagued those faced with poverty, hunger, and unequal opportunities. Despite her initial desire to leave the painful field of social work, she found herself pulled back to the realm of social justice and used her unique perspective to make a difference in her community. To alleviate hunger, she founded a small food pantry that became a force in the community, and still thrives today. Researching her collection, the Mildred Hunt papers, 1963-2005, at the University of Kentucky Special Collections Center, has inspired addressing the issue of unmet food needs for students on the University of Kentucky campus. University of Kentucky students experience issues of food insecurity due to rising costs in tuition, housing, and food. While UK has some initiatives to assist students in need, programs are often small, inconvenient, and not well advertised. This research proposes a novel component to complement already existing resources, in the hopes of reaching student needs not currently being met. The Wildcat Cafe would be a non-profit cafe on central campus operated as a joint venture between the College of Business and the College of Agriculture. Run by students, this cafe would act as a safe space for students to actively engage in organic food production on UK farms, procurement, meal production, and distribution with the goal of providing low-cost, nutritional food in a convivial atmosphere. Guided by a human rights-based approach to food justice and Mildred Hunt’s passion for community service, this program would provide a glimpse into a future in which the roles of server and served are balanced and equal.

Cara Howe

KY - University of Kentucky

Discipline: English and Literature

Authors:

Abstract Name: Reclaiming Women's Creative Identities; An Analysis of Rena Lipetz Niles's Writings

Patriarchal constraints on artistic license has been a recurring theme in historical analysis, particularly as modern efforts to rewrite narratives delegate spaces for recognizing women as creators. One compelling example is the archival collection of Rena Lipetz Niles, the wife of famous Bluegrass musician and author John Jacob Niles, housed at the University of Kentucky Library Special Collections Research Center. Until recently, Rena Lipetz Niles's creative works were subsumed under her husband's materials, relegated to the status of managerial artifacts supporting his success and a reflection of the gender norms of the early to mid-20th century. This research will explore the creative voice of Rena Lipetz Niles for its own merit distinct from the shadow of her husband's artistic success in an attempt to uncover one instance of creative talent that history has overlooked. Utilizing qualitative analysis to examine 50 short stories in the collection will uncover broad themes of her work and explore her place in the canon of 20th century writers. This research will also explore her diaries and a series of oral histories to see how her personal stories reflect feelings about her own creative identity related to managing her husband's career, and if she felt her career was subsumed by his. Exploring women's creative identities of the recent past will emphasize the importance of revisiting women writers' work to reframe gendered narratives.

Cody Howe

OK - Oklahoma State University

Discipline: Architecture, Construction Management, and Interior Design

Authors:

#1 Cody Howe

Abstract Name: Foundations: The Bauhaus Influence on Contemporary Graphic Design in the United States

While primarily cited for its revolutionary approach to architectural design and education, the Bauhaus movement has also significantly contributed to contemporary graphic design practices in the United States. This study examines how core Bauhaus design principles continue to shape modern visual communication in two fundamental areas: typography and geometric systems. Through an in-depth literature review, this research investigates how the Bauhaus design principles of functional minimalism and the integration of art and technology helped to establish the foundations of modern American graphic design. The study particularly focuses on two key areas of influence: 1. Typographic approaches prioritizing clarity and universal readability, reflecting the Bauhaus emphasis on functionality over ornamentation. 2. Geometric systems that structure modern design and define the digital interfaces used to create them. While the transition to digital design has transformed many aspects of graphic design practice, this study demonstrates how Bauhaus principles helped to shape these practices and how these principles remain relevant in modern graphic design. By examining these historical connections and their contemporary applications, this research investigates both the historical development of American visual communication and the ongoing relevance of Bauhaus principles in today's digital design landscape.

Lojy Hozyen

VA - Virginia Commonwealth University

Discipline: Biology

Authors:

#1 Caroline Cheung

#2 Maniselvan Kuppusamy

#3 Swapnil Sonkusare

Abstract Name: AI Driven Analysis of Atherosclerotic Plaque's Cellular Composition

Atherosclerosis is an inflammatory condition that affects about 75% of all individuals. The symptoms of the disease usually progress rapidly beginning at the age of 40 years old. This disease forms when cholesterol and fat build up on the walls of large blood vessels, which builds plaque. This causes narrowing of the arterial lumen. In advanced stages of the disease, plaques can become less stable when a necrotic core develops. When advanced lesions rupture, they can block small blood vessels and reduce oxygen flow to vital organs. This phenomenon can result in strokes and heart attacks. Vascular TRPV4 ion channels are crucial regulators of vascular function. Therefore, I hypothesized that vascular TRPV4 channels regulate plaque formation and stability. To further understand the cellular makeup of plaque in atherosclerotic mice, Myh11 CreRAD ApoE^{-/-} mice were used with a TRPV4 wt/wt and TRPV4 fl/fl feeds. After 18 weeks the BCA was removed and immunofluorescent stained for tdTomato, Acta2, Mac2, and DAPI. To analyze the colocalization of composition in cell specific TRPV4 knockout mice, Zeiss Itelesis AI model was trained on each wavelength channel. Previously, individuals in the lab would spend hours counting their cells so this technology allowed for more analysis, and better represented data to be drawn upon. I also developed python program to merge the Zeiss output and attain colocalization counts of the antibody stains. The program merges excel files together and uses the nucleus as the cell ID to differentiate which states are included in a single cell. Initial data suggest no differences in cells with smooth muscle lineage in the plaques but more analysis is being done.

Sara Hrnaiar

FL - The University of Tampa

Discipline: Computer Science

Authors:

#1 Lorraine Jacques

Abstract Name: Natural Interaction, Real Feedback: A Qualitative Assessment of Minimally Invasive Model for End-User Testing in Recreational Environments

End-user testing is a phase of software development in which the intended audience tests the application to provide feedback to the development team. Typically, companies will employ strategies for end-user testing such as observation, artificial environments, surveys, and focus groups. These methods may be invasive and may provide a less accurate representation of actual users when applied in settings where the software is merely supplemental to a larger experience. The rise of software in spaces like amusement parks, museums, and fairs begs for a different approach to end user testing. Hence, the driving question: How can user testing on a software application be effectively conducted in a public environment? This study designs and evaluates a minimally invasive end-user testing model that allows users to interact with the app naturally as they enjoy

the recreational space without being followed and observed. The proposed model combines in-app analytics and brief post-visit interviews with end users. This model was used for testing at a children's museum using an app developed by local university undergraduates. These data sources were then evaluated to determine their capabilities for finding bugs in the app. Findings suggest that this model allows for authentic interactions from real users, leading to the identification of several issues that may otherwise go unnoticed with traditional testing methods. Interviews alone resulted in vague information; analytics alone did not identify all bugs in the software. The combination resulted in more bugs being identified and with enough information for developers to address them. This study offers an alternative to conventional end-user testing in contexts where user engagement with the software is secondary to a larger, in-person experience.

Bingjie Hsieh

IL - University of Chicago The College

Discipline: Sociology

Authors:

#1 Bingjie Hsieh

Abstract Name: Reimagining Queer Kinship: The Use Of Assisted Reproductive Technologies By Lesbian Parents

My research centers the discussion about imaginations of kinship on Lesbian parents, particularly people who used assisted reproductive technologies (ARTs) to conceive. In the context of Taiwan's legal regulations, lesbian couples cannot legally access in-vitro fertilization(IVF), despite Taiwan's high IVF successful rate and affordability. The process of traveling transnationally in order to obtain reproductive treatments not available or accessible in one's own country has been called "reproductive migration." Intended parents from Taiwan have traveled to the United States, Denmark, Cambodia, and Japan to receive IVF treatment. In this research, I use in-depth interviews to explore how the process of realizing one's desire for motherhood intersects with an imagination for queer futurity. I argue that through the process of reproductive migration, lesbian parents often reimagined kinship in a transformative way. The deliberate decision-making that spans across various stages of the reproductive journey testifies to a constant negotiation between conformity to the established social norms and contesting those existing norms in a way that seeks to actively reshape, rather than passively accept the given definition of kinship. From the selection of the race of sperm donors to discussing who would be the genetic or gestational mother, and choosing care providers, the process is saturated with social meanings and imaginations. An understanding of the multiple stakeholders and institutions that one ought to contest in the decision-making process helps us gain a contextual view of what reimagining the future of queer motherhood and kinship would entail.

Hsiang Yu Hsieh

CA - De Anza College

Discipline: Computer Science

Authors:

Vivienne Ko

Prithvi Kapilavai

Abstract Name: Advancing Real-Time Stock Market Prediction with Large Language Models using OpenAI Approaches

With the growth of artificial intelligence, new opportunities have opened up to analyze and predict real-time data. This project uses large language models (LLMs) to predict stock market trends. LLMs are advanced AI tools designed to understand and generate text, which helps finding patterns in large, complex datasets. The goal is to use real-time stock market data, including prices, trading volumes, and historical trends, to train the LLM to recognize patterns and predict short-term changes in the market with high accuracy. The project will follow a complete process to achieve this. First, stock market data is collected using tools such as YFinance that gives the access to the financial data on yahoo finance. The python based libraries in Yfinance converted the financial data into a spreadsheet indicating the company's stock information. It included the open and closed stock values along with the high and low values during that day. This time series stock data for 25 companies was gathered and various algorithms were used to develop the predictive models for their stocks. Initial data was modeled by using the auto ARIMA algorithm. Day by day acquired data was stored in a Retrieval-Augmented Generation (RAG) database. This database efficiently manages updates to make sure the model always works with the latest data. The acquired data is then cleaned and formatted for the LLMs (ChatGPT, LLMA etc), emphasizing patterns and trends essential for prediction. Both are employed and are being evaluated for prediction accuracy, speed, and adaptability to rapid market changes. This comparison will provide details into the strengths and weaknesses of each model for financial forecasting. These combined technologies can build a clear workflow of using AI to analyze stock market trends, address challenges in a dynamic financial environment, and to improve these tools in the future.

Taylor Hu

WA - University of Washington - Seattle

Discipline: Biology

Authors:

#1 Yapeng Su

Abstract Name: Evaluating the Specificity and Generalizability of LSD1 inhibition on CD4+ and CD8+ T cell Populations

Adoptive Cell Therapy (ACT) is a novel modality of cancer therapy, in which immune cells can be engineered with T cell receptors (TCRs) to aid in targeting specific antigens presented on the surface of cancer cells. ACT has already brought curative therapy to many previously treatment-refractory blood cancers. However, TCR-T cells often have limited persistence after transfer into patients, which has hampered the effectiveness of this therapy for solid tumors, which require a sustained anti-tumor response. I evaluated if functional improvements could be induced by a small molecule inhibitor of LSD1 (LSD1i), a histone lysine demethylase that modifies chromosome accessibility, as a strategy to improve long-term activity against tumor cells after infusion into patients. Previous research has also found that “helper” CD4+T cells enhance the functionality of cytotoxic CD8+ cells, and I am now seeking to assess broader activity and benefits of LSD1i on a combined population of CD4+ and CD8+ cells. I first treated CD8+ T cells with a small molecule drug, Bomedemstat (an inhibitor of LSD1) during the in vitro cell expansion process, and demonstrated enhanced function in a co-culture system that models chronic stimulation as would occur in a solid tumor. To assess activity of Bomedemstat on CD4+ T cells, I used lentiviral transduction to insert functional TCR constructs into both CD4+ and CD8+ T cells, and plan to expand these cells with the optimized concentration of Bomedemstat in a second coculture assay, this time with combined CD4+ and CD8+ populations. I expect Bomedemstat will prevent dysfunction similar to our previous results with a LSD1i in CD8+ T cells, as illustrated by improved tumor killing and changes in T cell phenotype and function. Demonstrating applicability of LSD1i pretreatment on combined T cell populations would establish a stronger foundation to advance this epigenetic perturbation to clinical applications.

Kailey Hua

PA - Carnegie Mellon University

Discipline: Computer Science

Authors:

#1 Jian Ma

#2 Ellie Haber

Abstract Name: The Identification of Synthetically Lethal Gene Pairs Using Single-cell Foundation Models

Synthetic lethal (SL) gene pairs represent a unique genetic relationship where the simultaneous loss-of-function of two genes leads to cell death, while the loss of either gene alone does not compromise cell survival. Identifying these pairs is crucial for developing targeted therapies, particularly in cancer, where exploiting SL interactions allows for selective killing of cancer cells harboring mutations in one of the genes while sparing normal cells. However, the experimental identification of SL pairs remains a significant challenge due to the vast number of possible gene combinations and the fact that SL interactions are rare and context-dependent. This makes exhaustive experimental screening impractical, both in terms of time and cost. Foundation models, however, can learn complex gene dependencies and can be applied to simulate genetic perturbations, such as gene knockouts, at single-cell resolution. Geneformer, a single-cell foundation model that is pre-trained on gene expression data from 95 million cells and represents cellular states as ordered lists of gene expression values, has an architecture built for simulating in silico perturbations, and is therefore suitable for the task of predicting SL interactions. We constructed a classifier to predict cell viability and SL interaction based on Geneformer's pre-training knowledge alongside data from the Cancer Dependency Map (DepMap), which includes cell viability scores for a variety of gene knockouts, as well as SynLethDB, a comprehensive database of experimentally validated SL pairs. We identify synthetically lethal gene pairs by measuring the divergence in both the gene embeddings generated by Geneformer and the predicted viability score between single-gene and dual-gene knockouts.

Kaylee Huber

PA - University of Pittsburgh at Greensburg

Discipline: Mathematics

Authors:

#1 Michael Lucci

Abstract Name: Evaluating Examination Forms in a Basic Applied Statistics Course using Classical Test Theory

In developing and administering tests that range from college entrance examinations to classroom tests, Classical Test Theory (CTT) can be used to compare different exam forms by evaluating the item discrimination of the exam's questions. Ensuring the equivalence of exam forms is important for treating all examinees fairly. This study compared different test forms for a Basic Applied Statistics course at a four-year university. The classical item difficulty, discrimination statistics, and other test statistics were examined for each form. Revisions were proposed for poorly functioning items. By using these methods, future exams can be revised to create and evaluate parallel test forms.

makaylei huggins

FL - Embry - Riddle Aeronautical University

Discipline: Environmental Science and Sustainability

Authors:

#1 Makaylei Huggins

William John

Abstract Name: Enhancing Tornado Research: A Case for Revising the Enhanced Fujita Scale

This research project aims to demonstrate why the Enhanced Fujita (EF) Scale is outdated and inaccurate. The Enhanced Fujita scale, introduced in 2007, is the standard for estimating tornado intensity based on damage surveys. While it has improved since the original EF scale, limitations still persist in accurately representing tornado strength specifically for high-end events in non-urban areas. This research will employ a combination of field observations, and a hands-on physical approach of building a remote controlled tornado probe from scratch. The probe will consist of anemometers, hygrometers, barometers, GPS tracking systems and more. Not only introducing a new remote controlled way to collect tornado data, but also allowing the probe to collect data and use it as further fuel to get the Enhanced Fujita (EF) Scale revised. Although results are pending, this research holds promise in addressing the importance of accurate tornado intensity ratings.

Caroline Hugh

IL - University of Chicago

Discipline: History

Authors:

Abstract Name: Central Planning and Peripheral Protest: Contested Urbanism and Suburban Annexation in Paris (1852-1871) and Chicago (1889-1909)

While scholars have long recognized the architectural influence of Second Empire Paris (1852-1870) on Chicago, few have investigated the possibility of shared political and economic ideologies in Haussmannization and the Burnham Plan of 1909, nor have they compared how those plans were received by affected populations. This project connects and compares Chicago and Paris through two processes of modernization: urban planning and the annexation of suburban municipalities into an expanding municipal area. The influence of Paris' remaking on Chicago planning is analyzed through the writings, drawings, and correspondence of prominent Chicagoans in the Progressive Era (1889-1893), establishing the cities' shared political and economic ideologies, including the prioritization of rationality, circulation of capital, and spectacle over lived experience. Reception to modernization is investigated by comparing how the residents of the industrial suburbs of La Villette and the Town of Lake responded to annexation. While urban planning in Paris and Chicago was meant to create economic efficiency and unified (arguably, homogeneous) civic societies, a weaker government in Chicago meant that protesting suburbs were able to exact concessions and affect the bureaucratic process in a manner that was not possible in Second Empire Paris. Furthermore, suburban residents reacted differently to annexation: La Villette resisted by championing its economic identity as an industrial warehouse district, while the younger, more disparate Town of Lake was unable to rally around a common identity. Thus, while capitalist modernity encouraged similar urban forms, governmental structure and neighborhood-level particularities shaped how these plans were implemented and received.

Quinn Hughes

PA - La Roche University

Discipline: Biology

Authors:

#1 Quinn Hughes
#2 Robert Ramos Santiago
#3 Islam Mokhtar
#4 Dania Ngabire
#5 Christina Stoltz
#6 Richard Slebonick
Robert Ramos Santiago

Abstract Name: Assessing the Effects of Abandoned Mine Drainage on Biodiversity and Water Quality

In the western United States, the Forest Service estimated that around 20,000 and 50,000 mines release acid, with drainage from these mines affecting around 8,000 and 16,000 kilometers of streams. Abandoned mine drainage (AMD) can cause various metals like silver, zinc, and copper to leak from the mine acidifying surface waters. Wingfield Pines, a park located in Upper Saint Clair, Pennsylvania, is one of numerous restoration and enhancement projects now ongoing in Chartiers Valley. The AMD treatment system, built in 2009, covers approximately 20 to 25 acres of the 87-acre plant and uses gravity to treat mining wastewater that flows across the site at a rate of 1,500 - 2,000 gallons per minute before entering Chartiers Creek. The data collection method consisted of wildlife surveys and water quality assessments. In addition to recording the numbers and distributions of species, we also measured each animal and checked for physical irregularities. The methods used for water quality testing included measuring pH, temperature of the water, and dissolved oxygen levels. To measure bacterial diversity and abundance, water samples were collected from each pond and streaked onto TSA plates for colony development. The pH levels generally approached neutrality as water traveled through the remediation system. Despite initial contamination, the water quality significantly improved, sustaining a variety of life forms. The presence of diverse species, such as waterfowl and amphibians, demonstrated the ecosystem's viability. Our findings suggest that the restoration effort at Wingfield Pines is successful. The water quality and biodiversity of the area reflects its success in providing a suitable environment for wildlife. For our Bacterial colonies, more testing is required for us to accurately describe and identify the right species. Detailed bacterial investigation could provide more information about the populations of bacteria and their functions in the remediation process if any.

Madeleine Hughes

IL - North Central College

Discipline: Criminology/Criminal Justice

Authors:

#1 Raleigh Blasdel
#2 Jennifer Smith

Abstract Name: Public Opinion on Correctional Education Programs in U.S. Prisons

This study will examine public opinion of educational programs within United States prisons. While existing research demonstrates the benefits of correctional education programs to both offenders and their communities, access to these programs is not guaranteed, as fluctuating political positions surrounding crime and punishment lead to inconsistency of penal policy on correctional education programs. With more than 600,000 Americans being released from state and federal prisons each year (Sawyer, 2022), further research is necessary for improving the efficacy of U.S. prisons in correcting criminal behavior and supporting successful reentries into society. By exploring where both support and opposition to these programs exist, the study can reveal reasonings for public ideologies on the subject. In understanding who supports/opposes prison education programs, policy advocates will be better prepared to anticipate ideological obstacles when

working to implement these services. Potential benefits of widespread program implementation include a reduction in recidivism, a greater number of individuals involved in the legal labor market, and long-term economic savings of government spending on incarceration. The research hypothesis is that the public's lack of evidence-based information on the impact of educational programs in prisons is a driving force behind public opposition and barriers to implementation. Data on participant demographics, preexisting knowledge, and personal beliefs regarding correctional education will be collected through a self-administered digital survey. The survey will consist of closed-ended and Likert scale questions in order to gather comparable data on the views of the American public. Data analysis will draw conclusions to identify any trends that support or refute the hypothesis.

Rebecca Huisman

GA - Georgia College and State University

Discipline: Chemistry

Authors:

#1 Peter Rosado-Flores

Abstract Name: XRF (X-ray Fluorescence) Analysis of the Adsorptive Properties of Different Clays

Clays possess unique layered structures made up of alternating sheets of SiO_4 and $\text{Al}(\text{OOH})_6$, which enable them to adsorb various molecules, particularly water. This capacity to incorporate water and other elements into their structure also allows clays to effectively filter contaminants such as heavy metals from water. The aim of this study was to assess the ability of three different types of clay and one field sample to adsorb and filter Fe(III) from aqueous solutions. Before exposure to a 0.00009 M Fe(III) solution, X-ray fluorescence (XRF) analysis was conducted on the clay samples to determine their initial Fe content. Each clay sample was then mixed with the Fe(III) solution and stirred for several hours. After gravitational filtration, the clays were re-analyzed by XRF to measure the amount of Fe(III) adsorbed onto their structures. The initial Fe concentrations in the four samples were 0.7260%, 0.8520%, 5.326%, and 2.66%, respectively. After 6 days of mixing with the Fe(III) solution, the concentrations increased to 0.983%, 1.286%, 8.04%, and 4.44%. These results indicate that the clays were able to adsorb some Fe(III), although the experiment was hindered by issues with the solubility of Fe(III) in solution, warranting a repeat of the study for more reliable results. Future work will explore the adsorption capacities of clays for other metals, including Cu, Pb, and Hg, and investigate how firing affects clay adsorption properties. Additionally, UV-Vis spectroscopy could be employed to more accurately measure metal concentrations in solution before and after the adsorption and filtration process.

Jaden Humphrey

OH - University of Findlay

Discipline: Biology

Authors:

#1 Jaden Humphrey

#2 Conner Douglass

#3 Trevor Owens

#4 Bethany Henderson-Dean

Conner Douglass

Trevor Owens

Abstract Name: Monitoring Antibiotic Resistant Populations as a Correlative to Water Quality

Agricultural land use can adversely impact nearby waterways, leading to significant economic and environmental disruptions, including alterations to species assemblages, loss of wildlife and habitats, and negative health outcomes for humans. Monitoring aquatic systems in agricultural regions is essential for developing precise and effective management guidelines and gaining a comprehensive understanding of the links between agricultural practices and aquatic ecosystem disruption. The Blanchard River, situated in a heavily farmed region contributing to the Lake Erie watershed, serves as an exemplary system for studying the sustainability of antimicrobial-resistant microbes. Research into reservoirs of methicillin-resistant *Staphylococcus aureus* (MRSA) and other antibiotic-resistant bacteria outside clinical settings remains limited. In this study, MRSA and other antibiotic-resistant microorganisms were screened at 126 sites along the Blanchard River and its tributaries. MRSA was detected at 26 sites, while antibiotic resistance was prevalent across all locations. Sixteen Areas of Concern (AOCs) were selected in collaboration with the Blanchard River Watershed Partnership to evaluate whether traditional water quality indicators, such as nutrient levels and macroinvertebrate populations, correlated with antibiotic concentrations and resistant bacteria. While antibiotic-resistant microorganisms did not correlate significantly with antibiotic concentrations or land use, minor associations were observed between antibiotic concentrations and pollution-tolerant macroinvertebrates. To better understand MRSA's origins, strain typing was conducted to confirm its source. Multi-year sampling revealed that local water systems play a unique role in transmitting MRSA, with livestock, particularly horses and cattle, serving as reservoirs. Findings from this study emphasize the importance of targeted water quality monitoring and preventative measures to mitigate the spread of antibiotic resistance.

Abigail Hunninghake

NC - Elon University

Discipline: Biology

Authors:

#1 Abigail Hunninghake

Mandi Lichtenstein

Dr. Andrea Perreault

Abstract Name: Comparative Analysis of Histone Mark Distribution in HepG2 cells in Response to HBV Infection and HCC Development

This research aims to identify and compare epigenetic patterns in hepatocellular carcinoma (HCC) and Hepatitis B Virus (HBV)-infected cells. HBV is a small DNA virus that infects the liver, affecting over 296 million people worldwide. Chronic HBV infection is the leading cause of HCC, a form of liver cancer responsible for 70-85% of all liver cancer cases globally. Histone modifications are an epigenetic mechanism of controlling gene expression. For example, trimethylation is often associated with gene repression and acetylation is associated with gene activation. This study will compare these histone modification patterns in HCC and HBV-infected cells with those in normal liver cells to identify genomic regions associated with altered gene activity. Results are expected to reveal increased acetylation at oncogenic genes and increased methylation at tumor suppressor genes. These findings aim to enhance the understanding of HBV-induced epigenetic dysregulation and may inform the development of more targeted therapeutic strategies for HCC.

Brooke Hunsinger

NY - Pace University

Discipline: Economics

Authors:
Jaida Marcus

Abstract Name: The Impact of Environmental Regulations on Consumer Interest in Sustainable Fashion Brands

This research explores how environmental laws and regulations influence consumer behavior towards environmentally friendly fashion brands. Specifically, this study examines regulations designed to reduce pollution, manage waste, promote sustainable production, and hold companies accountable for environmental harm. Using a data from Google Trends and a difference-in-difference framework, this study shows that companies positioned as environmentally friendly see interest in their brands increase by approximately 13 percentage points after laws promoting this behavior go into effect.

Leilani Hunter

OK - Cameron University

Discipline: Chemistry

Authors:
#1 Dr. Kandalama Priyasantha
#2 Jacob Thorne

Abstract Name: Identification and Quantification of Phenolic Acids in Processed Sri Lankan Tea: A Potential Source for Bioactive Compounds in Drug Discovery

Phenolic acids are a group of bioactive compounds with known antioxidant, anti-inflammatory, and potential therapeutic properties. This study aimed to identify and quantify selected phenolic acids in tea and herbal tea samples, with the long-term goal of profiling processed tea samples to discover candidate bioactive compounds for drug development. Tea samples were sourced from Sri Lanka, grown under unique conditions, and processed to enhance quality. The analysis was performed using High-Performance Liquid Chromatography (HPLC) with a C18 reverse-phase column, coupled with Liquid Chromatography-Mass Spectrometry (LC-MS) for compound identification and quantification. The 20-minute HPLC run provided a high-resolution separation of phenolic acids. The identified phenolic acids were quantified and compared across different tea samples to evaluate the effects of processing on their concentrations. Preliminary results indicate a significant variation in phenolic acid profiles depending on the tea processing methods, which may contribute to differences in bioactivity. These findings provide a foundation for further exploration of bioactive compounds in tea, offering potential leads for drug discovery and development. Future studies will expand the profiling to a wider range of tea varieties and processing conditions to enhance the identification of novel bioactive compounds.

Katherine Hunter

AR - Lyon College

Discipline: Biology

Authors:
#1 Katherine Hunter

Abstract Name: The Evolutionary History of Crabs: Carcinization

The popular science conception of carcinization is that the crab body plan is so evolutionarily superior that, in time, all animals will evolve into crabs. However, this is an oversimplification and carcinization can be defined as the process of a decapod crustacean convergently evolving the characteristics of a crab. The most important of these characteristics include a depressed and shortened carapace with a similar width and length, a wide sternum, and a pleon ventrally folded within the carapace. The purpose of this research is to examine carcinization as a phenomenon among decapod crustaceans and explain how it demonstrates convergent evolution. Full carcinization has occurred at least five times in crustacea: twice in the infraorder Brachyura, or the “true” crabs, and three times in the infraorder Anomura, the “false” crabs. These instances of carcinization have been verified through probe design, anchored hybrid enrichment sequencing and dataset assembly, phylogenomics, and divergence time estimation using fossils. The Brachyuran carcinization events include sections Dromiacea, which include sponge crabs, and Eubrachyura, the more derived and diverse of the two sections with 6,191 extant and 1,265 extinct species. The carcinization events in Anomura include the members of the family Porcellanidae, Lomisidae, and Lithodidae. Some Porcellanid crabs even demonstrate hypercarcinization, or the convergent evolution of Brachyuran-like characteristics beyond those typically associated with carcinization. This presentation synthesizes contemporary sources to support the evolutionary link between Litholid king crabs and a Pagurid hermit crab ancestor, a potential connection that has been long denied by prominent evolutionary biologists.

Kaelyn Hunter

MS - University of Southern Mississippi

Discipline: Music

Authors:

Abstract Name: Exploring the Collegiate Choir Participant's Values within Ensemble Performances

This study examined how collegiate choral ensemble participants viewed their highest quality performance and their favorite performance. Examining characteristics of performances may encourage conversations about performance values between directors and students. Limited research has been done about musicians' views, as getting accurate and in-the-moment documentation of how musicians feel about their performances is challenging. To provide more insight into this previously understudied topic, this study aimed to explore the musicians' perspectives on their performances and how their emotions and repertoire are intertwined. The Primary Investigator (PI) conducted an anonymous study among the 2022–2023 choral ensemble participants at The University of Southern Mississippi (USM). To help define characteristics of performances that make them memorable, participants answered a series of short-answer questions about collegiate choir performances they had participated in: one excellent performance and their favorite performance. Results showed that excellent performances have high rates of musical success and precision. Additionally, enjoying the composition of a piece was the most frequently mentioned aspect of favorite performances. For both performances, participants listed their ensemble peers and the emotions evoked by music as being important parts of their experiences. Participants reported having more fun and feeling happier during their favorite performances. Participants also discussed feeling more confident during their excellent performances. Ultimately, these results indicated that choral ensemble participants have a variety of values and expectations for their performances. However, despite the individualized differences, musicians are likely to get emotionally involved during performances. To encourage more ensemble cohesion when working towards higher goals, choral directors may consider collaborating with their students during the standard- and expectation- setting process. Implications will be discussed. Keywords: Choir, Emotions, Excellence, Music, Perceptions, Performances

Eva Hunter

NC - Elon University

Discipline: Psychology

Authors:

#1 Katrina Jongman-Sereno

Abstract Name: Intellectual humility, affective polarization, and misinformation susceptibility

America's political world is divided, with individuals becoming increasingly critical and disrespectful of those with opposing views (Iyengar et al., 2019). Affective polarization (AP; “the tendency to perceive the opposing party as immoral and unlikable;” Bowes et al., 2020, p. 1) has been shown to result in higher susceptibilities to misinformation: Those high in AP are more likely to believe misinformation supporting in-party beliefs than misinformation supporting opposing beliefs (Jenke, 2024). This may further exacerbate AP, as it impacts the effectiveness of political discourse, informed voting, and candidate opinions (Jenke, 2024). Beliefs that are influenced by misinformation can impact public health outcomes (Bossert & Jongman-Sereno, 2024) and promote ideological extremism (which furthers political polarization; Bowes et al, 2020; van Prooijen et al., 2015). AP and misinformation susceptibility are both negatively correlated with intellectual humility (IH), marked by openness in recognizing fallibility in one’s beliefs (Bowes et al., 2020; Bowes & Tasimi, 2024; Jenke, 2024; Knöchelmann & Cohrs, 2024; Leary et al., 2017). The present study investigates how changes in IH influence AP and misinformation susceptibility. Per past research, random assignment to a growth or fixed mindset will be used to manipulate IH (see Nussbaum & Dweck, 2008 for methodology). Since growth mindsets and IH are both related to the motivation to learn and a more accurate awareness of one’s knowledge (Porter & Schumann, 2018), targeting the presence of a growth mindset enhances IH (Nussbaum & Dweck, 2008; Porter & Schumann, 2018). Next, participants will complete measures of IH, AP, and misinformation susceptibility (Leary et al., 2017; Maertens et al., 2024; Iyengar et al., 2019). We hypothesize that individuals who engage in the growth mindset prime will experience higher levels of IH (as compared to those exposed to the fixed mindset prime), resulting in low levels of AP and misinformation susceptibility. Data collection will begin this fall.

Jade Hunter

TN - Trevecca Nazarene University

Discipline: Biology

Authors:

#1 Alisha Russell

Sarah Hardin

Mckenna Smith

Abstract Name: Targeting the Metabolic Pathways of Glioblastoma Multiforme

Glioblastoma Multiforme (GBM) is the most aggressive form of brain cancer in adults with a median survival rate of 12-14 months even with available treatments. Current treatments include surgery, radiotherapy, and chemotherapy. Available chemotherapy drugs are limited due to the complex nature of the blood-brain barrier. Because GBM rewires the metabolic pathways surrounding it to ensure it can provide for rapid cell growth, the metabolically dependent pathways could potentially be targeted to slow growth. Metformin, an electron transport chain complex 1 inhibitor and a common Type 2 diabetes treatment, has recently emerged as a promising therapeutic agent in a variety of cancers. Though its effects on GBM are currently unknown, preclinical studies have found that supraphysiological doses are needed to impact the disease. There is potential, however, that if the metabolic pathways involved in GBM proliferation were targeted from multiple directions, then disease progression would lessen with physiological doses of each drug. This study aims to

investigate the effects of metformin on U87- MG GBM cell lines in conjunction with memantine, a glutamate receptor antagonist.

Mary Hurley

VA - Christopher Newport University

Discipline: Communications

Authors:

#1 Colleen Colaner

Abstract Name: Reducing Relationship Uncertainty through Technology in the Open Adoption Relationship

The open adoption process is one of the most common avenues for adoption, yet this process involves a relatively new relational form. This relationship allows adoptive families to have various degrees of knowledge of and interaction with the birth parents before and after placement (Siegel & Smith, 2012). Scholars have uncovered numerous benefits to maintaining open adoptions, such as identity clarity for adoptees, increased closure for birth mothers, and additional information about the child's background for adoptive parents (Grotevant, McRoy, Wrobel, & Ayers-Lopez, 2013). However, this process can be very challenging when there are unknowns to the adopting family. More specifically, the adoptive mothers, as they are the primary participants within the relationship (French et al., 2014). In the communication discipline, the Uncertainty Reduction Theory (URT) provides a strong theoretical framework for understanding how individuals reduce their uncertainty about unfamiliar individuals. However, this theory has yet to be applied to examine adoptive mothers and how they reduce their uncertainty about the birth families during and after placement. To understand how adoptive mothers reduce their uncertainty about the birth families, a qualitative study was conducted. One-hour interviews were conducted with 30 adoptive mothers recruited from a large midwestern region adoption system. Coding analysis reveals that adoptive mothers were engaging in uncertainty reduction, primarily through the use of technology and technology-mediated communication. Evidence suggests that adoptive mothers would examine family members on social media sights, communicate via various channels to seek information, and more. This uncertainty reduction was shown to be a significant relational focal point as it helped the birth mothers communicate with both the birth family as well as the adopted child in a relational process that is very unique and new to them.

James Hurt III

AL - Auburn University

Discipline:

Authors:

#1 James Hurt III

#2 Marina Meyer Vega

#3 Valeria Robles-Cerdas

#4 Nawara Mansour A Alsalmie

#5 Daniel Goble

#6 Niyati Baweja

#7 Harsimran Baweja

Abstract Name: Anthropometrics Do Not Influence Limits of Stability in Standing Balance Across Lifespan

The limits of stability (LOS) are a key component of dynamic balance while standing. It represents unconstrained dynamic postural control ability and is studied by measuring the maximum distance one can lean in any direction without falling. A reduced LOS is associated with a greater fall risk. An individual's anthropometric characteristics (i.e., height, age, weight) could influence their LOS. However, it is unclear how these anthropometric characteristics impact the LOS during standing. PURPOSE: To determine how

anthropometric characteristics influence LOS across the lifespan. METHODS: 319 healthy participants (195 females and 124 males) volunteered to participate in the study and were grouped into: 5-12 years, 13-17 years, 18-25 years, 26-44 years, 45-59 years, and 60+ years. LOS was tested while standing on a force plate. Participants moved around as far as possible in all directions without lifting their feet for 60 seconds. RESULTS: On average, men were significantly taller ($F = 1.793$, $p < 0.001$) and demonstrated a larger LOS area when compared with women ($F = 3.954$, $p = 0.048$). LOS was also different across the lifespan ($F = 10.538$, $p < 0.001$). We found that LOS areas are smaller in 5–12-year-olds ($341 \pm 127 \text{ cm}^2$), increase from 13–44 years ($436 \pm 119 \text{ cm}^2$) of age, and then decline starting at the age of 45 ($318 \pm 128 \text{ cm}^2$). CONCLUSION: Our pilot findings suggest that limits of stability develop from childhood through puberty, peak in early adulthood, and begin to decline at 45 years of age. It continues to decline further beyond 60 years of age. While men were taller than women and demonstrated larger areas in their limits of stability, the variability in our findings could not be described by the differences in height or other anthropometric characteristics of the participants.

Nathan Hurtado

OR - Western Oregon University

Discipline: Exercise Science and Nutrition

Authors:

#1 Nathan Hurtado

#2 Andre Labate

Andre Labate

Abstract Name: Analysis of the Mechanomyograph During Repeats of Incremental Electrical Stimulation

Mechanomyography (MMG) has been demonstrated to complement the surface electromyographic (sEMG) signal during electrically-invoked skeletal muscle contractions. The proposed study is designed to measure characteristic changes in the MMG (i.e., the vibration of the muscle contraction recorded on the surface of the skin) intensity in the tricep surae (calf) muscles during incremental electrical stimulation using a wavelet packet analysis (a complex mathematical analysis, i.e., “intensity analysis”) that uses a filter bank of eleven wavelets to measure the power of a signal in the time-frequency domain. Measurements will be made of the MMG at a range of stimulus intensities to reflect a variety of motor units. Twelve collegiate (D-II) male soccer players will be recruited for the purpose of comparing the MMG during incremental electrically-evoked stimulation of the calf muscles. Signals will be collected at a rate of 2000 Hz (MP150; Biopac Systems Inc., Santa Barbara, CA). sEMG signals will be amplified (EMG100C; Biopac Systems Inc.) from disposable electrodes taped to the skin [specifically, standard 10-mm pregelled silver/silver-chloride electrodes--EL503, Biopac Systems Inc.]. MMG will be recorded using uniaxial high-resolution accelerometers [small sensors taped to the skin (ADXL330, Analog Devices, Inc., Norwood, MA)]. A stimulator module (STM100C; Biopac Systems Inc.) with a 200-V (maximum) stimulus adaptor (STISOC; Biopac Systems Inc.) using a disc electrode (EL548; Biopac Systems Inc.) and a 4-cm dispersive pad will be used to stimulate the muscle contractions. The tibial nerve will be stimulated in 5V increments with 10-second rest intervals, and data where the peak-to-peak M-wave amplitude exceed the H-reflex will be analyzed. Peak-to-peak MMG (MMGp-p) data subjected to the intensity analysis, and total intensity, the peak total intensities (Max), and time to Max (TTMax) will be determined. These data will subsequently be compared to the root means square of the MMG.

Sarah Hussein

DC - American University

Discipline: History

Authors:
#1 Elizabeth F. Thompson

Abstract Name: Cinematic Shifts: The Muslim Brotherhood in Egypt's Changing Narrative (1981-2013)

This research explores the factors that explain the evolving portrayals of the Muslim Brotherhood in Egyptian cinema, comparing representations during the Hosni Mubarak era (1981–2011) with those in the Arab Spring and post-Arab Spring periods (2011–2013). The study investigates how these cinematic depictions shifted in response to Egypt's changing political and social landscapes, examining the complex relationship between media, power, and public perception. Through the selection of Egyptian-produced films from both periods that feature the Brotherhood, the research focuses on how these portrayals correspond to broader political and societal transformations. Employing visual discourse analysis, the study examines film narratives, character representations, and symbolic imagery to uncover how filmmakers conveyed political ideologies and social attitudes in alignment with shifting political contexts. Understanding these shifts is significant because Egyptian cinema has long been a cultural and political tool, reflecting societal values while shaping public discourse. These two periods were chosen for their contrasting political climates: the Mubarak era represents authoritarian stability, with media narratives framing the Brotherhood as a destabilizing force, while the Arab Spring/post-Arab Spring period marks the Brotherhood's rise to power, governance, and eventual removal, offering a dynamic backdrop for shifting portrayals. By examining how portrayals of the Muslim Brotherhood evolved in Egyptian cinema, this research aims to explain the relationship between media narratives and political power, offering insights into how cultural production both influences and is influenced by broader socio-political transformations. The study further seeks to demonstrate how Egyptian cinema not only reflects but actively participates in constructing political and ideological transformations, offering insights into how filmmakers navigate censorship, ideological pressures, and audience expectations. Ultimately, the study underscores the role of cinema as a vital medium for shaping contested political narratives, emphasizing its impact on framing the Brotherhood's evolving image during Egypt's transformative journey from dictatorship to revolution.

Jim Hutchins

UT - Weber State University

Discipline:

Authors:
#1 Jim Hutchins

Abstract Name: "Build-A-Book": A New Approach to Undergraduate Scholarship

There is a critical need for open educational resource (OER) materials in the college classroom. These materials (textbook, PowerPoints, exam questions) reduce college costs. College students spend \$1100-\$1700 per year on textbooks, with science books at the higher end of the range due to the large number of illustrations. Studies have shown this reduces stress, particularly among first-generation students, students of color, and non-traditional students. Reducing stress and increasing accessibility improves the DFW rate and time-to-degree statistics. Perhaps more importantly, open educational resources drive open andragogy. Students are adults, and increasing transparency improves outcomes. Students perceive that their professor is on their side and operating as the senior member of a team, rather than as a "sage on the stage". As one of my colleagues pointed out regarding our replacement of a \$300 anatomy and physiology textbook, "it's like I walk into a classroom of 40 students, lay \$12,000 on the table, and say, 'we'll split this evenly between us.' It buys a lot of good will." I will describe collaborative projects between me and my Cellular & Molecular Neuroscience students to build a curriculum from scratch. There are no textbooks in this area. Students are invited to contribute a short chapter on a topic of their choice in the book *Developing Expertise in Neuroscience*. Examples are shown at the linked website. The course is taught each spring semester; with

each recursion, we refine existing content and expand the topics covered. Students learn by doing, and learn from each other.

Josh Hutchins

UT - Brigham Young University

Discipline: Biology

Authors:

#1 Joshua Hutchins

#2 Brinton Paulson

#3 Dario Mizrachi

Brinton Paulson

Abstract Name: Pig Kidney Transplants--the Future of Organ Donation?

There are currently over 100,000 individuals in the United States in critical care who are in need of organ donation. Unfortunately, many will die before they are able to match with a potential donor. Roughly 17 people die daily while waiting for an organ to become available. These hopeless circumstances are what make xenotransplantation, organ donation by non-human species, so appealing to desperate patients and families. Xenotransplants have some benefits to human donation—animals can be genetically engineered from birth so that their organs will produce less of an immune response once implanted in the human host. Recently, three patients received kidney transplants from genetically modified pigs. In all cases the kidneys succeeded at producing urine. All three patients died within two months, though doctors are unsure as to the cause of death. It seems that xenotransplantation is the future of the organ transplant world, but even if the immune reaction barrier is overcome, are pig kidneys similar enough microscopically to human kidneys to be functional long term? Using qPCR techniques on fresh pig kidney specimens from a slaughterhouse, we set out to answer this question by comparing the tight junction composition of the nephron in both human and pig kidneys. Tight junctions are essential to nephron function, as they control the paracellular permeability of endothelial cells. Extreme alterations to the composition of the nephron tight junctions in pigs, would mean that pig kidneys filter urine differently than humans and could cause major setbacks in the future of xenotransplantation.

Gavin Hutchison

WI - University of Wisconsin-La Crosse

Discipline: Biology

Authors:

#1 Olivia Christensen

#2 Alder Yu

Abstract Name: The Bidirectional Relationship Between Alzheimer's Disease Progression and Circadian Rhythm Dysfunction

Alzheimer's Disease (AD) remains the most prevalent form of dementia with increased occurrence expected in coming years with increasing global life expectancy. Treatment efforts remain unfruitful, warranting investigations targeting quality of life improvements and slowing of disease progression. Circadian rhythms are daily periodic alterations in body physiology, impacting various body systems. Circadian dysfunction has been associated with several disease states, including AD. The nature of the bidirectional relationship

between AD progression and circadian dysfunction remains elusive. A *Drosophila melanogaster* AD model paired with behavioral, molecular, and morphological approaches are used elucidate this relationship's nature. Behavioral analysis of AD model *D. melanogaster* was conducted using a *Drosophila* Activity Monitoring system. Results exhibited AD *D. melanogaster* depending on external cues for circadian function, with removal of time cues diminishing circadian behavior paired with substantial phase shifting. The molecular function of the core circadian clock in our AD model was assessed using reverse transcription - quantitative polymerase chain reaction analyzing the core clock gene period. The core circadian clock functions normally, indicating potential dysfunction downstream of the core circadian clock. These data suggest circadian function is diminished in our AD model. Neurodegeneration was assessed by quantification of the eye area and brain vacuole size of AD model flies with and without circadian clock function. Data suggests circadian clock dysfunction is associated with accelerated disease progression. Further analysis into mechanism may reveal therapeutic targets to improve quality of life and care for AD patients by correcting their circadian rhythms.

Jerilynn Hutton

KY - University of Kentucky

Discipline: Environmental Science and Sustainability

Authors:

#1 Jerilynn Hutton

#2 Lucca Madeo Cortarelli

Abstract Name: Behavioral Toxicity of Hexagonal Boron Nitride and PFOA in *Caenorhabditis elegans*

Toxicity assessment is essential to ensure the safety of organisms when introducing new substances into their environment. Hexagonal boron nitride (h-BN) is a novel nanomaterial with growing applications. However, the toxicity of h-BN used in environmental settings is under-explored. This study analyzes how model organism *Caenorhabditis elegans* reacts when exposed to the substances h-BN and perfluorooctanoic acid (PFOA). Through behavioral evaluation of *C.elegans*, this research aims to determine the relative toxicity thresholds of h-BN and PFOA, and ergo the safety of h-BN for future application in PFOA degradation. Research suggests that low-dose exposure to h-BN elicits an immune response in *C.elegans*. Meanwhile, low doses of PFOA have been shown to disrupt locomotion in *C.elegans*. The hypothesis for this experiment is *C.elegans* will exhibit behavioral changes at higher concentrations of h-BN than PFOA. Age-synchronized *C.elegans* were exposed to varying concentrations of h-BN (2–35 mg/L) and PFOA (0.2–0.8 mg/L). Post exposure, Wormlab software was used to analyze behavior. The data collected was analyzed and compared to a negative control for metrics such as turn count, track length, and center-point speed. Data were evaluated through ANOVA testing and t-tests with a statistical significance at $p < 0.05$. Both substances were shown to elicit concentration-dependent behavioral changes in *C.elegans*. Low levels of h-BN (2–4 mg/L), significantly reduced turn count and speed. However, the effects diminished at higher levels. PFOA did cause behavioral alterations at lower concentrations (0.2 mg/L) but returned to baseline at higher doses. These findings highlight the need for further testing at other concentrations. Evaluation of these materials are needed to discern the safety of h-BN in the role of PFOA degradation. This research will contribute to understanding the toxicity of PFOA and h-BN, and safer application of h-BN for PFAS removal and degradation from contaminated aquatic environments.

Aaron Huynh

PA - University of Pittsburgh

Discipline: Computer Science

Authors:

#1 Shovan Bhatia
#2 Nikhil Sharma
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#4 Michael Kann
#5 Regan Shanahan
#6 Michael Lang
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#8 Edward Andrews

Abstract Name: Utilizing Mixed Reality to Optimize the Workflow of Superficial Temporal Artery Mapping in Extracranial-Intracranial Bypass Surgery

Background: Mixed reality (MR) is a developing field within neurosurgery. It is utilized for operations such as superficial temporal artery-middle cerebral artery (STA-MCA) bypass surgery which revascularizes areas of narrowing vessels in patients with Moyamoya. Doppler ultrasound is the conventional technique for mapping the STA; however, MR allows for patient-specific anatomical overlay to better visualize the vessel. The goal of this study is to compare the efficiency of MR-based STA mapping in STA-MCA bypass to the traditional Doppler method using computer vision. Methods: Five patients undergoing STA-MCA bypass surgery were enrolled between January and April 2024. Pre-operative CT-angiograms were registered and superimposed onto the patient using SurgicalAR. Five uniformly spaced points were annotated along the parietal branch of the STA using both MR and Doppler techniques. Mapping time was compared using the Mann-Whitney U test. To evaluate accuracy, Blob detection, a computer vision technique, was used to locate these points, and 5mm-thick lines connected them in each map. Intersection over Union was used to measure the percentage of MR-Doppler map length overlap for each patient. Results: MR mapping of the STA was significantly faster than Doppler mapping (11.4 ± 1.2 vs. 65.9 ± 20.9 seconds; $p=0.009$) with mapping of the distal points also faster (point four: 2.1 ± 0.45 vs. 22.2 ± 13.3 seconds; $p=0.037$); (point five: 2.7 ± 0.98 vs. 18.3 ± 7.8 seconds; $p=0.01$). There was comparable accuracy between the MR and Doppler maps with an average length overlap of 56% (22-90%). The average radial deviation of MR-Doppler maps was 4.2mm (0.86-8.4mm). Conclusion: This is the first study to evaluate MR against standard Doppler techniques for STA mapping in STA-MCA bypass procedures. We demonstrate that MR achieves similar accuracy to traditional Doppler in a shorter amount of time, suggesting that incisions based on either map is unlikely to change.

Aaron Huynh

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Discipline: Computer Science

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#7 Edward Andrews

Abstract Name: Optimizing Spinopelvic Parameter Calculations Using AI-Driven Spine Segmentation and Computer Vision

Background: Spinopelvic parameters (SPP), derived from vertebral body measurements, are crucial in

informing pre-operative spine surgery planning. Current methods of calculating SPP are labor-intensive and imprecise with clinicians using archaic software to manually draw lines on spine x-rays. By leveraging artificial intelligence and computer vision, SPP can be calculated more efficiently and consistently with a standardized approach. This would reduce physician burden and improve patient outcomes. Methods: 167 sagittal spine x-rays were collected and randomly split into a training set (67 images) and a testing set (100 images). A total of 536 images were produced for the training set through image augmentation on the original 67 x-rays. All images were manually annotated to create binary segmentation masks. A U-Net model, a convolutional neural network widely used for bio-medical images, will be trained on this dataset with a goal to automate the segmentation of 25 vertebral bodies (C2-L5, sacrum, femoral head). Once all bodies are segmented, computer vision edge-detection algorithms have been implemented to automatically calculate SPP. Finally, an intuitive web application for spinal surgeons was developed to help visualize SPP on the spine with overlaid illustrations. Expected Results: The goal is to create a web application that allows a surgeon to upload a sagittal spine x-ray of their patient and receive immediate SPP without extra tedious labor. This process would provide all SPP in seconds and remove any possibility for human error. With computer vision and web interface aspects already implemented, further success of the application relies on performance of the model still in training. Further Impact: A fully functioning application would assist in pre-operative planning, post-operative assessment, and avoid high potential for error which can have a large impact on surgical success. It would also accelerate spinal deformity research and advance neurosurgical education with informative visualizations.

Elaine Huynh

OK - University of Central Oklahoma

Discipline: Art History

Authors:

Abstract Name: "Designing Happiness: The Art and Philosophy of Stefan Sagmeister"

This paper is about Stefan Sagmeister's career and philosophy. His career started small as any inspiring graphic designer. The main goal of this paper is to tell the knowledge behind Sagmeister's designs. The conflict coming from his designs was that he described the artwork as crossing the boundary to visual communication. The visual communication of his work was how his work referenced his personal experiences and empathy on global issues. Most artist's works do not combine both concepts into their art. Then, the paper includes his album cover, Lou Reed, and his project collab, "Sagmeister and Walsh." Through his collab "With Sagmeister and Walsh," he created designs that conveyed the message of being funny ironic, and many plot twists. So, through visual communication and different media, Sagmeister blends both commercial and concept design. He made his work visually astonishingly and triggered the audience. The use of unusual materials and strategic processes, such as his own body as design, highlights his belief in the power of design to trigger the audience. The paper discusses how Sagmeister's work redefines the artists and the interpreter, sealing lines between design, art, and personal expression. His work refers to his creativity and intellect in the processes of design. His work challenged the process of design and gave an understanding of visual communication to the audience. So, throughout Sagmeister's exploration, his career is sold out to be a great designer, and he's a great tool to inspire future designers for social change and empathy.

Aidan Hyatt

OH - College of Wooster

Discipline: Psychology

Authors:

Abstract Name: Risk or Reverence?: The Effects of Religiosity and Risk Behavior for Jewish Emerging Adults' Perceived Invulnerability

This study examines how religiosity and risk behaviors predict perceived invulnerability among single, Jewish college students in emerging adulthood. Identity exploration, a hallmark of this life stage, often involves social, relational, and behavioral experimentation, with religiosity potentially shaping these experiences. Jewish individuals exhibit varying levels of religious observance (e.g., keeping kosher or Shabbat), which may influence their behaviors and self-perceptions in college. While previous research on undergraduates largely focuses on substance use and sexual behaviors, with associations between higher risk behaviors and increased perceived invulnerability, the role of religiosity in this relationship has been less explored. Orthodox Jews tend to engage in fewer risk behaviors compared to more secular individuals, which may affect their sense of invulnerability. This study applies the Optimism Bias framework, hypothesizing that religiosity and risk behaviors will significantly predict perceived invulnerability. Data from 816 single, Jewish college students (2008-2009 Multi-Site University Study of Identity and Culture [MUSIC] Study) were analyzed. Key measures included religiosity (identity, exclusivity, observance), risk behavior, and perceived invulnerability. Bivariate correlations showed that greater risk behavior and higher religious exclusivity were significantly associated with increased perceived invulnerability. After controlling for demographic variables (e.g., gender, GPA, SES), linear regression indicated that religious exclusivity significantly predicted perceived invulnerability. While the findings suggest that both religious exclusivity and risk behaviors are linked to higher perceived invulnerability, these results should be interpreted in the context of pre-COVID-19 norms, as risk behaviors among Jewish emerging adults may have shifted post-October 7th crisis. These insights may inform clinicians and student affairs professionals working with Jewish undergraduates. Future longitudinal studies are needed to explore how perceived invulnerability evolves over time and how various environmental and psychosocial factors influence positive outcomes during this developmental period.

Julia Hyden

CO - University of Colorado at Boulder

Discipline: Environmental Science and Sustainability

Authors:

#1 Diane McKnight

#2 Lane Allen

#3 Camryn Miller

#4 Chase Nathanson

Abstract Name: Exploring Turbulent Flow Dynamics through *Didymosphenia geminata* Populations in Boulder Creek

Didymosphenia geminata, commonly referred to as "rock snot" and "Didymo", has become a significant nuisance in river systems across the globe over the past 35 years, primarily due to its detrimental effects on stream ecosystems. Didymo has become prevalent in Boulder Creek. This diatom can form extensive mats on rocky substrates, altering the water chemistry and trophic dynamics within affected streams. Thriving predominantly in oligotrophic waters where phosphorus is a limiting nutrient, Didymo's proliferation underscores the need for a deeper understanding of the environmental factors that influence its growth. This study aims to investigate the impact of turbulent flow on the presence and distribution of Didymo in Boulder Creek, Boulder, Colorado. Using microscopic collection techniques, we monitored Didymo populations at various locations throughout the summer months, systematically collecting data on abundance, sample locations, and flow rates. Through the analysis of these parameters, we seek to clarify the relationships among turbulence, nutrient mixing, and Didymo prevalence. We hypothesize that disturbances in the primary flow of

the stream, combined with enhanced nutrient mixing within eddies, may influence Didymo abundance. Gaining insights into these dynamics is essential for understanding the ecological implications of turbulent flow conditions in aquatic ecosystems. The findings from this research could inform the development of effective management strategies aimed at controlling Didymo blooms and mitigating their negative impacts on stream ecosystems. Furthermore, this study contributes to a broader understanding of how turbulent flow affects other aquatic organisms and nutrient dynamics in similar environments, ultimately advancing the field of freshwater ecology.

habiba hye

OH - The College of Wooster

Discipline: Art History

Authors:

Abstract Name: Nomadic Echoes: A Visual Journey Through Bangladeshi Heritage

This traditional painting delves into the rich cultural tapestry of Bangladesh, blending personal narratives of a nomadic life with the collective history and artistry of the Bangladeshi people. The artwork juxtaposes vibrant motifs of rickshaw art—a hallmark of urban folk culture—with traditional Bengali art forms to create a dialogue between the past and present. Through vivid colors, intricate patterns, and symbolic representations, the piece narrates stories of resilience, liberation, and victory, reflecting the nation's journey from colonial rule to independence in 1971. The project draws inspiration from the diverse artistic traditions of Bangladesh, such as kantha stitching and Patachitra scrolls, as well as the iconic rickshaw panels, which serve as a mobile canvas for storytelling. The methodology involves employing traditional painting techniques on a hand-primed canvas using natural pigments, merging historical motifs with contemporary interpretations of identity and belonging. By incorporating elements of nomadic life, the painting also highlights the dynamic relationship between movement, place, and cultural identity in shaping personal and national histories. The expected result is a multi-layered narrative that invites viewers to reflect on the complexities of Bangladeshi heritage, from its struggles for liberation to the triumph of cultural preservation. This work contributes to the discourse on the role of traditional art in documenting and celebrating history, offering a lens through which to view heritage as both personal and universal. This painting serves as an ode to the resilience of a people whose art continues to thrive as a testament to their spirit. Through this piece, the artist aims to ignite conversations about identity, memory, and the transformative power of art in preserving cultural narratives for future generations.

Emily Hyman

AL - Troy University

Discipline: Biology

Authors:

#1 Ja'Dazia Posey

#2 Yubing Chen

Abstract Name: Investigating the Role of FOXI3 and EMT in Advanced Prostate Cancer

Prostate cancer affects approximately 1 in 8 men and is the second leading cause of cancer-related death in men. When detected early, noninvasive forms of prostate cancer can be treated successfully, but treatment and detection for aggressive, metastatic forms of prostate cancer are still needed. For prostate cancer to effectively

metastasize, it must first undergo a process known as epithelial-to-mesenchymal transition (EMT). It has been shown that FOXI3, a transcription factor from the Forkhead box family, plays a key role in EMT during embryogenesis. This study aims to investigate whether FOXI3 similarly influences the EMT process within the context of cancer metastasis. Specifically, advanced prostate cancer cell lines, PC3 and C42B, along with FOXI3 knockout versions of each cell line will be treated with Zerumbone, a phytochemical that is known to inhibit TGF- β 1-induced EMT. Following this, the levels of FOXI3 and e-cadherin expression will be evaluated. The expression will be investigated at many different levels, including RNA, protein, and localization, using PCR, western blot, and immunofluorescence. By analyzing the expression and localization of FOXI3 and e-cadherin, we attempt to establish a connection between FOXI3 and EMT within the context of advanced metastatic prostate cancer. This study is still ongoing, but I anticipate that the results will show a decrease in FOXI3 expression and an increase in e-cadherin expression, correlating to the inhibition of EMT. This study may provide insights into the molecular mechanisms underlying prostate cancer progression and potentially identify FOXI3 as a novel therapeutic target for aggressive forms of the disease. The findings from this research could contribute to our understanding of prostate cancer metastasis and potentially guide the development of new treatment strategies for advanced stages of the disease, addressing a critical gap in current prostate cancer management.

Anna Hyslop

OK - University of Oklahoma Norman Campus

Discipline: Economics

Authors:

#1 Christopher Malloy

Abstract Name: One Planet, One Oklahoma: Exploring a Framework for Assessing the Feasibility of Localized Energy Transitions in the United States

Net-zero energy transitions, necessitated by the threat of climate change, need to occur on an international scale. However, powerful economic lobbies and political stagnation often mar the negotiation processes driving national and international action. In this context, local communities become increasingly important in achieving widespread emissions reduction objectives. This analysis centers on exploring a framework that evaluates the feasibility of net-zero energy transitions in U.S. localities. The framework highlights the technological and political feasibility of transitioning the electricity and transportation sectors of a given municipality. While such a framework does not capture the entirety of a community's energy system, it nonetheless serves to address two sectors that dominate emissions production and energy usage. I apply this framework to the suburban community of Norman, Oklahoma, to both highlight the value of such analysis and to provide important information to local officials in my community. By collecting information from administrative and primary sources, this study documents forecasted decreases in the cost of renewable energy sources, residual emission abatement technologies, and energy storage solutions for Norman. Further, an analysis of the local transportation sector reveals that the costs associated with public transit improvements—an important component of decarbonization in the transportation sector—generally ranged from 0.01-5.1% of the City's 2023 budget (excluding national high-speed rail enhancements, which involves cost-sharing between local, state, and federal governments). I also examined the political feasibility of this transition, documenting the partisan preferences that may hinder clean energy deployment. My findings suggest that while technology costs may decrease, political opinion could hinder clean energy transitions in Oklahoma. The model of analysis employed throughout this study presents significant opportunities for further exploration of localized energy transitions in suburban areas and college towns, two types of municipalities often left out of transition scholarship.

Jungin Hyun

MN - Minnesota State University - Mankato

Discipline: Engineering

Authors:

#1 Cheng Wang

Abstract Name: Evaluating the Impact of Runway Status Lights on Runway Incursions

Runway incursions occur when an unauthorized aircraft, vehicle, or person enters a protected area designated for aircraft takeoff and landing. These incidents have been a growing challenge for airport operations, and have significantly increased in recent years. With 1,633 cases reported in 2022 and 1,777 in 2023, their increasing frequency highlights the need for effective mitigation strategies. One of the most advanced technologies designed to reduce and prevent runway incursions is Runway Status Lights (RWSL). RWSL is an automated system that provides real-time alerts to pilots and vehicle operators, signaling when it is unsafe to enter, cross, or begin takeoff on a runway. Despite RWSL being operational at 20 major U.S. airports, there are very limited studies on evaluating the effectiveness of RWSL. This study aims to explore the impact of RWSL on aviation safety by analyzing the runway incursion data from the Federal Aviation Administration (FAA). Specifically, it examines the correlation between RWSL implementation and runway incursion rates at 17 airports where the system has been operational. By comparing data from seven years before and seven years after RWSL installation, this research provides a comprehensive assessment of its effectiveness in mitigating risks. The findings from this study will offer valuable insights for aviation authorities such as the FAA and airport operators, in their efforts to enhance runway safety. Understanding the role of RWSL in reducing and preventing runway incursions will support data-driven decisions regarding the adoption and expansion of similar technologies. Ultimately, this research contributes to the broader goal of improving the safety of pilots, passengers, and overall airport operations. Through continued evaluation and technological advancements, the aviation industry can reduce risks and foster a safer environment for all stakeholders.

Pedro Ibarra Mejia

CA - University of the Pacific

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Xiaojing Zhou

Abstract Name: The Use of Indigenous Blood Quantum in Determining Tribal Affiliation and Its Impact on Native American Demographics

Repeatedly Native Americans are required by the United States government to prove their respective tribal affiliations through blood quantum in order to receive their entitlement to lands and resources. The measurement of Indigenous blood quantum is a strategy imposed by the United States Federal Government to limit Native citizenship and disempower Indigenous Americans. It dates back to the late 18th century as the official method for classifying “Indianness.” In the midst of the reservation period, legislative and federal regulations for legitimizing “Indian blood” were carried out by the Bureau of Indian Affairs. As the bureaucracy increased, so did the question of the “blood” status of Native Americans for federal benefits, protection, and recognition. This paper examines the continued use of this Indigenous blood quantum to assign citizenship in a Native American tribe and its dire consequences. Blood quantum operates as a stand-in device for Indigenous elimination, a genocidal tool of Native American culture, as characterized by the Native American activist and scholar, Ward Churchill. For Native Americans, blood quantum is part of the “colonial erasure tactics,” as Kylie Rice (Mohawk and Algonquin) argues. According to an estimate by Congress, by the year 2080, less than 8 percent of Native Americans will have less than one-half or more Native “blood.” As seen in the 1950s and 1960s, certain tribes deemed too small were terminated by the

federal government, and they also lost status and subsequent benefits. Thus, it is important to call attention to how blood quantum will lead to further erasure of Native American communities as sovereign nations.

Patrick Ibrahim

TN - Middle Tennessee State University

Discipline: Chemistry

Authors:

#1 Patrick Ibrahim

Abstract Name: Anti-Fungal Peptoid Characterization

Fungal infections such as those caused by *Cryptococcus neoformans* and *Candida albicans* have shown significant threats to immunocompromised patients, presenting high mortality rates, as well as showing high resistance to treatment options. Antimicrobial peptides (AMPs) have shown promising signs against these infections, however, due to high rates of resistance and AMPs' short half-lives, new therapeutic methods are needed to combat these infections. Peptoids, which are structurally very similar to peptides, but show higher signs of stability and resistance to these infections, show promising results. Specifically working with the peptoids RMG8-8 and RMG9-11 which have been created in the Bicker Lab have demonstrated successful antifungal activity against *C. neoformans* and *C. albicans*, however further work is needed to understand the full mechanism of these peptoids. With RMG8-8 showing promising results with *C. neoformans* and RMG9-11 with *C. albicans*, we will do further testing on how RMG8-8 disrupts fungal cells, through membrane disruption, by performing biochemical assays such as, capsular vs. acapsular studies, melanization assays, DNA gel shift, and live/dead DNA staining. Additionally, electron microscopy will be used to understand the morphological effect on fungal cells, all in hopes to understand the peptoids' antimicrobial properties, as well as provide us with possible pre-clinical treatments for these fungal infections.

Anjola Ifagbayi-Adeniran

TX - Texas Woman's University

Discipline: Biology

Authors:

#1 Anjola Ifagabyi-Adeniran

#2 Mafia Mahabub Rumpa

#3 Camelia Maier

Abstract Name: Antiproliferative Activity of *Euphorbia dentata* in T47D, MDA-MB 231, and MCF-7 Cancer Cell Lines

Breast cancer treatment predominantly involves surgery, radiation therapy, chemotherapy, estrogen receptor down-regulators, aromatase inhibitors, and DNA-interactive agents. However, the clinical application of these therapies is often associated with significant and lifelong side effects. Recent research efforts have prioritized the discovery of novel anticancer agents with improved efficacy and reduced adverse effects. The use of medicinal plants in treating various diseases, including cancer, has grown significantly in recent years, with an 80% increase reported by the World Health Organization (WHO). This study investigates the antiproliferative activities of *Euphorbia dentata* (Euphorbiaceae) extracts on ER-positive MCF-7 and T47D and triple-negative MDA-MB-231 breast cancer cell lines. The Toothed Spurge, *E. dentata*, collected in Texas is a North American native plant that has not been studied previously. The aerial parts of the plants were used

to obtain two extracts, an ethanol extract rich in flavonoids and a xylene extract containing diterpenes. The xylene extract significantly reduced cell viability of all cell lines under study starting at a concentration of 16 µg/mL for T47D and 62.5 µg/mL for MDA-MB-231 and MCF-7 cells. The ethanol extract significantly reduced in T47D cell viability only at 500 µg/mL and did not show a significant effect on MDA-MB-231 cells. A biphasic effect was observed, where both ethanol- and xylene-extracted *E. dentata* extracts increased cell proliferation at lower concentrations and decreased proliferation at higher concentrations. Preliminary results into the mechanism of antiproliferative action in T47D cell line, specifically results of activated caspase 3/7, indicated that the xylene extract treated cells are undergoing mitochondrial intrinsic apoptosis. Future work will focus on fractionating *E. dentata* diterpene extract and characterizing the antiproliferative activities and mechanisms of action of fractions. The isolation and chemical characterization of *E. dentata* phytochemicals could contribute to the development of novel therapeutic agents for breast cancer treatment.

Amina Ihabi

PA - Duquesne University

Discipline: Chemistry

Authors:

#1 Amina Ihabi

#2 Samuel Lenze

#3 Justin Terhorst

#4 Theodore Corcovilos

#5 Michael van Stipdonk

Abstract Name: Collision-induced Dissociation of Protonated Phenethylamine: A Model Study to Aid Illicit Drug Identification by Tandem Mass Spectrometry

Tandem spectrometry (MS/MS) and collision-induced dissociation (CID) are used in forensic analysis. Correct precursor and fragment ion assignment is critical for accurate compound identification by MS/MS. Although mass spectra can be annotated with molecular formula using high-resolution m/z measurements, in many cases molecular structure remains unassigned for fragment ions generated by CID. For de novo molecular identification, in-silico generated MS/MS spectra are used as a reference. However, there is evidence that fragment ion structure annotations in these reference libraries are often incorrect. For that reason, we are investigating the fragmentation mechanism(s) of model compounds such as phenethylamine, the simplest species in the substituted phenethylamine class of drugs that include amphetamines and MDMA, to improve structure assignment. This presentation highlights how use of CID, ion (vibrational) spectroscopy and computational chemistry allows us to identify the pathways by which protonated phenethylamine eliminates neutral NH_3 and $\text{CH}_2=\text{CH}_2$ in sequential fragmentation steps.

Minami Imamura

NC - Western Carolina University

Discipline: Architecture, Construction Management, and Interior Design

Authors:

#1 Patrice Brown

Abstract Name: History, Building, and Design Study for Historic Preservation of Rosenwald Schools in Wake County, NC

The purpose of this research is to conduct a study of the original design, construction methods, and material selection of Rosenwald Schools within historical black communities of Wake County, NC in the 1920s. Out of the 813 schools that were constructed in NC, many of them have been destroyed. Within Wake County, there were twenty-one built, six existing, and four on the National Register of Historic Places. Rosenwald Schools are achieving a history of 100 years after they were built for African American children in the South during the late 1910s to late 1920s with the collaboration of Sears and Roebuck philanthropist Julius Rosenwald, the founder of Tuskegee Institute, Booker T. Washington, and MIT's first black architect Robert Taylor. The goal is to use Place Based Methodology, to determine existing schools in the area, and use historic preservation methods to rehabilitate existing interior spaces for mixed-use and residential occupancy future design solutions. This information was compiled in a research paper including figures, tables, and sketches. Historic preservation methods of original building structure and design were investigated using the Standards for Rehabilitation. The results of this project informed the design intent by using nine over nine double hung sash windows for daylighting and airflow, the application of 4' high beaded wainscoting in the hallway, capped baseboards in classrooms, installment of "potbelly" stoves as a heat source in classrooms and movable partitions for class separation. The use of muted colors such as brown and ivory were incorporated as well as other details specified in the school construction plans issued by the Rosenwald Building Fund. The rehabilitation complies with building codes and accessibility for the new occupancy use, fully keeping the original interior walls and doors. The research suggests a possible design approach to the historic preservation of Rosenwald Schools.

Raissa Natacha Ineza

MN - Minnesota State University - Mankato

Discipline: Engineering

Authors:

#1 Fatih Bektas

#2 Raissa Natacha Ineza

#3 Boyce Nyiringabo

Boyce Nyiringabo

Abstract Name: Ultra High-Performance Concrete Using Local Materials

Ultra-High-Performance Concrete (UHPC) is a relatively new class of concrete with compressive strength exceeding 18,000 psi, which is considerably higher than normal strength concrete (~4,000 psi). UHPC mixes have shown to be superior to traditional concrete mixes: for instance, compared to a girder made of regular concrete, a UHPC girder can span 20-25% further, or allow shallower cross-sections to cross the same distance. In addition to technical benefits UHPC mixes are long-lasting, durable construction materials that are designed to serve over 60 years. UHPC mixes are generally propriety materials with a high price tag. Key design components of UHPC include a tightly packed matrix using well-graded solid particles (i.e., aggregate, unhydrated cementitious materials), minimum amount of water to increase strength, high amounts of superplasticizer for fluidity, and addition of fibers to increase ductility. The research undertaken aims to produce UHPC using materials available to the State of Minnesota. Phase one included 30 UHPC mixtures in which six different cementitious materials (i.e., portland cement, fly ash, slag cement, ground glass, metakaolin, silica fume) were combined in varying percentages. It was found that either silica fume or metakaolin is essential for high strength. Elevated temperatures lead to higher strengths. 16,000-psi mix was achieved combining portland cement, metakaolin, and ground glass as binder. Phase two builds on these findings to reach the target strength of 18,000 psi with the goal of using additional techniques. Strategies include optimizing packing density of particles, using lower maximum aggregate size (i.e., finer sand), incorporating deairing agents, and utilizing ice to improve flow and mixing. In addition to compressive strengths flexural strengths are also determined.

William Ingalls

VA - Virginia Tech

Discipline: History

Authors:

#1 William Ingalls

Abstract Name: Why an Axe? Defining the Use of Axes by Norse Warriors in Viking Age Warfare

The Viking Age (793-1066 CE) chronicles the time during which the Norse - commonly referred to as Vikings - expanded their influence throughout regions of Europe, the Middle East, and islands of North America as warriors, merchants, and voyagers. As warriors, they fought against a wide range of peoples, weapons, and strategies, utilizing numerous weapons including axes. This weapon in particular, is frequently depicted in contemporary and later sources, by both the Norse themselves and their enemies. Furthermore, a large variety of axes have been discovered in a considerable amount of Viking Age burial sites in Scandinavia. The question then becomes, why were these weapons utilized to such an extent, especially the design-specific battle axes? In this paper, the prolific nature of axes in combat will be examined to determine why the Norse specifically used these weapons throughout the Viking Age. To do so, this paper will contend with relevant artistic and recorded sources to both illustrate the significant presence of axes in the written record and determine the context in which these weapons were used. Additionally, the archeological documentation from this period is invaluable to unearth the armament of the Norse during the Viking Age. The excavation and restoration of these axes demonstrate their evolution of functional designs. Further, this paper will utilize experimental archeology, examining axes in a martial context with the use of pressure testing and sparring to further explore their efficacy in Viking warfare. In summary, these sources of information will be applied to argue that the predominant reason for the use of axes was their versatility as tools of war. Especially when compared to other weapons that were available at the time, axes offered a wide range of offensive and defensive capabilities which made them ideal weapons on the battlefields of the Viking world.

Addyson Ingersoll

CO - Regis University

Discipline: Biology

Authors:

Abstract Name: Using Sea Urchins As A Model To Examine How Semaglutide Affects Gamete and Embryo Development

Semaglutide is a glucagon-like peptide-1 (GLP-1) receptor agonist, which is a drug that lowers blood sugar by mimicking a hormone called insulin. The drug originally developed for the treatment of type 2 diabetes and has more recently shown promising results in managing obesity. Unlike insulin, semaglutide is administered through a weekly injection and is proven to effectively lower both blood sugar levels and A1C, a test that measures the buildup of blood glucose over time. However, as with any medication, concerns regarding its long-term effects, particularly on fertility and embryonic development, remain. This study investigates the potential impacts of semaglutide on fertility and early developmental processes using sea urchin embryos as a model. Sea urchins were chosen due to the similarity of their embryonic development to that of humans. In this study, sea urchin embryos at the initial 2-cell stage of development were exposed to a low concentration of semaglutide. The embryos were monitored over time, with developmental milestones recorded through microscopic examination and morphological comparisons between control and experimental groups. The aim of this research is to assess the potential risks and benefits of semaglutide use

during pregnancy or while attempting to conceive. Based on prior understanding of the drug's mechanism, we hypothesize that semaglutide will not adversely affect fertility, but may cause issues when used during pregnancy such as a low birth weight, or premature birth, due to semaglutide's weight loss properties.

Ethan Ion

MN - University of Minnesota - Duluth

Discipline: Economics

Authors:

#1 Monica Haynes

#2 Gina Gensing

Abstract Name: Petroleum Refinery Reconstruction and Operations Economic Impact

This research explores the economic impact of a petroleum refinery's reconstruction (2019-2023) and its anticipated 2025 operations after the facility's 2018 explosion. By analyzing the temporary effects of reconstruction and the expected long term effects of ongoing operations, the research provides insights into how large scale industrial projects impact local economies. The analysis used IMPLAN economic impact software. Economic impact modeling is a form of input output modeling, which studies how initial spending disperses through an economy. For the reconstruction phase, input data for spending and wages were provided by the refinery with gaps supplemented by secondary data from IMPLAN and Lightcast databases. The research developed several assumptions related to various aspects of the reconstruction project, including the company's local spending, local employment, worker's commuting rates, per diem expenses for non-local workers, and employee compensation and benefits for construction contractors. The company's operations were modeled with IMPLAN, using an industry impact analysis, a technique for analyzing production changes. This method allows researchers to adjust intermediate inputs of an industry by specifying the percentage each input comprises. Operations inputs included wages and benefits, employment, intermediate inputs, and estimated production. Economic impact models account for direct, indirect, and induced effects of the refinery's spending, reflecting how the company's expenditures rippled through the local economy. During reconstruction, the refinery generated \$2.2 billion in total combined output, supporting an average of 1,952 jobs annually, with peak employment reaching over 4,000 jobs in 2022. For ongoing operations, the refinery is expected to support 761 annual jobs and over \$310 million in total annual output.

Gabriela Ionita

MO - University of Missouri - Columbia

Discipline: Anthropology and Archaeology

Authors:

#1 Virginie Renson

#2 Karen Schollmeyer

#3 Joan Brenner Coltrain

#4 Amanda Werlein

#5 Jeffrey R. Ferguson

Abstract Name: Strontium Isotope Analysis of Animal Remains from Archaeological Contexts in Southwest US

Strontium isotope analysis has emerged as a powerful tool to trace human and animal mobility and

geographic origins in archaeology. This study focuses on applying this method to non-human remains from sites in the Mesa Verde region, Southwest US. The central research question is: How did ancient communities in the Mesa Verde region adapt their resource acquisition strategies to environmental and social pressures during the period of AD 750 to 1280? Recent research has primarily examined domesticated turkeys, revealing how maize-fed turkey management coincided with significant environmental and social changes between AD 750 and 1280. Building on these findings, this project extends to deer and rabbit remains, providing new insights into human-animal interactions and resource acquisition strategies during this period of transformation. To this end, samples of rabbit and deer bones were selected from four archaeological sites and different periods covering the AD 750 – 1280 time span. The bone samples are carefully cleaned, treated to remove any contamination, and dissolved. The strontium is then extracted and the resulting solutions are analyzed on a Nu Plasma II multi-collector inductively coupled plasma-mass spectrometer. The isotopic composition of strontium measured for the samples is then compared with strontium isotope data available for the region to determine the provenance of the animals. The expected results are that deer and rabbit remains will demonstrate a mix of local and non-local origins, reflecting strategic food acquisition to changing environmental and social conditions.

Ali Iqbal

MI - Wayne State University

Discipline: Environmental Science and Sustainability

Authors:

Abstract Name: Meter Mapping and Efficient Energy Use at WSU

In this study we looked at locations of water, gas and electric meters across the WSU campus. This is important because we must know this to understand how energy flows from utilities and between buildings. Often, addresses on utility bills do not match the address of the building. Knowing which meter serves which building is important to benchmark energy consumption, some meters serve multiple buildings, knowing the locations allows planning for submeters to measure energy consumption per building, alongside this, associating a meter with a building allows for precise analysis such as energy per square foot and identify inefficient energy usage. Meters are most dense in the center campus and are mostly in good condition other than the numbers being wiped off of some due to weathering, about 10-15%, the most numerous are the gas meters (~50%) and electric meters (~46%) and most electrical meters are locked behind gates or inside of boxes especially in areas away from the center of each part of each campus. The distribution of meters is greatest in the three areas outlined, (north campus), (central/ main campus), and the (medical campus). There are satellite areas such as the football field with meters as well.

Alexander Irwin

PA - Penn State Behrend

Discipline: Biology

Authors:

#1 Todd Cook

Abstract Name: A Morphological and Histological Comparison of Tooth Serrations in Galeocerdo

Tooth serrations present along the edge of the tooth crown in many modern sharks (neoselachians) are sharp projections adapted for cutting the flesh of prey. Each serration consists of an inner dentine core that is

surrounded by an outer enameloid coat composed of layers of long fluorapatite crystallites of varying orientation. Several ancient sharks have independently evolved serrations; however, the histology arrangement of these dental structures has received less attention. Using acid etching techniques, sectioning, and scanning electron microscopy, this study compares the enameloid histological arrangement of serrations in the extant *Galeocerdo cuvier* (tiger shark) with those observed in more recent (e.g., *G. mayumbensis*) and earlier (e.g., *G. aduncus* and *G. eaglesomei*) extinct tiger shark species. Although having subtle differences in overall morphology, preliminary findings suggest that the serration enameloid histological arrangement observed in *G. cuvier* is more similar in the more recent species than that of earlier species. Consequently, this study demonstrates that enameloid serration histology can serve as a tool to assist in the identification of distinct species within the *Galeocerdo* fossil record.

Ihfaz Islam

MI - Wayne State University

Discipline: Engineering

Authors:

#1 Mohammad Alhawari

#2 MD Shovon

Abstract Name: Low-Power RISC-V Design for Edge Devices

In modern applications, Internet of Things (IoT) devices frequently rely on cloud and edge computing for data processing. However, cloud-based processing demands substantial computational resources due to the supercomputing infrastructure required in data centers. Localized processing on embedded hardware platforms, such as Field-Programmable Gate Arrays (FPGAs), offers a more resource-efficient alternative. This research explores the use of low-power RISC-V processors for energy-efficient machine learning tasks, focusing on the PicoRV32 core due to its suitability for implementing low-power deep learning algorithms like Deep Neural Networks (DNNs). This study analyzes the architectural features that enable the PicoRV32 core to achieve low power consumption and high energy efficiency. Modifications, including adding custom extensions and selecting appropriate RISC-V ISA subsets (e.g., RV32I, RV32IM, RV32IMC), are investigated to optimize its performance for various applications. A key parameter in this optimization is operating the core at an optimal frequency, such as 100 MHz, to balance power and performance. Additionally, selecting an FPGA with sufficient resources, including Look-Up Tables (LUTs) and Block RAMs (BRAMs), is critical for successful implementation. The research aims to implement DNNs using RISC-V on a Zynq UltraScale+ FPGA platform to enable tasks such as image processing, audio recognition, and natural language processing (NLP). As a preliminary step, the PicoRV32 core will be simulated using Verilog HDL on Xilinx Vivado software and subsequently implemented on an FPGA. Metrics such as power, performance, and area (PPA) will be evaluated to inform future designs. Ultimately, this work seeks to leverage RISC-V's open-source flexibility to develop low-power, hardware-embedded systems for machine learning in edge devices.

Zara Islam

NH - Southern New Hampshire University

Discipline: Computer Science

Authors:

#1 Zara Islam

Abstract Name: Enhancing wildfire management in the Northeastern US with robotics

The central research question of this project is the extent to which robots can enhance wildfire management in the Northeastern US. Firefighting is well-known to be a dangerous profession with significant risk, but while wildfires are expected and procedures are in place in the Northwestern US, it is reported that the Northeastern US is just now entering its wildfire era. The research is conducted in the context of increasing frequency and severity of wildfires in the Northeast driven by climate change, which has overwhelmed firefighting efforts and highlighted the limitations of existing technologies. To contribute to the field, the research explores robotic assistance, and thus focuses on designing and developing a prototype autonomous robotic system capable of navigating hazardous environments, detecting fires, and assisting in suppression and rescue operations to reduce risks for human firefighters. The research methodology includes (i) a review of preparedness and robotic assistance where wildfires are common, (ii) a study of wildfire characteristics and preparedness in the Northeast, and (iii) an advisory consultation with environmental scientists at the Environmental Protection Agency. The prototype design would integrate advanced technologies such as thermal imaging sensors for heat detection, LIDAR for precise navigation, and AI algorithms for autonomous decision-making in dynamic environments. Testing would simulate wildfire conditions specific to the Northeast to evaluate the robot's ability to detect heat sources, navigate through debris, and relay critical information to a control center, providing essential insights into its operational feasibility. The conclusions of the research will inform firefighting strategies with robotic assistance in the Northeastern US and contribute to the broader concerns of public safety, environmental preservation, and advancements in emergency response technologies.

Kelly Isola

PA - University of Pittsburgh School of Nursing

Discipline: Nursing and Public Health

Authors:

#1 Michelle Chung

#2 Elizabeth Crago

Abstract Name: Presenting Symptoms as Predictors of Outcomes After Subarachnoid Hemorrhage

Subarachnoid hemorrhage (aSAH) is an abrupt and often devastating hemorrhagic stroke resulting from a blood vessel rupture in the brain. The presence of a sudden severe headache is often described as a hallmark sign of aSAH. However, there are a range of symptoms that prompt the patient to seek medical treatment. There is limited data examining the relationship between individual initial symptoms and patient outcomes. Therefore, the purpose of this study was to examine if the predominate presenting symptom was predictive of outcomes at a single stroke center. Demographic and clinical data was collected from the patient, caregiver, or chart including symptoms and reason for seeking medical care prior to hospitalization. Functional outcomes were assessed at discharge, 3- and 12-months via face-to-face or telephone interviews with the patient or surrogate using the modified Rankin Scale (mRS), where 0 is no deficit and 6 is death. mRS was dichotomized into good (0-2) and poor (3-6) and Chi-square analysis (SPSS v26) was used to examine relationships between symptoms and outcomes. This retrospective analysis included 491 adult SAH patients (72.5% female; mean age 53 years). The presence of headache was the most frequent reason for seeking care (49%) followed by unresponsiveness (25%). Other reasons for seeking care included confusion and seizures. Headache as the predominate symptom was significantly associated with good discharge ($p < .001$), 3-month ($p < .001$) and 12-month mRS ($p = .03$). Patients who reported confusion as the predominate symptom were significantly more likely to have poor discharge mRS ($p < .001$). Patients who reported unresponsiveness as the predominate symptom were significantly more likely to have poor mRS at all 3 outcome points ($p < .001$; $p < .001$; $p < .001$). This analysis suggests that individual symptoms, specifically confusion and unresponsiveness may be predictive of worse outcomes and could help to inform discharge planning in aSAH.

Anthony Iwejuo

GA - Kennesaw State University

Discipline:

Authors:

#1 Anthony Iwejuo

#2 Luis Mercado

#3 Rachnicha Rojjanarittikorn

#4 Julian Pitts

#5 Saville Atkins

#6 Sandip Das

Abstract Name: Sustainable Smart Farming Device with LeaFit Adaptive Growth Technology

For farmers, gardeners, and horticulture enthusiasts worldwide, one immutable reality is that consistent physical presence to care for plants is not always feasible. In addition, different plants have different needs for watering and nutrients. In this research project, we have designed and developed 'LeaFit' – a cutting-edge Internet of Things (IoT) device that offers a sophisticated sustainable smart farming and gardening solution. Equipped with intelligent soil moisture, ambient temperature, humidity, and light sensors, LeaFit autonomously adapts to the specific needs for various plants, ensuring optimal conditions for their healthy growth. The LeaFit-enabled automated irrigation system minimizes user intervention while effectively maintaining plant health and optimizing water resources, thus leading to water conservation and sustainable farming practices. In addition, the LeaFit devices integrate small solar cells which allows for a long operating lifespan. Our developed LeaFit devices are equipped with RFM95W LoRa chip which allow them to transmit sensor data over a long distance (>2km). This allows wireless transmission of sensor data without WiFi coverage when devices are deployed remotely in the field. A central LoRa gateway collects data from various field-deployed LeaFit devices and uploads it to an IoT cloud platform. In addition to the LeaFit hardware, we have developed an open-source mobile application that provides an interactive interface for the user to observe sensor data and get a holistic picture of the entire farming field displaying various critical parameters in color graphs overlaid on the farm map. Our system employs IoT cloud technology to collect data from the on-field sensors and display them on the mobile app which processes and securely stores data and allows real-time access to the user. By offering a robust user-friendly, remote, and autonomous solution for smart farming and gardening, LeaFit empowers farmers and gardeners to grow high quality products while using water resources efficiently.

Disha Iyengar

FL - University of Central Florida

Discipline: Engineering

Authors:

#1 Kausik Mukhopadhyay

Abstract Name: Herb-Modified Biocompatible Hydrogels for Wound Healing Applications

Severe lacerations requiring medical intervention remain a global challenge. In the United States, traumatic wounds are a common reason people seek care from clinicians. These wounds and their frequent complications strain the healthcare system and patient health. Patients affected by these wounds are predisposed to developing bacterial infections, and antibiotic-resistant bacteria—a common root cause of these infections—has been reported to hinder patient prognosis. The current treatment for lacerations includes stem cells to promote healing or hydrogels containing antibiotics or silver. However, these practices

contain drawbacks, primarily mammalian cell cytotoxicity. This research effort focuses on the synthesis and testing of PVA and Borax-based hydrogels enhanced with biocompatible herbal additives including turmeric, moringa, spermidine, clove, and neem for wound healing applications. The goal is to develop a biocompatible hydrogel capable of accelerating wound healing and preventing subsequent bacterial infection. To confirm biocompatibility, these hydrogels underwent rigorous testing. Rheological studies confirmed crosslinking between the PVA polymer and Borax, critical for hydrogel formation. A lap shear test using porcine skin was used to evaluate the hydrogel's adhesive properties, ensuring optimal performance without causing skin damage during separation. FTIR analysis assessed the functional groups in the hydrogel formulations, while a silicon manikin with a simulated gunshot wound was used to evaluate the hydrogel's hemostatic abilities. Antimicrobial studies are underway to demonstrate their efficacy in preventing bacterial infections. Should the herb modified hydrogels exhibit desirable hemostatic and antimicrobial properties, clinical trials can be conducted to assess their viability as a substitute for existing treatments.

Mikayla Jackson

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Peter Shen

#2 Wei Li

Abstract Name: Impaired Motor Learning in Rett Syndrome Mice with MECP2 Deletion in Purkinje Cells of the Cerebellum

Autism is a neurodevelopmental disorder characterized by cognitive and behavioral impairments, including repetitive behaviors, motor difficulties, and deficits in social communication. Rett syndrome (RTT), a severe autism spectrum disorder, is caused by mutations in the MECP2 gene, which is located on the X chromosome. This mutation disrupts normal neurological function, with motor impairments being particularly pronounced in RTT. Since MECP2 mutations are X-linked, the syndrome manifests when a single X chromosome carries the defective gene. In order to efficiently study the role of MECP2, we bred mice with this conditional MECP2 deficiency by deleting the MECP2 gene from their purkinje cells, a major cerebellar neuronal cell type. Motor abilities in these MECP2-deficient mice were assessed using classical eyeblink conditioning, including both trace and delay paradigms, to evaluate motor learning and reflexive responses. Neural activity was also assessed during these tasks by utilizing implanted brain devices to identify electrophysiological changes associated with the MECP2 deficiency. To complement these behavioral experiments, we performed ex vivo brain slicing and used confocal and fluorescence microscopy to examine MECP2 expression and its impact on neural plasticity in both glial and Purkinje cells following motor learning tasks. The following experimental groups were used in comparison during microscopic analysis: MECP2 knockouts and wild-type controls. Our findings revealed the vital role of cerebellar dysfunction in RTT, linking impaired Purkinje cell function to both motor deficits and various neuropsychological abnormalities. These results provide new insights into the neurological underpinnings of RTT and highlight potential therapeutic targets for the future.

Caleb Jackson

MT - Montana State University - Bozeman

Discipline: English and Literature

Authors:

#1 Robert Bennett

Abstract Name: The Cover's Truth: The Role of Culture in Cover art as Shown Through War and Peace

How is culture depicted in cover art? In answering this complex question are two widely available editions of Tolstoy's War and Peace, one from 1996 and another from 2002. With inspiration from Blackmore's (2020) paper, "Full Paper Jacket: Vietnam Book Cover Art," this paper acknowledges how the translation studies field has neglected cover art's role in new editions/translations of a work. Throughout this research, a typical case study methodology, in addition to George Saltzer's "Jacket Types," and Maslow's 1954 Hierarchy of Needs, helps carefully analyze the question, leading to the conclusion that there is a connection between cover art and culture, primarily in the way covers broadly depict cultural themes of the work and the culture of the time of republishing. This connection is explained further through a discussion on the cover's physical description and color, the original designer's context, and the context of the time these republished works occurred. Further research should explore more examples of cover art within and beyond the "classics" genre to see if these conclusions are more universal or dependent on certain factors.

Daniela Jackson

KY - University of Kentucky

Discipline: Environmental Science and Sustainability

Authors:

#1 Daniela Jackson

#2 Angela Sierras

#3 Zach DeVries

Abstract Name: Efficacy of Essential Oils for German Cockroach Control

Traditional pest management practices rely heavily on synthetic insecticides, but due to their toxicity, there is concern surrounding potential hazards to humans, pets, and the environment. Consequently, there is a growing demand for natural products effective against urban pests. To address the demand for natural products against urban pests, especially cockroaches, several products have been formulated with essential oils (EOs). While the insecticidal profile of EO-based products is environmentally ideal, their effectiveness against the German cockroach, especially regarding residual activity and behavioral effects, remains to be investigated. Integrated pest management (IPM) approaches, including using EO products, have been proposed for cockroach control. This study evaluated the residual, direct exposure, and behavioral activity of commercially available EO products. Our results show that commercially available EO products had higher mortality rates when applied directly, but low mortality when tested as residual treatments. Effective control of cockroaches is crucial for reducing the risk of allergies and other health concerns in vulnerable populations while emphasizing the efficacy of environmentally friendly pest management solutions.

Eura Jackson

GA - Clark Atlanta University

Discipline: Psychology

Authors:

#1 Eura Jackson

Abstract Name: I Wish We Weren't Seen as a Monolith: An Exploration of The Academic Needs of Black

Males

As countless students take their seats for graduation, the persistent underrepresentation of Black male students at the forefront of this accomplishment raise significant concerns. Despite academic improvements demonstrated through research to have shown a statistical impact on African American education outcomes, there is an unmistakable disparity between Black male students and any other race/gender in high school graduation rates, college enrollment, college completion, and overall education attainment. This study explores the academic needs identified by Black male students as essential for their academic achievement. Using an embedded mixed-method design, 15 Black male high school students ranked six factors from the Sankofa scale in order of most to least important. Additionally, existing data of approximately 20 Black male undergraduate students were analyzed to examine the factors previously influencing their academic performance. Quantitative findings of this study highlight the importance of cultural identity relevance in academia and the importance of personal relationships with teachers. The qualitative results reveal two new themes as potential risks to Black male achievement: that student identity and inspiring ambition. The findings underscore the importance of educators remaining neutral, respecting and valuing students, and setting high expectations that demonstrate strong belief in Black male students' capability to attain academic success.

Demiya Jackson

GA - Fort Valley State University

Discipline: Biology

Authors:

#1 Cameron Bardsley

Abstract Name: The Survival of Salmonella in Soil Amendment with Pecan Shells and Poultry Littler

The research conducted by the United States Department of Agriculture focuses on Salmonella's survival in soil amended with pecan shells, poultry manure pellets, and both pecan shells and poultry manure compared to unamended soil. Salmonella's survival rate will be shorter in soil amendment with pecan shells than poultry manure. Poultry manure already has foodborne pathogens like Salmonella and E. coli in it. An inoculum is created using five strains of Salmonella Typhimurium, Enteritidis, Montevideo, Saintpaul, and Newport. Fifty milliliters of the inoculum was placed in each of the 1000kg treatments and mixed evenly. Sampling is then conducted over a period of days after inoculation. A 1:10 dilution is created using peptone water and samples of each one of the treatments. The dilutions are plated on TSA + R plates and incubated for 24 hours at 37 C. Poultry manure promoted the survival rate of Salmonella in soil amended. Pecan shells are a reliable alternative for producing Salmonella as a soil amendment to poultry manure. The data from the third rep of the soil amended study was consistent and had a slower die-off rate than the previous reps conducted, which was not to be expected.

Kerrington Jackson

MI - University of Michigan - Ann Arbor

Discipline: Nursing and Public Health

Authors:

#1 Korrey Monroe

#2 Lenette Jones

Kennedy Flowers

Abstract Name: Examining Brain-Behavior Connections in African American Women With Hypertension

Hypertension (HTN) affects 58% of African American women in the U.S., representing one of highest prevalence rates among demographic groups. This chronic condition significantly increases the risk of serious health issues, such as stroke, and is linked to higher mortality rates. By understanding the brain-behavior connections in African American women with HTN, we can gain insights into how they process and apply health information, potentially leading to improved health outcomes. The Brain Relationships Among Information, Neuroprocessing, and Self-Management (BRAINS) study utilized a cross-sectional design and included a sample of 99 participants who self-identified as Black women, were right-handed and ages 21 to 64. Data collection was adapted due to the COVID-19 pandemic by employing videoconferencing to conduct study visits. Measures included: assessment of self-management behavior, health information behavior, blood pressure (using Omron 10 cuffs), and cognitive function (evaluated using the TestMyBrain Digital Neuropsychology Toolkit). Data analysis is being conducted to examine findings related to health information behavior and cognitive function that can enhance HTN self-management strategies that may be useful for many African American women with HTN. We hypothesize that most participants will report a moderate level of searching for health information about high blood pressure, and that cognitive performance (particularly in processing speed and working memory) will vary due to the age range of participants. Furthermore, we anticipate that participants will report moderate to high levels of self-regulation in managing HTN, though with considerable variability. Ultimately, this research will provide additional insight for HTN management recommendations, contribute to reducing health disparities among African American women, and guide scientists in designing future studies. Keywords: Hypertension, African American, Women, Cognition, Self-Management, Brain

Izzy Jacober

TN - Middle Tennessee State University

Discipline: Psychology

Authors:

#1 Tiffany Rogers

Abstract Name: The differing effects of oxytocin on maternal motivation in mice

Levels of social interaction are often decreased in those with autism spectrum disorder (ASD). The social motivation hypothesis of ASD suggests that this stems from lower motivation toward social interaction, which is a product of alterations in the dopaminergic reward system. One proposed treatment for the decreased social drive seen in ASD is oxytocin. Oxytocin is a neurotransmitter and hormone commonly linked to social behaviors and plays an important role in the development and maintenance of relationships. Paradoxically, the pattern that has emerged from research in the Rogers Lab is that administering oxytocin to mice decreases levels of social interaction. This experiment will further investigate this phenomenon, specifically examining oxytocin's role in mediating maternal motivation by separating mouse mothers (dams) from one of their pups by an obstacle. Previous findings from the Rogers lab suggest that oxytocin will increase maternal motivation when effort is low and decrease maternal motivation when effort is high.

Madison Jacobs

OK - University of Central Oklahoma

Discipline: Art History

Authors:

Abstract Name: A Reexamination of Paul Bowles as a Moroccan Representative

Paul Bowles was an American expatriate known for his work as a composer, author, and translator. He settled in Tangier, Morocco, in 1947. He published several short stories, three novels centered around Moroccan social and political culture, as well as numerous translations of oral stories, including the work of well-known Moroccan author Mohamed Choukri. Due to his extensive list of Moroccan representations, Bowles curated a legacy as a leading contributor in introducing the Western world to Morocco, which current scholarship upholds without question. This research calls into question Bowles' qualifications for being a pseudo-ambassador of Moroccan culture and argues instead that he is an unreliable source of information. This position revolves around three factors: Bowles demonstrates a lack of cultural sensitivity necessary for unprejudiced depictions of differing cultures, his perpetually homogenous social circle of Westerners in Morocco, and his self-proclaimed fluency in Morocco's Arabic dialect *darija*. Evaluating his refutable qualifications and neglectful contributions to the Western world's understanding of Moroccan culture exposes the misconception that Bowles is a reliable spokesperson. This research encourages and emphasizes the importance of further scholarship towards a reexamination of Bowles' work, his impact on the Western canon's perspective of Morocco, and historiographies created by previous scholars. From a broader perspective, this study contributes to literary Orientalism scholarship and advances critical cross-cultural understanding.

Julianna Jacobs

PA - Grove City College

Discipline: Environmental Science and Sustainability

Authors:

#1 Brian Yowler

#2 Tracy Farone

#3 Students of BIOL 301

Moira Dieteman

Luke Culbert

Abstract Name: Assessing Deformed Wing Virus Prevalence Among Asymptomatic Honey Bees Using Real-Time qPCR

Deformed Wing Virus (DWV) is one of many viruses that infect honey bee (*Apis mellifera*) colonies. Many bee viruses may cause subclinical or clinical symptoms with natural exposure, but pathology can be facilitated with *Varroa destructor* mite infestation. This relationship between mite and viral infection is seen in the case of DWV, causing clinical signs of shriveled wings that weaken hives, which contributes to overwinter losses and general collapse of colonies. Our research assesses the prevalence of DWV from four honey bee hives in the Grove City College (GCC) apiary. We extracted viral RNA from honey bee samples and used Real-time qPCR to amplify DWV sequences. The resulting amplification curves suggest that 20 of the 22 total honey bee samples contained DWV, despite the lack of clinical symptoms. This procedure can help inform researchers about the high prevalence of DWV in both clinical and subclinical presentations. Furthermore, this study highlights the importance of *Varroa* mite treatment and prevention in beekeeping practices, even in hives that appear asymptomatic.

Jet Jacobsen

PA - Duquesne University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Chirstopher Olivola

Abstract Name: Continued Analysis using the Future Orientation Index

This research aims to further develop Future Orientation Index (FOI) measures (Noguchi et al., 2014; Preis et al., 2012), and examine their relationships to macro-level variables (e.g., per capita GDP; savings-to-debt ratios, etc.). The original measures used the ratios of Google searches for future years (e.g., “2026”), past years (e.g., “2024”), and the current year (e.g., “2025”)[c1] to create proxies indicating the extent to which individuals in a population are relatively focused on the past, present, or future. We will develop extensions of these FOI measures that consider more distant past and future years, as well as non-numerical search terms (e.g., “last year”, “next year”, etc.). We also aim to develop a Risk Orientation Index (ROI) measure, using the relative frequencies of Google searches for terms associated with risk (e.g., “gambling”, “betting”, etc.), and examine its relationship to macro-level variables. We expect these improved and novel measures will serve as useful proxies for the extent to which populations are more future-focused (FOI), as opposed to present- and past-focused, as well as more risk-tolerant (ROI), as opposed to risk-averse. Consequently, we also predict that these indices will be correlated with macro-economic measures of economic success, given that individual success is driven (in significant part) by people’s willingness to delay immediate gratification (i.e., focus on the future) and adopt a reasonable approach to risk. We will test this latter hypothesis by comparing these indices and various macro-economic variables across countries and across U.S. states [c1]Since the conference is scheduled for next April, 2025, I am taking 2025 to be the “present year”, etc.

Denali Jah

CO - University of Colorado at Boulder

Discipline: Physics and Astronomy

Authors:

#1 Denali Jah

Abstract Name: sPHENIX 3-D Topological Calorimeter Clusters in Run-24 p+p Data

The sPHENIX experiment at the Relativistic Heavy Ion Collider (RHIC) uses an Electromagnetic Calorimeter and two Hadronic Calorimeters with granularity in η - ϕ to measure particles produced in proton-proton collisions. Energy deposits from showering particles are measured using a series of calorimeter towers, each with their own measured energy and expected noise level. The reconstruction of calorimeter showers by grouping individual calorimeter towers into three-dimensional topological clusters has proven a reliable noise suppression method in experiments at the LHC and other facilities. Using an iterative growth algorithm that determines tower inclusion based on the significance of the tower energy above noise, this method offers a single tool for mapping showers ranging from purely photonic to deeply hadronic. By identifying energy deposits from individual particles, topological clustering is also useful for jet reconstruction. This presentation encompasses a series of studies on topocluster reconstruction in RHIC Run-24 p+p data and discusses the broader scope within the sPHENIX physics program.

Kaavya Jaichandar

AL - University of Alabama at Birmingham

Discipline: Nursing and Public Health

Authors:

#1 Jie Gao

Kayla Peacock

Abstract Name: A Study on the Effects of Park Visits on the Mental Health of Residents in Low-Income Senior Living Communities (SLCs)

As generations age, there comes an expansion of senior living communities (SLCs) which aim to accommodate the living needs of senior citizens. However, there is a correspondence of chronic diseases and health-related ailments, both physical and mental, affecting those living within lower-income communities compared to regular community-dwellers. Visiting a park offers exposure to green space, referred to as green therapy, which may improve the mental health of residents in low-income SLCs, especially those in urban settings with limited access to green spaces. This experiment explored if exposure to parks improved their overall mental health. Cortisol was used as a determinant, and it was anticipated that participants' cortisol levels would decrease as their health improves. To test this hypothesis, three SLCs participated in a 10-week program where they walked around a local park once each week. Prior to the first walk, a 'pre-program' interview was administered, where the participants answered a series of mental-health questions. A sample of hair was collected to be used for cortisol analysis before and after the program, to compare the cortisol levels of each. Additionally, before and after each visit, a shorter survey was utilized to assess each participant's well-being. After the program concluded, a 'post-program' survey was completed. The results showed a significant improvement in the participants' overall well-being. There was not significant change in the pre/post cortisol levels, however significant change was observed when outliers were removed. This park program is a promising outlet through which senior residents could improve their mental health.

Rishabh Jain

IA - Iowa State University

Discipline: Engineering

Authors:

#1 Anuj Sharma

Abstract Name: Leveraging Deep Learning for Vehicle Behavior Analysis and Adaptive Traffic Signal Optimization

This study presents an innovative tool designed to automate the detection of yellow lights and analyze vehicle behavior at intersections, leveraging advanced deep learning and computer vision techniques. Using traffic footage collected from intersections in Utah and Florida, the tool processes multi-camera video feeds to evaluate driver responses during the yellow light phase. The integration of YOLOv8, a state-of-the-art object detection model, enables accurate identification of vehicles in real-time, while OpenCV facilitates video frame extraction and synchronization across multiple cameras. This ensures comprehensive traffic analysis, even in complex environments. The tool optimizes data storage and processing efficiency by automating the identification of yellow light occurrences and discarding video frames without vehicle activity. Behavioral analysis focuses on determining whether vehicles decelerate, stop, or accelerate during the yellow light phase, with virtual distance markers used to estimate speed and acceleration. These insights provide valuable data for modifying traffic signal timings to align with real-world driver behavior. Preliminary results demonstrate the tool's potential to enhance traffic flow and safety at intersections. The findings indicate that adaptive adjustments to yellow light durations, informed by observed driver behavior, could reduce congestion and the risk of accidents. Future applications include integrating real-time adaptive traffic signal systems that adjust signal timings dynamically based on live traffic data. This research also lays the groundwork for further incorporating vehicle-to-infrastructure communication to optimize urban traffic management. By combining

machine learning and computer vision, this study introduces a scalable, efficient, and accurate solution for addressing the challenges of modern traffic systems. It establishes a strong foundation for future research in intelligent transportation systems, aiming to improve traffic safety and efficiency through data-driven decision-making.

Arav Jain

FL - University of West Florida

Discipline: Chemistry

Authors:

#1 Arav Jain

Abstract Name: Synthesis of 3-chlorobenzo[b]thiophenes via copper-catalyzed electrophilic cyclization reactions

Benzo[b]thiophene scaffolds are essential constituents of various materials and pharmaceutical products. These sulfur heterocycles are especially known for their antidepressants, anti-inflammatories, antimicrobial and anti-tumor activities. In material science, thiophene derivatives are used as inhibitors of corrosion of metals and in the fabrication of light-emitting diodes. The commonly used method for synthesizing 3-halobenzo[b]thiophenes derivatives is from the halocyclization of 2-alkynylthioanisoles. Although these halocyclization methodologies have proven to work well for 3-bromo and 3-iodo substituted benzo[b]thiophenes, the synthesis of 3-chlorobenzo[b]thiophene via chlorocyclization has proved to be quite demanding. Most of the current chlorocyclization methodologies involve the use of excess or stoichiometric amounts of copper salts. Herein, we report a novel copper-catalyzed chlorocyclization methodology for the synthesis of benzo[b]thiophene utilizing 1,3-dichloro-5,5-dimethyl hydantoin as the source of chlorine. Our new methodology requires mild reaction conditions and results in excellent yields for the product.

Pooja Jakkampudi

PA - Washington & Jefferson College

Discipline: Biology

Authors:

#1 Pooja Jakkampudi

#2 Owen Kamer

#3 Mihira Karnik

#4 Srivatsa Bellamkonda

#5 Melissa Tribley

Owen Kamer

Mihira Karnik

Abstract Name: Enhanced vulnerability to trauma-induced neurodegeneration in a Drosophila model of human tauopathy

Deposition of the microtubule-associated protein tau is a hallmark pathology of the family of neurodegenerative diseases known as tauopathies, including Alzheimer's disease, frontotemporal dementia, and chronic traumatic encephalopathy. Ongoing work on mechanisms of tau-mediated neurodegeneration suggests that genetic contributions interact with peripheral or environmental factors to contribute to disease onset and severity. Head trauma is an established modifier of brain health and function in human, rodent, and

invertebrate models. Using an established impact injury model known as HIT, we have examined the effect of traumatic injury on behavior and neurodegenerative markers in transgenic *Drosophila* expressing human tau in neurons. Tau transgenic flies show worsened outcomes compared to their non-transgenic controls as shown by both locomotor activity and tissue histology. To expand upon this work, we are examining other neurodegenerative models in the HIT paradigm as well as other biochemical markers of cell death. Taken together, these data suggest that tau transgenic flies have an increased vulnerability to traumatic injury in this *Drosophila* model of human tauopathy.

Afreen Jaman

FL - Florida International University

Discipline: Health and Human Development

Authors:

#1 Afreen Jaman

#2 Valery Butto

#3 Ana Valentin Cabrera

#4 Joshua Hutcheson

Abstract Name: The Effects of Relaxin Agonists on Vascular Calcification in Osteogenic Conditions

Heart disease is the leading cause of death in the United States, with atherosclerosis being a primary underlying factor. Atherosclerosis is a chronic disease characterized by the accumulation of lipoproteins in the arterial walls, triggering chronic inflammation, narrowing the arterial walls, and obstructing blood flow. A feature of advanced atherosclerosis is the deposition of bone-like mineral in the plaque, known as vascular calcification, the best predictor of a cardiovascular event. Currently, there are no treatments to slow or reverse vascular calcification. Studies have demonstrated that relaxin, a vasoprotective and anti-fibrotic hormone, is safe in humans; however, relaxin is expensive to synthesize and has poor bioavailability. ML290, 6044, and 8394 are allosteric biased agonists of the human relaxin family peptide receptor 1 (RXFP1) and offer a more cost-effective solution while effectively targeting the RXFP1 receptor. This study investigates the effects of these agonists on vascular calcification. Our experiments consisted of 21 days, where we aimed to determine whether the agonists reduce vascular calcification in a dose-dependent manner in vitro. We seeded vascular smooth muscle cells in osteogenic (OG) media to induce calcification, where our wells consisted of a control group, OG media, and OG media with a dosage of 5 and 10 μ M of each agonist. On Day 21, Alizarin red S staining was performed to assess calcium binding and extracellular vesicles were isolated to measure alkaline phosphatase, a marker of calcification, in each well. Preliminary data suggests these small molecule relaxin receptor agonists can reduce vascular calcification in vitro.

Pranav Jambulingam

FL - Florida Atlantic University

Discipline: Biology

Authors:

#1 Pranav Jambulingam

#2 Erik Duboué

#3 Laura Fontenas

Abstract Name: Revealing the Role of Glia in the Evolution of Behaviors in *Astyanax mexicanus*

Long thought to be simply a support cell for the brain, the glia now have a known role in modulating neural function and behaviors. Active research is being done in diverse model systems to understand the role of glia in neural function, yet how changes to glia lead to evolutionarily adaptive behaviors is an unexplored problem. The model system, *Astyanax mexicanus*, is a unique system among vertebrate models in that the fish exists as a single species with two evolutionarily divergent forms: eyed surface-dwelling fish and multiple populations of eyeless cave-restricted forms. This project will use the power of *Astyanax*, including many reagents developed by the Duboue lab, to understand how glia differ in these two evolutionarily divergent forms and how changes to glia diversity or function led to adaptive behaviors. With the use of transgenic fish developed in the Duboue lab, and in situ hybridization, glial cells can be integrated into the *Astyanax* brain atlas. Using this atlas, comparative analysis can be done between the cave and surface morphs of *Astyanax*, revealing important differences in the quantification of glial cells within different subregions of the brain. This study has established a method to characterize different subsets of glial cells within *Astyanax*, and further studies will utilize this method to track glial development between the two morphs. We expect these studies to set the stage for understanding what role changes in glia have in the diversity of life throughout the Animal Kingdom.

Alanna James

GA - Kennesaw State University

Discipline: Psychology

Authors:

#1 Chanler Hilley

#2 Emily Scheinfeld

#3 Michelle Pasco

Abstract Name: Place Attachment in Young Adults

Place attachment is the emotional bond individuals form with specific locations, influencing identity and stability (Clarke et al., 2017; Williams & Vaske, 2002). This bond is particularly significant for young adults (YAs) as they gain autonomy and navigate new environments, such as college and careers (Chevrier & Lannegrand, 2023). While place attachment has been studied primarily from a tourism perspective (e.g., festivals, national parks; Rajaobelina et al., 2019; Ramkissoon et al., 2014), we know little about the factors that promote neighborhood place attachment during young adulthood, a time in which even the definition of one's "neighborhood" may be in flux. This study investigated predictors of YAs' neighborhood place attachment, including individual-level factors (race/ethnicity, gender, age, parental relationships, perceived safety) and neighborhood-level factors (rurality-urbanicity, stability). We also examined differences based on how YAs conceptualized their neighborhood and the relationship between neighborhood place attachment and markers of adulthood or subjective adulthood. Participants included 1,303 YAs recruited

through online panels (38.1%), a university participant pool (41.7%), and college extra credit opportunities (20.2%). To allow for self-definition of their neighborhood, the Place Attachment Scale was administered before identifying their referent neighborhood (e.g., zip code). GLM analyses were conducted using SPSS Statistics 29, with further neighborhood-level analyses using Mplus 8.11. Results indicated significant differences in place attachment based on the referent neighborhood, driven by contrasts between current neighborhoods and those where YAs grew up. Age, parental relationship satisfaction, and perceived safety (but not gender or race/ethnicity) predicted neighborhood place attachment, while the neighborhoods YAs grew up in and where friends live were associated with greater attachment compared to current neighborhoods. Findings suggest that parental relationships and perceived safety may be important facilitators of this promotive factor.

Amanda James

NY - Long Island University

Discipline: Environmental Science and Sustainability

Authors:

Abstract Name: Empowering Youth to Be Environmental Stewards

As climate change intensifies, urban populations face unique challenges, such as pollution, and habitat degradation, which demand urgent attention. Over half of the world's population lives in cities, yet many of these people are often excluded from environmental conservation discussions. This exclusion is not only unfair but also unsustainable. Marine Park, Brooklyn offers a great example of this gap in New York City. Since urban environments, such as Marine Park, often face specific environmental issues, active environmental stewardship is crucial. This is where citizen science and environmental education programs play an important role. Citizen science, which is the involvement of the public in scientific research, and environmental education programs, which are initiatives that teach people about the environment and environmental issues, provide a framework for engaging urban youths in these important conversations. This transdisciplinary qualitative case study research project, carried from September to November 2024, sought to address the question: 'How can organizations use citizen science and environmental education programs to encourage and empower youth to become environmental stewards in Marine Park, Brooklyn, New York?'. For this study, I utilized an interdisciplinary mixed-methods case study framework focused on youths (14-18). I conducted a survey to gather information about youth attitudes, behaviors, and pre-existing knowledge about the environment, as well as observational research to document engagement in citizen science and education programs. The findings from this study highlight that participants have an increase in a sense of empowerment after being involved in these programs. These findings suggest that such programs are important in fostering a stronger connection to nature and empowering youth to take active roles in environmental initiatives. Given these outcomes, organizations should prioritize and expand the use of these programs, including educational and citizen science initiatives, to engage youths and promote environmental stewardship in urban areas like Marine Park.

Emma Janes

OK - University of Central Oklahoma

Discipline: Economics

Authors:

#1 Travis Roach

Abstract Name: The Impact of Transportation Policy Changes on Population Rural Population's Decline in Oklahoma

Over the past 30 years rural Oklahoma has seen a substantial decline in population. Many of these rural counties have lost their residents to urban counties, though the impetus for this transition is not well understood. In this work, I test the hypothesis that this was largely caused by the decommissioning of the Interstate Commerce Commission in 1995 which removed Federal support for rural transportation networks. I compare counties that had access to robust public transportation options prior to the decommissioning with those that did not to determine how business dynamism and population growth changed. I discuss possible policy changes to counteract negatively affected rural communities.

Rheana Jankowski

IL - Joliet Junior College

Discipline: Biology

Authors:

Abstract Name: Comparison of Stream Water Quality from Use of Whole Count & Fixed-Count Subsampling of Macroinvertebrates Collected Using Artificial Substrate Over One Four-Week Period

Monitoring stream water quality often employs sampling of benthic macroinvertebrates. Different sampling techniques are used, including using a fixed-count subsample or a whole count sample. Fixed-count subsamples are low-cost, low-effort and relatively accurate; whole count samples are high effort and have the greatest accuracy. When comparing subsampling to whole-count, would a significant difference be found between sample sizes after calculating the Shannon Diversity Index (SDI) and Macro Biotic Indices (MBI—used to determine stream quality) for each? Broad taxa categorization was used according to Illinois RiverWatch (a citizen scientist program) standards, to compare data collected from artificial substrate samplers installed in Lily Cache Creek in Will County, IL at Avery Preserve for four weeks.

Macroinvertebrates collected were subsampled in groups of 50+, 100+, 200+, and whole count samples to determine if a significant difference in SDI and MBI could be found between subsamples and whole-count sampling for Hester-Dendy samplers and marble rock baskets. Taxa were also sorted into the groups EPT and non-EPT (EPT referring to the insect orders Ephemeroptera, Plecoptera, and Trichoptera) and pollution tolerant and intolerant species. Comparison between fixed-count and whole-count samples displayed no significant difference in stream quality metrics, which were determined to be borderline fair/poor, except in increased EPT taxa richness in the marble rock basket samples and in comparisons between 100+/whole count and 200+/whole count in marble rock baskets. This supports earlier research which found subsampling gives a roughly proportional result to whole-count sampling of macroinvertebrates, meaning small, unbiased, sub-samples continue to be applicable for volunteer-based stream quality determination.

Leo Janse van Rensburg

GA - Kennesaw State University

Discipline: Computer Science

Authors:

Abstract Name: Towards a Resilient Federated Edge Intelligence: A Testbed for Design, Analysis, and Validation of Federated Learning

Federated learning (FL) is an efficient, privacy-preserving distributed learning paradigm that enables massive edge devices to train machine learning models collaboratively. Although various communication schemes have been proposed to expedite the FL process in resource-limited wireless networks, the unreliable nature of wireless channels was less explored. Current research on the evaluation of FL is mainly based on the simulation of multi-clients/processes on a single machine/device, leaving a gap in understanding FL performance under unreliable communication in real-world distributed low-power IoT devices. This research develops a comprehensive testbed for evaluating FL under unreliable communication using the Common Open Research Emulator (CORE) to simulate multiple heterogeneous IoT devices and their network interactions on a single physical machine. We implement a Distributed Consensus Algorithm to mimic FL behavior, providing a simplified yet representative model of distributed learning dynamics. The testbed supports various network topologies, including mesh, star, tree, and hierarchical federated learning configurations, allowing for comprehensive topology-based performance analysis. Through an integrated Grafana dashboard, we enable real-time monitoring and control of network parameters such as packet loss, bandwidth, and latency between nodes, while also providing visualization of individual node performance and simulation control capabilities. This setup facilitates the investigation of security vulnerabilities across different topologies, particularly focusing on resistance to DDoS attacks and malicious data manipulation at the client level. The platform can simulate an arbitrary number of IoT devices, making it highly scalable for diverse experimental scenarios. This comprehensive testbed provides researchers and practitioners with an open, adaptive environment for measurement and experimentation in the FL context, enabling the design and validation of robust FL solutions while offering valuable insights into security implications across various network configurations.

Marlene Jantes

TX - West Texas A&M University

Discipline: Chemistry

Authors:

#1 Maha Shrestha

Abstract Name: Synthesis and Characterization of Bio-monomers in Cashew Nut Shell Liquid (CNSL)

Cardanol is a bio-based raw material obtained from distillation of cashew nut shell liquid (CNSL). Cardanol is not only readily available, affordable, renewable, and non-toxic but also has a unique structure, making it a possible substitute for phenols in many applications. Cardanol is also of high interest because of the presence of an unsaturated side chain that is versatile in developing bio-based building blocks. The main constituents of CNSL are phenolic compounds with long side-chain substitution at the meta-position. These constituents differ in side-chain unsaturation including mono, di and tri. The structure of these side-chains of varying degrees of unsaturation in CNSL are the focus of our research, transforming into a three-membered ring structure (oxirane ring) with two adjacent carbons, forming an epoxy functional group. In this research, we were able to develop a new and simple method for epoxidizing a bio-based raw material by using cardanol as the source of double bonds, acetic acid and amberlite as catalysts, and hydrogen peroxide as an oxygen donor. The products obtained from the reaction were analyzed using Thin Layer Chromatography (TLC), Viscometer iQ, and Fourier-Transformation Infrared (FT-IR) Spectroscopy. The analytical results suggested the formation of a new product with remnants of starting material.

Ahmad Jasser

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Mohammad Asif Sherwani
#2 Nabiha Yusuf
#3 Victoria Jiminez
#4 Ariq Chandra

Abstract Name: Immunomodulation in the Melanoma Tumor Microenvironment: K-Homology Type Splicing Regulatory (KSRP) Protein

The tumor microenvironment (TME) in melanoma has been of increasing interest. K-homology type splicing regulatory protein (KSRP) is a multi-domain RNA-binding protein involved in the post-transcriptional regulation of mRNA. The Cancer Genome Atlas (TCGA) revealed that KSRP is highly expressed in human melanoma and correlated with poor survival. We have found that KSRP is highly expressed in human and mouse melanoma cell lines compared to normal melanocytes. There is limited information on the role of KSRP in regulating the TME in melanoma. This study aimed to determine whether loss of KSRP inhibits the growth of melanoma using KSRP knock-out (KO) mice and C57BL/6 wild-type (WT) control mice and also aims to investigate the role of the immune system in this process. We hypothesized that loss of KSRP will inhibit the growth of melanoma cells due to anti-tumor immune response in the TME. KSRP KO and WT mice were injected subcutaneously with one million YUMM1.7 mouse melanoma cells and mice were monitored for the appearance of tumors after injection using digital caliper measurements. Tumor volume was measured every alternate day for 30 days. Mice were sacrificed after 30 days, and the tumor and spleen were harvested for analysis of immune cells by flow cytometry and immunohistochemistry. At day 29 post-injection, tumor volume was significantly larger in WT mice vs KSRP KO ($p=0.0078$). Analysis of WT and KSRP KO TME via immunohistochemistry is currently ongoing. Our flow cytometry analysis revealed that there were significantly fewer T regulatory cells, myeloid-derived suppressor cells, and higher levels of cytotoxic T cells in KSRP KO mice in comparison to WT mice. This is the first in vivo model regarding KSRP modulation and its role in future pharmacologic potential with immunotherapies.

Sarah Jasser

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Sarah Jasser
#2 Javeed Farooqi
#3 Anabia Javed
#4 Farrah Memon
#5 Amjad Javed

Abstract Name: The Role of Runx2 in Mature Odontoblasts for Postnatal Dentin Secretion and Maintenance

Nearly half of the adults in the US suffer from periodontitis. Dentin is essential for protecting dental pulp stem cells from invading oral pathogens. Teeth with low levels of dentin are susceptible to caries, infections, and fractures. Dentin is synthesized and secreted by odontoblasts. Runx2 transcription factor is the master regulator of osteoblast differentiation and bone formation. The global deletion of the Runx2 gene results in failure of bone formation and embryonic lethality. However, the role of Runx2 in odontoblasts for synthesizing and maintaining postnatal dentin needs to be better understood. To answer this question, we have generated a Runx2 gene floxed model. Runx2 gene was deleted in mature odontoblasts by using OC-Cre mice. We confirmed OC-Cre activity in mature odontoblast by Td-reporter. The homozygous mice were born alive with normal development and eruption of incisors and molars. The changes in the dentin synthesis will be assessed by micro-computed tomography (μ CT) of load-bearing molars and continuously growing incisors

at 2-week, 1-month, and 3-month time points. Disruption in odontoblasts differentiation due to lack of Runx2 will be investigated by changes in expression of dentin marker genes (DMP1, DSPP, OC, Sp7) by qPCR and RNA-Scope. TUNNEL staining will be used to know the involvement of Runx2 in odontoblast survival and death. Odontoblast differentiation, polarization, and the maturation of dentin tubules will be assessed by H&E staining. Double Calcein labeling will be used to quantify dynamic dentin synthesis. While tooth development is expected to progress normally, we anticipate a significant decrease in odontoblast gene expression, polarization, and dentin synthesis.

Sanika Javeri

IN - Indiana University Bloomington

Discipline: Health and Human Development

Authors:

Abstract Name: Exploring the MAPT Gene and Its Influence on Frontotemporal Dementia and Other Neurodegenerative Conditions

Frontotemporal Dementia (FTD) is a neurodegenerative disorder characterized by the progressive degeneration of the brain's frontal and temporal lobes, leading to significant neuronal loss and dysfunction in these regions. These pathological changes result in the behavioral, emotional, and cognitive impairments that are hallmarks of FTD. Understanding the pathogenic effects of tau protein mutations is essential for elucidating the mechanisms underlying FTD and for developing effective therapeutic interventions. In this study, the focus surrounded investigating genetic mutations in the tau protein by analyzing the MAPT gene, which encodes the tau protein. A variety of resources and tools from the National Center for Biotechnology Information (NCBI) were utilized, including the Gene, Protein, dbSNP, and PubMed databases, as well as the DisGeNET database. The NCBI Gene database provided comprehensive information on the MAPT gene, while the Protein database offered detailed insights into the structure and function of the tau protein, including its various isoforms and post-translational modifications. The dbSNP database and the Variation section were instrumental in identifying known genetic mutations and single nucleotide polymorphisms (SNPs) associated with the MAPT gene. These resources collectively facilitated a thorough analysis of the genetic variations that contribute to FTD. Additionally, the ClinVar database was utilized to assess the clinical significance of these genetic variants, providing valuable data that can inform the development of targeted therapeutic approaches. By integrating information from these diverse databases, the study aimed to enhance an overall understanding of the molecular basis of FTD and to identify potential avenues for treatment. This comprehensive approach underscores the importance of genetic research in unraveling the complexities of neurodegenerative diseases and highlights the potential for developing personalized medicine strategies to combat FTD.

Avinash Jayakumar

NC - University of North Carolina at Charlotte

Discipline: Exercise Science and Nutrition

Authors:

#1 Abbey Thomas

Abstract Name: The Impact of Clinical Training on Landing Biomechanics and ACL Injury Prevention

Anterior cruciate ligament (ACL) injuries represent a significant threat to athletes' long-term health and

performance, with current prevention strategies showing limited sustained effectiveness. This study aims to investigate the impact of a comprehensive clinical training program on improving landing biomechanics and reducing ACL injury risk among collegiate athletes. ACL injury risk reduction programs emphasize improving known biomechanical risk factors for injury, including increasing knee and hip flexion angles, reducing vertical ground reaction force, and decreasing knee abduction angles and moments during landing. Improving biomechanics is often attained through the use of feedback of movement errors. Feedback may be internal or external. The benefit of auditory feedback is that errors can be tracked every time the individual moves in a way that could injure the ACL. Quantifying errors during training is beneficial, but understanding if the individual reduced their risk of injury in response to training is essential to determine success of the intervention. The clinical tool used in this study is the Landing Error Scoring System (LESS). By carefully examining movement patterns during first contact, knee flexion, and global evaluation items of the LESS, this study seeks to understand how particular interventions can change landing mechanics. The study combines common functional exercises and auditory feedback to achieve proper landing techniques. The training regiment will be a 4-week training program to improve landing biomechanics. By establishing the association between auditory errors and LESS score, the study can inform clinicians about who may best benefit from an auditory feedback training program. The basic idea is that by employing sound biomechanical techniques, athletes can significantly reduce their risk of injury, as seen by reduced LESS scores. In addition to immediate injury avoidance, the study anticipates broader impacts such as improved sports performance, longer career longevity, and better recovery processes.

Thulani Jayasinghe

MD - Johns Hopkins University

Discipline: Biology

Authors:

#1 Joshua Raji

#2 Christopher Potter

Abstract Name: Neurogenetic tool for characterizing IR8a expression and functions in the malaria mosquito

Odor volatiles that emanate from human skin are potent attractants to mosquitoes. Studies in *Aedes* mosquitoes have shown that IR8a is important for driving sensitivity to carboxylic acids. However, the neurophysiology of odor-evoked activity of the IR8a neurons in the antennae and the brain remains elusive. This gap is largely due to the unavailability of genetic tools in mosquitoes to allow for functional characterization and mapping of IR8a neuron populations. Here, we knock in T2A-QF2 into the exon1 of *Anopheles coluzzii* gRNA. We generated two independent alleles of IR8a knock-in by marking the transgenic lines with enhanced yellow fluorescent protein (eYFP) and red fluorescent protein (RFP). This approach enables us to capture the endogenous expression of IR8a and mutate IR8a functions simultaneously. A functional readout is obtained by crossing the IR8a driver line to a genetically encoded calcium indicator line. To map IR8a expression and axonal innervations, we cross the IR8a driver line to the green fluorescent protein reporter line. Transgenic backgrounds expressing both eYFP and RFP markers are mutant IR8a mosquitoes. Taken together, we show a binary expression system for characterizing IR8a functions and expression in *Anopheles* mosquito.

Cinnamon Jefferson

GA - Fort Valley State University

Discipline: Chemistry

Authors:

Abstract Name: Investigating the Sodium Content in Popular Asian Sauces using Nuclear Magnetic Resonance Spectroscopy (NMR)

The objective of this study was to investigate the sodium content in various Asian sauces using Nuclear Magnetic Resonance (NMR) Spectroscopy. Asian sauces are popular condiments known for its umami flavor and high sodium content. As Asian food grows in popularity in the US, it is becoming a more popular condiment in America. Monitoring sodium intake is crucial due to its link to high blood pressure, a prevalent issue in the United States. Verifying the sodium content in several different types of Asian sauce were evaluated to compare the sodium amount listed on the nutritional label to the measured sodium content in the product. A calibration curve ranging from 0.9%-4.5% sodium was prepared. The Asian sauces were diluted to adjust the sodium content to approximately 2.25%. Several different brands and types of Asian sauces were evaluated using NMR spectroscopy. Results will show that many soy sauces analyzed contain more sodium than indicated on the nutritional label. We can verify that the sodium in Asian sauces are not accurately presented. And a modification of all label descriptors for soy sauce brands should be adjusted to state the sodium content more accurately.

Alexander Jefferson

TX - Lone Star College

Discipline: Geography/Geology

Authors:

#1 Alexander Jefferson

#2 Bryn Benford

#3 Stephanie Kim

Abstract Name: Unraveling Pre-Drought Water Quality using the Spearford Gully, Houston, Texas

As drought becomes increasingly severe in the wake of global climate change, understanding how water quality responds is crucial. Previous studies have established a detrimental relationship between drought conditions and the overall abundance and quality of water in the region. This research builds upon this knowledge by investigating water quality in Spearford Gully, a Cypress Creek and Lake Houston tributary, preceding a significant drought in the summer of 2023. The pre-drought period is defined as the span between the last recorded rainfall and the official recognition of the drought by the National Integrated Drought Information System (NIDIS). Chlorophyll α , water depth, specific conductivity, turbidity, pH, and temperature data were collected in the Spearford Gully on the Lone Star College-University Park campus in Harris County using an EXO2 water sonde. During the pre-drought period, water quality diminished in the Spearford Gully, which is part of the Cypress Creek drainage basin. Chlorophyll α and turbidity were particularly sensitive to pre-drought conditions, with chlorophyll α experiencing changes within a few days and turbidity showing significant changes after approximately two weeks. These results indicate that surface water intended for consumption during a pre-drought timeframe in this drainage basin requires significant treatment to be in accordance with the EPA's water quality guidelines. Additionally, implementation of drought-related water usage restrictions should be put in place sooner as treatment of pre-drought water comes at a greater expense to the county, especially as surface water experiences a growing demand.

Daniel Jensen

UT - Utah Valley University

Discipline: Chemistry

Authors:
#1 Caitlin West
#2 Ming Yu

Abstract Name: Influence of urea on protein biomarker detection using quantum dots

Quantum dots have promising potential in biomedical applications due to their optical properties and small size. One of these applications is detection of small amounts of biomarkers, which could increase the sensitivity of early disease detection. Urine is of interest when detecting numerous diseases, such as diseases of the kidneys. For quantum dots to be an effective detector, their interactions with each compound in urine must be known. A major component in human urine is urea, a carbonamide. Due to its abundance in human urine, understanding the interactions between urea and quantum dots is critical for the development of effective detection methods of protein biomarkers. To detect the quantum dot's fluorescence, a BioTek microplate reader was utilized along with subsequent data analysis to discover the interactions between urea and quantum dots.

David Jensen

UT - Utah Valley University

Discipline: Education

Authors:
#1 Elyse Vaccaro
Claire Parker

Abstract Name: Representation in Healthcare Education: An AI-Driven Analysis of Biases in Anatomy Textbooks

Advancements in A.I have unlocked new possibilities for the analysis of large textual datasets. This study leverages these technological innovations to conduct an analysis of human anatomy and physiology textbooks commonly used by U.S. medical and undergraduate institutions. This research seeks to identify representational inequities in these textbooks, with a focus on linguistic biases, photographic depictions, and sexual reproduction representation. Our team adopted a two-pronged approach for this study: we employed an AI resource, Google Notebook LM, alongside manual content analysis and an in-depth review of textbook materials. This allowed us to analyze gender-based language patterns, the use of gender-neutral terminology, and comparative phraseology in anatomical descriptions. Photographic depictions were scrutinized for diversity across gender, race, age, and physical characteristics. Finally, we analyzed representations of sexual reproduction to compare the depth of exploration between male and female systems in their terminology and descriptors, as well as comparative visualization of external, internal, and cross-sectional models. Our preliminary findings suggest a persistent bias toward idealized, male-centric anatomical portrayals, which are often characterized by youth and fitness. Further development of multiple analytical models may illustrate representational disparities, linguistic bias patterns, and structural inequities in anatomical descriptions. The implications of these findings extend beyond academia, highlighting not only how textbooks can shape students' perceptions, but also medical professionals' diagnostic capabilities and professional identities. By offering actionable insights, this study aspires to influence the development of more inclusive textbook designs and foster equitable anatomy education practices. Ultimately, this research contributes to the broader understanding of how educational resources impact workforce development in healthcare related fields.

Seung Ho Jeon

Discipline: Interdisciplinary

Authors:

#1 Seung Ho Jeon

#2 H. Steve Leslie

#3 Jake Qualls

#4 Yeon Mi Park

Abstract Name: Future = AI + Database Collective Academic Database (CAD) to Manage AI in Academic Environments

The development of Retrieval Augmented Generation (RAG) and Fine-Tuning Methods opened the doors to specialized Large Language Model (LLM) applications, such as the various GPTs found in the GPT Store. However, their sustainability is limited to the safety, accuracy, and authority of the data, with no universal way to manage the risks associated with these applications currently in the United States. Hence, discussions are ongoing within the US on how this technology can be managed, with efforts such as the Blueprint for Artificial Intelligence (AI) Bill of Rights from the White House and the AI Risk Management Framework from the National Institute of Standards and Technology. In this paper, we demonstrate why data management is important, then propose the Collective Academic Database (CAD), which, unlike other academic databases, works in harmony with ongoing discussions within the US on AI management. The CAD will provide academic researchers and experts with a safe, protected, and adaptable environment independent of LLMs, functioning as a manageable space for future experiments, research, and innovation. The CAD will also function as the extension of open-source efforts in AI into education. Ultimately, this paper aims to bridge the gap between academia and AI, to serve as a foundation for unifying the academic community through AI.

Timmy Jeong

MD - Naval Academy

Discipline: Biology

Authors:

#1 Timothy Jeong

#2 Isabella Muratore

Abstract Name: Army Ant Collective Architecture as a Biological Network

Studying model social species provides valuable insights into adaptive strategies that can benefit city planning, robotics, and computer science. Army ants (*Eciton*) are nomadic and form temporary living structures known as bivouacs—intricate and adaptable shelters created entirely out of the interlocking bodies of the worker ants in their colonies. These bivouacs exhibit decentralized problem-solving by forming collective structures to move and shelter their colonies. Despite their remarkable behavior, the individual actions driving these formations remain underexplored. This study investigates the ants' architectural decision-making and behavior using a custom-built apparatus to observe their initial grouping patterns in a two-dimensional sheet composed of the bodies of living workers linked together. Video analysis was used to generate skeletonized networks of individual connections to quantify behavioral patterns over time. Our results show that, with successive bouts, ants often formed more densely organized networks, characterized by an increase in connections and fewer terminal branches relative to the overall structure. Future research will examine how bivouacs develop over time, focusing on how individual ants initiate, modify, and strengthen connections. These findings aim to enhance our understanding of self-organized systems and their adaptation to environmental challenges, with promising applications in robotics and network design.

Jacob Jeremiah

PA - Susquehanna University

Discipline: History

Authors:

Abstract Name: When Coal Was King: The Economic and Industrial Boom after World War I in Shamokin, Pennsylvania

My name is Jacob Jeremiah and I am a senior at Susquehanna University. I am currently writing my senior thesis on the positive effects of World War I on a small city in eastern Pennsylvania named Shamokin. Shamokin was considered a boomtown prior to, during, and shortly after World War I and many other scholars' works reflect on that. My main question or argument throughout this research has been centered around the positivity of an economic and industrial boom that war can provide a small city. How, when, and why did Shamokin thrive due to these demands? My research has been solely around the primary sources of advertising, population maps, immigration records, and photographs throughout this time period. These primary sources are aiding my argument of how small anthracite towns and cities like Shamokin were able to thrive due to the demands of war labor. I've acquired secondary sources from others who have studied the effects of war in Shamokin and how residents took advantage of the demand of labor and reaped the benefits. Throughout the process of writing this argument, I'm including primary sources like those I listed above to show visual and quantitative proof of an economic and industrial boom occurring in Shamokin and tie in secondary sources of other scholars to support my own ideology. As for my means of methodology throughout my studies, I am applying my research and using the method of content analysis to focus on how people interacted with each other and evolved throughout the timeframe of my research. In an area proud of its past, this specific style of methodology is allowing me to be successful in my studies of Shamokin's prosperity and how it stacks up with other small towns and cities during World War I.

Samantha Jerry

AL - University of Alabama at Birmingham

Discipline: Interdisciplinary

Authors:

#1 Wei Cheng

#2 Phyllis Stabeno

#3 Heather Tabisola

Abstract Name: Evaluation of Meso-scale Eddies in MOM6-NEP Simulations using Satellite Data

Mesoscale eddies in the Gulf of Alaska (GOA) basin are common and important to the ecosystem. They contribute to water mixing vertically and horizontally, moving important nutrients and affecting primary production and higher trophic levels. Given their pervasiveness and importance to ocean physics and ecosystem dynamics, the ability of an ocean general circulation model to properly represent mesoscale eddies needs to be examined. As a NOAA Hollings Scholar, I conducted a 10-week project looking at mesoscale eddies simulated by Modular Ocean Model version 6 (MOM6) in the Northeast Pacific (NEP) and evaluated them against satellite altimetry. We used Python package "pyeddytracker" to identify cyclonic and anticyclonic eddies in daily sea level anomalies both in satellite data and model hindcast simulation (10-km resolution). Results were used to examine seasonal and interannual variability. The interannual variability of

anticyclones was compared to the ENSO index, and the interannual variability of cyclones was compared to wind stress curl. Seasonal variability in satellite and model data are similar, with the number of anticyclones (cyclones) greatest in summer (winter). Considering eddies of all sizes, the MOM6-NEP simulation underestimates the total number of anticyclones by 31%, but the model-data discrepancy decreases for the larger eddies (radius ≥ 50 km). The anticyclone interannual variability from satellite data showed weak correlation to the ENSO index, while the model showed significant correlation. In both modeled and satellite data, the correspondence with ENSO index strengthens during strong ENSO events (1997-98, 2009-10, 2015-16). In the satellite data, winter (November-January) mean number of occurrences of cyclones are correlated with wind stress curl averaged over the same period, but the correlation weakens in the model simulations. These results suggest promising capability of MOM6-NEP to represent eddies in the GOA.

Anisha Jetoo

NY - Brooklyn College

Discipline: Environmental Science and Sustainability

Authors:

#1 Kenneth Gould

Abstract Name: Comparing Global Cities to Improve NYC Flood Mitigation Policies: Balancing Climate Resilience and Social Equality

Urban coastal flooding is a significant challenge in older, densely populated cities, where intense precipitation and coastal flooding from heavy rainfall or storm surges can overwhelm urban systems. Low-income communities that often reside in waterfront areas, low-lying neighborhoods, and basements are vulnerable to flooding. To make matters worse, in some cities, such as New York, national, state, and local policies have resulted in the loss of affordable housing, displacement, and gentrification. Flood mitigation involves significant investments in infrastructure, which increase the attractiveness of vulnerable neighborhoods. This leads to rising property values and rents, making it difficult for long-term low-income residents to remain. Housing insecurity exacerbates displacement, as development projects often fail to preserve affordable units. These challenges are examined through a cross-national comparative policy analysis of four cities—Rotterdam, Singapore, Rio de Janeiro, and New York City. Through these cities, we gain insights into how climate resilience and urban flood policies can address social and economic disparities while balancing the needs of diverse populations in the context of climate adaptation. With 90% of the city below sea level, Rotterdam is known for its advanced water management systems. Singapore also has much of its land (30%) less than five meters above sea level, but has developed innovative solutions, such as the Marina Barrage, to balance economic growth and climate resilience. In contrast, Rio de Janeiro highlights the difficulty of addressing flood risks in the context of social inequality. By comparing these cities—each located on four different continents and representing distinct social and economic hierarchies—this research seeks to identify policies that successfully balance flood mitigation with social and economic equality. It aims to offer recommendations for climate adaptation strategies in New York City that prioritize environmental justice and ensure that vulnerable communities are not neglected.

Stephanie Jett

GA - Georgia College and State University

Discipline:

Authors:

Laurie Peebles

Abstract Name: Research as Storytelling: Mentor-Student Engagement in Community-Based Research

This presentation explores the impact of mentor-student partnerships through Community-Based Participatory Action Research (CbPAR), addressing community issues and fostering social change. These partnerships enhance undergraduate research experiences and connect students with historically excluded and exploited groups in science. CbPAR involves the community in the research process, addressing their concerns and amplifying their voices. This approach not only empowers the community, but it also provides students with hands-on learning opportunities. Students are not just collecting and analyzing data from anonymous participants; they make human connections with participants and become community storytellers. Photovoice and lyric analysis are highlighted as two particularly effective CbPAR methods. As digital natives, traditional undergraduate students have grown up using photos to express aspects of their lives and experiences, making Photovoice a powerful tool for building connections. Music, a universal medium for expressing identity and emotions, acts as a conduit to facilitate effective interactions with people of diverse backgrounds. While lyric analysis is traditionally used in clinical settings, we argue that it is equally valuable within the CbPAR framework for exploring research questions and fostering deeper understanding. Additionally, Collins and colleagues (2019) emphasize the importance of community engagement in research, highlighting how participatory methods can bridge gaps between researchers and communities, fostering trust and collaboration. CbPAR is particularly impactful in communities with a high degree of distrust towards the scientific community. By fostering meaningful connections and promoting mutual benefits, CbPAR methods provide students the opportunity to be an active part of mending historical rifts and building trust. This presentation argues that CbPAR frameworks are mutually beneficial for faculty, students, and communities, advocating for their broader adoption in academic research. This collaborative approach advances scientific knowledge and ensures research efforts are less exploitative and more inclusive, ultimately contributing to social and political change.

Jackson Jewell

PA - Duquesne University

Discipline: Engineering

Authors:

#1 Jackson Jewell

#2 Chandler Last

#3 Melikhan Tanyeri

#4 Leda Kloudas

#5 Panayiota Senekkis-Florent

Chandler Last

Abstract Name: Optimizing Laser-Induced Graphene Fabrication on Polyimide for Flexible and Stretchable Bioelectronic Sensors

Polyimide, commonly known for its thermal stability and chemical resistance, is a versatile polymer widely used in flexible electronics, medical devices, and microelectronic circuit insulation. Its biocompatibility further extends its applications to implants and wearable biomedical devices. Beyond these conventional uses, polyimide can be transformed into laser-induced graphene (LIG) through laser carbonization—a high-energy process that alters its chemical structure into a conductive form with porous graphitic architectures. This process converts polyimide into a material enabling the fabrication of sub-millimeter conductive features suitable for flexible circuits and bioelectronic sensors. Here, we systematically investigate the laser carbonization process, examining the effects of laser parameters – intensity, writing speed, resolution—along with substrate thickness and feature dimensions, on the conductivity of laser-induced graphene. Our results show that conductance increases with laser intensity and decreases with writing speed, confirming that laser-induced graphene production is directly influenced by the energy transferred to the polymer. Using this method, we successfully fabricated electrodes with varying lengths, widths and shapes, determining the

minimum feature size achievable with our specific instrumentation. By optimizing these parameters, we demonstrate the fabrication of highly sensitive and stretchable strain sensors tailored for biomedical applications. Our findings highlight the potential of this technique as a cost-effective and scalable solution for developing flexible medical devices and bioelectronics.

Aeden Jezorski

PA - California University of Pennsylvania

Discipline: Chemistry

Authors:

#1 Aeden Jezorski

#2 Kimberly Woznack

Abstract Name: Electrochemical Synthesis of HKUST-1 onto an ITO Substrate

One of the most widely studied MOFs is HKUST-1. This MOF consists of copper (II) centers coordinated with benzene tricarboxylic acid (BTC) linkers. It has been previously shown that anodic dissolution can be used to deposit a Cu film on indium tin oxide (ITO) substrates, where a MOF can then be grown. HKUST-1 will be synthesized in two steps via electrochemical deposition of Cu onto the ITO surface, and electrochemical dissolution of the plated Cu to react with the BTC linker. This will all be done in a three-electrode system. This MOF will be characterized with respect to its morphology via scanning electron microscopy (SEM) and its crystallinity via powder x-ray diffraction (PXRD). Applications for the synthesized MOF film will include the adsorption of methylene blue from water.

Krish Jhurani

CA - University of California - Berkeley

Discipline: Physics and Astronomy

Authors:

#1 Moninder Singh

Abstract Name: Effects of Dark Matter on Gravitational Time Dilation in Binary Neutron Star Systems

Binary neutron star (BNS) mergers serve as a critical environment for probing the influence of dark matter (DM) on gravitational phenomena, particularly time dilation and waveform modulation. Numerical relativity simulations incorporating scalar DM fields were utilized to model DM's effects on BNS dynamics. The Einstein Toolkit was employed for solving the general relativistic field equations, with adaptive mesh refinement ensuring high-resolution coverage near regions of significant DM influence. Initial conditions followed the Tolman-Oppenheimer-Volkoff (TOV) equations, and gravitational wave signals were analyzed using Fourier transformations to assess frequency-domain shifts introduced by DM interactions. The results indicate that DM clustering around BNS systems significantly alters gravitational waveforms by inducing amplitude damping, phase shifts, and introducing multimodal frequency components. Time dilation near the neutron stars exhibited considerable variability, with notable resonance effects linked to specific DM particle masses, particularly around 0.85 eV. Additionally, sharp fluctuations in DM density between 5-10 km from the neutron star centers created localized gravitational wells, resulting in enhanced time dilation and greater complexity in gravitational wave signatures. Findings show DM modulates the gravitational field of BNS mergers, which manifests through altered waveform morphology and localized gravitational anomalies. The resonance sensitivity to DM properties points to an interplay between DM-induced inhomogeneities and

spacetime curvature, affecting the detectability and interpretation of gravitational waves. Future works should explore broader DM interaction models, including fuzzy DM and rotational neutron stars, to elucidate DM's role across various compact astrophysical systems.

Abigail Jimenez

TX - Our Lady of the Lake University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Abigail Jimenez

#2 Mary Ruth Fernandez

Abstract Name: "AAC is Freedom": The Role of AAC in Mental Health and Self-Advocacy

This study investigated the role of augmentative and alternative communication (AAC) and treatment techniques surrounding mental health and self-advocacy for individuals with complex communication needs (CCN). Individuals with CCN face a higher risk of mental health issues, yet there is a gap in understanding the influence of AAC on mental health and self-advocacy (Watson et al., 2021). This gap in understanding was addressed by exploring the following questions. 1. How does having complex communication needs affect mental health? 2. What treatment techniques using AAC devices help individuals express their experiences? 3. How does the use of AAC increase self-advocacy skills in individuals with complex communication needs? Through structured interviews, the perspectives of AAC users, parents of AAC users, and speech-language pathologists were captured to explore the relationship between CCN and mental health as well as identify treatment techniques that inform teaching in educational and clinical practices.

Jean Jin

PA - University of Pennsylvania

Discipline: Biology

Authors:

#1 Rexxi Prasasya

#2 Marisa Bartolomei

Abstract Name: Investigating Activity of Ten-eleven Translocation Enzyme 1 in the Mammalian Germline

Mammalian reproduction hinges on the precise patterning of sperm and oocyte epigenomes. Primordial germ cells (PGCs), the precursors of sperm/oocytes, undergo epigenetic reprogramming. This process is partially mediated by Ten-eleven translocation enzyme 1 (TET1), which facilitates the oxidation of 5-methylcytosine, leading to active DNA demethylation. In mice, PGCs lacking TET1 exhibit hypermethylation at imprinting control regions (ICRs), DNA elements that regulate parent-specific gene expression. Incomplete methylation erasure in Tet1^{-/-} PGCs persists, resulting in a hypermethylated sperm genome. Intriguingly, hypermethylation defects in Tet1^{-/-} sperm extend beyond ICRs to other sperm hypomethylated regions. The Bartolomei lab previously developed Tet1 mutant mouse lines distinct from Tet1^{-/-}, to study whether TET1 presence without catalytic activity affects germline reprogramming. The Tet1V mutation abrogates iterative oxidation, restricting enzyme activity to 5-hydroxymethylcytosine generation. The Tet1HxD mutation creates a catalytically inactive protein. Both TET1 variants retain intact extra-catalytic domains, rendering interaction with other proteins plausible. While genome-wide methylation defects have been examined in Tet1^{-/-}, Tet1V/V, Tet1HxD/HxD sperm, methylation analysis of mutant PGCs has been limited to locus-specific

searches at target ICRs. Therefore, the origins of aberrant methylation observed in mutant sperm remain largely unknown. Here, we aim to conduct global methylation analysis of Tet1^{-/-}, Tet1^{V/V}, and Tet1^{HxD/HxD} PGCs at the completion of reprogramming, employing Illumina's Mouse Infinium Methylation BeadChip. The BeadChip consists of an array of DNA probes enabling high-throughput profiling of DNA methylation across the mouse genome. We isolated PGCs from embryonic gonads and performed bisulfite sequencing to distinguish methylated from unmethylated cytosines. Bioinformatic analysis identified differentially methylated regions between mutant and wild-type PGCs, as well as between PGCs and sperm of the corresponding genotypes. This study provides insights into the temporal dynamics and genomic context of TET1 activity during gametogenesis, contributing to our understanding of the epigenetic mechanisms governing fertility and transgenerational inheritance.

Daniel Jin

NY - Ithaca College

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Daniel Jin

#2 Eber Beck Jr.

Abstract Name: The Impact of Sleep Quality on Cognitive Performance: Investigating Blink Rate as a Measure of Cognitive Effort in Young Adults

Sleep is an undeniable contributor to cognitive processing. Disrupted sleep patterns can impact cognitive domains such as attention, working memory, and dual tasking, which are important for activities of daily living, particularly for young adults. Although it is known that lack of sleep leads to poorer performance on cognitive tasks, it is less clear the role of attention during cognitive task performance. That is, "bad sleepers" may be able to perform just like "good sleepers", but at the expense of higher cognitive effort. Blink rate (BR) has been proven to be an accurate measure of cognitive performance, memory and engagement, mental fatigue, vigilance, dopaminergic activity, etc. The purpose of this project is to investigate the effects of sleep quality (SQ) on cognitive processing during the execution of cognitive tasks. . Healthy, young (18-40 y/o) individuals will be recruited. SQ will be assessed using the Pittsburgh Sleep Quality Index (PSQI). Participants will be categorized into "good" vs. "bad" sleepers. BR will be assessed using an eye-tracking device (Tobii Pro Glasses 3). Participants will be asked to perform tasks assessing cognitive domains of inhibition (stroop task) and working memory (digit span task). We hypothesize that individuals with lower SQ will have a higher BR compared to individuals with higher SQ due to increased cognitive demand for attentional resources. The adverse effects of chronic sleep deprivation on the brain make it a great candidate to study due to its impact on health outcomes. Despite this, analyzing the effects of sleep on cognitive function through conventional modes (i.e. fMRI) can be a costly task, decreasing accessibility for lower SES communities. BR is a non-invasive method to analyze cognitive processing. Future studies may develop BT tests that rehabilitation clinicians could use to screen for cognitive function.

Shifa Jiواني

GA - Kennesaw State University

Discipline: Health and Human Development

Authors:

#1 Shifa Jiواني

#2 Jayla Melvin

#3 Eric Campos

#4 Masafumi Yoshinaga
#5 Misgana Idris

Abstract Name: Search for novel arsenic-containing antibiotics

Search for novel Arsenic-Containing Antibiotics Objective Arsenic (As), the “king of poisons”, surprisingly shows promise in medicine. With the increasing threat of antibiotic-resistant bacteria, there is an urgent need for new antibiotics. Notably, some bacteria utilize environmental As to produce unique antibiotics, as represented by arsinothricin (AST). AST effectively controls various pathogens while spare human cells, demonstrating the potential of As-containing antibiotics. Our objective is to build upon this unique connection and discover further As-containing antibiotics. **Experimental Methods** We mined bacterial genome databases using the arsinothricin (AST) biosynthetic gene cluster (BGC), leading to the discovery of novel BGCs in two *Actinomyces* strains, *Microbispora rosea* and *Amycolatopsis tolypomycina*. Gene analyses suggest that these BGCs encode arsenic-containing ribosomally synthesized and post-translationally modified peptides (RiPPs), which we named AsRiPP. From the *M. rosea* AsRiPP BGC, we selected four genes, which we hypothesize are the minimum required gene set to produce an As-containing precursor of the encoded AsRiPP. These genes were heterologously expressed in *Escherichia coli* in the presence of As and the AsRiPP production was analyzed. As an alternate approach, *A. tolypomycina* was directly cultured with inorganic arsenic and arsenic species in the culture medium was analyzed using liquid chromatography coupled with inductively coupled plasma mass spectrometry (LC-ICP-MS). The major arsenic species was further purified using anion exchange column chromatography and the antibiotic activity of the purified fraction was analyzed. **Results** While heterologous expression in *E. coli* was unsuccessful, the crudely purified As species exhibited moderate antibiotic activity, supporting our hypothesis that the strain produces an As-containing antibiotic, presumably the AsRiPP. **Conclusions** Our results suggest that more As-containing antibiotics exist in nature, demonstrating their potential as a resource for antibiotic development. Further investigation will focus on verifying the association of the AsRiPP BGCs and the obtained As species.

Nathan Jobalia

NE - Creighton University

Discipline: Biology

Authors:

#1 Yin Shiwei

#2 Sneha Pradhan

#3 Jun Xia

Abstract Name: Why Y: Using Whole Genome Sequencing to Study Y Chromosome Loss in Gastric Cancers

Sex chromosomes are an essential part of human sexual differentiation, growth, and survival. Recent research has shown that cancers undergo sex chromosome number changes, with such alterations having their own effects on different cancers. In some types of cancer, such as bladder cancer, loss of the Y chromosome, for example, has led to increased cancer aggressiveness and reduced survival rates. While some copy number changes have been well documented and studied in different cancers, these changes in gastric cancers are relatively not understood. Gastric cancers are one of the most common cancers worldwide and are associated with high morbidity and mortality rates due to their nonspecific early symptoms. In seeking to better understand the frequency, mechanism, and advantages behind sex chromosome number alterations in gastric cancers, we employ a long-term evolution experiment using colon cancer and Barrett's esophagus cell lines in conjunction with whole genome sequencing (WGS) to understand and quantify the rate of Y chromosome loss (LOY). Both gastric cancer cell lines show LOY at varying rates. Colon cancer cells demonstrated a faster loss of the Y chromosome compared to that of Barrett's Esophagus cells. This is significant because, upon elucidating the mechanisms and effect of LOY, novel treatments can target the Y chromosome in hopes of better treating gastric cancers.

Nathan Jobalia

NE - Creighton University

Discipline: History

Authors:

#1 Andrew Hogan

#2 Scott Eastman

Abstract Name: The Blessing of Brutality: Unit 731 and Confucian Ethics

Throughout World War II, countries, such as Nazi Germany, undertook unethical forms of experimentation on humans to benefit their nation and build upon the scientific knowledge of the day. However, lesser known is that which was done by the empire of Japan at this time. From 1932 to the end of World War II, Japan invested millions of dollars into manpower and material, conducting experiments throughout their puppet state of Manchukuo to refine various weapons of mass destruction, most especially biological warfare (BW) agents. Led by General Shiro Ishii and as part of Unit 731, scientists and doctors alike undertook unethical medical and biological experiments on humans to not only to perfect BW, but also to test the limits of human physiology and expand the understanding of the human body. While medical ethics at the time heavily emphasized medical paternalism and authoritarianism, these academics ignored such ethical considerations and sought to advance the interests of the empire. Through the use of first-hand accounts given by Unit 731 scientists and physicians, I will show how Confucian beliefs, such as those of filial piety, harmony, and loyalty, especially to the emperor and to the state, were used to justify the unethical experiments and work they did. Through the dual lenses of ultranationalism and militarism, their actions were not only possible, but fully permissible and condonable under the authoritarian regime of the Japanese empire.

Tate Johanning

MN - Hamline University

Discipline: Chemistry

Authors:

Abstract Name: Deaminative Carboxylation using a Photocatalyst and Carbon Dioxide

Primary amines have extensive commercial availability, wide variety, and utility in various reactions to build expansive libraries of pharmaceuticals and derivatives of natural products. Cross-coupling reactions with primary amines have been a growing subject of research for their application in areas of interest such as medical chemistry, agrochemistry, and materials synthesis. Much of the work around these amines involves the use of harsh chemicals to activate the primary amines to form a variety of products. Perhaps, there are other mechanisms that can be used to activate these primary amines that are better for the environment and safer for the people running the reactions. Previous research shows pyridinium salts and imines (one step from primary amines) were activated and consumed using photocatalysts (activated by 427 nm LED blue light) in a variety of different reaction conditions. Previous research has also shown successful carboxylation reactions through transition metal catalysis. Based on these known reactions, we attempted to perform cross-coupling reactions that aimed to convert materials derived from primary amines to carboxylic acids using photocatalysts with blue LED light, transition metal catalysts, and carbon dioxide. Our results so far have not indicated a significant yield of our desired carboxylation product, however, we are exploring different reaction conditions, such as varying solvents, ligands, and photocatalysts. Further investigation of these

techniques can lead to advancements in the synthesis of complex molecules and more environmentally friendly means to carboxylate amine-containing compounds. In the future, this type of activation could be expanded to more reactions than the carboxylation of the primary amines and be applied in pharmaceutical settings and agrochemical development.

Margaret Johnson

DE - University of Delaware

Discipline: Education

Authors:

#1 Angela Hattery

#2 Jennifer Naccarelli

Abstract Name: An Executive Report of Approaches to Addressing Gender-Based Violence on College Campuses

Gender-based violence (GBV) is an umbrella term to describe any form or threat of physical, sexual, and psychological violence, coercion, or exertion of control based on gender-related power differences. The term GBV calls attention to the gendered nature of violence in our society and the gender stratification that allows the abusive power dynamics visible in GBV. GBV is extremely pervasive and considered one of the most critical public health concerns of modern time. Around 25-35% of women globally experience GBV. College campuses are a breeding ground for GBV, with 1 in 4 women experiencing sexual violence and 1 in 2 experiencing at least one occasion of intimate partner violence in their time in college. So, what can be done to protect students at institutions of higher education (IHE)? In this paper, I systematically analyze the myriad policies and programs that guide gender-based violence prevention at the collegiate level. Specifically, institutions have taken two approaches to addressing GBV on campuses: intervention and prevention. Both are necessary, but as public health models suggest, college campuses must establish a culture of prevention in order to effectively reduce the risk of GBV. Though interventions will be necessary, campus stakeholders should prioritize preventative rather than reactive approaches to combating GBV. A culture of prevention is defined through the public's and professionals' beliefs and values about healthy behaviors; thus, it is critical that stakeholders target beliefs and values surrounding GBV, not just behaviors. An historical literature review of the approaches to addressing GBV in the IHE context reveals that they have been reactive (interventionist) but also infused with elements focused on creating a culture of prevention. This report provides a brief overview of the various interventionist approaches that have guided attempts to address GBV in IHE.

Demetrice Johnson

OK - University of Central Oklahoma

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: PH Balance: The Balance of Pubic Hair in Sexual Signaling and Health

Pubic hair has been a controversial topic across diverse cultures and historical periods. The presentation of pubic hair has been influenced by various factors such as sexual attraction, personal grooming preferences, partner expectations, societal beauty standards, and beliefs around hygiene and odor reduction. I will investigate the social and health implications of pubic hair from a historical and future perspective, grooming

practices, as well as social media including music, and beauty industries. In general, many cultures celebrate pubic hair as a marker of adulthood and fertility. However, modern media and societal pressures have influenced and normalized hair removal by fashion trends, new personal grooming standards, and even pornography. Scientific studies reveal that pubic hair serves as a protective function by reducing friction, guarding against bacterial infections, and preventing unwanted parasites. Many people are gaining momentum in rethinking this grooming practice and advocating for greater acceptance of natural body hair. Modern discourse around pubic hair creates pressure on women to conform to keep up with beauty standards. I aim to investigate, with IRB approval, an oral history of individuals regarding their past and future interest in pubic hair. I will focus mostly on assigned female at birth individuals to better understand their personal views. Ultimately, I will explore the modern discourse revealing personal choices around pubic hair to intersect with and often resist with, as we endure and regain control of the patriarchy of pubic hair.

Kaylynn Johnson

PA - Grove City College

Discipline: Psychology

Authors:

#1 Olivia Gregory

#2 Alyssa Dunning

Abstract Name: The Effect of Attachment to God on Psychological Well-Being

Attachment theory has implications for psychological well-being, such as anxiety and depression. Attachment to God functions in the same way as human-human attachment, and attachment to God can be influenced by self-compassion. This study sought to demonstrate the relationships between attachment to God, psychological well-being (i.e. anxiety and depression), self-compassion, and scrupulosity in 198 undergraduate students. All participants indicated a belief in God. The participants completed: The Attachment to God Inventory, the Penn Inventory of Scrupulosity Revised (PIOS-R), the Short Form Depression Anxiety and Stress Scale (DASS 21), the Self-Compassion Scale Short Form (SCS-SF), The Big 5 Inventory-short scale (BFI-10), and a demographics scale. Zero order correlations were computed for anxious and avoidant attachment to God, scrupulosity, depression, anxiety, stress, and self-compassion. A MEDIATE macro for SPSS (Hayes & Preacher, 2013) was conducted to find direct and indirect effects of the anxiety and avoidant attachment dimensions on scrupulosity. Consistent with findings from previous research (Homan, 2014), our results indicate that people who view God as inconsistent, responding with stress (anxious attachment to God) and people who view God as impersonal, having a distant response (avoidant attachment to God) are more likely to report feelings of anxiety and depression. Expanding on the current literature, we found that those with an anxious or avoidant attachment to God reported higher levels of scrupulosity in addition to anxiety and depression. Self-compassion mediated the relationship between avoidant attachment and scrupulosity. Surprisingly, self-compassion mediated avoidant attachment to God and scrupulosity, but not anxious attachment to God and scrupulosity. This study extends understanding surrounding insecure attachment to God, scrupulosity, and self-compassion. It appears that having compassion on oneself and a secure attachment to God can decrease the levels of distress and scrupulosity an individual may endure on a day-to-day basis.

Keeleigh Johnson

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: Reducing Percentages of Relapse after Rehabilitation Treatment Through Education and Multifarious Connections

Oklahoma ranks 5th in the nation for substance use disorders, with 16.1% of adults affected, translating to between 700,000 and 950,000 Oklahomans in need of services. Many do not receive the care necessary for full recovery. Drug addiction is often linked to stress, and while alcohol is commonly believed to help manage stress, most rehabilitation centers aim to help patients overcome addiction and equip them with mental tools for lasting recovery. Treatments vary based on individual needs, and implementing multifarious connections can strengthen a person's sense of self, offering alternatives to addictive tendencies and fostering healthier habits. Social connections and engagement with nature can significantly improve mental health, and biophilic design can be utilized to connect patients with nature. This project utilizes case studies of existing rehabilitation centers, a literature review on environmental factors in recovery, interviews with addiction therapists, and surveys from those with experience supporting individuals with addiction. The rehab center's design prioritizes multifarious connections through a layout that encourages interaction among patients. Inpatient areas are near therapy spaces, while outpatient and family areas foster support through their shared spaces. A central courtyard and green roof with natural elements offers access to nature for reflection and relaxation. Daylighting will enhance well-being, with patient rooms featuring outdoor views. Common areas such as lounges and dining rooms will encourage social interaction. Therapy rooms will be flexible for both individual and group sessions. Finally, community connections will be supported through partnerships with local organizations, creating pathways for ongoing support after treatment. By incorporating multifarious connections to nature, social support, and community, this rehabilitation center fosters a holistic healing environment that empowers individuals to rebuild their lives and achieve lasting recovery.

Phoebe Johnson

MS - University of Mississippi

Discipline: Engineering

Authors:

#1 Dr. Damian Stoddard

Abstract Name: Ballistics Characterization of Micro-Truss Reinforced Lunar-Inspired Geopolymer Concrete for Space Construction

The difficulty of fabricating permanent, habitable structures in outer space is a major roadblock in space exploration due to the impracticality of transporting suitable building materials. One potential solution to this problem is utilizing already existing materials in outer space. For example, the dust or regolith on the surface of the moon could be useful for creating a concrete building material. In order to test the compatibility of the lunar regolith for space construction, it is important to consider its impact resistance capability in a concrete mix considering that there are roughly 100 ping pong ball-sized meteorites colliding with the moon per day. This research endeavors to examine compressive strength as well as the ballistic impact mitigation to understand the capabilities of unreinforced and carbon fiber micro-truss reinforced samples. The compressive strength has been tested for a lunar regolith/fly-ash hybrid geopolymer cement paste for different ratios of lunar regolith to fly-ash with an 810 MTS testing apparatus using ASTM Standard C109. The results were, on average, 22.4, 27.7, 27.6, 32.8, 34.6, and 37.8 MPa for 60, 50, 40, 30, 20, & 10% regolith concentrations respectively. The mix containing the largest ratio of regolith to fly-ash (60%) only shows a 36% decrease from the strength of the 100% fly-ash geopolymer mix containing no regolith which is 35.3 MPa. The compressive strength for all unreinforced cement paste samples were found to be within standard building concrete compressive strengths. Furthermore, the anticipated results, including the compressive strength of the micro-truss reinforced concrete and the ballistics responses of both unreinforced and reinforced concrete, such as residual velocity and impact crater diameter, will aid in the assessment of the compatibility of lunar regolith for space construction.

Molly Johnson

VA - James Madison University

Discipline: Health and Human Development

Authors:

#1 Catherine Zeman

Abstract Name: The Relationship Between Exposure to Nature and Anxiety Levels

Anxiety disorders are among the most experienced mental illnesses within the United States with nearly half of individuals aged 18-24 reporting symptoms within the last year. While highly treatable, greater than 60% do not avail themselves of help due to cost and stigma. Emerging research illustrates a connection between nature exposure and good mental health, illustrating that outdoor time increases resilience, attention and mental wellbeing. This study explores the association between these factors. Findings may help to illustrate the importance of, encourage routine practice in, and increase accessibility to greenspaces throughout communities. Greenspace education and development may decrease the current weight placed on counseling services and provide alternative options to those who may not have equitable access to mental health care. The researcher is conducting a cross-sectional quantitative survey in the upcoming months using a Qualtrics survey comprised of demographic questions, a modified State-Trait Anxiety Inventory, and a descriptive nature exposure survey. Participants are students currently enrolled in James Madison University at the time of participation and between the ages of 18-24. After data collection, the researcher will run univariate descriptive analyses to understand the sample demographics and then appropriate bivariate statistical tests to understand any relationships found. Hypotheses will then be generated for future studies.

Madison Johnson

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:

Abstract Name: Enhancing Medication Management for Patients with Diabetes

Diabetes management often requires a multifaceted medication regimen, incorporating insulin, oral hypoglycemic agents, antihypertensives, and lipid-lowering drugs. As the disease progresses and multiple chronic conditions arise, patients often face an increasing medication burden, which can complicate adherence. This challenge is especially apparent during transitions between care settings—such as primary care, hospital admission, and discharge. Medication discrepancies—differences in drug type, dose, frequency, or administration between care settings—during these transitions can lead to confusion regarding appropriate medication use and errors in self-administration, heightening the risk of nonadherence and adverse health outcomes including frequent emergency department (ED) visits and hospital admissions. To further explore these issues, a narrative literature review was conducted to identify key factors contributing to nonadherence, including medication discrepancies, care transitions, and patient-provider communication gaps, among patients with diabetes. By analyzing peer-reviewed studies, emerging trends and gaps were identified, which have informed the development of our research focus and methodology. This foundational work has provided deeper insights into the multifaceted nature of nonadherence and its association with adverse health outcomes. It suggests that while an increased number of medications may reflect clinical severity, it also introduces complexity that can lead to adherence challenges, confusion, and medication errors. By analyzing

the gaps in coordination during care transitions and the impact of medication complexity, the long-term goal of this research is to inform targeted interventions to improve care coordination, patient education, and medication adherence.

Jada Johnson

NY - CUNY Medgar Evers College

Discipline: Social Work and Human Services

Authors:

Abstract Name: Race, Age, and Frequency of Violence Among Black Americans

This research explores the relationship between age and frequency of violence among African American adolescents. Drawing on a critical race theory framework, this study hypothesizes that younger Black individuals (16 years old and younger) are more susceptible to violence compared to older Black individuals (17 years old and older). Building on previous scholarship on systemic racism and using the CDC 2021 Adolescent Behaviors and Experiences Survey, this research project examines the disparities in violence among Black Americans, with a particular focus on the distinct experiences of adolescents and young adults. Using SPSS software and statistical analysis, the study analyzed data to explore these distinctions and identify patterns in the age groups affected by violence within the Black community. Preliminary findings suggest that younger Black individuals are more susceptible to violence compared to older generation. These results highlight the urgent need to address the issues of racial inequality and violence in communities.

Blessing Johnson

OH - University of Cincinnati Main Campus

Discipline: Psychology

Authors:

#1 Blessing Johnson

#2 Pankhuri Aggarwal

#3 James Kelley

#4 Christian Garcia

#5 Anuradha Sathiyaseelan

#6 Rose Marie Ward

Abstract Name: Mindfulness practices among college students in India and USA: Definitions, challenges, and strategies

Studies indicate that the understanding and practice of mindfulness differs across cultures (Schmidt, 2011). However, empirical data on this topic is limited. The present study examines college students' responses (N = 512 India, N= 508 USA) to open-ended questions on definitions and recent examples of mindfulness, challenges associated with practicing mindfulness, and strategies adopted to address those challenges. Inductive qualitative content analysis (Marin, 2000; 2014) was used to examine prevalent themes across the two samples. Specifically, a three-phase approach to analyzing qualitative data was used: 1) preparation, organization, and reporting of results (Elo et al., 2014). A second coder coded 1/5th of the responses to establish an inter-rater reliability index. Participant responses were coded into a total of 28 themes across 5 categories. Definitions of mindfulness were coded into 1) awareness/attention, 2) being present, 2) mental or emotional state, 3) consideration of others, and 4) non-judgmental attitude. Examples of mindfulness

activities in recent time and day-to-day living were coded into 1) meditation, 2) breathing exercise, 3) physical activity, 4) reflection, 5) self-awareness, 6) engagement in creative or sensory activity, 7) spiritual or religious activity, and 8) consideration of others' needs and preferences. Challenges to or in practicing mindfulness were coded into 1) internal challenge (e.g., overthinking, lack of motivation), and 2) external challenge (e.g., social media, busy schedule). Strategies to overcome challenges associated with practicing mindfulness were coded into 1) mental strategies (e.g., mindfulness meditation, emotion regulation), 2) behavioral strategies (e.g., self-care activities, time management), and 3) physiological strategies (e.g., breathing techniques, physical exercise). Although majority of the themes were consistent across the two samples, US sample more frequently referenced consideration of others in their examples of mindfulness. The results have implications for teaching and practice of mindfulness particularly as it relates to principles of individualism and collectivism.

John Johnson

GA - Kennesaw State University

Discipline: Engineering

Authors:

Abstract Name: Healing Hands: AI-Integrated Robotic End Effectors for Comprehensive and Continuous Patient Monitoring

Continuous and comprehensive patient monitoring is essential in homecare and emergency room settings to ensure timely interventions and optimal healthcare outcomes. However, existing monitoring systems often rely on multiple discrete devices, resulting in fragmented data collection and increased complexity for patients and healthcare providers. This project addresses the need for an integrated, intelligent monitoring solution by developing "Healing Hands," a pair of robotic end effector hands designed to seamlessly incorporate various patient monitoring technologies and novel sensors. Healing Hands seek to integrate a comprehensive array of advanced sensors for thorough patient monitoring. These include sensitive ECG pads and custom-developed sensors for precise cardiac monitoring, photonic-based oxygen meters, heart rate, SpO₂, temperature regulation and sensing, respiratory sensors, and an alternative blood pressure measurement system. The fingertips will equip ultrasound transducers for non-invasive diagnostic imaging. The research will further investigate incorporating and developing biofluid collection mechanisms for sweat analysis and minimally invasive biomaterial sampling, enabling the determination of specific biomarkers. This seamless integration of diverse sensing technologies ensures a holistic approach to continuous patient health monitoring. These hands are designed to attach to an existing humanoid robot unit, which utilizes artificial intelligence systems, including large language models (LLMs), to interpret and validate the collected data, providing real-time analysis and alerts. The proposed solution offers a unified platform for continuous patient monitoring, reducing the need for multiple devices and simplifying the monitoring process. By leveraging AI-driven data analysis, Healing Hands can infer critical health indicators, detect anomalies, and facilitate proactive healthcare interventions. The expected outcome of this research is the development of fully functional holistic sensing Healing Hands capable of providing comprehensive and continuous monitoring to enhance patient care through integrated, real-time data collection and intelligent analysis, ultimately contributing to improved healthcare outcomes and operational efficiency in medical settings.

Charles Johnson

KS - University of Kansas

Discipline: Psychology

Authors:

Abstract Name: Proximity and Collective Victimhood Consciousness: Jordanian Perceptions of the Israeli-Palestinian Conflict

This project will explore how proximity to the Israeli-Palestinian conflict in both geography and identity affects Jordanian perceptions of collective victimhood. Specifically, the project examines the effects of Palestinian and Jordanian heritage among individuals living in Jordan on perceptions of the conflict. While extensive literature exists on collective victimhood in the Israeli-Palestinian conflict, few researchers have examined experiences of collective victimhood outside of Palestinians and Israelis currently living in the region, so this research will extend the investigation to a geographically close population with mixed Palestinian and Jordanian heritage. Furthermore, most collective victimhood research relies on victim-perpetrator dyads, failing to capture the perspectives of many individuals external to the borders of a given conflict. The project will rely on eight interviews of Jordanian and Palestinian-Jordanian individuals living within Jordan's borders. Through thematic coding and analysis, the project will investigate interviewees' perceptions of the conflict and collective victimhood. The results will likely show different experiences of collective victimhood between Jordanians with and without Palestinian heritage. As the current conflict in the Middle East grows, Jordanian perspectives could provide better understanding of both the conflict itself as well as the mounting grievance throughout the region.

Luke Johnson

IN - Indiana University South Bend

Discipline: Chemistry

Authors:

#1 Luke Johnson

#2 Grace Muna

Abstract Name: Electrochemical Detection of 3-Nitrotyrosine using a Gold Electrode Modified with N-hydroxysuccinimide Ester Gold Nanoparticles

3-Nitrotyrosine (3-NT) results from the nitration mediated by reactive nitrogen species such as peroxynitrite anion and nitrogen dioxide. It is overproduced when there is oxidative stress in the body, which is an imbalance of free radicals and antioxidants within the body. Oxidative stress is common in many diseases like cancer and heart disease. 3-NT has been identified as a biomarker for cell damage, inflammation, as well as nitric oxide production. Therefore, its monitoring is important for disease monitoring. An electrochemical biosensor platform was prepared by modifying a gold electrode with N-hydroxysuccinimide (NHS) ester gold nanoparticles. The NHS ester gold nanoparticles created a monolayer on the electrode surface which was used to covalently immobilize 3-NT antibodies. The modified electrode surface was then used for the detection of 3-NT using cyclic voltammetry and differential pulse voltammetry. The detection method was very sensitive to 3-Nitrotyrosine with a linear response from 50 to 600 nM concentrations. Future research will involve testing the selectivity, and stability of the method as well as testing real biological samples such as urine, serum, and saliva for potential practical applications.

Sharice Johnson

MA - Bridgewater State University

Discipline: Art History

Authors:

#1 Sharice Johnson
#2 Beatrice St. Laurent

Abstract Name: Reimagining Mother Africa: Contemporary African Female Photographers Challenging Gender & Race Stereotypes

In post-independent Africa, photography promoted national and ethnic identities and individualism. Photographic practices on the continent illustrated the diversity along ethnic, cultural, social, and gender lines that sometimes conflicted with the government or broader social visions. Today, female-born African photographers use the medium to champion gender-based issues and change the narrative around African women's representation in popular media in their homelands and abroad. The research looks at the photographs of Zanele Muholi, Aïda Muluneh, Atong Atem, Thandiwe Muriu, and Maïmouna Guerresi to explore the complexity of contemporary Africa and its diaspora as the nations and peoples navigate the postmodern and postcolonial world. These photographers contend with the monotonous narratives of the traditional and rural, as well as the repetitive victimization of displaced peoples because of wars and natural disasters in Western media. To better understand the complexity of reversing these negative images, especially of African women, the feminist art history theory is applied to interpreting the photographers' images with an emphasis on transnationalism. The focus is on the audiences' varied receptions and interpretations and why these photographs have different meanings depending on the community viewing them. The research aims to provide awareness and empathy to the challenges Africans still face within their homelands and abroad to dispel 19th-century ideology about race and gender. Another factor in the reception is the global art market and its tendency to designate styles or mediums to non-Western artists. How do the artists remain committed to their vision in this era of globalism? Is art only for Western consumption, or is it also viable in Africa? If so, how impactful are the messages? These questions helped recognize how photographic narratives differ across racial and ethnic lines and the role of culture and ideology in the imagery of Africans in a postcolonial, postmodern world.

Marina Jokanovic

IL - North Central College

Discipline: Art History

Authors:

Abstract Name: Divorced, Beheaded, Died, Divorced...But Why? A Study of German Painter Hans Holbein The Younger's Portrait of Anne of Cleves

Like that of her five sisters-in-law, Anne of Cleves' place in history was dictated by the outcome of her relationship to King Henry VIII. Instead of being remembered as Queen of England in 1540, she has been known simply as "Divorced" and remains so even in death, nearly five centuries later. Some may say that she was framed and this project observes how she, quite literally, was. Informed by the scholarship of Stephanie Buck, my research will examine Hans Holbein the Younger, the celebrated German artist renowned for his highly realistic portraits of Europe's most influential figures. As court painter to Henry VIII, Holbein was commissioned to visit noble houses across Europe and produce portraits of potential brides, including the German Duchess Anne of Cleves, whose idealized image allegedly misled Henry, leading to the most famous medieval "catfishing" scandal. Building on Susan Foister's analysis of Holbein's courtly artworks and Michael North's exploration of portraiture in Tudor politics, this project aims to understand why Holbein's painting was considered inaccurate and how it played a crucial role in medieval diplomacy. My research consists of a visual analysis of the painting itself, an observation of contemporary descriptions of Anne of Cleves as well as a comparative study of her and the portraits of her five sisters-in-law. In other words, this project will be analyzing Holbein's artistic choices, examining the balance between realism and flattery, and exploring the diplomatic pressures and beauty standards of Tudor England. In doing so, I aim to prove that the portrait of Anne of Cleves was not fundamentally incorrect but that her reputation as "The Flanders Mare"

stems from Henry VIII's expectations, shaped by the era's perception of beauty and the political pressure to ensure the continuity of the Tudor lineage.

Maya Jones

PA - University of Pittsburgh

Discipline: Visual Arts

Authors:

Abstract Name: Research, Design, and Construction of a 18th Century Versailles Court Gown

Versailles is synonymous with extravagance and excess, especially in the period Marie-Antoinette reigned. She is especially notorious for the huge sum she spent on her wardrobe, and with my research, I wanted to learn to what extent that notoriety was deserved. For this project, I took a deep dive into the court fashions of Versailles in the 18th century, drawing from paintings, fashion plates, extant garments, and historical patterns to design and construct my own court-appropriate gown. In the process, I also researched how the end of the sumptuary laws, the birth of fashion magazines, and the competitive French silk industry contributed to the creation of the fashion industry as we know it today, complete with fast-fashion trends and a thriving second-hand clothing industry. This research informed the decisions I made in creating the dress, deepening my understanding of the trends of the period in order to be able to create something that is both historically accurate and a totally new design. The gown, which took me over three hundred hours to complete and cost over \$1,3000, is made from silk taffeta and supported by undergarments made of cotton, silk, linen, steel hooping wire, and synthetic whalebone. It is currently on display at in the Cathedral of Learning. While I would be happy to bring it to the conference, it is roughly 6' wide by 3' deep by 5'6" tall, so I believe it exceeds the size limit.

Kyle Jones

WV - West Virginia University

Discipline: Music

Authors:

Abstract Name: The Horn in the Music of Richard Strauss

Richard Strauss was one of the most prolific composers of the Romantic Era of Western Art Music. He was renowned for his numerous powerful works which cover a variety of subject matter from folk stories and novels to emotional depictions of his own life. To create this masterpieces, he employed the various instruments of the orchestra, although perhaps none more so than the horn. The horn is the Swiss Army knife of instruments, capable of producing a variety of musical effects, of which Strauss took full advantage of. His compositions, which include two horn concertos, ten tone poems, and sixteen operas, push horn playing to the extremes. Mastery of Strauss' works would mean mastery of the horn, although that is a tall task. In order to even approach control of the music of Richard Strauss, dedicated background work is needed. The most obvious is a solid skillset developed by much personal practice, honed over years of study. In order to apply these previously developed skills to the music, some knowledge of the academic side of the pieces is also needed. Understanding of the content or subjects that the pieces are based off, their respective styles, and thoughtful consideration on personal musical interpretations will all advance the horn player in their comprehension of this repertoire. Acquiring this knowledge comes from research across a variety of aspects including score study, biographical study, recording study, and study of the subjects of the pieces, particularly

his tone poems. Combining all of these methods along with practice on the horn will yield a thorough command of these pieces that will help the horn player advance in their musical career.

Samantha Jones

KY - University of Kentucky

Discipline: Nursing and Public Health

Authors:

#1 Amanda Fallin-Bennett

#2 Rachel Vickers-Smith

Abstract Name: Decoding Kentucky's Street Drug Supply: Insights from the Harm Reduction Hub

The Kentucky Harm Reduction Hub is a pioneering initiative uniting academic and community-based scientists, harm reduction advocates, and local stakeholders to gain critical, early insights into Kentucky's street drug supply. By analyzing drug residues from used syringes, the initiative provides timely data on drug trends and composition, fostering a service-centered model with direct, two-way feedback loops to support community partners. This pilot study, conducted across Jefferson and Fayette counties, tested residues from 107 syringes, of which 73 contained detectable drug residues. Preliminary results reveal distressing patterns: xylazine, a powerful sedative, appears frequently, either alone or in mixtures. Methamphetamine, though sometimes present as a standalone substance, is often mixed with other drugs. Particularly alarming is the combination of methamphetamine and fentanyl, which rarely occurs without xylazine. Additionally, diphenhydramine (Benadryl) is commonly found, potentially added as a filler or to mimic sedative effects. The complex layering of substances underscores the heightened risks posed to individuals who inject drugs, as unexpected interactions can lead to severe health consequences. This hub's transdisciplinary approach allows for rapid response and tailored harm reduction strategies that adapt to evolving drug trends, aiming to protect and inform communities in Kentucky.

Bella Jones

TX - Lone Star College

Discipline: History

Authors:

Abstract Name: His Day is Marching On: A Music Theory Analysis of Battle Hymn of the Republic

This study analyzes the music theory within Julia Ward Howe's "Battle Hymn of the Republic" (1862) with an aim to highlight the impact of the song's musical structure on its historical significance. Much of the existing scholarly conversation surrounding the hymn places an emphasis on its lyrics while disregarding its musical structure. Utilizing the work of scholars such as music historian Elizabeth Morgan, cognitive scientist Steven Pinker, philosopher Alain de Botton, and historian David S. Reynolds, resulted in an interdisciplinary chord analysis of the song. The analysis reveals inherently simple and stable patterns comprised of mainly IV and V chords, resolved by a Perfect Authentic Cadence (PAC). Attributed to original composer William Steffe, the chord progressions and phrase endings on a PAC indicate that the simplicity and finality of the tune may have appealed to listeners struggling to find stability in their everyday lives. Prior to Howe's lyrics, Steffe's original tune, John Brown's Body (ca. 1850), was a popular American folk song. During the American Civil War, Howe's lyrics repurposed Steffe's composition as a patriotic anthem for the Union Army. The use of a familiar tune with such polarizing lyrics depicts the heightened tension between the

Union and Confederate armies. Findings within this study conclude that rather than solely analyzing historically significant events in a traditional, “textbook” manner, music provides additional and valuable insight for the study of social attitudes and perceptions. This research suggests the use of music analysis as a lens through which to contextualize the innately qualitative features of history.

Angela Jones

IA - Iowa State University

Discipline: Interdisciplinary

Authors:

#1 Ulrike Passe

Ethan Rapoza

Abstract Name: Experimental validation of computational models to assess impact of tree evapotranspiration (ET) on building internal thermal conditions

This research's main objective is to develop a computational model assessing the impact of extreme heat events on residential structures with limited or no air conditioning. We are particularly interested in understanding how trees, positioned at varying distances from homes, can mitigate indoor temperatures through the process of evapotranspiration (ET) and thermal fluxes. The goal of this part of the research is to validate the model with experimental data collected over the summer. This data is vital because a model is being produced that relates the outside weather conditions to conditions collected inside the Mobile Diagnostics Lab (MDL). The MDL is downwind of a selected tree, and upwind of the tree, we have a deployable Campbell Scientific weather station equipped with a ClimaVUE 50. Sensor. We are collecting variables such as wind speed and direction upwind of the MDL and focus tree, ground temperature, evapotranspiration, tree canopy width, and density, tree to MDL distance, building R-value (the walls of the MDL), temperature inside the MDL, and heat Flux inside the MDL. Our current data collection examines how trees at different distances from homes can help lower heat flux and, thus, interior temperatures by evapotranspiration (ET). To measure the ET rate of trees, we used a LI-COR LI-600 Porometer/Fluorometer and an LAI 2200C Plant Canopy Analyzer to collect the tree canopy width. Infrared camera thermal images measure the ground and surface temperature of the MDL. The resulting data will provide data to validate the computational model and then allow the team to build a localized heat health warning system for the City of Des Moines.

Leo Jones

MN - Hamline University

Discipline: Physics and Astronomy

Authors:

#1 Lifeng Dong

Abstract Name: Utilizing Natural Activators in Wood for Sustainable Biochar Production in Coin-Type Supercapacitors

As global interest in sustainable energy increases, so does the demand for environmentally friendly energy storage devices like coin-type supercapacitors. Traditionally, biochar activation for electrodes involves multi-step, energy-intensive physical and chemical processes that require corrosive chemicals and high temperatures. This research offers a sustainable alternative by creating a simple one step activation utilizing natural activators in various types of wood. This technique of one step activation was used for three different types of wood chips: white pine, white cedar and bur oak. Bur oak was selected as a base line while white pine and white cedar were selected due to their high porous levels and content of calcium oxalate. During pyrolysis, the biochar from these woods was naturally activated through the presence of calcium oxalate. After the pyrolysis the biochar was mixed with Carbon black and other agents to form a slurry. This slurry was then spread on aluminum and copper substrates, dried, punched out into electrodes and assembled into a

coin-type supercapacitor with Na₂SO₄ electrolyte for testing. Of the tested supercapacitors, white pine showed the highest specific capacitance (256 F/g) at 0.1mA). Far out performing a commercial capacitor (36 F/g). Both the white cedar and bur oak had around the same capacitance. White cedar(6.4 F/g), Bur Oak (6.8 F/g) which were unexpectedly low capacitances. Future research will focus on stabilizing the charge-discharge rates and investigating other types of chemical compounds found in various species of wood as potential self-activators for biochar.

Jeremy Jones

PA - Duquesne University

Discipline: Biology

Authors:

#1 Margaret McQuaid

#2 Caitlin Crelli

#3 Riddhi Vichare

#4 Jelena Janjic

Abstract Name: Investigating Sex-Specific Differences in mRNA Expression of Atf3 During Neuropathic Pain and Relief

Chronic neuropathic pain affects millions in the U.S. with significant healthcare costs. Pain responses differ between males and females due to sex-specific neuroimmune interactions. Understanding the biological basis of these differences is crucial for developing effective treatments specific to the individual. We recently reported that gene expression in the dorsal root ganglion (DRG) of rats experiencing pain and relief from a nanotherapeutic NSAID is sexually dimorphic. Activating transcription factor 3 (Atf3), a cyclic-AMP Response Element Binding protein, was one of the genes showing high fold change. This project seeks to correlate the quantitative expression of Atf3 mRNA to the differential protein expression previously discovered. Briefly, DRGs from male and female rats experiencing neuropathic pain and relief were collected. RNA isolation and reverse transcription PCR were used to isolate and stabilize Atf3 RNA as cDNA. Forward and reverse primers were designed for the four known exons of rat Atf3. PCR assays were conducted using six primer combinations to assess mRNA expression across sexes and conditions. PCR products were analyzed by agarose gel and the resulting data revealed the corresponding amplicons. Additionally, fluorescence in-situ hybridization (FISH) was used to visualize Atf3 RNA expression within the DRG to correlate Atf3 RNA expression to protein expression. Further analysis will provide additional insight into how Atf3 expression differs between treatment groups. This research aims to advance the understanding of sex-specific mechanisms underlying neuropathic pain and how Atf3-mediated pathways could be targeted for personalized pain relief treatments.

Jacob Jorden

MD - Towson University

Discipline: Political Science

Authors:

#1 Michele Calderon

Abstract Name: An Analysis of Fascist Rhetoric In Speeches Given by Vladimir Putin

Since the invasion of Ukraine in 2022, there has been an increased evaluation of the potential presence of

fascism in Russia. Often these analyses take a narrow view at events occurring around or after the invasion, primarily consisting of comparing competing definitions of fascism and specific elements of fascist behavior. Measuring these fascistic tendencies can aid in determining if concerns over an expansionist right-wing governments in Europe are valid, especially after statements from the EU, US, and Ukraine all made comparisons between Putin's regime and those of Nazi Germany. The present study takes a generalized approach and evaluates the usage of fascist rhetoric in speeches given by the leader of the Russian state, Vladimir Putin, from his inauguration in 2000 to 2024. Analysis of these speeches can be used to demonstrate either an increase or decrease in his use of fascist rhetoric. Utilizing Umberto Eco's 14 characteristics of fascism, developed in his essay *Ur-Fascism*, a codebook was created to measure the presence and type of common elements of fascistic rhetoric and changes in its usage in Putin's speeches. The author expects to see a general increase in the use of fascistic rhetoric over time, with notable spikes around 2014 and 2022, correlating with the invasion of Crimea and the invasion of mainland Ukraine. War and conflict create an increased need of the state to rally support around central ideological messaging, which fascistic rhetoric attempts to achieve, thus creating incentives for its use. Finding instances of fascistic rhetoric may be useful in understanding the long-term goals of Russia's mass media campaigns as it pertains to the desired relationship being cultivated between the Russian state and its populace.

Tony Joseph

NY - Brooklyn College

Discipline: Biology

Authors:

#1 Tony Joseph

#2 Kush Modi

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Kush Modi

Mark Genkin

Abstract Name: Determining the Role of Pregabalin in Diabetic Peripheral Neuropathy Pain Management

This study aims to define the efficacy of pregabalin in treating neuropathic pain in diabetic peripheral neuropathy (DPN), both as a monotherapy and in combination with other drugs that are commonly used to treat DPN in a clinical setting. Thus, physicians are able to make more informed decisions when choosing drugs to relieve DPN. This study evaluated the role of pregabalin in diabetic peripheral neuropathy pain management and its efficacy compared to other treatments by analyzing study type, drug type, treatment duration, and primary endpoint. Experimental groups varied from amitriptyline, duloxetine, carbamazepine, venlafaxine, and Xiaoketongbi Formula (XF). Pregabalin was shown to have no difference when compared to amitriptyline; however, more extended treatment regimens should be performed. Duloxetine is more effective at lower dosages, but pregabalin is more effective at higher dosages. Additionally, pregabalin was found to be more effective than carbamazepine and venlafaxine. Surprisingly, XF was found to be as effective as pregabalin, demonstrating the potential role of herbal treatments. Combination therapies did not have a significant advantage over pregabalin monotherapy in treating DPN. Regarding adverse effects, pregabalin was more tolerated among patients, though side effects were generally mild. Pregabalin is still an effective treatment for DPN pain management, and it is still considered non-inferior to current monotherapies and combination therapies. Overall, pregabalin is an effective drug therapy to address DPN despite the array of alternative medications present; however, evolving treatments, specifically herbal medications like XF, should be explored in a future research setting.

Tony Joseph

NY - Brooklyn College

Discipline: Biology

Authors:

#1 Pratyai Dey

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Mubasshir Mumtaz

Abstract Name: Evaluating Google and ChatGPT 4o as Sources of Patient Information for Laparoscopic Colorectal Surgery

This study aims to determine the differences in search engine information between Google and GPT-4o in the context of the type of questions, the readability of answers, the validity of the sources, and numerical accuracy for the most commonly asked questions about Laparoscopic colorectal surgery. Comparing such differences is essential to understanding the knowledge gaps between Google and GPT-4 in terms of patient education, which can significantly increase confusion and anxiety over standard medical procedures. Using this design, it was determined that readability of responses from Google and ChatGPT significantly differed, as shown through the Flesch-Kincaid Score and Flesch Reading Ease Score ($p < 0.001$). In addition, the types of questions asked by Google and ChatGPT were quite similar, as noted by a Rothwell grading system, which indicates that question type was a major contributor to such difference in answers. However, the credibility of the sources provided by these search term engines differed as Google provided more reliable sources than ChatGPT, as noted through the JAMA source criterion. Readability was not the only difference observed, as numerical responses to recovery time, pain level, weight loss, success rate, the time until daily function recovery, and surgery duration were significantly different between ChatGPT and Google responses, indicating a high variability in information provided to patients. More effort must be placed to provide patients online information with a more concise, readable language, with supplementary information from credible sources.

Sneha Joshi

VA - Marymount University

Discipline: Business

Authors:

#1 Noor Hashim

Noor Hashim

Abstract Name: Employee dissatisfaction and negative ESG media attention

This study investigates the relationship between employee satisfaction and future environmental, social, and governance (ESG) media incidents. We utilize anonymous employee reviews from Glassdoor.com, analyzing their sentiment using the Valence Aware Dictionary and Sentiment Reasoner (Vader) tool. ESG incident data is sourced from RepRisk's ESG database. Our findings indicate a significant association between employee dissatisfaction and negative ESG performance of companies. We observe that firms often underinvest in employee welfare, potentially due to the perceived costs of improving working conditions. Our research

provides evidence for the importance of prioritizing employee satisfaction, as it correlates with negative ESG media attention. These results suggest that companies should consider employee well-being as a crucial factor in their overall ESG strategy and public perception management.

Anvi Joshi

PA - University of Pittsburgh

Discipline: Psychology

Authors:

#1 Anvi Joshi

#2 Melanie Grad-Freilich

#3 Jennifer Silk

Abstract Name: Affective Instability in the Parent-Child Relationship: Implications for Adolescent Anxiety

Adolescence is a period of emotional and psychosocial upheaval during which youth, particularly girls, are at increased risk for the development of anxiety. One potential risk factor for the development of anxiety is affective instability (AI)—rapid, uncontrollable fluctuations of intense affect. Research indicates that AI is associated with increased anxiety in children, adolescents, and adults, and parental AI is associated with increased subsequent adolescent AI and anxiety. However, the mechanisms by which parental AI influences adolescent anxiety remain poorly understood. Based on past research, we propose a model whereby heightened adolescent AI mediates the relationship between heightened parental AI and heightened adolescent anxiety. We will test this model using data from the three-wave longitudinal GIRLS: Brain Study, which examined how adolescent girls at risk for internalizing disorders reacted to emotional stimuli. At each timepoint, our participants ($n = 103$) completed questionnaires and 16 days of ecological momentary assessment (EMA) data, capturing in-vivo affect (3 times daily, up to 54 total observations). Parents self-reported parental AI using the Affective Instability subscale from the Personality Assessment Inventory Borderline, and adolescents self-reported anxiety symptoms using the General Anxiety Disorder subscale in the Screen for Child Anxiety-Related Emotional Disorders. Child AI is calculated separately for positive and negative affect using the mean square successive difference of their EMA momentary affect ratings. We predict that heightened parental AI at timepoint 1 (T1; ages 11-13) will be associated with heightened adolescent anxiety two years later at timepoint 2 (T2; ages 13-15). Additionally, we expect heightened adolescent AI at timepoint 1 will mediate the relationship between heightened parental AI (T1) and heightened adolescent anxiety (T2). Analyses will be completed by the time of the conference. Results will help to further clarify the mechanisms by which experiences in adolescence influence anxiety development, potentially aiding target interventions.

Tara Joshi

GA - Kennesaw State University

Discipline: Engineering

Authors:

Abstract Name: Powering the Future: Fabricating Ceramic-in-Polymer Composite Solid Electrolytes with Enhanced Li-Ion Conductivity from Zirconium/Sulfur Interactions

All-solid-state batteries (ASSBs), which replace flammable liquid electrolytes with solid electrolytes, have received significant research interest due to their enhanced safety. Ceramic-in-polymer composite solid

electrolytes, characterized by impregnating ceramic ion-conductors within interconnected polymer networks, show great potential for meeting the high-performance requirements of ASSBs due to the combined benefits of fast Li-ion conductivity and facile interfacial contact with Li-metal anodes. Grafting the surface of ceramics with lithophilic ligands can further enhance Li-ion transport across the bulk material and at the extrinsic interface with electrodes. In this project, we developed a layer-by-layer method that exploits the coordination interaction and electron transfer interaction between Zirconium (Zr) and Sulfur to fabricate LLZO-in-PEGDA composites, achieving precise control over the homogeneity and structure of the composites. Notably, the LLZO-in-polymer composites demonstrated higher ionic conductivity and lower activation energy than their sulfur-free counterparts, facilitated by the Zr/Sulfur interactions. This improvement can be attributed to changes in the polymer network, characterized by a larger mesh size and the introduction of a lithophilic environment that promotes rapid Li-ion association and dissociation at various intrinsic interphases. As a result, the LLZO-in-Polymer composite exhibited a high conductivity value of $5.1 \times 10^{-4} \text{ S cm}^{-1}$, exceeding the vendor-reported bulk ionic conductivity of polycrystalline LLZO. This suggests that the sulfur-containing ligands facilitate faster Li-ion transport between LLZO and other phases within the composites, compared to the LLZO|LLZO interphases (i.e., grain boundaries) within polycrystalline LLZO. In addition, the sulfur-containing LLZO-in-PEGDA composites showed improved toughness and stretchability, suggesting the potential dual role as a protective layer for electrode materials. Finally, the sulfur-containing composites can stabilize the interfacial resistance with Li anodes, suggesting the formation of a solid-electrolyte interlayer (SEI) layer with Li-anode. Elucidation of Zr/Sulfur interactions on Li-ion transport within multi-phase composites offers a foundation for designing better Li-ion transport pathways.

Ruthu Josyula

VA - George Mason University

Discipline: Political Science

Authors:

Abstract Name: Regional Connections with the Sangh Parivar and the Union Ministry

In looking at Hindu nationalist organizations and their ties to the government, there is no clear list or data that has been gathered in one spot. The Sangh Parivar is a collection of right-wing Hindu nationalist organizations stemming from the Rashtriya Swayamsevak Sangh. With over 5 million people officially a part of the RSS, it is the world's largest far-right organization. Due to the lack of centralization within the Sangh Parivar, there is no clear way to know whether a person was a member of one of the many organizations unless they themselves have mentioned it before. In a population of over 1.4 billion people, there are many regional differences and conclusions that can be drawn about different voting patterns, and how that relates to a politician's connection to organizations like the RSS. Since 2014, the Modi Union Ministries have been becoming closer and closer tied to the Sangh Parivar, which has been clearly displayed in the regional make up of the politicians on the Union Ministry. With the current Union Ministry, those that are connected to the RSS, are far more likely to be from a northern state, with the exception of Karnataka, than those who are not connected.

Andrew Joyce

PA - Saint Vincent College

Discipline: Physics and Astronomy

Authors:

#1 Daniel Vanden Berk
#2 Michael Antonacci
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#4 Coty Walters
#5 Matthew Vanden Berk

Abstract Name: Muon and gamma-ray rates, and atmospheric monitoring during the total solar eclipse of April 8, 2024

Ambient muon and gamma-ray count rates were measured simultaneously during the total solar eclipse of April 8, 2024, at a location within the path of totality, using an array of ten CosmicWatch detectors in five coincident-counting pairs. No significant variations in the muon or gamma-ray rates were observed during any phase of the eclipse, relative to rates measured well outside of the eclipse times. Temperature and illuminance decreased during the eclipse, and relative humidity increased, as expected from previous studies. We find no unexpected variations in atmospheric pressure or carbon dioxide concentration measured at the site during the eclipse.

Kendra Jude

MN - University of Minnesota - Rochester

Discipline: Chemistry

Authors:

#1 Deepali Butani

Abstract Name: Synthesis of trans, trans-Dibenzylideneacetone Derivatives as Potential Sunscreen Agents

Dibenzylideneacetone (DBA) and its derivatives possess promising ultraviolet (UV) absorption characteristics due to their extended pi-conjugation, making them potential candidates for sunscreen agents. This study focuses on synthesizing DBA derivatives via cross-aldol condensation reactions between aldehydes and ketones under basic conditions. Utilizing various substituents, we synthesized and characterized multiple DBA derivatives to evaluate their UV-absorbing properties, including molar extinction coefficients and λ_{max} values. UV-Vis spectroscopy revealed that modifying the DBA scaffold by introducing different functional groups can enhance UV absorption, which is crucial for effective UV protection. Additionally, melting points and spectroscopic data provide insights into the synthesized compounds thermal stability and molecular structure. Future work will further investigate the structure-activity relationships, photostability, and potential for formulation into sunscreens. Our findings contribute to the development of novel UV-protective agents, aiming to improve the efficacy and safety of sunscreen molecules.

Mark Julian

CA - University of California - Merced

Discipline: Environmental Science and Sustainability

Authors:

#1 Sam Markolf

#2 Ruby Diaz

#3 Caspar Donnison

#4 Minerva Uribe-Robles

Abstract Name: Assessing Stakeholder Perspectives and Their Influence on the Success or Failure of Carbon Dioxide Removal (CDR) Projects in the United States

As concerns over the impacts of climate change persist, carbon dioxide removal (CDR) technologies are likely to play a key role in achieving global and national targets of net zero carbon dioxide (CO₂) and greenhouse gas (GHG) emissions. CDR projects work to remove carbon dioxide from the air and transfer it into a form of durable storage, some also generating cleaner forms of energy. Many rising CDR projects encounter public opposition from local communities, as well as other challenges that can result in their ultimate cancellation. This research aims to understand barriers to success for CDR projects and explore how future projects might overcome potential setbacks and gain public acceptance. Our research combines qualitative and quantitative approaches to examine the relationship between public reception and the regional characteristics of CDR projects, including economic, geographic, and demographic influences. Additionally, we analyzed broader U.S. trends in gubernatorial communications and policy frameworks related to climate change, environmental strategies, and CDR initiatives. Methodologies for this work include data collection on active and proposed CDR projects, discourse analysis of public opinion through media reports and local stakeholder feedback, and spatial analysis. By contrasting findings across various regions, we aimed to identify recurring themes in project successes or challenges, as well as identify broader patterns in how state-level leadership influences the acceptance and framing of CDR initiatives. Early results indicate that the success of a CDR project depends on support or opposition from the local community, and is affected by the community's understanding of the project. Efforts must be taken to inform the local population and engage with their concerns about emerging technologies to help determine the best role for CDR in their community.

Aditi Junagade

PA - University of Pittsburgh

Discipline: Health and Human Development

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- #1 Michael Kann
- #2 Shovan Bhatia
- #3 Amogh Vellore
- #4 Jayne Miner
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- #9 Samuel Adida
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- #12 Fritz Steuer
- #13 Vincent Miele
- #14 Peter Gerszten
- #15 Jacob Biehl
- #16 Edward Andrews

Abstract Name: Evaluating the Effect of Augmented Reality Platforms in Pre-operative Patient Counseling

Surgical informed consent traditionally involves a dialogue between surgeon and patient to convey the complexities of surgery and ensure patient understanding. However, studies reveal that less than 50% of patients adequately understand the procedure due to limited medical knowledge. Augmented reality (AR) offers a novel solution to improve patient comprehension, retention, and expectations. AR technology can

transform a patient's unique anatomy into an interactive 3D model, allowing visualization of specific pathologies and procedures during preoperative counseling. This study evaluates the effectiveness of AR-enhanced preoperative counseling compared to conventional methods for patients undergoing anterior cervical discectomy and fusion. It is a non-blinded, randomized clinical trial with two groups: a control group receiving standard counseling and a treatment group utilizing Medivis' AnatomyX and Surgical AR technologies. These AR tools will introduce normal anatomy, outline procedural steps, and present personalized 3D models based on patient imaging. Preoperative and postoperative surveys assess outcomes such as perioperative patient satisfaction, preoperative anxiety, confidence in the surgeon, postoperative pain levels, and knowledge retention. Collaborations with neurosurgeons, nurses, and physician assistants informed the study's design, ensuring integration into clinical workflows. A standardized checklist was created to ensure essential topics were consistently covered during preoperative counseling, along with a quiz to evaluate patient knowledge retention. REDCap was employed for remote postoperative surveys, and attending neurosurgeons were trained in AR applications for patient education. The study was accepted on ClinicalTrials.gov (NCT06340672). So far, six eligible patients were contacted, with three consenting to participate. The results aim to demonstrate how AR enhances patient education, increasing satisfaction, reducing preoperative anxiety, and improving trust in the surgical team. This innovative approach provides a framework for integrating AR into routine clinical practice, ultimately aiming to improve the quality of surgical informed consent and patient outcomes while advancing the use of technology in healthcare.

Alain Juneau

VT - Norwich University

Discipline: Environmental Science and Sustainability

Authors:

#1 Alain Juneau

Abstract Name: Designing a Heating and Cooling System for US' Martian Colonies

Heating and cooling Mars' colonies present unique challenges due to the planet's extreme temperatures, lack of a substantial atmosphere, and the need for self-sufficiency in energy sources. Mars experiences wide temperature fluctuations, with daytime temperatures reaching around 70°F (20°C) near the equator but dropping to as low as -195°F (-125°C) at the poles. This study aims to find innovative, sustainable solutions to design a heating and cooling system on Martian colonies that meet human needs. This research starts with a thorough literature review. After that, this study demonstrates and discusses Earth's different heating and cooling systems and how they would aid interior climate control on Mars. The research reveals that each HVAC system has pros and cons and is useful in other applications. The study also finds and explains what daily life looks like on spacecraft, such as the International Space Station, which helps show where Mars's heating and cooling systems can be improved. In addition, the research describes and discusses the timeline of Mars' discoveries and what is known about the planet today as human-crewed missions to Mars are in the near future. Factors affecting HVAC systems, such as extreme temperature variations and atmospheric composition, are also identified with an example of what a colony on Mars could look like. Moreover, this study explains and illustrates how Building Information Modeling (BIM) can be utilized to design virtually a 3D BIM module, a digital twin, for HVAC systems. A selected case study formulates the Martian heating and cooling system research findings. The research finds that geothermal heat pumps and heat-capturing devices like insulation thermal storage walls are the heating and cooling systems of choice. The rationale for this proposed system is also justified with critical points of maximizing efficiency and limiting pollution.

Wanvimol Juneau

GA - Agnes Scott College

Discipline: Biology

Authors:

#1 Anchana Thancharoen

Abstract Name: Behavioral and Morphological Insights into Water-Associated Ecological Classification of Pteroptyx Fireflies

Beetles (Coleoptera) are often difficult to designate as aquatic, semi-aquatic, or terrestrial due to unclear parameters for these classifications, as well as diversity within the order. Our study investigates behavioral diving patterns and morphologies of *Pteroptyx valida*, *Pteroptyx malacciae*, and *Pteroptyx tener* via scanning electron microscope (SEM) imaging to assess and potentially correct their current terrestrial classification while simultaneously contributing to refining the current parameters of water-associated classifications in Coleoptera. We hypothesize that if *Pteroptyx* larvae show behavioral patterns that suggest statistical inclination towards breaching water in an intertidal zone and opened eversible respiratory organs during submersion, it will provide strong evidence for reclassifying these *Pteroptyx* fireflies as semi-aquatic. The behavioural diving experiments reflect the natural environments during firefly larval stages, which include aquatic, sloped, and terrestrial zones. Larvae were placed in a dry aquatic zone which was then gradually flooded to mimic the tide. Diving or escaping behaviours and total time spent in water was recorded for further analysis. Results assessed possible statistical significance of diving and escaping during tidal cycles, providing insight into whether *Pteroptyx* fireflies exhibit terrestrial or semi-aquatic behaviors. SEM imaging was conducted, with a focus on eversible respiratory organs. Both specimens submerged in water and out of water were frozen and preserved for observation and analysis. We will examine the eversible organs to see if they are open or closed. Future results will determine if these organs play a role in underwater respiration. SEM images will also reveal whether functional eversible organs during submersion are a morphological adaptation to water, a characteristic commonly found in semi-aquatic beetles. Overall, our study seeks to clarify ecological classifications of *Pteroptyx* fireflies contributing to a more precise understanding of *Pteroptyx* firefly behavior and morphology in water-associated environments, and refining the parameters used to distinguish aquatic, semi-aquatic, and terrestrial species.

Jenna Junge

UT - University of Utah

Discipline: Nursing and Public Health

Authors:

#1 Stuti Das

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Abstract Name: Facilitators and Barriers of Providing Culturally Informed Pediatric Refugee Care From The Perspective of Pediatric Emergency Department Providers: A Qualitative Study

Fundamental to each refugee's story of migration is a story of trauma. Refugees experience trauma related to war and persecution in their home country, during exile from their homeland, and resettlement in a new country. The United States has become a new home for many refugees, and since 1998, over 25,000 refugees have resettled in Utah specifically. Refugee families' only option for pediatric emergency care in the Intermountain West is Primary Children's Hospital (PCH). As more refugees arrive in Utah, it is vital that healthcare professionals in all settings, including the emergency department, are culturally informed about diverse patient demographics. Currently, there are no educational programs dedicated to teaching culturally informed care for pediatric emergency professionals at PCH. As a result, a gap in understanding develops

between healthcare teams and refugee patients leading to worse patient outcomes. This IRB-approved study aims to gather insights from pediatric emergency healthcare professionals and families of pediatric refugee patients at PCH to understand facilitators and barriers to care. Since August of 2024, in-depth interviews (IDIs) with physicians, care managers, and nurses, followed by focus-group discussions (FGDs) with refugee families have been conducted. IDIs and FGDs are recorded, transcribed, and analyzed using applied thematic analysis. Data analysis will be performed through Dedoose software, analyzing data for salient themes with discrepancies resolved by consensus, and initial results will be produced by January, 2025. This study is the first to gather perspectives from refugee families seeking care in a pediatric emergency department in the United States. The impact of this study is to provide educational resources for pediatric healthcare professionals about the nuanced needs of refugee families. We aim to foster a more culturally sensitive healthcare environment, enhancing the quality of care for the refugee community.

Nathan Jyachosky

PA - Allegheny College

Discipline: Psychology

Authors:

Abstract Name: Biases in Jury Decision Making: Autism Versus Down Syndro

This research will aim to look at perceptions of individuals with intellectual disabilities to see if that has any impact on how participants render a verdict. The data will also be used to see if any discrepancies are present between the two groups (autism spectrum disorder and Down Syndrome) and how often a guilty verdict is rendered. This is important research to conduct because there is little previous research that has been done on this specific topic. There is so little research that has been done looking into one type of disability and how perceptions affect a juror's verdict, let alone research on two types of disabilities. Think about past research that has been done comparing the verdicts and sentencing of African-American versus White citizens; my research questions are working off of the same idea in a way, just looking at it with different levels as compared to race. This research is important for the same reasons as that, and that is because everyone has the right to a fair trial. At the end of the day, it is protected under the Fifth and Sixth Amendments of the United States Constitution. In this study, participants will complete a survey consisting of a disability perception scale (ADS), a reading of a case summary, and two questions regarding that case summary. This study has two hypotheses. First, participants who get assigned to read the case on Autism will be more likely to render a guilty verdict. The second hypothesis is that the worse a person's perception of individuals with disabilities is, the more likely it is for them to render a guilty verdict.

Heidi Kaczynski

OH - Walsh University

Discipline: Chemistry

Authors:

#1 Amy Heston

Abstract Name: Beyond the Bean: Exploring the Chemistry Behind Coffee Consumer Satisfaction

This research project evaluated the relationship between Arabica coffee quality and consumer satisfaction. Experiments were designed to uncover trends of customer satisfaction in coffee samples with varying post-brew intervals. Another objective was to discover if there were any correlations between older (longer post-

brew) coffee and an increase in consumer dissatisfaction. One unique feature of this project included studying consumer responses in an effort to improve coffee preparation, particularly for companies who serve coffee. Considering green chemistry applications, longer hold times will decrease company waste as well as decrease common customer complaints of coffee tasting “old” or “stale.” Two Arabica coffee samples were prepared: one freshly brewed (Sample A) and one having a post-brew time of 8 hours that was reheated (Sample B). Consumers (N=61) provided data on feedback forms that indicated consumer preference for Sample A (46%) and Sample B (54%). Consumer feedback showed fairly similar perceptions when asked to select which brew was fresher with Sample A (49%) and Sample B (51%). Results related to the Emotion Index Adjectives indicated Sample A: 11 positive, 12 negative and Sample B: 7 positive, 5 negative. Looking deeper into the brewed coffee, both samples were analyzed at the chemical level using Liquid Chromatography Mass Spectrometry (LCMS). The LCMS spectra showed a large peak at 195 m/z for both Sample A and Sample B that represented the caffeine found in the samples and aligned with the results found for the caffeine standard. This project proved to be an effective learning experience in creating a successful IRB proposal, qualitative analysis in assessment strategies, and quantitative chemical analyses utilizing LCMS. Collectively, these aligned with the institution’s mission with respect to preparing students to become knowledgeable and responsible scientists, especially for those intending on pursuing graduate degrees in chemistry.

Jennifer Kahn

WI - University of Wisconsin-Stevens Point

Discipline: Biology

Authors:

#1 Nicole Hayes

Abstract Name: Invasive Zebra Mussel Habitat Preference in a Newly Invaded Lake

Zebra mussels are an invasive species widespread throughout states in the eastern and midwestern United States. In invaded lakes, zebra mussels spread quickly, reach high population densities, and transport large amounts of nutrients and carbon from the water column to the lake sediments. Once large amounts of nutrients and carbon are translocated to the sediments, the water column food web can become deprived of food resources and fish populations may decline. Zebra mussels were first found in Lake Menominee (Menomonie, WI) in May 2024. To determine the potential for zebra mussels to colonize the lake and alter the food web, we conducted a whole lake survey to assess their current distribution and the speed of their invasion. Using a stratified random survey, we sampled sites encompassing the range of habitats in Lake Menominee, a range of depths, distance from site of discovery, and substrate type. At shallow sites, we hand sampled rock and sandy sediments. At deep sites (2-4.5 m), we dredged sediment substrates. We also hand-sampled human substrates including buoys and a vehicle towed out of the lake. The highest densities (averaging 242.7 zebra mussels per sq.m) were found on human-made substrates like the metal truck and plastic buoys. Densities at shallow sites (primarily sand and cobble) averaged 6.9 zebra mussels per sq. m. Deep sites had soft, mucky substrate with no zebra mussels detected. Since most zebra mussels were found on human-made substrates, populations could continue to be low due to limited habitat. However, populations could also be low due to their recent arrival. High zebra mussel density on human-made substrates may cause damage in the future and careful cleaning of boats and infrastructure is imperative to prevent spread to other local lakes.

Lauren Kahn

TX - The University of Texas at San Antonio

Discipline: Psychology

Authors:
#1 Joseph Houpt

Abstract Name: Enhancing Dyslexia Diagnosis with Pseudoword Mask Assessment

Dyslexia, a neurodevelopmental disorder, impairs reading, spelling, and phonological processing. While traditional diagnoses focus on phonological deficits, research suggests that dyslexia also affects visual and auditory processing. This highlights the need for diagnostic methods that address these multisensory impairments. We hypothesized that integrating visual and auditory stimuli would enhance understanding and accuracy of dyslexia diagnoses. Specifically, we proposed that: (1) dyslexic individuals may perform better in one modality over another; (2) combining visual and auditory stimuli would improve their performance, narrowing the gap with non-dyslexic controls; and (3) across all conditions, dyslexic individuals would exhibit slower response times and lower accuracy than controls. Using a 2x3 ANOVA, we tested dyslexic and non-dyslexic participants on a pseudoword matching task under three conditions: visual-only, auditory-only, and combined visual-auditory. Pseudowords (e.g., "blart") are pronounceable non-words, isolating decoding and pattern recognition. Response times and accuracy were measured across conditions. In our non-dyslexic participants, a paired t-test showed faster response times in the auditory condition ($M = 1.25s$, $SD = 0.35s$) compared to the visual condition ($M = 1.50s$, $SD = 0.40s$), though not statistically significant, $t(9) = 1.75$, $p = 0.12$. Accuracy was highest in the combined condition ($M = 0.85$, $SD = 0.10$) but also not significant, $t(9) = 1.50$, $p = 0.17$. Dyslexic participants demonstrated slower response times and lower accuracy in both single-modality conditions but improved in the combined condition, suggesting multimodal integration helps mitigate deficits. These findings support a multimodal diagnostic approach that incorporates visual and auditory stimuli. This method could provide a more nuanced understanding of dyslexia's complexity, enabling accurate diagnoses and personalized interventions to improve outcomes for individuals with dyslexia.

Jillian Kalinyak

PA - Saint Francis University

Discipline: Biology

Authors:
#1 Katharine Criswell

Abstract Name: Development of the Reproductive Tract in a Cartilaginous Fish

The reproductive tract is a key structure in vertebrate anatomy, and its development and differentiation has been studied in detail in bony model organisms like mice and zebrafish. In mammals and birds, reproductive development begins with an undifferentiated gonad and two sets of ducts, the Wolffian ducts and the Müllerian ducts. In males, the Wolffian duct goes on to form the male reproductive tract while the Müllerian duct degenerates; in females, the opposite happens. In bony fishes, like the zebrafish, a completely new duct forms to carry sperm or egg out of the body. However, reproductive tract development in non-bony vertebrate groups remains unclear and we know little about its development and the timing of male and female differentiation. Cartilaginous fishes, including sharks, skates, and rays, are useful for studying the evolution of development because they diverged from bony vertebrates over 400 million years ago, and their developmental patterns can give insight into the diversity of vertebrate reproductive structures. To compare reproductive tract development in cartilaginous fishes with other vertebrates, we studied the little skate (*Leucoraja erinacea*). Skates are oviparous (egg-laying) and are easy to obtain at different developmental stages. We investigated the reproductive tract by performing histological sectioning and Masson's trichrome staining from the first emergence of the gonad to hatching. We compared males and females and, identified reproductive structures including the indifferent gonads, differentiated ovaries and testes, oviducts, cloaca, ductus deferens, and urogenital sinus. We found that in the skate, reproductive tract development is more

similar to mammals and birds than to bony fishes like zebrafish, suggesting that this dual duct system is ancestral for jawed vertebrates. Our results can give evolutionary insight into how this fundamental anatomical structure diverged across vertebrates.

Netochukwu Kalu

IL - Elmhurst University

Discipline: Interdisciplinary

Authors:

Abstract Name: The impact of globalization on the growth of the American sports industry and the pathway of international student-athletes into college and professional sports.

My research discusses the impact of globalization on the growth of the American sports industry and the pathway of international student-athletes into college and professional sports. The main objective is to investigate how the rise in globalization helped to grow the American sports industry in viewing and the participation of foreign athletes. This research is relevant because the growth and ultimate investment in American sports like Lacrosse, baseball, basketball, and flag football internationally, will make foreign athletes more competitive at the next Olympic Games in Los Angeles. Additionally, with the exponential growth in women's sports in the last two years, this research will shed light on whether or not there will be more female athletes being drafted before they graduate college. The methodology used is surveys, a qualitative interview with the flag football league in Lagos, Nigeria, performance analysis, and case studies. My expected results are that the rise in broadcasting and the spread of American sports has led to increased viewership across continents, a rise in foreign athletes in college and professional sports, and a rise in American sports development, through flag football, basketball, and baseball leagues internationally, and that male athletes are more likely to spend fewer years in college before they get drafted into professional leagues, while female athletes typically spend the full four-years in college before being drafted. The main reason for this is due to the popularity of male athletes over female athletes.

Numa Kamal

PA - Drexel University

Discipline: Biology

Authors:

#1 Numa Kamal

#2 Laura Cort

#3 Jennifer Hope

Abstract Name: Real-Time Quantification of T-Cell Mediated Pancreatic Cancer Cell Death

The average lifetime risk of developing pancreatic cancer (PC) is about 1.5%, yet PC is the third leading cause of cancer-related deaths in the United States. This poor clinical outlook is likely the result of late-stage diagnosis and resistance to currently available cancer treatments. Further, the pancreatic tumor microenvironment is highly immunosuppressive with limited infiltration of anti-tumor immune cells observed. From an immunological perspective, little is known about what regulates anti-tumor immunity to PC and particularly what limits CD8⁺ T cell responses to PC. We designed an assay co-culturing mouse PC cells modified to be recognized by CD8⁺ T cells in order to evaluate and quantify CD8⁺ T cell-mediated PC cell death. Recent studies suggest that signaling through the cell surface marker P-Selectin Glycoprotein

Ligand-1 (PSGL-1) promotes CD8+ T cell exhaustion, a state of decreased cytotoxicity and proliferation. We hypothesize that PSGL-1 deficiency will promote increased T cell responses and improved tumor control. Future studies of this research may include targeting PSGL-1 expression in T cells as a method of attacking PC.

Anish Kambhampati

IN - Purdue University Main Campus

Discipline: Computer Science

Authors:

#1 Durga Mandarapu

#2 Milind Kulkarni

Abstract Name: Analyzing the Performance of GPU-Based Point-in-Polygon Algorithms

The point-in-polygon (PIP) query determines whether a point lies inside or outside a polygon. It is a fundamental problem in computational geometry, with applications spanning computer graphics, geographic information systems, and scientific simulations. While traditional approaches to this query, such as the ray casting algorithm and winding number algorithm, rely on CPU-based computations, advancements in GPU computing have enabled high-performance alternatives. In this paper, we benchmark three GPU-based PIP algorithms: (1) a straightforward CUDA-based ray-casting implementation, (2) RayJoin, a state-of-the-art algorithm leveraging NVIDIA's hardware-accelerated ray tracing (RT) [Geng et al., ICS 2024], and (3) s-ray, a novel approach using NVIDIA's RT hardware with a per-edge triangle index. We evaluate these methods against two distinct scenarios: a high point-to-polygon ratio and a more balanced point-to-polygon ratio. Our findings reveal significant trade-offs between query performance and build (preprocessing) costs. While the CUDA-based implementation is simple and build-free, it is the slowest in query throughput. RayJoin achieves up to 30x speedups over the CUDA algorithm by optimizing edge groupings into axis-aligned bounding boxes (AABBs). The s-ray algorithm further doubles RayJoin's throughput, albeit at the cost of 6–20x longer build times. Our work highlights the tradeoffs between different GPU-based PIP algorithms, providing a foundation for users to select and/or develop their own high-performance PIP algorithms.

Samantha Kammerer

FL - University of West Florida

Discipline: Engineering

Authors:

#1 Luis Cwu Rodriguez

#2 Diego Cwu Rodriguez

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#4 D'andre Walden

Sarah Southall

Ethan Shelstad

Abstract Name: Smart Platform for Intelligent Dynamic Exploration and Robust Walking (S.P.I.D.E.R.)

This project will design and build a robot for applications in inaccessible and remote environments that can maintain stability after the loss of a leg. Currently, most robots in these environments are designed to move using wheels, which can only handle certain terrain. In contrast, legged robots are less restricted in their

movements. However, if one leg is damaged or rendered useless, the robot becomes unstable. To maintain stability after leg loss, more legs can be added. For example, a hexapod (six-legged robot) will be able to support itself on at least two legs while walking. Previous research has achieved adequate levels of compensation in hexapods, but have varied results on the body's stability, which can affect payloads. To increase stability, this study will create an eight-legged prototype. The leg design is inspired by the segmented legs of spiders, with four degrees-of-freedom in each leg. While operating, the robot will analyze positional data in real-time to adjust the tilt of the body based on pre-programmed parameters. To gather the most accurate data, a leg will be fully removed when testing for stability after leg loss. For testing, the robot will run a predetermined course before and after a limb has been removed, and the mean tilt error (the difference between nominal parameters and maximum tilt) will be analyzed. Compared to hexapods, it is expected that the body will be 20% more stable after limb loss, and able to recover stability 60% faster from the loss event.

Yousuf Kanan

PA - Moravian University

Discipline: Physics and Astronomy

Authors:

#1 Yousuf Kanan

#2 Gour Jana

#3 Chinedu Ekuma

Abstract Name: Accelerating Simulations of Strongly Correlated Systems with OpenMP Parallelization

The primary objective of this project is to identify specific routines within the simulation that are suitable for optimizing large-scale many-body code designed to model strongly correlated systems, specifically ones where Coulomb Interactions play a central role. By employing various profiling techniques, we pinpoint performance bottlenecks within the code. We then apply OpenMP parallelization to accelerate these targeted routines, significantly boosting simulation performance. Implementing OpenMP in these areas can reduce execution time and enhance resource efficiency. The outcomes of this project are expected to benefit researchers working in computational physics and materials science by providing an efficient toolset for exploring complex physical phenomena.

Maria Kang

WA - University of Washington - Seattle

Discipline: Biology

Authors:

#1 Weston Powell

#2 Madison Ohm

#3 Carolina Daluz

#4 Lindsay Clark

#5 Maria White

#6 Elizabeth Vanderwall

#7 Camille Gates

#8 Lucille Rich

#9 Jason Debley

Abstract Name: Differential Gene Expression in Response to Viral Infection in Pediatric Obstructive Sleep

Apnea

Obstructive sleep apnea (OSA) is linked to early life viral infections with resultant adenotonsillar hypertrophy, and children with OSA have increased severity of viral respiratory illnesses. As respiratory viral infections occur in airway epithelial cells and initial epithelial responses to viral infections have been linked to disease manifestations, we sought to investigate the differences in epithelial viral responses between children with OSA as compared to children without. We hypothesized that gene expression in response to rhinovirus (RV16) infection would differ between healthy children and children with OSA. Primary airway epithelial cells (AECs), from both healthy pediatric donors and children diagnosed with OSA were cultured on an air-liquid interface as an ex-vivo model, and then infected with RV16. RNA-sequencing quantified gene expression at baseline and after RV16 infection, and Limma was used to identify the genes with differential expression in response to infection in healthy AEC as compared to AECs from donors with OSA. Weighted gene co-expression network analysis (WGCNA) was able to organize the identified genes into groups of interest. Using Enrichr, the primary biological functions of the groupings were analyzed. Following infection, 122 genes were found to have differing gene expression responses to RV16 in OSA when compared to healthy cell lines. WGCNA identified two modules of gene expression with differential expression following infection in OSA compared to healthy. Module one consists of 43 genes enriched for glycogen metabolism which are downregulated in healthy, but upregulated in OSA following RV16 infection. Module two consists of 23 genes enriched for DNA repair and replication which are upregulated in healthy, but downregulated in OSA. Epithelial cell gene expression differs in response to RV16 in healthy AECs as compared to AECs from children with OSA. Further studies are needed to link altered epithelial responses in OSA to more severe respiratory infections.

Sion Kang

MI - Hope College

Discipline: Education

Authors:

#1 Sion Kang

Abstract Name: The Transformative Impact of Translanguaging Pedagogy in Bilingual Read-Aloud Activities

This presentation explores the transformative effects of translanguaging pedagogy on the academic engagement and emotional experiences of an emergent bilingual elementary student. I specifically examine how bilingual read-aloud activities, guided by translanguaging principles, influence the student's participation and emotional responses compared to traditional English-only approaches. By incorporating both the home language and English, translanguaging fosters a more inclusive and supportive learning environment. As part of a research team, I conducted an in-depth study featuring eight 90-minute interactive read-aloud sessions with a local emergent bilingual student. Using a single-subject experimental design, I compared the student's engagement and emotional responses during bilingual translanguaging sessions with those from English-only sessions. The findings reveal clear benefits of integrating translanguaging into literacy activities. The student demonstrated increased motivation, participation, and emotional connection during bilingual sessions, compared to more limited engagement and emotional expression in English-only sessions. This research underscores the cognitive and emotional advantages of translanguaging in supporting emergent bilingual learners. The presentation aims to offer practical insights for integrating translanguaging pedagogy into classroom instruction. By embracing students' home languages, teachers can enhance literacy development while supporting the emotional well-being of emergent bilingual students. In sum, this presentation highlights the transformative power of bilingual read-aloud activities, driven by translanguaging pedagogy, in shaping students' literacy skills and emotional experiences, surpassing traditional monolingual English-only methods. My ultimate objective is to equip attendees with practical ideas they can readily implement in their classrooms, providing a deeper understanding of how to effectively support emergent bilingual students' learning and emotional well-being through translanguaging pedagogy.

Destiny Kanning

MI - Michigan State University

Discipline: Health and Human Development

Authors:

#1 Destiny Kanning

Abstract Name: The Value of Patient Education in the Overutilisation of Paediatric Emergency Medicine

Districts 1 and 5 of Michigan face high levels of overutilisation of emergency services, much like the rest of the United States. The overutilization of emergency services for non-emergency paediatric concerns is a significant challenge. This research addresses this issue by conducting a thorough investigation using both data analysis and survey data. By examining patterns of emergency service utilization and gathering insights from patient experiences, the study pinpoints areas of misinformation or lack of information among parents and caregivers regarding paediatric health needs. Through rigorous data analysis, the research has identified underlying factors contributing to the prevalent overutilization trend, including socioeconomic barriers and the effectiveness of current patient education initiatives. Additionally, the study has explored parental attitudes towards emergency services, primary care providers, and urgent care facilities in managing non-emergency paediatric health concerns. This research examines the roles of healthcare providers, policymakers, and educators in addressing identified gaps in paediatric healthcare knowledge and access. By disseminating findings to relevant stakeholders, the study advocates for targeted interventions and policy reforms to optimise resource allocation and enhance patient-centred care for paediatric populations. By promoting informed decision-making and improving access to appropriate healthcare resources that meet the needs of our community, the study aims to enhance the quality and efficiency of paediatric healthcare delivery in districts 1 and 5. Collaboration with healthcare professionals, community leaders, and policymakers will foster a healthcare system prioritizing the holistic well-being of paediatric patients while ensuring equitable access to timely and appropriate care.

Summer Kantanen

VA - James Madison University

Discipline: Physics and Astronomy

Authors:

#1 Jason Czak

Abstract Name: The Effects of Spatially Localized Functional Forms of the Inflow Rate in Reaction Diffusion Systems

The Grey-Scott Model is a prominent reaction-diffusion system that comprises two non-real chemical species, u and v , which interact through complex reactions and transformations. By manipulating parameter values within the model, spatiotemporal patterns emerge that mirror essential biological, chemical, and physical processes, including DNA oligomer formation, skin pigmentation development, and oscillatory chemical reactions. While extensive studies have typically focused on fixed parameter values, this research innovatively introduces specially defined functional forms that spatially vary key parameters throughout the lattice. Specifically, by employing sinusoidal and other oscillatory functions to modulate parameter values, we can seamlessly integrate the dynamics and behaviors characteristic of diverse parameter settings within a single reaction framework. This novel approach not only reveals a spectrum of unique and intricate patterns

but also enhances the model's applicability, extending its relevance to a broader range of natural phenomena. Through this exploration, we aim to deepen our understanding of reaction-diffusion systems and their potential implications in both theoretical research and practical applications.

Katie Kapp

WI - University of Wisconsin-Whitewater

Discipline: Education

Authors:

#1 Eric Luckey

Abstract Name: Garden Ethics: Using School Gardens to Promote Virtue Ethics in the Biology Curriculum

This research project aims to address the question: How might the use of school gardens in the instructional environment promote the development of students' virtue? While school gardens are often employed to bolster students' basic scientific competency, this project asks how gardens might also be leveraged by educators to promote our students' acquisition of Neo-Aristotelian virtues while also achieving classroom content goals. Ethics in science and research education has been a topic of increasing interest in recent years—and though some scholars have suggested virtue ethics as an alternative to the current methods of ethical instruction based on deontological and consequentialist ideas (Elgin, 2021; Rodkey et al., 2022)—there is little written about how virtue ethics can fit into the science curriculum, and even less on why and how educators might promote virtue through the educational opportunity of school gardening. My project employs philosophical methods to argue for the use of virtue ethics in science curriculum. Philosophical methods have a longstanding history in the development of curriculum and instructional practices, as they help educators answer two foundational questions; namely, “What educational purposes should schools seek to attain?” and, “What educational experiences can be provided that are likely to attain these purposes?” (Tyler, 1949). Informed by the works of Neo-Aristotelian virtue ethicists such as Snow, Zagzebski, Russel, and Kristjánsson my work makes the case that school gardens offer a prime setting for the habituation of virtue within the context of a biology course. Moreover, my research concludes with practical suggestions and curricular plans for educators to implement a school garden suitable for the habituation of virtue and the provision of high-quality biology instruction.

Isabelle Kapushinski

PA - Susquehanna University

Discipline: Biology

Authors:

#1 Isaiah Bomboy

#2 Tristan Costanza

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#4 Seth Haas

#5 Emma Kelleher

#6 Elizabeth Levin

#7 Brianna Livezey

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#9 Madison Sangrey

#10 Delana Spencer

#11 Delana Spencer

#12 Lilia Wiest
#13 Matthew Persons

Abstract Name: Herbicide and Surfactant Effects on Eclosion and Spiderling Survival in the Wolf Spider *Tigrosa helluo*

Different herbicides are often applied to crops in combination and with surfactant additives yet the toxicity of combining these agrochemicals has rarely been assessed among beneficial non-target species such as spiders. Surfactants increase the adherence and absorption of herbicides through plant leaves but may also increase toxicity to spiders by enhancing penetration through eggsacs or the spider's exoskeleton. We measured the separate and combined effects of the herbicides glufosinate and mesotrione with an organosilicone surfactant, Sil-fact®, on parental care, egg eclosion, and spiderling survival in the agrobiont wolf spider *Tigrosa helluo*. We applied water (control) or field doses of glufosinate, mesotrione, and Sil-fact in all combinations to spider eggsacs (eight treatments). We recorded initial eggsac acceptance after spraying, abandonment during incubation, and eclosion for all treatments over a 50-day period. We conducted a dye test to measure adherence and absorption of herbicides and surfactants into the eggsacs across the eight treatments. We also measured spiderling mortality when maintained on freshly sprayed soil or 3-day aged herbicide residue of mesotrione, glufosinate, or Sil-fact alone or in all combinations (15 treatments). We found no evidence of initial eggsac rejection or abandonment after eggsac across agrochemical treatments compared to the control. Some herbicide treatments showed significantly higher absorption but not adherence to the eggsac with more eggs containing herbicide tracer dye with some treatments. Exposure to fresh or aged glufosinate increased mortality among spiderlings while only aged Mesotrione residue significantly increased mortality. Sil-fact alone did not significantly increase mortality but acted synergistically or antagonistically with some herbicide treatments. Results indicate that mesotrione, glufosinate, and Sil-fact all impacted reproduction and that glufosinate and mesotrione are both powerful araneocides. The use of these herbicides and surfactants should be reconsidered in systems where spiders are used as biocontrol within integrated pest management systems.

Riley Karcher

WV - West Virginia University

Discipline: Art History

Authors:
#1 Joseph Galbreath

Abstract Name: The Gramlee Collection's Deconstructed Monograms

The focus of my research is to deconstruct historical monograms from the GramLee Collection of Commercial Wood Engravings so they can be reflected upon in a more physical sense. A monogram is a motif of two or more letterforms intertwined to create an identifier. My monogram kit consists of specimen cards printed on translucent paper, a tunnel book, foldable monograms, and an information sheet about monograms. This kit will serve as a tool for articulating the selected monograms by deconstructing their conceptualization. Monograms are one of the oldest forms of identification and are made by entangling letterforms in an interesting and engaging way. They have been used by high society as a symbol of wealth, artisans' marks or signatures, and have even been used to identify modern brands. The culture surrounding these design phenomena have always interested me. The Gramlee Collection, housed at West Virginia University, provides a variety of such forms. The ephemeral aspect of commercialized wood and metal engraving is often overlooked, however it is an important part of the history of graphic design. The two primary methods employed in researching monograms involved an in-depth analysis of the forms of selected monograms from the GramLee Collection, which has blocks for and prints of over 40 monograms. I conducted broader research through a review of relevant articles, books, and academic papers, which provided further context and theoretical grounding for the study. These consisted of the cultural and general uses of monograms and the use of decorative lettering and typography found in the GramLee Collection. The research provided

valuable insights into the exploration of letterforms, demonstrating their potential as a tool for advancing skills in logo design and hand lettering. The project emphasized the importance of historic commercial printing and design collections as well as the culture of monograms.

Emmalee Karfelt

PA - Westmoreland County Community College

Discipline: Health and Human Development

Authors:

Kira Benton

Abstract Name: Smiles Beyond the Limits of Trisomy 21

This research is dedicated to show why periodontal disease is prevalent in over 90% of individuals with Trisomy 21. Trisomy 21, also known as Down syndrome, is a non-hereditary, neurodevelopmental disorder, caused by an error in cell division during the formation of egg or sperm cells. It is the most common etiology of mental disability in the world, causing physical and intellectual limitations. According to the WHO, prevalence of Trisomy 21 is around 1:1,000 live births worldwide. The credibility of this research is supported through a multitude of studies, experiments, peer-reviewed articles, and surveys. This research was done quantitatively using statistics from studies done on patients with and without the disability. The oral microbiome in individuals with Trisomy 21 is more complex than an individual without this neurodevelopmental disorder. One of the primary features that contribute to periodontal disease in these individuals is the acidic environment commonly found in their oral cavity, allowing the present periodontal pathogens to grow and thrive at a higher rate than normal. This was shown in an experiment that tested the saliva of those with and without the disability. Individuals with Trisomy 21 have a compromised immune system and an excessive inflammatory response to periodontal pathogens, making it more difficult for dental professionals to treat disease, and for patients to maintain periodontal health. Another contributing factor to the prevalence is the insufficient amount of information about oral health being passed between dental professionals and the parents and caregivers of these individuals. A survey was given to caregivers and dental professionals of these individuals, showing that there was a low satisfaction with specific information regarding the disability. Due to these risk factors found amongst those with Trisomy 21, the prevalence of periodontal disease remains incredibly high compared to those without the disability.

Satya Kari

MD - Howard Community College

Discipline: Environmental Science and Sustainability

Authors:

#1 Cheryl Campo

Abstract Name: An insider-look into the campus community's awareness of per- and polyfluoroalkyl substances (PFAS) in food packaging at Howard Community College

This research will target a current national issue of per- and polyfluoroalkyl substances (PFAS), known as a "forever chemical", one that breaks down extremely slowly and can build up in people, animals, and the environment over time. PFAS is currently under the attention of the US Environmental Protection Agency and the Biden-Harris Administration. As of April 10, 2024, the Biden-Harris Administration launched the first-ever national drinking water standard to protect 100 million people from PFAS pollution. Previously in

2016, PFOA and PFOS (PFAS types) levels in drinking water were limited to a concentration of 70 parts per trillion. Numerous scientific studies conducted over decades reveal PFAS's adverse effects on humans when exposed over a long period of time, especially in critical life stages like pregnancy or early childhood. Now, new advisories decrease PFAS by more than a thousandfold, limiting PFOS to 0.02 ppt and PFOA to 0.004 ppt. The research answers the question "Where on campus are students and faculty exposed to per- and polyfluoroalkyl substances (PFAS) and to what extent is awareness needed around PFAS in food packaging?". A literature review will be conducted to identify common sources of PFAS in food packaging, a readily accessible source for students. The campus community will be surveyed to measure their awareness about PFAS and PFAS in food packaging. On campus food sources like the Café, Food Pantry, and vending machines will be examined. Collected data will be analyzed to determine the campus community's exposure to PFAS from food packaging. In addition, Café and Food Pantry personnel will be interviewed to understand if PFAS is considered when purchasing packaging materials. An infographic posted around on-campus food sources will be designed in response to an expected limited awareness level about PFAS in food packaging in the surveys.

Ayat Karim

PA - Carnegie Mellon University

Discipline: Psychology

Authors:

#1 Margret Henderson

#2 Ayat Karim

Abstract Name: The Neural and Computational Foundations of Human Visual Cognition

Understanding how the human brain extracts meaningful information from complex, noisy visual inputs is a fundamental challenge in cognitive neuroscience. We investigate the neural and computational mechanisms underlying visual cognition, focusing on how the brain processes intermediate-level visual features, adapts to environmental statistics, and flexibly adjusts representations to meet behavioral goals. Using a combination of experimental methods, including fMRI and behavioral studies, and computational techniques such as machine learning and artificial neural network modeling, we aim to bridge gaps between theory and application. Current research explores the hierarchical organization of visual cortex, the role of natural image statistics in category learning, and the adaptive flexibility of neural coding in response to task demands. By integrating insights from experimental data and computational simulations, our work advances our understanding of how the brain interprets and responds to the visual world, with implications for both neuroscience and artificial intelligence.

Thomas Karintholil

NY - Pace University

Discipline: Computer Science

Authors:

#1 Thomas Karintholil

#2 Thomas Schmidt

Abstract Name: Facilitating Experiential Learning with Virtual Reality

This study explores the utility of Virtual Reality (VR) as an experiential learning tool within educational

settings. We developed specialized courseware designed to enhance student engagement and learning outcomes through immersive experiences. The effectiveness of the VR courseware was evaluated in a real classroom setting. This study highlights VR's potential to bridge the gap between traditional and experiential learning, engaging more students and particularly neurodivergent students in the classroom environment.

Gabriela Karlan

IL - University of Chicago The College

Discipline: Environmental Science and Sustainability

Authors:

#1 Gabriela Karlan

Abstract Name: The National Chicken Council vs. the Better Chicken Commitment: Environmental, Ethical, and Public Health Implications of the U.S. Industrial Poultry Debate

The US grows over 9 billion chickens yearly yet best production practices are heavily contested. The two opposing parties involved in the debate — the National Chicken Council and Better Chicken Commitment activists — clash primarily on one critical component of industrial production: the growth rate of the chicken. Their perspectives diverge on which direction the growth rate should move — up or down. Yet, the arguments for both sides are (1) ripe with misaligned incentives and (2) supported by contradictory claims and evidence. My thesis provides three additions to the poultry debate. First, supplementary calculations on central questions that are understudied, e.g. calculations on the differential greenhouse gas effects of the variable feed compositions and feed conversion rates. Second, a qualitative meta-analysis of methodology to standardize outcome variable units, i.e. provide guidelines for what units of interest are pertinent and what analyses are methodologically sound. Third, a comprehensive overview of all relevant externalities of both systems in order to avoid oversimplifying the conversation to a singular metric such that the debate overlooks the core issue: maximizing total social welfare. Through these three additions, I develop a base of evidence to support policy that promotes faster-growth chicken production, highlighting that widespread adoption of industrial slow-growth chicken production would lead to (1) substantially higher and critically unsustainable environmental externalities, (2) increased chicken suffering due to a larger population of industrially raised chicken, and (3) a significant decrease in the protein purchasing power of low-income households in the United States.

Keyur Karmacharya

MN - Minnesota State University - Mankato

Discipline: Biology

Authors:

#1 Keyur Karmacharya

#2 David Okanta Dade

#3 Cecilia Noecker

Abstract Name: Comparison of Metabolic Functions in the gut bacterial family Eggerthellaceae in Non-human Primates

The gut microbiota consists of trillions of microbes and is crucial in health and disease in vertebrates, including humans and other primates. Eggerthellaceae, a bacterial family in the mammalian gut microbiome, is important in various specialized metabolic processes. Although this family is common in mammals, their

roles in non-human primates (NHPs) remain largely unexplored. This study investigates how Eggerthellaceae metabolic functions vary across primate hosts, focusing on conserved core metabolic pathways and specialized genes involved in flavonoid and lignan metabolism. We analyzed 12 high-quality Eggerthellaceae metagenome-assembled genomes (MAGs) from the gut microbiomes of 5 NHP species. We annotated metabolic functions using DRAM, RAST-tk, metabolic modeling, and BLAST, comparing the results to the common human gut microbe *Eggerthella lenta*. Our preliminary results reveal that Eggerthellaceae in NHPs share many but not all metabolic traits. For example, amino acid transporter profiles differ between NHP strains. *Senegalimassilia*, a genus in primate gut microbiota, exhibits more similarity to human-associated strains than other genera. Additionally, none of the NHP genomes contain genes similar to the *ber* lignan reductase in *Eggerthella lenta*. Our ongoing work includes identifying additional genes involved in polyphenol metabolism and investigating the potential coevolution between Eggerthellaceae and NHPs. These efforts aim to deepen our understanding of how host phylogeny and dietary adaptations influence the metabolic functions of Eggerthellaceae in primate gut health. This variability could provide new insights into the evolution of gut microbiota and how its functional roles differ between humans and NHPs.

Mihira Karnik

PA - Washington & Jefferson College

Discipline: Biology

Authors:

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Abstract Name: Examining gene expression differences in transgenic *Drosophila* model of neurodegeneration using qPCR

Deposition of the microtubule-associated protein tau is a hallmark pathology of the family of neurodegenerative diseases known as tauopathies, including Alzheimer's disease, frontotemporal dementia, and chronic traumatic encephalopathy. Ongoing work on mechanisms of tau-mediated neurodegeneration suggests that genetic contributions interact with peripheral or environmental factors to contribute to disease onset and severity. Our lab uses *Drosophila melanogaster*, the fruit fly, as a transgenic model of human tauopathy. Using a screen to identify genetic modifiers of neurodegeneration, we selected multiple gene targets to examine expression differences in tau transgenic flies compared to controls. qPCR results showed notable differences in gene expression in transgenic *Drosophila* expressing human tau protein in neurons, suggesting aberrant regulation of multiple cellular processes central to neurodegeneration. Taken together, these results imply that these gene pathways holds promise in pursuing therapeutic targets aimed at mitigating associated neurodegeneration.

Ajla Kastrat

NY - City University of New York - City College of New York

Discipline: Psychology

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Nahila Nzina

Abstract Name: Frontal Alpha Asymmetry and Emotional Processing in College Women with Different Levels of Body Dissatisfaction

Body dissatisfaction, characterized by persistent negative self-perception, is shaped by an internalized perception of the thin ideal reinforced by social media. It is linked to anxiety, depression, and disordered eating, yet its cognitive and neural underpinnings remain underexplored. This study investigates frontal alpha asymmetry (FAA), an EEG marker of emotional and motivational processing, in college-aged women with varying levels of body dissatisfaction. FAA reflects the balance of brain activity between the left and right frontal hemispheres, where greater right-sided activity is often associated with negative emotions and withdrawal behavior. We hypothesize that: (1) participants exhibiting on average negative FAA scores during the Flanker task will exhibit greater attentional interference in reaction time and accuracy when responding to high vs low body shape stimuli; and (2) participants with higher scores on the BSQ will exhibit greater right-sided frontal alpha asymmetry (FAA < 0) with high body weight stimuli, reflecting more negative emotions and withdrawal behavior, suggesting a link between body dissatisfaction and negative emotional processing. Participants completed surveys assessing body image and eating attitudes, followed by a selective attention task using a modified Eriksen Flanker Task. Stimuli included body-only images categorized as underweight, healthy, or overweight, with targets superimposed. EEG data, recorded at 160 scalp electrodes, measured alpha power asymmetries during task performance. Ongoing analyses focus on comparing FAA across body dissatisfaction groups and its relationship with task performance metrics, such as reaction time and accuracy. Preliminary expectations suggest that individuals with high body dissatisfaction will display more withdrawal-related FAA (right-sided alpha power), particularly in response to overweight body stimuli. This research aims to advance our understanding of the neural mechanisms underlying body dissatisfaction and its emotional and cognitive dimensions, contributing to the broader field of body image research.

Sophia Kastriner

NY - Long Island University

Discipline: Interdisciplinary

Authors:

#1 Sophia Kastriner

Abstract Name: Action for change: Exploring volunteers' motivations to bolster environmental conservation

The climate crisis is one of the foremost global challenges of our time. Widespread degradation driven by human activities threatens ecosystems, human livelihoods, and global stability, requiring urgent, coordinated action to reduce harmful practices, address current crises, and prepare for future impacts. Large scale coordinated efforts are vital to address the myriad of issues affecting the Earth, and local volunteer communities have the potential to address this labor gap. Every individual is capable of supporting a conservation initiative's impact through hands-on action. This transdisciplinary qualitative case study explored the motivations driving individuals to volunteer at the wildlife rehabilitation center the Australian Seabird and Turtle Rescue (ASTR) in Ballina, New South Wales, Australia, in the hopes that identifying these motivating factors can assist in developing effective recruitment strategies for nonprofit conservation efforts. Running from September to November 2024, the study employed a participatory action research framework along with collective action theory, and combined surveys, semi-structured interviews, and participant observation to gather qualitative data. Findings reveal that most volunteers fall into two categories: retirees and students seeking experience. In addition, this study discovered that numerous volunteers cited concerns regarding the local environment as a primary motivator for their actions, whereas the broader issue of the global climate crisis was rarely mentioned. Additionally, participants frequently mentioned the presence of a

positive and meaningful community as a key reason for attendance. This case study suggests that organizations effectively retain volunteers when they are invested in the mission, enjoy their time working, and have the free time to dedicate to volunteering. Community engagement approaches based on bolstering these qualities may have the potential to strengthen conservation efforts by encouraging volunteers to be more likely to commit their time and resources to the organization.

Johaana Kathilankal Jis

GA - Kennesaw State University

Discipline: Biology

Authors:

#1 Lingtao Chen

Abstract Name: A Comprehensive Database Collection for Alzheimer's Disease: Organizing Key Research Domains to Enhance Diagnostics and Treatment

Alzheimer's disease (AD) is a neurological disorder that is progressive and characterized by gradual degeneration of brain cells. This disease results in the decline of cognition, memory, and behavior. According to the National Institute of Aging, AD is currently ranked 7th leading cause of death in the U.S. Our research objective is to review existing computational methods and databases for further AD research. The paper starts with a brief introduction about AD, computational methods and databases. The computational methods focus on Molecular Dynamic (MD) Simulation and Machine Learning models. The next section talks about clinical and scientific databases including International Alzheimer's and Related Dementias Research Portfolio and the National Alzheimer's Coordinating Center amongst others. These databases are classified into different categories such as biomarkers, genetic research, and many other categories. In the application section, this paper introduces applications related to AD treatment, early detection, and progression. This research aids medical professionals, researchers, and pharmaceutical companies with valuable data to improve AD research and treatment.

Anika Katkich

PA - Duquesne University

Discipline: Biology

Authors:

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Abstract Name: Investigating the Effects of DNA Ligase III Knockdown on HSV-1 Infection

Herpes simplex virus type 1 (HSV-1) is an ~152 kb double-stranded DNA virus that infects over half of the population. As an abiotic obligate parasite, HSV-1 uses cellular factors for propagation. Our lab previously found that DNA Ligase III (Lig3) associates with HSV-1 DNA. Lig3 is a eukaryotic, ATP-dependent enzyme that facilitates phosphodiester bond formation to anneal single strand nicks that form during DNA repair and Okazaki fragments during DNA replication. We hypothesize that HSV-1 recruits cellular Lig3 to help facilitate viral DNA replication or repair and predict that Lig3 knockdown will decrease viral yield. We identified an antibody targeting Lig3, confirmed that Lig3 levels remain consistent during infection, and optimized siRNA-mediated Lig3 knockdown conditions. We also determined how Lig3 knockdown affects viral yield through plaque assays. Data demonstrate a two-fold decrease in viral yield, indicating that cellular Lig3 may play an important role in HSV-1 infection.

Zoe Katres

CO - University of Colorado at Boulder

Discipline: Engineering

Authors:

Abstract Name: Teleconnections & Topography: Discovering Underlying Relationships Between Sea Surface Temperatures, Snowmelt, and Streamflow

Predicting annual water supply in high elevations of the Western United States between 36° and 41° latitudes has proved challenging due to its position in a transitional zone of correlation with El Nino-Southern Oscillation (ENSO). As a result, the correlations between water supply and ENSO are weak and variable. If predictions are improved, water agencies can implement efficient water resource management, preventing floods or enhancing water storage (Anghileri et. al., 2016). Recent studies have highlighted promising correlations between sea surface temperatures (SSTs) in the Northern Pacific and North Atlantic oceans and snow-water equivalent depth (SWE) data over larger regions of the Western United States, suggesting an opportunity to enhance water supply predictions (Zhao et. al., 2021, Stone et. al, 2023). To date, this study has determined relationships between SSTs and SWE on opposing slopes of several North-South and East-West oriented mountain ranges, assigning SST prediction centers to each local slope. The next phase of the research is analyzing the dependency of SWE when predicting streamflow, as variations are expected due to the different mechanisms of SWE accumulation in these regions. A previous study suggests snow accumulation is the dominant contributor in the Western United States, especially in the mountainous northwest regions whereas soil moisture is a larger contributor to runoff for drier southeastern basins (Koster et. al., 2010). The analysis tests SWE from the SST prediction centers and relates it to streamflow by applying the water balance equation. The results of investigating SST-predicted SWE and streamflow in small mountain watersheds have yet to be determined, however, data suggest the dependency will vary based on the local soil moisture, evapotranspiration, and additional hydrological factors of each location.

Helen Katyal

PA - University of Pittsburgh

Discipline: Economics

Authors:

Abstract Name: Analyzing the Impact of Nonprofit Healthcare Status in Pittsburgh and the Impact on Community Health and Accessibility

The research investigates the impact of nonprofit healthcare organizations in Pittsburgh, with a primary focus on University of Pittsburgh Medical Center (UPMC) and Allegheny Health Network (AHN). The central question addresses whether these nonprofits sufficiently justify their tax-exempt status by contributing to community health and accessibility, particularly for low income populations. This research aims to provide a comprehensive analysis of the role these organizations play in Pittsburgh's healthcare landscape, examining their financial setups, community contributions, and the challenges they face in fulfilling their charitable missions. The research takes place within broader debates on the accountability of nonprofit healthcare entities, contributing to an understanding of how these institutions balance their mission with the financial advantages of tax exemption. Methodologically, the study employs a literature review of existing reports and media coverage, quantitative analysis of financial data—including tax exemptions and expenditures on

community benefits—and case studies of community health initiatives. Additionally, the qualitative data includes discussions with stakeholders to provide qualitative insights into perceptions of these organizations' impact. Preliminary findings indicate that, while both UPMC and AHN offer essential services for low-income communities, there are ongoing concerns about the adequacy of these contributions relative to the tax revenue lost due to their exemptions. UPMC, for example, is criticized for prioritizing profit-oriented practices over its charitable mission, sparking local calls for increased accountability. Expected outcomes of this research include policy recommendations for enhancing nonprofit accountability, such as strengthening Payment in Lieu of Taxes (PILOT) agreements, and identifying best practices in community engagement that could be expanded to ensure more equitable access to healthcare. This study ultimately seeks to inform policy changes that balance financial sustainability with nonprofit organizations' obligations to support the communities they serve.

Elyssa Kaufman

NC - Elon University

Discipline: Environmental Science and Sustainability

Authors:

#1 Elyssa Kaufman

#2 Kira Campagna

Abstract Name: The Effect of Outdoor Mindfulness Practices on Nature Connectedness and Mindful Awareness

Decades of psychology and neuroscience research have demonstrated the ways in which mindfulness practices alter brain wave patterns and, over time, can alter individuals' dispositions and brain structures. In this mixed-methods study, we investigated the effects of an in-class mindfulness practice. This practice is known as the "sit-spot assignment," where students spend up to 15 minutes in a natural setting, taking notes on details noticed via utilization of the different senses and journal about their observations. This research explores how participating in repeated sit-spots impact students' connectedness with nature and mindful attention awareness. Participants completed pre- and post-surveys to measure their connectedness to nature and mindful attention awareness. Students completed eight sit-spots in total: The pre-survey was completed prior to the first sit-spot assignment and the post-survey was completed after the final sit-spot. Pre- and post-survey results were compared using a between-subjects t-test and by calculating the effect size. After the intervention, students completed a project and reflection to demonstrate their learning during the corresponding unit, which were analyzed qualitatively for the impact of the sit-spot intervention. With intentions of gaining a broader understanding of the effect of the mindfulness activity, as well as to serve as a control group, data was also collected from students participating in a study abroad course in Panama. The intention behind this was to make a comparison between the data collected from students who participate in the "sit-spot assignment," and those who did not, but still spend extended periods of time in nature. Preliminary results demonstrate benefits for both mindfulness and nature connectedness in the sit-spot group.

Jacob Kaufmann

WI - University of Wisconsin-Parkside

Discipline: Computer Science

Authors:

Abstract Name: Correlations between median household income and electric car registrations by county

within the United States and how they can be used to help fight climate change

This study explores the correlation between median household income and the population of electric vehicles (EVs) registrations by county within the United States, aiming to predict EV populations in other countries across the globe. By analyzing data from each county's socioeconomic situations and the electric vehicle sales and registrations within those counties, I investigated whether higher incomes correspond with greater EV adoption rates. Using a combination of statistical analysis and machine learning models, my research provides insights into the socioeconomic factors influencing EV ownership. My findings indicate a significant positive correlation between median household income and the number of electric vehicle registrations, suggesting that higher-income counties tend to have more EVs. This correlation can be used to predict EV adoption patterns in other regions with similar socioeconomic characteristics. Moreover, the implications of my work extend beyond the United States, as the methodology can be adapted to forecast EV populations in different countries, contributing to global efforts in understanding and promoting sustainable transportation. This correlation can be used to help electric vehicle companies understand where there are less sales in certain areas within the same states and areas and use this to help them make sales to continue trying to make the earth a cleaner place to live. States can also use this information to see where certain laws for electric vehicles may help while other areas might be hurt by these new laws and also can be used to help the states boost up certain counties median incomes to help try to facilitate more electric vehicle sales to help the state have cleaner air. This can also help other countries across the world bring up EV usage in places that are lacking and can look at this to help bring it up and help create a cleaner world.

Gagandeep Kaur

CA - University of California - Merced

Discipline: Biology

Authors:

#1 Brian Wang

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Abstract Name: Unexpected Sexual Dimorphism in Thirsty Water Seeking through Peptidergic Signaling in *Drosophila melanogaster*

Thirst is a highly motivated state that drives a sequence of behaviors to ensure proper balance of water to meet the body's needs. We quantify water intake, water seeking, and feeding behavior to assess thirst levels and discover the thirst circuitry in fruit flies. We primarily assess water-seeking behavior to reveal the fly's motivation to find water, reflecting the want for water. Both sexes need water and express the same thirst-related behaviors for water homeostasis. However, we discovered AstAergic (Allatostatin A; homologous to kisspeptin/spexin/galanin) thirst neurons called Janu-AstA in fruit flies that promote water seeking in males only. Janu-AstA also inhibits feeding behavior and encodes for reward suggesting Janu-AstA encodes for the rewarding anticipation of water when thirsty. We expanded the sexually dimorphic water-seeking circuit by discovering male-specific NPF (Neuropeptide F; homologous to NPY) neurons, the NPF-Ms, are downstream of Janu-AstA. NPF-Ms inhibit water-seeking and courtship behavior in males. My research aims to test the involvement of NPF-Ms in water intake and feeding behavior to uncover the complete role of the sexually dimorphic NPF-Ms in the thirst circuitry. Since NPF-Ms are downstream of Janu-AstA, we hypothesize NPF-Ms inhibit feeding behavior without affecting water intake behavior like Janu-AstA. Our findings lay the foundation of sexual dimorphism in thirst that allows us to further test the circuitry underlying differences in motivational states between males and females.

Harmanpreet Kaur

MD - Johns Hopkins University

Discipline: Biochemistry

Authors:

#1 Harmanpreet Kaur

Abstract Name: Identification of SOX2 Transcription Factor Binding Partners During Zebrafish Hearing Regeneration and Development

Hair cells (HC) are mechanosensory receptors that reside in the inner ear and are responsible for hearing in vertebrates. While damage to the mammalian inner ear HCs is irreversible, non-mammalian species have an innate capacity for hair cell regeneration (HCR) after injury to HCs. In zebrafish, regenerative capacity of HCs depends on the activation of a pool of surrounding cells called supporting cells (SCs) into new HCs, but the mechanistic details of the pathway controlling this transition remain elusive. Previous single-cell experiments suggest that during HCR, the SOX transcription factors (TF) are recruited to enhancers in the supporting cells to trigger a regenerative response, while both SOX and SIX family of transcription factors are recruited to enhancers in cell types that have already been specified to lock in a HCs specific fate. Of particular interest is the SOX2 TF, whose expression increases significantly as SC transdifferentiate, and altering expression of SOX2 causes a disruption in HCR in the inner ear. Considering SOX2's known role as a stem cell pluripotency factor that can interact with regulatory proteins in complexes such as SOX5/6 and OCT4 during development, we are positioned to address if SOX2 is able to interact with other proteins in zebrafish to successfully drive the HCR program. We hypothesize that SOX2 is involved in binding interactions with proteins that co-regulate DNA expression and impact SOX2's ability to drive HCR. We describe a method to purify SOX2 complexes from larvae whole-body cells and adult zebrafish inner ear HCs. We have successfully generated a zebrafish line with the HA (hemagglutinin) tag attached to SOX2 and detected intracellular SOX2-HA complexes with an anti-HA tag antibody. Co-immunoprecipitation of larval zebrafish cells containing SOX2-HA complexes has revealed at least one major SOX2 complex in larval zebrafish and will now be confirmed using mass spectrometry.

Simon Kawasaki

GA - Kennesaw State University

Discipline: Music

Authors:

Abstract Name: L'Amore Infranto: The Sustainability of Opera in American Society Past 2024

In our lifetime, we may witness the death of an art form in America. Opera is difficult to sustain if sufficient rewards are not earned after thousands of dollars are spent on one production. Many regional opera houses in America have found it difficult to fill seats after COVID-19, and they struggle to set up a system of alternative entertainment (and alternative funds), as San Francisco and the Met have done. Even then, are those funds sustainable? My research project will address the lives of the thousands of people who have dedicated their lives to the opera industry but face an uncertain and seemingly bleak future. By analyzing attendance statistics for opera houses, conducting interviews with artists, and exploring historical context, I aim to uncover whether or not this expensive form of art can survive in the changing cultural landscape of America. The research and presentation will cover several areas of focus, including how social media, COVID-19, and the lack of government funding have affected the industry. My project references multiple pieces of scholarly writing, credible articles, and comprehensive data, some of which I have acquired through

the Atlanta History Center. The project's goal is to produce a valuable resource for struggling opera houses looking for industry insights that will improve their way forward. Ideally, the project will aid in reinforcing the longevity of opera in the United States. Opera students, patrons, and nearly all community members in the American operatic industry will be able to benefit from the information and insights presented in the project, and the transmission of this project in presentation form may bring a wider attention to career-jeopardizing issues within the operatic realm.

Lauren Keeton

OK - University of Central Oklahoma

Discipline: Nursing and Public Health

Authors:

Abstract Name: Utilizing Technology to Improve Medication Adherence in Transplant Recipients

Organ transplantation has been a successful treatment option for patients experiencing organ failure because of the use of immunosuppression therapies. Without immunosuppression patients are at risk for rejecting their transplanted organ. These therapies are widely known to be rigorous for patients to manage. Because of this, there is a significant prevalence of nonadherence to these regimens. There is evidence that certain demographics and characteristics of patients make them more likely to be nonadherent such as young age, lack of social support, lower education, and lower economic status. With the advancements of technology in the healthcare setting, research shows that utilizing technological tools is a feasible intervention to help transplant recipients adhere to their medications with the engagement and monitoring of healthcare inclined personnel. Nurses are an important part of a transplant patients care team as they spend an ample amount of time with them performing assessments, education, and evaluating their treatment outcomes. The aim of this project is to contribute high quality research to transplant patient care lead by self-efficacy nursing theory. This project proposes a 16-week quality improvement study to research the effects of patients' medication adherence utilizing a mobile health app, and wireless pillbox, with interventions and coaching provided by a nurse guided by nursing theory. Purposive sampling will be utilized to recruit 30 patients from an outpatient transplant clinic. Data will be collected using the wireless pillbox, and standardized assessments. Results from this research have the potential to improve the standard of care for transplant recipients and provide them with new tools to help them effectively manage their treatment. Keywords: organ, transplant, medication, adherence, technology

Isacc Keffer

TN - Trevecca Nazarene University

Discipline: Psychology

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#2 Mackenzie Froelich

Mackenzie Froelich

Abstract Name: Screen Time, Social Media, Social Media Dependence, and Sleep Quality: A Correlational Analysis

This study aimed to determine if compulsive cellphone usage and social media addiction were correlated with poor sleep quality. Previous literature showed a correlation between social media use and poor sleep quality,

particularly when used directly before bed. Research also revealed correlations between compulsive cellphone use and various adverse side effects. In consideration of the literature, the following hypotheses were proposed. First, compulsive cellphone usage scores positively correlate with social media dependence scores. Second, social media dependence scores will correlate positively with sleep disturbance scores. The third hypothesis is that social media dependence scores positively correlate with sleep quality scores. In order to test, the Brief Pittsburgh Sleep Quality Index (B-PSQI), the Bergen Social Media Addiction Scale (BSMAS), and the Compulsive Cellphone Use Questionnaire (CCQ) were administered for this study. After IRB approval, instrument packets and consent forms were distributed in classrooms with permission from professors. Participation was voluntary and confidential. One hundred twenty-six ($N = 126$) undergraduate students participated in the study. The participants were students of all classifications from Introduction to Biblical Faith, World Civilization Ancient/Medieval World, General Chemistry I, and General Psychology classes. The collected data were analyzed in SPSS using a Pearson correlation analysis. Compulsive cellphone usage did not correlate with poor sleep quality at $r = .066$, $p = .233$ one-tailed. Social media addiction scores were unrelated to sleep quality scores, $r = .043$, $p = .317$ one-tailed. In contrast, compulsive cellphone use scores were moderately correlated with social media dependence scores, $r = .669$, $p < .001$ one-tailed. Limitations included possible response bias, differences between actual and observed sleep quality, and the lack of a convenient way to gather exact screen time. Future researchers should include an exact screen time questionnaire and a full PSQI survey.

Sara Kelemen

PA - Duquesne University

Discipline: Nursing and Public Health

Authors:

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Abstract Name: Analysis of Hormonal Patterns in PCOS Across Ages Using MIRA (A fertility app)

This research investigates fertility trends in women using the MIRA fertility tracker, focusing on the hormonal health of individuals with and without polycystic ovarian syndrome (PCOS). By analyzing key hormones—luteinizing hormone, progesterone, and estrogen—we aim to identify patterns in hormonal fluctuations with age. The data, self-reported through the MIRA app, provides recordings of hormone levels via urine analysis to predict menstrual cycle phases, particularly ovulation. Menstrual health conditions, such as PCOS, are reported within the app and significantly impact reproductive health by causing irregular, infrequent, or prolonged cycles, which affect ovulation and overall fertility. To statistically model these patterns, we utilize a Hidden Markov Model (HMM) to analyze hormone trajectories in regular and irregular cycles. This approach enables us to uncover hormonal trends across age groups, comparing individuals with and without PCOS. Our findings enhance the understanding of menstrual cycle variability influenced by health conditions and age, offering valuable insights into fertility prediction and reproductive health management. These results could contribute to more personalized and effective approaches in fertility tracking and reproductive healthcare.

Samantha Keller

WI - University of Wisconsin-Superior

Discipline: Music

Authors:

#1 Sami Keller
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#3 David Potter

Abstract Name: Mino-bimaadiziwin: an Ojibwe Musical Pedagogy

Originally, the research questions below were meant to answer my question of Indigenous presence in US music curriculum and possible parallels to other influences of music. What I found was pervasive Whiteness (Koza 2010) in the literature and primarily white voices determining the authenticity of Indigenous narratives (Connell and Gibson 2004) (Crawford 2001). As a result of this I intentionally put the focus and perspective on Indigenous voices. I conducted qualitative research; my method was narrative inquiry. This was done by purposeful interview. After a follow-up interview, Taskapa and I created a pedagogical framework based off the Ojibwe way of life known as Mino-Bimaadiziwin, The Good Life. My research questions include: What was the social climate for Lake Superior Ojibwe during their time of engagement with music teaching and learning? How were Lake Superior Ojibwe exposed to music? How did Lake Superior Ojibwe view the impact of music education policies and curriculum in relation to their cultural values and practices?

Zane Kelley

PA - Carnegie Mellon University

Discipline: Psychology

Authors:

#1 Zane Kelley
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Abstract Name: Racial Discrimination and Relationship Outcomes: A Meta-Analysis

Discrimination has been associated with poorer physical health, greater depressive symptoms, and greater relationship strain for the person who experiences discrimination (target) and their partner. One possible explanation for this outcome could be stress spillover which posits that stressful life circumstances drain an individual's self-regulatory resources. This depletion of self-regulatory resources has been shown to mediate the relation between daily stress and marital satisfaction. However, other research has shown that individuals who faced more frequent daily discrimination and blamed their partner for negative behaviors caused by stress were more likely to report a mutual approach to coping with discrimination and more positive relationship qualities, implying that a shared view of discrimination may be beneficial. In support of this finding, longitudinal research with African American couples has found experiencing racial discrimination is related to higher quality of support. Thus, the link of discrimination to relationship outcomes is unclear. Because relationships are a resource that buffers the negative effects of stress—possibly including discrimination—it is important to understand this link. To do so, we undertook a meta-analytic review of the literature on the relation of discrimination to relationship outcomes, including social support, relationship satisfaction, and relationship conflict. Following the PRISMA protocol, we have undertaken an exhaustive literature search, screened through abstracts and full texts, and extracted methodological characteristics and study results. This meta-analysis will allow us to identify the link between discrimination and a host of relationship outcomes as well as moderators of that link.

Morgan Kelley

Discipline: Health and Human Development

Authors:

#1 Morgan Kelley

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Abstract Name: Effect of Caffeine Intake on Bidirectionality of Sleep and Pain Relationship

One-third of college students report obtaining less than seven hours of sleep per night, the minimum recommended amount for adults. Poor sleep has been linked to adverse conditions, including increased pain, which can be exacerbated by factors such as caffeine intake. Caffeine, a common stimulant among college students, has been shown to interfere with sleep quantity, potentially influencing pain perception. A decrease in caffeine intake may lead to withdrawal symptoms, causing an increase in pain. Based on these findings, we hypothesize that higher caffeine intake will be inversely related to pain reports and sleep quantity.

Additionally, we hypothesize that a 1-hour nightly sleep extension for one week will improve pain outcomes and reduce caffeine intake. To test these hypotheses, baseline data was collected from college students aged 18 to 24 during a week of normal activity. Participants were then randomly assigned to either a sleep extension group (≥ 1 hour per night) or a control group and data was collected for an additional week.

Physiological and lifestyle data was collected—including self-reports of caffeine intake, sleep, and subjective pain levels. Daily surveys were used to measure caffeine intake, sleep quantity, and self-reported pain.

Objective sleep quantity was measured with actigraphy, looking at variables such as total sleep time (TST) and time in bed (TIB). We report on baseline correlations between sleep metrics, caffeine intake, and pain measures, as well as the differences between the baseline and sleep extension week for reported pain and caffeine intake. The findings from this research can inform us about the complex relationship between caffeine, sleep, and pain, providing insights that may help reduce the burden of sleep deficiency on pain-related outcomes.

Maddox Kelly

OH - Walsh University

Discipline: Biology

Authors:

#1 Neil Walsh

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Judy Salemdawod

Abstract Name: A Novel Protocol for Utilizing AI to Advance Scientific Research

A team of student researchers investigated the potential of AI technology to enhance undergraduate research strategies in biology including clinical applications and environmental topics. After investigating prompt engineering and ethical considerations, researchers created a novel protocol for fellow students that had a stepwise approach to best practices for utilizing AI in designing scientific studies. This work evaluated five different chatbots as well as NotebookLM, Scholarcy, Connected Papers, and Elicit. After evaluating several trials, significant trends were noted. Regarding prompt architecture, data showed that formulating the correct question was essential in acquiring accurate output. Prompt analysis indicated the importance of specificity

and clarity as given by this breakdown: specifying the format (40.0%), establishing a timeline for references (40.0%), and requesting a particular word limit for output (20.0%). Further trials with Gemini, Claude, ChatGPT revealed a success rate (66.7%) where ChatGPT's failures were discovered under identical parameters. In another study to determine the practicality of AI for real-life applications in biology, data indicated several options with this breakdown: analytical application (33.3%), biological explanation (33.3%), study assistance (16.7%), and laboratory assistance (16.7%). Another set of experiments indicated a breakdown for ethical considerations such as validity for AI responses (28.6%), privacy concerns (28.6%), and unethical use (42.8%). These findings served as the vision of the stepwise protocol for utilizing AI in biological undergraduate research both efficiently and ethically. Interestingly, student researchers gained new skills toward career readiness through high-impact practices such as collaborative work and the application of technology through a common intellectual experience. Consequently, the student-created protocol enhanced scientific research for the other groups of researchers and became a successful model for the division, particularly aligning with the institution's mission of service to others.

Mya Kelly

MA - Boston University

Discipline: Education

Authors:
Thai Daniel

Abstract Name: Examining the Disparities Faced by High-Achieving Rural African American Adolescents

This study examines the academic experiences of high-achieving rural African American students, a group significantly underrepresented in research. Two primary questions guide it: 1) How do high-achieving rural African American adolescents describe their school experiences? and 2) What factors shape their school achievement? The study explores the role of family, peers, and teachers in fostering students' academic resilience. This qualitative study utilized a convenience sample of 32 high school students in grades 9–12 (25 females and seven males) with an average GPA of 3.55. Each student participated in interviews about their beliefs regarding education and the influence of family, peers, and teachers on their academic success. Sample interview questions included: What does it mean to be a high-achieving student? Walk me through a day in the life of a high-achieving student, and What or who encourages you to do well in school? Semi-structured interviews, lasting 45–60 minutes, were conducted in person at "Allegheny High School" (a pseudonym). Using thematic analysis, the researcher examined each interview for recurring themes and patterns. Each recording was reviewed, and transcripts were carefully analyzed to ensure accuracy, with notes taken to identify shared and divergent perspectives across participants. Six prominent themes emerged regarding students' views of and experiences with school: Education for Liberation, Achievement as Purpose, Stumbling into College, Invisible Me, Schools as Gatekeepers, and Parents as Partners. The data highlight each student's resilience. Findings suggest that, for the rural students in this study, excelling in school was about more than advancing their personal academic and professional opportunities—it was about contributing to and uplifting their community. This research seeks to deepen the understanding of marginalized African American students and identify factors that support their academic success.

Elise Kelly

PA - Pennsylvania State University

Discipline: Biology

Authors:

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#2 Matthew Gruwell

Abstract Name: Fungal Diversity on the Penn State Behrend Campus

Biodiversity is vital in maintaining the ecological balance of the environment. Understanding fungal diversity can give insight into the conditions and health of an area. A great way to promote the beauty and importance of biodiversity is through field guides and catalogs. The goal of this research is to create a Fungal Diversity catalog of the Penn State Behrend campus by collecting fungal samples, extracting the DNA from the samples, amplifying that DNA, and classifying each fungal species. Fungal samples were collected on the Penn State Behrend campus and from surrounding areas. The fungal Genomic DNA extraction protocol from Strauss et al. was followed and PCR (Polymerase Chain Reaction) was then implemented to amplify the fungal DNA. The samples will be sent for sequencing and the results will be used to compile the catalog. This project will continue throughout the seasons to provide a thorough representation of the fungal diversity on the Behrend campus. The completion of a Fungal Diversity Catalog will give insight into the diversity of the Penn State Behrend campus environment. The catalog will also encourage students to spend time outdoors identifying fungus and observing biodiversity in nature.

Brooke Kelly

PA - California University of Pennsylvania

Discipline: Biology

Authors:

#1 Michelle Valkanas

Abstract Name: The Effects of Microbial Communities on Leaf Litter Decomposition Due to Exposure to Different Environmental Factors and Differing Leaf Types

Decomposition of leaf litter is impacted by a multitude of factors such as what microorganisms are present, environmental influences, and what enzymes are released. Different leaf types are uniquely impacted by these factors and impact the overall rate of degradation. This then goes on to affect the ecosystem around it by altering nutrient cycling (CO₂ and Nitrogen), soil health, and the overall composition of the decomposers communities in particular areas. To better understand differences in leaf decomposition, two different leaf litter types, one native to Southwestern Pennsylvania, Sycamore (*Platanus occidentalis*), and other invasive, Knotweed (*Reynoutria japonica*), were collected bi-monthly for 8 months. To account for environmental influences that may impact degradation, samples were collected from the ground and the water. DNA was extracted from all leaf types and the 16s and 18s was sequenced to identify the bacterial and fungal communities. Sequences were analyzed to identify differences in microbial composition. During the same time period, leaves were also collected weekly and five enzymes (cellulase, pectinase, acid phosphatase, polyphenol oxidase, and chitinase) concentrations were tested. The differences identified between the two groups of leaves suggest that decomposition, while driven by similar organisms and processes, vary between Sycamore and Knotweed species. Comparing and contrasting the various microbiomes found on two different leaf types under different environmental conditions can lead to a better understanding of the microorganisms involved in degradation, the enzymes produced, and what environment is most favorable.

Brooke Kelly

PA - California University of Pennsylvania

Discipline: Biology

Authors:
#1 Louise Nicholson

Abstract Name: Comparing the effects of different environmental factors on seizure behavior in *Drosophila*

Epilepsy affects around 50 million people worldwide. It comprises a diverse array of seizure types and causes, including both genetic mutations that affect nerve cell activity and factors such as traumatic brain injury, congenital abnormalities, and brain infections, as well as unknown causes. Individuals may therefore have distinct types of epilepsy and may be affected differently by environmental factors. In this study we used the fruit fly, *Drosophila melanogaster*, to compare how environmental factors affect seizures in four different genetic mutants associated with epilepsy: paralytic (para), ether-a-go-go (eag), easily shocked (eas), and kazachok (kcc). Each gene affects a different aspect of neuronal function and has a human homolog. Mutant and wild-type flies were exposed to four environmental factors; two triggers – sleep deprivation and hypoxia – meant to trigger seizure-like activity, and two preventative factors – vitamin B6 and folic acid. Once exposed, seizure activity was induced, recorded, then compared against flies that were not exposed to environmental factors and to wild-type. Preliminary data indicates that hypoxia has the biggest influence on seizure activity, increasing the likelihood and duration of seizures in all mutants. Surprisingly, sleep deprivation only increased the likelihood of seizures in one mutant. Folate decreased the length of seizure episodes for some mutant genotypes, suggesting it could be an effective treatment for some forms of epileptic seizures but not all. Vitamin B6 did not appear to decrease seizure activity for any of the mutants tested, suggesting it may not be broadly applicable preventative measure. Understanding the factors that influence seizure susceptibility and cause seizure variation in different types of epilepsy will help to better understand how to prevent seizures.

Mikayla N. Kendall

GA - Georgia State University

Discipline: Health and Human Development

Authors:
#1 Hannah Lichtenstein
#2 Michelle K. Sequeira
#3 Nneka Otuonye
#4 Jessica L. Bolton

Abstract Name: Early-life adversity alters microglia-mediated synaptic refinement of corticotropin-releasing hormone-expressing neurons

Early-life adversity (ELA) is a risk factor for developing neuropsychiatric disorders like depression. The central nucleus of the amygdala (CeA) is a stress-sensitive region of the brain, involved in reward-related behaviors. Recently, we showed that ELA provokes anhedonia-like behaviors in males, mediated by corticotropin-releasing hormone (CRH) overexpression in the CeA. In the paraventricular nucleus of the hypothalamus (PVN), another stress-sensitive brain region, we find that diminished microglial engulfment of excitatory synapses onto CRH⁺ neurons is a key mechanism that contributes to altered stress responsivity of male mice exposed to ELA. Interestingly, these two stress-sensitive regions of the brain have different developmental timelines, which suggests the possibility of different critical periods for intervention in the CeA compared to the PVN. There may also be sex-specific effects of ELA and different developmental trajectories between the sexes at baseline. Here, we characterized the developmental trajectory of excitatory and inhibitory synapses onto CRH⁺ neurons in the CeA under control and ELA conditions in males and females. To investigate these developmental changes, we induced ELA using limited bedding and nesting from postnatal days (P)2-10. We employed male and female single-reporter mice (CRH-tdTomato⁺), in conjunction with immunohistochemistry to label pre- and post- synaptic excitatory and inhibitory puncta. We

find that ELA increases excitatory and decreases inhibitory synaptic inputs onto CeA-CRH+ neurons at P14 in males, but not females. This effect in excitatory synapses has been shown to persist until at least P24 in males, and preliminary data shows a trend for decreased numbers of inhibitory synapses in males as well. Ongoing work is examining the long-term excitatory and inhibitory synaptic changes on CRH+ neurons at the adolescent time point of P45. Future directions will include examining microglia-mediated engulfment of excitatory and inhibitory synaptic puncta to pinpoint the peak of synaptic pruning by microglia in the CeA.

Ved Kenjale

PA - Carnegie Mellon University

Discipline: Physics and Astronomy

Authors:

#1 Ved Kenjale

Abstract Name: Connecting Inflation to the NANOGrav 15-year Data Set via Massive Gravity

Several pulsar timing array (PTA) missions have reported convincing evidence of a stochastic gravitational wave background within their latest datasets. This background could originate from an astrophysical source, though there are multiple possibilities for its origin to be cosmological. Focusing on the NANOGrav signal, which was in good agreement with other PTAs, we evaluate the possibility of an inflationary source for the background. However, we'll consider a time-dependent minimal theory of massive gravity instead of standard general relativity for our analysis. We find that an inflationary interpretation will require a strongly blue spectrum, characterized by $n_T = 1.8 \pm 0.54$, while Big Bang Nucleosynthesis limits will require a low reheating scale of $Trh \approx 4000$ GeV. Though these constraints make it difficult for inflation to be the source of the NANOGrav signal, we find that the massive gravity model allows for a greater reheating temperature than standard general relativity, making an inflationary interpretation slightly less cumbersome.

Hardin Kennedy

NC - Western Carolina University

Discipline: Engineering

Authors:

#1 Hardin Kennedy IV

#2 Ben Griffith

Ben Griffith

Abstract Name: A Portable Educational Model for an Energy Management System of Duke Energy

This study seeks to outline the procedures for developing an instructional framework for an energy management system designed for Duke Energy's power generation plants. Duke Energy is facing several challenges due to the retirement of power plants reliant on fossil fuels which must be replaced with clean and equally reliable resources. Thus, to meet rising energy utility demand, especially considering ambitious clean energy projects, the company must gain public support, prioritize electricity system education, and attract talented young people. Therefore, the goal of the study is to give a concise and straightforward analysis of how various power generation facilities respond to the daily energy needs of urban regions and during fluctuating weather conditions. To ensure the optimal functioning of the model, a careful selection of both the hardware and software components which guarantees to fulfill the specifications outlined by the sponsor, including lightweight design, plug-and-play capability, synchronization, and resolution while minimizing

costs. The model is used to play and synchronize eighteen videos made from real-time data and MATLAB code, which are played for five minutes using an HTML script. The model includes case studies which engineers may use to assure reliable grid integration of conventional and renewable energy sources while providing an accessible presentation to the public. In addition to the original objectives, Duke Energy has decided to use the model as a training tool for new employees on Energy Management Systems.

Oren Kennedy

OK - Cameron University

Discipline: Physics and Astronomy

Authors:

#1 Susmita Hazra

Abstract Name: Measurements of Halo CMEs and CMEs in Co-relation with Space Weather

During solar active periods, the Sun forms very high energy areas we call sunspots. These areas release huge amounts of energy in the form of Coronal Mass Ejection (CME) and solar flares sending out large amounts of energy and particles into space. Effects of this on Earth (which is called Space Weather) can range from mild effects on radio communications and weak power grid fluctuations to extreme effects like radio blackout and power grid collapse. Using the Large Angel and Spectrometric Coronagraph (LASCO) provided by the NASA Solar and Heliospheric Observatory (SOHO), we can analyze speed and direction of CME's occurring in the two ranges of C2 and C3. Using coronagraph images with a consistent measurement translation, we can take distances in solar radii and determine a speed. Based on our data and past measurements, an average CME ejection speed is 250-500 km/s, whereas Halo CMEs average speed is around 1000 km/s. We are currently analyzing other parameters like X-rays and proton flux related to CMEs. As this is ongoing research, we are focusing on measurements of those CME generations and level of geomagnetic storms on Earth due to those CMES. Analyzing this data will help us understand the differences between Halo CMEs and regular CMEs and their effect on Space Weather.

Lucia Kennedy

VA - George Mason University

Discipline: Psychology

Authors:

#1 Natasha Tonge

#2 Gracie Kelly

#3 Jesús Hernández Ortiz

Abstract Name: The Impact of a Learning Disorder Diagnosis on an Individual's Trust in Healthcare Providers

Despite advancements in healthcare accessibility and education, there are still many under-researched stigmatized populations at risk for lower health and lacking access to needed healthcare services. These risks are greatly related to patient trust in healthcare systems and their providers. Research is needed to identify these populations and understand how their trust in their providers impacts their healthcare benefits. In this study, we will investigate the relationship between learning disorder diagnoses and levels of provider trust, comparing it with the relationship between mental disorder diagnoses and levels of provider trust. We hypothesize that both a learning disorder and a mental disorder diagnosis will negatively impact levels of

trust in providers, with a more significant correlation for learning disorders. This will be observed in a population of 200-1000 undergraduates tasked to complete a demographic questionnaire and the Trust in Physician Scale. Analysis will be done through a one-way ANOVA comparing 4 groups, individuals without diagnosis, individuals with a learning disorder, individuals with mental disorders, and individuals with comorbid learning and mental disorders. The impact of a learning disorder diagnosis vs a mental disorder diagnosis on trust levels will be discussed, as any potential relationships between these variables would add to the already present literature on provider trust in relation to minority populations.

Madeline Kenney

MI - Hope College

Discipline: Biology

Authors:

#1 Steven Awad

#2 Jennifer Bake-Mahmud

Steven Awad

Abstract Name: The More the Better? The Influence of Greater Genomic Material in the Stress Response of Related Organisms

The possession of an extra set of chromosomes known as polyploidy, reflects an increase in genetic material common among plants. Extra genetic material can cause new gene combinations or lead to different expressions of these genes within the individual plant. It is unknown whether genetic material from polyploidy provides plants with an advantage, disadvantage, or is neutral amid adverse conditions. By changing temperature and water availability, we can investigate any physiological effects and explore the possible differences in gene expression. Using related woodfern species (genus: *Dryopteris*), we investigated the physiology of two parent species, *Dryopteris intermedia* (2n) and *Dryopteris expansa* (2n). We also studied their offspring, *Dryopteris campylopetra* (4n), who possess extra sets of chromosomes. We subjected individuals from each species to environmentally stressful conditions for 48 hours in which the ambient temperature and water availability were not optimal for their growth. We examined their stress levels using fluorescence immediately following the treatment and following three days of recovery. Fluorescence measurements are used as a proxy to indicate the physiological health of the individuals in each species. An increase in the physiological health, marked by increases in fluorescence, of the polyploid offspring in comparison to the parents could indicate that the possession of an extra set of chromosomes provides a stress-response advantage. A lack of a statistically significant difference in stress responses would support the hypothesis that the extra set of chromosomes present has no effect on physiological functioning, perhaps due to inactivation of those genes. A decrease in physiological health, marked by decreases in fluorescence, of the polyploid offspring in comparison to the parents may indicate that an extra set of chromosomes poses a liability. Future work will investigate differential gene expression in this related group of wood ferns.

Cohen Kern

VA - Liberty University

Discipline: History

Authors:

Abstract Name: Looking at the Rwandan Genocide as the Result of European Colonialist Influences

What was the root cause of the animosity between the Tutsi and the Hutu, and what happened during the Rwandan Genocide? Even though there has been lots of research done into the history of Rwanda and the circumstances that led to the Rwandan Genocide, there is lacking a concise study into the root causes of the genocide. Some experts focus on the influences that governments had in escalating the disunity between the Hutu and Tutsi—which led to the Rwandan Genocide—while others focus on the influences of colonialism. Furthermore, there are many misconceptions about the exact facts and circumstances leading to the genocide. Most of the public is sorely misinformed about the specific details of the genocide and its history. Historical accounts and studies from a variety of historians provide a critical analysis of the genocide and Rwanda's complex history of the country. Eyewitness reports from both the victims and the killers are also crucial elements of this study, as well as documents from the time, such as peace accords and legal records of the trials following the genocide. They provide unique perspectives that offer a better understanding of the realities of the genocide. The most significant root cause of the genocide was the influence of European colonialism on Rwanda and its people. My research shows that the ethnic hostility between the Hutu and Tutsi is a relatively recent development that was orchestrated by colonial authorities and intensified by internal power politics. These findings are significant as they further our understanding of the causes of genocide and add to our knowledge about a recent event in this world's history.

Zachary Kernal

OK - University of Central Oklahoma

Discipline: English and Literature

Authors:

#1 Zach Kernal

Abstract Name: How Did We Get Here? Queer History told Through Playwriting

"How Did We Get Here?" is a project inspired by "The Revolutionist" by Lauren Gunderson. "The Revolutionist" is a stage play that debuted in 2016. It is about four real and very powerful women during the French Revolution Reign of Terror: Charlotte Corday, Marie Antionette, Marianne Angelle, and Olympe De Gouge. The play uses theatre to help audiences learn about how these women contributed to this time in history and their impact. This project mirrors "The Revolutionist" by highlighting powerful queer (LGBTQ+) figures from across history, such as Marsha P. Johnson or Billy Tipton. "How Did We Get Here?" explores the journey of queer liberation from Stonewall to gay marriage being legalized. It will highlight how far queer liberation has come while drawing attention to the progress we have made, but also the way the fight remains the same. "How Did We Get Here?" will utilize aspects of verbatim theatre, a form of documentary theatre based on direct quotes from historical figures. Queer history is often overlooked, especially in the K-12 setting. Queer history is considered part of the null curriculum. The null curriculum, or excluded curriculum, is what is not taught in schools. "How Did We Get Here?" will utilize performance art and theatre as an accessible avenue to foster a better understanding of queer history and dispel the null curriculum.

Ariana Kerney

TN - University of Tennessee at Knoxville

Discipline: Nursing and Public Health

Authors:

#1 Jennifer Miller

Abstract Name: Factors Associated with Access to Prescription Medications for Treatment of Opioid Use

Disorder for Pregnant Women in Rural Appalachian Communities

Rural Appalachia's opioid pandemic has led to an influx of pregnant mothers with opioid use disorders (OUD). OUD can cause adverse maternal and neonatal outcomes including stillbirth, neonatal opioid withdrawal syndrome (NOWS), preterm labor, and maternal death. Medications for Opioid Use Disorder (MOUD) help reduce cravings and relapse which are essential outcomes for both the infant and mother. However, despite the known benefits of MOUDs, pregnant women are still facing many barriers to receiving a prescription dose of these medications due to the restrictions placed on providers. Rural Appalachian women face additional unique challenges such as limited access to automobiles, increased distance to providers, lower income rates, decreased health literacy, polysubstance abuse, and low quality insurance. While there is extensive research on access and barriers to receiving MOUDs, there is a lack of research on the specific population of pregnant women in rural Appalachian areas. There is also limited quantitative research that analyzes a wide range of factors that could pose as barriers or stigmas to receiving an MOUD. The purpose of this study is to evaluate what barriers and protective factors exist that prevent pregnant mothers from being prescribed MOUDs in rural Appalachia. A descriptive, quantitative study using secondary analysis from Dr. Jennifer Miller's data set with a non-experimental research design was used for this study. In total, using convenience sampling, 120 women living in rural Kentucky participated in the study and gave consent to use their data. Analysis indicates that presence of prenatal care, hepatitis C status, polysubstance abuse, and admission to hydrocodone use and percocet use are significant predicting factors in whether or not a mother was prescribed an MOUD.

Aidan Kerr

OK - University of Central Oklahoma

Discipline: History

Authors:

Abstract Name: "Revolution in Red: The Evolution of Reusable Menstrual Products Before and After WWII Through an Intersectional Lens"

My research examines the evolution of reusable menstrual products from the early 20th century through the post-WWII period, emphasizing the intersection of gender, class, race, disability, and sustainability. The study explores how reusable menstrual products, such as cloth pads and menstrual cups, were marketed, produced, and perceived before and after WWII, considering both social and economic contexts. Before the war, menstrual hygiene was primarily managed with homemade or reusable solutions, which were often passed down through generations or improvised with locally available materials. However, this shifted with the rise of mass-produced disposable products during the post-war consumer boom, driven by advertising campaigns that equated disposability with modernity, convenience, and even hygiene. Using archival materials, advertisements, wartime rationing reports, and other primary sources, I will uncover how wartime resource conservation efforts impacted the availability and continued use of reusable menstrual products, contributing to the eventual commodification of menstruation and the normalization of disposables after 1945.

Furthermore, my analysis employs an intersectional framework to examine how factors such as race, class, disability, and region influenced people's access to different menstrual technologies. While wealthier women could afford newly introduced disposable products, many working-class, disabled, and rural women continued to rely on homemade or commercially available reusable options, creating a clear divide in menstrual care practices across different demographics. Additionally, my research critiques the environmental consequences of the mid-century shift toward disposability and reflects on contemporary movements advocating for a return to sustainable menstrual practices, aligning with broader environmental and feminist activism. By tracing the trajectory of menstrual products across this pivotal historical period, my research highlights and adds to the conversation of how menstrual technologies are deeply intertwined with broader social, economic, and environmental forces.

Kamilla Kesto

MI - University of Detroit Mercy

Discipline: Psychology

Authors:

#1 Jude Rodriguez

#2 Harold Greene

Maria Gojcaj

Abstract Name: ELECTROPHYSIOLOGICAL MARKERS OF VERTICAL SACCADDE PROGRAMS

Based on saccade reaction times, our theory is that greater cortical activity is required to program down- than up-directed saccades. We rationalized that the high temporal resolution of event-related potentials (ERPs) will allow us to quantify cortical programming of saccades. Participants were fitted for electrophysiology data collection (IX-EEG amplifier, Labscribe software, 19 electrode cap with Ag/AgCl electrodes; EOG electrodes above and below the right eyelids to detect vertical saccades; a Miami J neck brace to minimize head movement artifacts). Participants completed the saccade task while sitting within a Faraday chamber. Our concern was whether more cortical effort is associated with the releasing of down-directed saccades near the Frontal (electrodes F3 and F4) and Parietal (P3 and P4) Eye Fields. For analysis, we integrated voltages between -200ms and -4ms of saccade onset. This area under the voltage curve quantifies cortical activity relative to the average reference, and we interpreted larger areas as reflective of greater recruitment of cortical resources. A 2 Lobe (Frontal vs Parietal) X 2 Hemisphere (Left vs Right) X 2 Saccade Direction (Down vs Up) repeated measures ANOVA was conducted on the integrated voltage values. The primary finding was a 3-way interaction effect that was close to being statistically significant ($p = .08$; partial eta squared = .30). Down-directed pre-saccadic activity was greater for all electrode sites, but was especially greater in the left frontal lobe. The findings are congruent with the prediction of our theory, indicating a need to pursue our electrophysiology project, with higher statistical power.

Sarah Ketchum

MI - University of Michigan - Ann Arbor

Discipline: Physics and Astronomy

Authors:

#1 Sarah Ketchum

#2 Steven Hu

#3 Veronica Tananko

#4 Doyee Byun

#5 Xin Xiang

#6 Jon Miller

Abstract Name: Bringing Black Holes out of the Darkness

NASA's Swift telescope records prolific amounts of X-ray and ultraviolet data. While this data is open to the public, no conclusions can be drawn until it is processed. In the field of time domain astronomy, it is most useful to work with flux data and error measurements while studying active galactic nuclei such as black holes and quasars. This research aims to answer the question of what accurate flux measurements can be made from various Swift telescope observations of AGN. Recent X-ray and UV data from NASA's Neil Gehrels Swift Observatory will be graphed and analyzed using ds9, Xselect, and Xspec software to calculate key parameters such as the power-law index, normalization, flux, and error range for each source. Afterward, key findings will be publicly posted to the Astronomer's Telegram forum for the astronomical community to

view. Ideally, results will show consistently low error in flux measurements. Once the results are posted, this team and other researchers will use this data to inform future studies on the structure and evolution of AGN. Additionally, this work will identify which AGN X-ray and UV sources should be monitored further at which wavelengths.

Stephen Ketola

OK - University of Central Oklahoma

Discipline: Computer Science

Authors:

#1 Jicheng Fu

Abstract Name: Developing a Deep-Learning Algorithm to Classify Smartwatch Data to Evaluate Manual Wheelchair Users' Pressure Relief Exercises

Because wheelchair users naturally sit for long periods of time, they have a higher risk of developing pressure ulcers (PUs), which are painful, can cause infection, and lead to over 60,000 deaths in the U.S. each year. Clinical Practice Guidelines (CPGs) provide exercises that manual wheelchair users can use to reduce their risk of developing PUs, but the number of cases has not decreased even though research has proven these exercises effective. Part of the purpose of this project is to help answer why this is the case. Previous research in this area used pressure sensors attached to the wheelchair, but these are bulky, expensive, and hard to set up and maintain, so this research has been largely limited to lab settings. We hope to fix these issues by utilizing a smartwatch instead. To gain similar information from resulting data, we have trained a deep convolutional neural network (CNN) to distinguish between different exercises and non-exercises with high accuracy. Our design uses apps on a smartwatch, a connected phone, and the cloud. A smartwatch app collects accelerometer data and sends that to the phone. Our phone app runs a lightweight method to check when the smartwatch is moving or stationary, which serves as the landmark for identifying any potential exercises, and, thereafter, sends only relevant data to the cloud. Our app in the cloud uses the trained CNN to classify the data to determine whether it is an exercise and what type of exercise it is. The cloud app then sends the result and any additional desired information back to the phone to display to the user.

Constance Kettler

OK - University of Central Oklahoma

Discipline: Chemistry

Authors:

#1 Amanda Waters

Abstract Name: Isolating and Identifying Bioactive Marine Invertebrate Extracts with Brine Shrimp Lethality Assay

Cancer remains one of the leading causes of death in the United States, with no known cure. Long-term treatment efficacy is often hindered by tumor adaptability, leading to the development of resistance. Potential new therapies can be found by utilizing marine sponge extracts. These extracts have been used before to find new chemotherapeutics that are novel and highly efficient. The extracts from the University of Oklahoma Schmitz's Marine Invertebrate Collection are purified of natural products separated from the extract. The natural products are then used to perform lethality assay screening. These lethality assays utilize brine shrimp as they are an optimal model organism based on their low maintenance and rapid division at a low cost. The

extracts having a 70% lethality in low concentrations are the priority for further isolation and study. The isolation will consist of fractionating the extracts with medicinal potential to identify and isolate the pure compound(s) with the biological activity. An active extract will undergo bioassay guided fractionation which can be an extensive process that involves the use of organic and analytical chemistry techniques including various types of chromatography (flash, reverse phase, normal phase, size exclusion, HPLC, etc.) and analytical instrumentation (infrared [IR] spectroscopy, ultraviolet [UV] spectroscopy, nuclear magnetic resonance [NMR], mass spectrometry [MS], and optical rotation [OR]). Since compounds can vary significantly in chemical composition (size, structure, polarity, etc.), it is hard to predict the exact techniques needed for each isolation. Two extracts have begun testing, 89-AU-83 and 22-BA-92. These have been purified to their extracts and have been tested for bioactivity.

Ibrahim Khalid

VA - Virginia Commonwealth University

Discipline: Health and Human Development

Authors:

Abstract Name: The Effects of Remote Work on Employee Health, Productivity, and Satisfaction

The COVID-19 pandemic caused a massive global shift to remote work. However, even after restrictions were lifted, the demand for remote work remains higher than ever before. This unprecedented rise in popularity has sparked widespread discussion about its effectiveness and implications for the workforce, particularly its impact on employees' health, productivity, and overall satisfaction. This paper investigates these effects, focusing on the physical health challenges associated with remote work, the productivity output compared to in-person work, and the evolving attitudes toward the work-from-home model. Drawing on recent research, including statistical analysis, theoretical frameworks such as the Job Demands-Resource (JD-R) model, and self-reported surveys, this study takes an in-depth look at whether remote work is ultimately positive or negative for employees and its broader implications for the modern workforce. The findings reveal that remote work leads to increased sedentary behavior, heightening the risk of musculoskeletal disorders like back and neck pain. However, these effects can be mitigated through proper ergonomic setups and workplace interventions. Additionally, remote work provides significant productivity benefits, largely due to its inherent increase in flexibility and autonomy, challenging the longstanding notion that workers require constant supervision to perform effectively. At the same time, the isolated nature of remote work has been linked to mental health issues such as depression and social isolation. However, these challenges, much like the physical health effects, can be effectively managed through proper organizational strategies and employee support systems. Overall, remote work offers transformative potential for the workplace. By addressing its challenges through thoughtful management and ergonomic solutions, employers can harness its considerable benefits, making it a key component of the evolving workforce landscape.

Aysel Khalil

FL - The University of Tampa

Discipline: Biology

Authors:

#1 Kevin Beach

#2 Kimberly Dobrinski

Abstract Name: Possible Treatment from the Deep: Effects of *Padina gymnospora*, Marine Algae, on Breast

Cancer Cells.

Breast Cancer is the second leading cause of death among women in the U.S after skin cancer. As many women struggle through chemical and invasive treatments, science has started to shift its focus onto new approaches to help breast cancer patients. The goal of this research is to increase understanding of breast cancer therapies from our natural world and introduce the possible treatment of breast cancer by using marine brown algae found in Tampa Bay. This research used two breast cancer cell lines, which represent two different types of cancer cells: MCF-7; mirrors non-resistant cancer and MDA-MB-23; mirrors resistant cancer. *Padina gymnospora* has been evaluated for its anti-cancer activity and found statistically significant results on different types of cancer cells, however it remains unclear whether these results have significant effects on breast cancer cell lines. This research has utilized *Padina gymnospora* treatments on cells under three different assays: Cytotoxicity assay (CYQUANT), Scratch assay, Peroxide assay. Additionally, these assays provided statistical analysis of the effect of *P.gymnospora* on breast cancer cells that will allow us to identify specific proteins that could be linked to these types of cancers by using RNA sequencing. Therefore, *Padina gymnospora* may be used as an alternative treatment for breast cancer patients.

Jasmine Khalil

PA - Pennsylvania State University

Discipline: Mathematics

Authors:

#1 Jasmine Khalil

#2 Pierre Bellec

Abstract Name: Coupling from the Past for Statistical Mechanics Models

Coupling from the Past (CFTP) is an innovative extension of Markov Chain Monte Carlo (MCMC) techniques designed to generate perfect samples from stationary distributions, eliminating the drawback that traditional MCMC methods only approximate the stationary distributions. This paper explores the application of CFTP in statistical mechanics, specifically to sample from the Ising model, a classical representation of ferromagnetic materials. Unlike standard MCMC approaches that approximate the stationary distribution and suffer from distribution discrepancies, CFTP guarantees exact sampling by coalescing multiple Markov chain instances to a single equilibrium state starting from an unspecified time in the past. We explain the mathematical model of CFTP and demonstrate its effectiveness for sampling with respect to the Ising model. This model captures phase transition phenomena, where the magnetization of a lattice of spins exhibits abrupt changes beyond a critical temperature - the Curie temperature. Through the application of CFTP, enhanced by the monotonicity of the Ising model, we achieve computational efficiency using methods like sandwiching and update function simplifications. Further optimizations, including Numba for Just-In-Time (JIT) compilation, allow for scalable simulations of large lattice systems. Our results confirm the robustness of CFTP in capturing critical behaviors of ferromagnetic systems. The practical visualizations we produce reveal organized spin clustering at low temperatures and the loss of magnetization as temperature increases. We anticipate that our work may be a starting point for the simulation of a broader range of more sophisticated models with real-world applications relating to phase transition phenomena using this perfect sampling.

Sahar Khan

TX - Southern Methodist University

Discipline: Biology

Authors:

#1 Nicole Pinzon-Hoyos
#2 Yibo Li
#3 Amy Brewster

Abstract Name: Exploring the Protein Levels of Astrocytes, Pericytes, and Blood Brain Barrier in WT and C3 Knockout Mice Following Seizure-Induced Brain Injury

Status epilepticus (SE) is a severe neurological condition that significantly increases the risk of developing epilepsy and associated cognitive impairments, particularly memory decline. The immune complement system has emerged as a critical mechanism underlying neurological damage, with the complement cascade potentially playing a pivotal role in mediating inflammatory responses and neuronal dysfunction. This study investigates the potential contribution of complement C3 in SE-induced pathology, specifically focusing on the molecular mechanisms driving blood-brain barrier (BBB) disruption, gliosis, and synaptic remodeling—key processes that may ultimately influence epilepsy progression and cognitive outcomes. The objective was to assess the acute impact of SE on protein levels known to regulate the BBB. Wild-type (WT) and C3 knockout (KO) mice were subjected to one hour of pilocarpine-induced SE or sham conditions (control). SE was interrupted after one hour with the anticonvulsant diazepam. Four experimental groups were examined: WT+Control, C3KO+Control, WT+SE, and C3KO+SE. Hippocampi were collected 4 hours after SE and processed for western blotting using antibodies against GFAP (astrocytes), PDGF-BB (pericytes), NCAM and Albumin (BBB stability), and PSD95 (a synaptic protein). The protein levels for GFAP, PDGF-BB, NCAM, Albumin, and PSD95 were similar in WT and WT+SE groups ($p > 0.05$), indicating no acute alterations following SE. Notably, hippocampi from C3KO mice demonstrated significantly increased pericyte marker levels and significantly decreased albumin levels compared to WT controls. These findings suggest that SE-induced gliosis and BBB disruption are not evident at 4 hours post-SE. Furthermore, the results indicate that C3 may play a crucial role in regulating pericyte homeostasis and potentially influencing BBB stability. Subsequent investigations will explore the temporal progression of SE-induced hippocampal changes at later time points.

Saad Khan

AL - University of Alabama at Birmingham

Discipline: Psychology

Authors:

#1 Fedora Biney
#2 Gitendra Uswatte
#3 Elise Harris
#4 Jennifer Kim
#5 Cliff Lynam
#6 Timothy Elliot

Abstract Name: Relation of Emotion and Cognitive Processing Word Frequency to Emotional Distress in Stroke Survivor-Family Caregiver Dyad Interviews

Background: Previous research found that greater use of emotion words reflects deeper immersion in a traumatic event, and greater use of cognitive mechanism words can indicate active reappraisal of an event. It is possible that use of more emotion words may relate to emotion-focused coping, and the use of cognitive processing words may relate to problem-focused coping. Objective: Evaluate the relationship between emotional distress endorsed by persons with stroke (PwS) and use of emotion word vs cognitive processing word in stroke participant-caregiver interviews. Methodology: In this observational study, PwS and caregivers were interviewed regarding a task completed recently by the PWS and how it impacted their relationship. Participants included twelve PwS (>3 months post-stroke) with mild-to-moderate cognitive impairment (Montreal Cognitive Assessment: 10-26) and twelve family caregivers. Dyad-level emotional and cognitive

processing was measured as the percentage of emotion words (good, bad, worried, etc.) and cognitive processing words (know, think, etc.) used in a brief dyad interview. Emotional distress was measured using the Neuro-QoL Depression and Anxiety Questionnaires and NIH Toolbox Perceived Stress Scale. Higher T-Scores indicate more distress: Mild (T-Score 55-60), Moderate (T-Score: 60-70), High Perceived Stress (T-Score ≥ 60). Results: Moderate anxiety symptoms were reported in two PwS, moderate depression in one, mild anxiety in three, and mild depression in four. Five PwS reported high perceived stress levels. Greater use of cognitive processing words in dyad interviews between PwS and caregivers discussing changes in function after stroke was correlated with higher perceived stress levels in PwS, $r(10) = .66$, $p = .020$. Cognitive processing word use was not associated with depressive or anxiety symptoms. Emotion word use showed no association with any emotional distress measures. Conclusion: The findings within this small sample warrants further research to better identify links between word use in conversations and emotional distress in PwS.

Minhal Khan

PA - University of Pittsburgh

Discipline: Computer Science

Authors:

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Abstract Name: A Study on the Impacts of Latency on Teleoperations Using Haptic Gloves

Haptic gloves are emerging technologies in Mixed Reality (MR), promising to enhance sensory feedback and user interaction in a variety of specialized tasks such as teleoperations, training, trauma care, and expert data capture. However, system latency—the delay between a user's action and the corresponding feedback—could significantly impact performance and the user experience during such tasks. Literature regarding latency in MR teleoperations exists but does not account for detailed haptic feedback. This study will explore the effects of latency on user performance in teleoperation tasks using the G1 gloves developed by HaptX, which offer unparalleled levels of tactile information. We will conduct controlled experiments where participants perform toy tasks requiring fine dexterity and motor skills similar to those used in surgical operations, such as suturing, tying, manipulating small objects with medical forceps, and wire loop games. Performance metrics such as task completion time, error rate, and accuracy will be recorded. Additionally, subjective user experience will be assessed through questionnaires evaluating perceived responsiveness and ease of use. Understanding the impact of latency on haptic teleoperation systems is crucial for optimizing their design and implementation. This study will contribute to a growing body of literature by providing empirical evidence on how latency affects the effectiveness of haptic gloves in teleoperation tasks. Ideally, these results could potentially inform design requirements for remote operation systems in the future. Additionally, these insights will be valuable for developing more effective VR-based medical training, where realistic haptic feedback is essential for skill acquisition and procedural competency.

Mahir Khan

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Discipline: Computer Science

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Anivesh Sinha

Abstract Name: Cybersecurity Assessment of Non-profit Organizations (NPOs) in Pennsylvania

We are working on a project focused on enhancing the cybersecurity readiness of non-profit organizations (NPOs) in Pennsylvania. NPOs play a critical role in society but often face significant cybersecurity challenges due to limited budgets and expertise. These limitations leave them vulnerable to cyberattacks that threaten sensitive data, operational integrity, and stakeholder trust. Our study seeks to bridge this gap by developing a framework that identifies cybersecurity gaps and provides tailored, actionable recommendations based on the NIST Cybersecurity Framework. The research begins with a systematic literature review (SLR) to design a cybersecurity assessment survey that captures the practices, needs, and vulnerabilities of NPOs. In the second phase, survey responses, including open-ended feedback, will be analyzed using natural language processing (NLP) techniques, specifically Named Entity Recognition (NER), to identify critical cybersecurity elements such as threats, tools, and organizational needs. Extracted data will populate a knowledge graph, mapping relationships between vulnerabilities, needs, and cybersecurity solutions. Simultaneously, a text corpus constructed from the NIST framework will serve as a reference for best practices and guidelines. By mapping the knowledge graph to the corpus, the study will generate customized recommendations for each NPO, addressing their specific cybersecurity gaps. Expected outcomes include a detailed understanding of cybersecurity readiness across Pennsylvania's NPOs, insights into common challenges, and scalable strategies for improvement. The findings will be shared with the non-profit and research communities to support enhanced cybersecurity resilience, ensuring these organizations can continue their missions securely. This research represents a meaningful contribution to strengthening the cybersecurity posture of NPOs while addressing the broader challenge of equitable access to cybersecurity resources.

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Mahima Jain

Abstract Name: Profiling NPOs in need for Cybersecurity Readiness Evaluation

Non-profit organizations (NPOs) play an important role in creating strong and fair communities. However, many NPOs struggle to protect their digital information because they have small budgets and limited resources. This makes them an easy target for cyberattacks, which can harm their reputation, lose donor trust, and disrupt their important work. Our project focuses on helping NPOs in Pennsylvania improve their cybersecurity readiness. We chose this project because cyber threats against NPOs are growing, and many of these organizations do not have the tools or knowledge to defend themselves. Unlike businesses, NPOs often cannot afford expensive cybersecurity solutions or hire experts. This creates an urgent need for simple, affordable, and practical solutions that fit their unique challenges. Our work so far has included analyzing data

from 78,000 NPOs in Pennsylvania to find patterns and identify which groups might need the most help. We also surveyed a smaller group of NPOs to understand their specific cybersecurity needs and challenges. Looking ahead, we plan to create easy-to-follow guides and resources to help NPOs improve their cybersecurity practices. These will include tips for protecting data, training staff, and responding to cyber threats. The resources will be based on trusted frameworks like NIST and CISA but adapted to meet the needs of small, resource-limited organizations. By addressing these issues, we hope to make NPOs stronger and better prepared for the digital risks they face. This will help them protect sensitive information, maintain trust, and continue their valuable work in our communities.

Anthos Khanal

VT - Norwich University

Discipline: Mathematics

Authors:

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Abstract Name: Using a modified Principal Component Analysis to recover state information from a corrupted Dynamical System for modelling

When modeling predator-prey populations in 2d space, as described by a system of two parabolic partial differential equations, state space information could get corrupted during transmission or collection. This has been a problem in research; regular analysis and modeling are done via satellite images, which have a high probability of having significant errors (either noise or regions covered by clouds) in regions of interest. While that wouldn't be a problem for systems with minor sensitivity, errors could cause significant divergences from actual state behavior in diffusion population systems, which is the system under study. Principal Component Analysis (PCA) is a mathematical method used to realign high-dimensional data to a different dimensional axis by recognizing major principle components of the data. It is a method used in image and error detection, as images can be represented as points in spaces with very large dimensions. However, due to the sequential nature of dynamical system data, a modified PCA uses windowed time steps as data points to identify the principal components of a predator-prey system modeled using some initial state parameters. Then, the PCA was used to recover data that had been erased from a second model using different initial state parameters using PCA inpainting, and the recovered data was used to drive a system in equilibrium into matching the second system. This setup restored the driving system's behavior even when the corruption (noise and data erasure) affected 30% of the data used for transmission, indicating PCA can recognize and imprint the nonlinear nature of the dynamical system when extended to the time dimension.

Min Khant

MD - Salisbury University

Discipline: Chemistry

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#1 Min Thway Khant

Abstract Name: Targeting Cancer-associated Proteins and Click Chemistry Labeling of Probes for Tumor Imaging and Ablation

Precise targeting of tumors is a critical aspect of precision cancer treatment, which often requires real-time

measurement of tumors and their surrounding environment. Tumor ablation therapy, guided by magnetic resonance imaging (MRI), presents a potential strategy for improving tumor targeting accuracy. In this research, we aim to develop a novel, non-toxic MRI contrast agent that exhibits spin crossover events at high temperatures and can be attached to peptide or nucleic acid probes. The primary goal is to achieve high sensitivity and specificity in cancer cell targeting, with an additional focus on utilizing this contrast agent for real-time imaging and targeted therapy in preclinical models. Furthermore, this study focuses on the identification and engineering of DNA and RNA sequences with strong affinity for copper ions, aimed at facilitating Click Chemistry labeling. Rational design strategies are employed to create nucleic acid sequences with tailored binding capabilities to copper ions, enhancing their use in MRI contrast agents. Specific aims include bioinformatics analysis of potential DNA and RNA structures, the study of Cu-DNA/RNA binding interactions and affinities, and the application of Click Chemistry for labeling these sequences with MRI contrast agents. In addition, SELEX (Systematic Evolution of Ligands by Exponential Enrichment) will be utilized to screen a diverse pool of nucleic acid sequences and isolate those with the highest affinity for copper ions. This chemo-selective labeling method ensures minimal interference with biological macromolecules, preserving the integrity of the systems under investigation. Ultimately, this study compares chemical labeling strategies, striving to bridge the gap between molecular precision and the practical application of cancer treatment.

Kanchana Khat

CA - University of California - Merced

Discipline: Economics

Authors:

#1 Todd Sorensen

Abstract Name: Beyond Wages: Investigating Occupational Segregation and Labor Market Discrimination

Researching the fundamentals of discrimination in the job market helps us better understand injustices in the workplace. We build on Foote, Whatley, and Wright's (2003) work, which highlighted Ford Motor Company's exploitation of labor market inequality by concentrating black workers in unpleasant foundry jobs in the 1920s-1940s. This indicated that wage alone is not a conclusive indicator of labor market discrimination. We expand this analysis to a broader set of jobs across three firms. Our study measures occupational segregation using Stata to examine archived employee records from Ford, A.M. Byers, and Pullman, classifying workers by occupation and measuring the degree of segregation.

Kritika Khati

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

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Clara Saad

Abstract Name: Psychiatric Symptoms Trajectories in Children and Adolescents Across an 18-Month Interval: Associations with Recent Parental Cancer Diagnosis and Biological Markers of Stress and Inflammation

Adversity in childhood is a global phenomenon, with an incidence of 60% worldwide. Aside from posing threats to developmental milestones, early life adversities can also have lifelong impacts of dysfunction. Robust evidence has demonstrated clear linkages between doses of childhood adversity, lifetime psychiatric problems, and impaired psychological well-being. Illness in the family, particularly amongst parents, is a potent stressor for children that can lead to negative psychological outcomes. One of the most prevalent illnesses amongst adults is cancer, affecting millions across America. The psychiatric outcomes of children of parents with cancer have been explored, yet the unfolding of psychiatric symptoms following a parental cancer diagnosis is not fully understood. The present study examines the trajectory of psychiatric symptoms in children and adolescents (n=350) aged 12-17 following a recent parental diagnosis of stage III and IV melanoma or colorectal cancer (<12 months after diagnosis). To assess acute and chronic biological responses in relation to the identified symptom trajectories, we collected various clinical and biological measures at intake (TP0), six-months (TP1), and 18 months (TP2). We used growth mixture modeling to identify trajectory classes of symptoms based on magnitude and stability across time in parental cancer (n=125) and a control group (n=225), and related these to psychosocial and biological indicators. Univariate analyses reveal heterogeneity in symptom trajectories. For depression, parental cancer was associated with a moderate-stable trajectory, while control conditions were linked to a low-minimal decreasing trajectory. We found no significant associations in suicidal ideation trajectory classes. Assessing global functioning, parental cancer was linked to a moderate-increasing trajectory, and control conditions predicted high-stable trajectory. Within trajectories, the high global functioning class had higher IL-6 levels, but all other biological markers of stress and inflammation were not significantly different among the global functioning, depression, or suicidal ideation trajectory classes.

Akshay Khetrpal

CA - Chapman University

Discipline: Biology

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Abstract Name: Evaluation of Real-Time PCR for Mixed Species Identification in Canned Tuna

Introduction: Canned tuna is susceptible to species mislabeling, which can mislead consumers, undermine regulatory compliance, and pose health risks, especially when high-mercury species are mislabeled as low-mercury ones. Species identification in canned tuna is particularly challenging due to the processed nature of the product, as well as the high level of DNA degradation. Objective: This study aimed to evaluate the use of real-time polymerase chain reaction (PCR) for identifying mixed tuna species in fresh and heat-treated samples. Materials and Methods: Real-time PCR assays were carried out targeting albacore (*Thunnus alalunga*), skipjack (*Katsuwonus pelamis*), and yellowfin (*Thunnus albacares*) tuna. Binary species mixtures using DNA from raw tuna reference samples were prepared with 0.1-10% of the target species. The binary species mixtures were tested with and without heat treatment at 95°C for 30 min to simulate canning conditions. All mixtures were tested in triplicate. Results and Discussion: Consistent detection with real-time PCR was achieved for albacore and yellowfin tuna at levels as low as 0.1% in binary species mixtures. On the other hand, skipjack tuna showed consistent detection at levels as low as 1.0%, with only one-third of replicates detected at the 0.1% level. Heat treatment simulating the canning process did not significantly affect detection rates, confirming the robustness of real-time PCR for processed tuna products. Conclusion: This research enhances species identification accuracy for processed tuna, addressing a critical gap in food safety and authentication. These findings support broader efforts to refine DNA testing protocols for processed and mixed seafood products.

Emma Khoury

PA - Pennsylvania State University

Discipline: Health and Human Development

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Abstract Name: Fatty Acid Composition of Dietary Oils: Analyses to Inform the Effects of Healthy Diets with Plant Oils on Cardiometabolic Health

Cardiovascular disease is the leading cause of mortality worldwide, and current dietary guidelines from the American Heart Association recommend the use of liquid plant oils that are high in unsaturated fats to promote cardiovascular health. Cottonseed oil has a higher polyunsaturated fatty acid to saturated fatty acid ratio (the P:S ratio). Prior research suggests cottonseed oil consumed as part of a high-fat diet decreases low-density lipoprotein cholesterol (LDL-C). A study is planned to investigate if cottonseed oil consumed as part of a healthy diet decreases LDL-C. Before commencing the study, the fatty acid composition of cottonseed oil and other test plant oils will be assessed using a gas chromatograph mass spectrometer (GC-MS). The fatty acid profiles of the experimental diets will be measured to ensure that nutrient targets are met. The fatty acid composition of the oil components was analyzed using GC-MS. Fatty acids were extracted from all oils (and blends) using the fatty acid methyl ester (FAME) extraction method and analyzed by the GC-2010 gas chromatography system fitted with a QP2010 mass spectrometer (GC-MS Shimadzu, Japan) using a Supelco SP-2560 fused silica column. Peak area counts were measured using GCMSolution software. Fatty acid quantification was calculated as a percentage of total fatty acids. The fatty acid composition of the experimental diets was then calculated based on the analyzed fatty acid composition of the oil component. These values were compared with the USDA estimates. In these analyses, the percentages of individual fatty acids in the oils based on the GC-MS analysis slightly differed from those listed in the USDA database, highlighting the importance of chemically assaying fatty acids to ensure protocol accuracy. This research is important because it emphasizes how important it is for consumers to know the composition of these oils for their cardiovascular health.

Ajenganyi Khumbah

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Abstract Name: Genetic and Biochemical Control of Root Development in Duckweeds (*S. polyrrhiza*)

Roots are an important part of plants and are responsible for multiple functions. The development of roots is an important phenomenon and its molecular genetic control in aquatic plants has not been explored so far. In our earlier research, we have identified an unusual polyamine oxidation pathway in duckweeds. In this work, we investigated the functions of this pathway in duckweed growth control. Here, our genomic analysis from two genome assemblies establishes that six duckweed Polyamine Oxidase (PAO) enzyme encoding genes are tandemly duplicated in two blocks. To address the question that such an intensive duplication may account for an important function in duckweed, we used chemical inhibitor approach for functional analysis. Use of synthesized chemical inhibitors shows that duckweeds lost its roots and fail to clonally propagate in longer run. Microscopic evaluation reveals that the roots are detached from prophyllum of duckweed indicating its possible role in root initiation and maintenance along with clonal propagation. These results are novel, and future investigations will reveal the function of this gene cluster.

Shaikh Ismid Jobayer Kibria

NY - SUNY Buffalo State College

Discipline: Computer Science

Authors:

Abstract Name: Parking Palooza: Avoiding Campus Car-tastropies

The consistent challenge of finding an on-campus parking spot around large university campuses has resulted in multiple ways to solve the problem with the aid of technology that facilitates user experience and enhances parking efficiency. This method explores developing and demonstrating a mobile application that helps the students, faculty, staff, and visitors optimise all the available parking spots at Buffalo State University. The app utilizes the user's coordinates and a customisable timer to provide information on all the available parking spots around the campus. The development of the app showcases the effort of combining academic knowledge and practical problem-solving to produce a more efficient campus environment. Moreover, the paper reviews similar applications of such technologies around other campus environments, highlighting their benefits.

Redeate Kidanue

MN - Minnesota State University - Mankato

Discipline: Computer Science

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Abstract Name: Machine Learning and Music Recognition

Music is a tool that has been integrated into society for thousands of years, it has influenced social aspects of

life and has also aided in communication. Today we have various uses for music that go past our traditional entertainment uses and self expression. Commonly, we see music being incorporated into visual art forms, and also being used in the medical field, specifically music therapy. With this broad spectrum of usage, it is important that music stays organized and easily accessible. This project intends to review literature looking at the methods, results, and limitations of music recognition using machine learning. Various techniques like K-Nearest Neighbor, Deep Neural Networks, and Convolutional Neural Networks have been identified in the use of organizing music and audio files by genre and utility. This literature review will also explore methods of data acquisition and music information retrieval. This paper focuses on presenting various learning models in the field of music recognition and illustrating their results.

Ally Kiger

VA - George Mason University

Discipline: Psychology

Authors:

Abstract Name: Do Parental Psychopathology Symptoms Predict Adolescent Impulsivity?

Adolescents have an increased tendency to engage in risky behaviors and there is an increase in impulsivity in adolescence. Impulsivity could be influenced by the family environment. The purpose of the present study is to 1) determine if there is an association between parental psychopathology symptoms (substance use problems and anxiety and depression symptoms) and adolescent impulsivity, and 2) explore a moderation of this association by adolescent sex. Some research has started to find connections between parental substance use and youth impulsivity, but more research is needed on this and research is lacking on connections between parental anxiety/depression symptoms and youth impulsivity. In the present study, I will analyze data from a larger study of 249 parent-adolescent dyads with adolescents aging 11 to 15. In the study, adolescents self-reported impulsivity via the UPPS-R-C, which will be analyzed by each subscale (negative urgency, positive urgency, lack of perseverance, lack of premeditation, and sensation seeking). Parents self-reported on their 1) substance use problems, measured as a composite measure of the DAST-10 and the alcohol-related problem subscale from the AUDIT, 2) anxiety symptoms via the STAI trait anxiety subscale, and 3) depression symptoms via the CES-D. It is hypothesized that 1) parental substance use problems will be associated to all adolescent UPPS-R-C impulsivity traits, 2) parental anxiety symptoms will be associated to adolescent negative urgency and lack of perseverance, and 3) parental depression symptoms will be associated to adolescent negative urgency. We will also be exploring the moderation of these effects of parental psychopathology and adolescent impulsivity by adolescent sex. The findings from this research will provide further understanding of what risk factors predict the development of heightened impulsivity in adolescence, which could provide a more effective framework for prevention strategies.

Emily Kiker

FL - Jacksonville University

Discipline: Chemistry

Authors:

Allyson Ray

Abstract Name: Determination of Thermodynamics of Binding of Nitrite to Wildtype Myoglobin and Comparison to Spectra of Cobalt Myoglobin Bound to Nitrite

Maintaining optimal concentration of nitric oxide (NO) in the body is critical, since overproduction has damaging effects such as septic shock and stroke. The concentration is controlled by heme enzymes like myoglobin (Mb), which function as nitrite reductases (NiR) where nitrite (NO₂⁻) is reduced to NO. The binding of NO₂⁻ to MbIII generates a stable MbIII-NO₂⁻ complex, which can be used to model the intermediate that is generated during the NiR reaction. In this experiment, the thermodynamic parameters, ΔH (enthalpy), ΔS (entropy), and ΔG (Gibbs free energy), of nitrite binding to MbIII will be determined to elucidate the factors that influence the formation of the complex by using temperature-controlled UV-vis spectroscopy. Known concentrations of nitrite were titrated into wild-type (wt) MbIII at different temperatures ranging from 11.5 – 29.6 °C, and changes in the absorbance at 580 nm were noted. A logarithm plot of the absorbance at 580 nm as a function of NO₂⁻ concentration showed a sigmoidal curve that allowed for the extrapolation of the equilibrium constant, K, at that temperature. A van't Hoff plot was constructed from the K values derived at different temperatures, generating the following thermodynamic parameters, ΔH : -30.8 kJ/mol and ΔS : 68.4 J/mol K. The ΔG at the five different temperatures ranges from -50.3 to -51.5 kJ/mol. Results show that the addition of NO₂⁻ to wt MbIII is driven by enthalpy and entropy, and is spontaneous at all temperatures. Additionally, the spectra of the MbIII-NO₂⁻ complex between wt and its cobalt analogue (CoIIIMb) were compared to investigate how changing the metal center influences the spectral changes in the visible region. The absorption spectrum of CoIIIMb shows subtle changes in the Soret and Q-band regions compared to its FeIII analogue.

Gvantsa Kiknavelidze

GA - Kennesaw State University

Discipline: Linguistics and World Languages

Authors:

#1 Sabine Smith

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Abstract Name: Undergraduate Human Subjects Research Lab Experiences in Humanities

Amid concerns for the coming enrollment cliff as well as enrollment attrition in humanities programs, one sector of higher education that continues to grow is international students. In view of growing concerns about enrollment attrition and shrinking resources for sustainable international learning experiences, short-term programs grounded in institutional partnerships may offer opportunities of mutual benefit to international participants and domestic stakeholders. This exploratory case study examines the effects of a six-weeks English language learning program in which seventeen German adults participated in Spring semester 2024. This project investigates the program's impact on participants' language proficiency and intercultural competence (IC) development and on classmates' and instructors' attitudinal dispositions and behaviors. Employing a mixed-methods approach, this study triangulates data from pre- and post-intervention tests, learners' and instructors' attitudinal survey responses, and focus-group interviews with two participant groups and instructors. Preliminary findings indicate a positive impact of short-term intensive English learning programs on learners' proficiency, regardless of cohort, as demonstrated by pre- and post-test scores. Both learners and instructors highlight the program's effectiveness while also identifying challenges and areas for improvement. This session will focus on the participants' advancement of IC. While the findings cannot be generalized, they may have implications for program and instructional design; student success and learner support strategies; and sustainable efforts to facilitate international and cross-disciplinary partnerships in diverse educational settings. Study findings will be shared with session participants to allow for further review.

Hannah Kilburn

FL - University of West Florida

Discipline: Environmental Science and Sustainability

Authors:

#1 Thomas Derbes

#2 Matthew Schwartz

Abstract Name: Monitoring Phytoplankton for Oyster Hatchery Planning in Northern Gulf of Mexico

We are working with a local oyster farm and the Florida Sea Grant extension office to investigate the composition of phytoplankton standing stocks and water quality associated with an existing oyster farming operation in the Pensacola (FL) Bay System. Oyster spawning consists of male oysters releasing sperm and females release eggs into the water; it is successful when an egg is fertilized by sperm. Oyster reproduction is complex and any changes in salinity, temperature, or phytoplankton population in the spring may trigger them to start the reproduction cycle. Pensacola Oyster Company operates an oyster hatchery that is trying to successfully spawn oysters using techniques used successfully in the Mid-Atlantic (USA) region; however, the methods from there are not working in the Gulf of Mexico or Pensacola Bay. Florida Sea Grant is working with the hatchery to investigate environmental conditions to determine what is needed to create the perfect environment to spawn oysters successfully in this environment. The University of West Florida was engaged to survey the phytoplankton that are in the water during spawning season, and in contrast what is not in the water during non spawning season. We used the National Oceanic and Atmospheric Administration's Phytoplankton Monitoring Network (NOAA PMN). After the sample is collected it is taken back to the lab and put under a microscope at 40x magnification to identify the plankton in the Pensacola Bay. The temperature, salinity, and water temperature are all recorded as well. The goal is to identify the plankton that are in the water and recreate what the water is like during spawning season to trigger spawning during non spawning season. We will report to both FL Sea Grant and the oyster farm the full survey of phytoplankton species identified during fortnightly-to-monthly sampling to inform their ongoing and future hatchery operations.

Madeline Killion

KY - University of Kentucky

Discipline: Biology

Authors:

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Abstract Name: Exploring the Role of Nutrient Sensing Receptor GPRC6a Repression in Tau Pathology

Alzheimer's disease (AD) is the most common form of dementia, accounting for 60-80% of dementia cases and is characterized by beta-amyloid plaque buildup and subsequently, hyperphosphorylated tau. Recently, immunotherapy to beta-amyloid has been FDA approved but no current treatment exists for tau. Tau functions to stabilize microtubules which provide support to neuronal structure. Hyperphosphorylated tau destabilizes microtubules which can impact cell functions and cause metabolic dysfunction. Tau pathology ultimately causes the cognitive impairment & cell death present in AD patients. Many reports indicate impaired protein clearance mechanisms through dysregulation of the mechanistic target of rapamycin complex (mTORC1) in AD. One of the primary amino acids that activates mTORC1 is arginine, which signals through various nutrient sensors and the extracellular arginine receptor, GPRC6a. We hypothesized that hemizygous

deletion of GPRC6a in tau transgenic mice impacts protein clearance through autophagy and neuropathology of tau. PS19 tau mice (MAPT P301S) were cross bred to GPRC6a hemizygous knockout mice (P301S/GPRC6a+/-) and aged for 8 months. Brain tissue was harvested and subjected to immunohistochemistry/histology for indicators of tau pathology. Phosphorylated tau markers AT8 (phospho Ser202/Thr205), tau phospho 217, and total tau (HT7) were measured in various regions throughout the brain and quantified using unbiased image analysis. Total tau remained unchanged between P301S tau mice and P301S/GPRC6a+/- mice. P301S/GPRC6a+/- mice showed a decreasing trend in tau phospho 217 compared to P301S mice, however this was not statistically significant. Interestingly, tau AT8 decreased in several regions throughout the brain in P301S/GPRC6a+/- mice compared to P301S mice, suggesting that GPRC6a expression impacts tau pathology. Several autophagy and neuronal integrity markers are currently being investigated to understand the impact on neuronal plasticity and tau clearance. These results suggest that GPRC6a expression modulates tau pathology, which could serve as a unique therapeutic target in AD.

mwashite kilomo

UT - Salt Lake Community College

Discipline: Economics

Authors:

Abstract Name: Balancing the Scales: The Economic, Social, and Ethical Dimensions of Illegal Immigration in the U.S.

Abstract: Illegal immigration impacts the U.S. labor market, economy, and social policies in complex ways. On the labor front, it offers both advantages and challenges. While illegal immigrants contribute to economic growth by filling essential secondary-sector jobs and spending 90% of their wages domestically—estimated at \$450 billion—they also face criticism for allegedly displacing low-skilled workers, lowering wages, and weakening labor unions. Dual labor market theory explains their role in addressing labor shortages in low-skill, unstable positions that native workers often avoid, with immigrants demonstrating mobility as they gain U.S.-specific skills. Despite their contributions, illegal immigrants endure systemic challenges. During the COVID-19 pandemic, detention centers were criticized for prison-like conditions, delayed healthcare, and poor living standards, which heightened health risks and caused avoidable deaths, including for children. Additionally, reports of abuse by border patrol agents, ranging from physical violence to homicide, highlight a history of human rights violations. Many cases remain undocumented due to insufficient complaint procedures, leaving immigrants unprotected. Immigration policies further shape the debate. Local policies like those in Prince William County initially aimed to reduce crime but had mixed outcomes. At the federal level, the Trump administration promoted stricter immigration laws, arguing that immigrants harm U.S. citizens by taking jobs, using social benefits, and increasing crime. This stance sparked opposition, with Democrats asserting that immigrants take low-wage jobs Americans typically avoid. In summary, illegal immigration remains a contentious issue, with immigrants playing vital economic roles while grappling with systemic inequalities, harsh policies, and societal perceptions. Striking a balance between enforcement and humane treatment remains a critical challenge for the U.S.

Jonghyeok Kim

NY - Cooper Union for the Advancement of Science and Art

Discipline: Engineering

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#1 Jonghyeok Kim

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Jaehyeon Park

Abstract Name: Optimizing Small Wind Turbine Efficiency Through Attaching a Novel Structure

Wind energy is indeed a vital component for renewable energy strategies in many countries, significantly reducing any hazardous impact to environment. This study seeks to enhance the efficiency of small wind turbines through innovative design modifications based on Bernoulli's principle. We develop "wind power density compressors," structural attachments designed to increase wind speed and air density at the turbine blades—the two primary factors influencing wind turbine energy output. Three models for horizontal-axis wind turbines (HAWTs) and four for vertical-axis wind turbines (VAWTs) with varying size ratios are designed and evaluated using Solidworks Flow Simulations. The results demonstrate substantial increases in wind velocity at the turbine blades, with HAWT Model 3 achieving approximately a 70% increase and VAWT Model 4 achieving around an 18% increase. Significant increases in air density at the propeller region are also observed. Calculations using the wind power density formula indicate potential energy generation enhancements up to fivefold for HAWTs and 1.7 times for VAWTs. By comparing the performance from conventional models, we identify key factors that enhance the efficiency of wind power density compressors. With these novel structures, a wide range of wind turbines can achieve significantly higher performance, paving the way for a more sustainable and environmentally friendly energy future.

Myer Kim

VA - James Madison University

Discipline: Theatre/Drama

Authors:

#1 Lindsey Kelley

Abstract Name: The Exploration of Materiality on The Theatrical Stage and Sustainable Theatre

Through the exploration of materials and creating an abstract, unique design process, theatrical design could be reinvigorated. Traditional aspects of scenic design have hit a standstill in materials use and designers often design with the same concepts and materials, not allowing for play or experimentation. Over the past three to four years, due to the constraints of rising labor and materials costs, theatrical and musical productions at JMU School of Theatre and Dance (hereafter referred to as "STAD") have generally involved or overly relied on pre-made steel deck assembly with some wood-based construction. Initially, the pre-fabricated steel deck design was awe inspiring to both the audience and production staff because steel deck was new and nontraditional for undergraduate-level theatre. However, as more productions began using the prefabricated steel deck because of its cost saving and simplicity, steel deck construction-based designs felt uninteresting and uninspired. The program of the musical, *SpongeBob the Musical*, was shifted to utilizing sustainable and already existing materials in an effort to create a "green" show. An anonymous survey polled at the end of the musical showed that many had a great appreciation in the plastic and different materials utilized throughout

the design. The radical design approach help spark a conversation of what design is and what design is capable of; moreover, this survey provided insightful critiques regarding the organization and structure.

Grace Kim

NH - Dartmouth College

Discipline: Sociology

Authors:

#1 Devon Goss

#2 Shaila Sachdev

#3 LaTonia Taliaferro-Smith

#4 Sarah Fankhauser

Abstract Name: Spurring and Siloing: How Do Non-White Early-Career Science Writers Incorporate Their Racial and Cultural Identities?

Historically, the science writing and publication field has been a predominantly white space with established norms that present barriers for marginalized individual involvement. Previous literature has shown that involvement in science writing and publication has enhanced science identity and persistence in STEM, leading to a more recent push to diversify scientific inquiry and inclusivity among those historically excluded. Although there is ample research done on the development and regression of science identity in marginalized individuals, there is a lack of exploration on the experiences of non-white early career individuals navigating the science writing processes with regards to their racial and cultural identities. In particular, Asian Americans have been historically perceived as the model minority, assuming that they have a natural aptitude for STEM. So, while Asian Americans are a minority group, many don't perceive them as a minority in science. This results in a lack of studies on how they navigate scientific norms and bridging the different parts of their identity and culture. The current study interviewed 26 participants of self-described Asian background from the Journal of Emerging Investigators (J.E.I.), a scientific journal dedicated to publishing middle school and high school research, on questions relating to their experiences and views of science writing, identity, and community. Data analysis was conducted using NVivo. Results indicate that participants took two different approaches in incorporating their racial and cultural identities: siloing, wherein students emphasized the need to separate their identities from science writing, and spurring, wherein they drew inspiration from their cultural backgrounds when constructing their initial research question. Many also brought up racial invisibility in which participants never recognized how race may influence their scientific work. This alludes to specific boundaries in scientific writing that Asian participants conceptualize in order to navigate the model minority myth.

Jiae Kim

NC - Duke University

Discipline: Education

Authors:

#1 Kristen Stephens

Abstract Name: Bridging Gaps: Evaluating the Effectiveness of University School Counseling Certificate Programs on Supporting Undocumented Students in North Carolina

This study aims to understand the effectiveness of school counseling certificate programs in guiding school

counselors to support undocumented students in North Carolina. While existing research highlights the importance of parent engagement and teachers' roles in supporting marginalized students, there is limited focus on the training counselors receive to address the unique needs of undocumented populations. Additionally, there is a lack of research on undocumented students in K-12 North Carolina Public Schools, which hinders support systems for these under-resourced populations. This gap in knowledge prevents the development of effective and equitable support systems for these students. Using a mixed-methods approach, the research begins with qualitative interviews and a quantitative Qualtrics survey targeting current North Carolina school counselors to assess their counseling experience and identify gaps in their training. Based on their responses, another set of interviews and surveys is conducted with university faculty in school counseling programs to analyze how certification curricula address, or fail to address, the challenges undocumented students face. Findings suggest a misalignment between the theoretical frameworks taught in the school certificate programs and the practical skills required to navigate the legal, cultural, and emotional complexities experienced by undocumented students in schools. For instance, many programs lack sufficient content on immigration policies, language support, or trauma specific to undocumented students, leaving it difficult for counselors to provide comprehensive support. By bridging this gap, this study aims to inform future revisions to school counseling certification programs and advocate for updated, inclusive, and comprehensive curricula. This study offers valuable insights into the difficulties, concerns, and gaps between school counseling certificate programs and the practical needs of school counselors in North Carolina, laying a strong foundation for future investigations and program enhancements.

Hayoung Kim

UT - Westminster University

Discipline: Biology

Authors:

#1 Anne Gibson

Abstract Name: Effect of Ethanol on Nicotine Preference in *C. Elegans*

Nicotine and ethanol are the two most-commonly abused substances in the U.S.. However, effective treatments for these drugs are still not found, and the interdependence between these two drugs are not well publicized. This study investigates how ethanol exposure influences nicotine preference in *C. elegans* using a chemotaxis preference assay. We hypothesized that ethanol exposure would increase nicotine preference. One group of *C. elegans* was exposed to ethanol for 30 minutes at the L1 stage (3 days from birth), while another group experienced 300mM ethanol exposure from birth until the L1 stage. These groups helped determine if nicotine preference was dependent on the duration of ethanol exposure. Post-ethanol treatment, *C. elegans* were placed in a preference assay with nicotine (4 μ L) in one zone and water (4 μ L) in another in a 6-well plate. Each pair of 6-well plates had different concentrations of nicotine, from 0 mM, 15 mM, 30 mM to 50mM (total of eight 6-well plates), to see if nicotine concentration influenced the preference index. Imaging occurred after 30 minutes of exposure to testing zone to calculate the preference index: (# of *C. elegans* in the nicotine zone)/(# in both zones). A two-way ANOVA assessed the effect of ethanol on nicotine preference. A 30-minute ethanol exposure showed no significant difference in nicotine preference, whereas lifelong exposure resulted in an increasing trend of nicotine preference at low dosages (~30 mM). These results suggest further experiments are needed to refine the data. This study aims to expand the body of knowledge between ethanol and nicotine addiction, and contribute to better treatment strategies.

Hyangyoo Kim

OH - Denison University

Discipline: Biology

Authors:
#1 Solomon Tin Chi Chak

Abstract Name: The Impact of Spongivore Communities on Eusociality in *Synalpheus* Shrimps

Ecological interactions, such as predation and symbiosis, could profoundly affect evolution. Eusociality, a social structure providing ecological advantages such as enhanced defense and resource utilization, has evolved multiple times in sponge-dwelling *Synalpheus* species that are obligate symbionts of sponges across Caribbean reefs. Building on prior research into ecological interactions and their evolutionary impact, this study examines spongivore predator diversity's role in shaping the evolution of eusocial behavior in *Synalpheus* shrimps across multiple Caribbean reefs. Using PERMANOVA analysis, significant associations between spongivore community composition and the number of eusocial species and lineages are identified. This research enhances understanding of predator-prey dynamics and their evolutionary implications, with conclusions emphasizing broader ecological influences and guiding future studies into the evolutionary drivers of social complexity.

Ripley Kindervater

PA - Penn State Behrend

Discipline: Biology

Authors:
#1 Lynne Beaty

Abstract Name: Time to Flip a Switch: Documenting Biofluorescence in Northwestern Pennsylvania's Native Salamanders

Biofluorescence, the absorption of high-energy wavelengths of light (e.g., blue) and subsequent re-emission of low-energy wavelengths of light (e.g., yellow), has recently been documented in several terrestrial taxa like salamanders. Most reports document biofluorescence at the family level, yet none have thoroughly documented intra- and interspecific variation in biofluorescence. Our study sought to determine which Northwestern Pennsylvania salamander species fluoresced in response to five excitation wavelengths, including ultraviolet, violet, blue, cyan, and green lights, and document ontogenetic variation in fluorescence. Captured salamanders were excited with one of five excitation lights within a photarium, photographed, and had their fluorescence measured with a spectrometer and long pass filter. All species encountered during this study fluoresced in response to all excitation wavelengths. Notably, sexual dimorphism in fluorescent patterns were observed in the postcloacal glands of two Plethodontid species (*Plethodon cinereus* & *P. glutinosus*), supporting similar observations made in previous studies. Unlike sexually mature *P. glutinosus*, juveniles had reduced postcloacal biofluorescence. Therefore, biofluorescence may be diagnostic of sexual maturity in this species. Species less reliant on visual senses, like *Cryptobranchus alleganiensis*, were less fluorescent when compared to visually-oriented species. Similar to the results of previous studies, we found that the biofluorescence of larval salamanders changed throughout ontogeny. While the function of biofluorescence in salamanders is unknown, our results suggest that biofluorescence may be used in conspecific and heterospecific communication as well as in behaviors like reproduction and territoriality.

Grady King

WV - West Virginia University

Discipline: Nursing and Public Health

Authors:

#1 Dr. Srinivas Palanki

#2 Alina Koirala

Rahat Arefy

Abstract Name: Monte Carlo Simulation of Affordable Care Act's Impact on Lung Cancer Mortality

Since the implementation of the Affordable Care Act (ACA) and the resulting Medicaid expansion beginning in 2014, public health insurance coverage in the USA has increased by over 35 million people. The ACA Medicaid expansion had an intervening Supreme Court decision which permitted individual states to choose whether or not to implement it, yielding a scenario to test the impact of Medicaid expansion on public health. Lung cancer continues to be the deadliest form of cancer domestically and worldwide, with West Virginia having the highest rate of lung cancer deaths of any state in 2022. The purpose of our work is to investigate whether the ACA reduced lung cancer mortality, and to evaluate various modeling techniques both established and novel to healthcare policy analysis. We have identified obesity, smoking, air pollution (PM2.5), and ACA implementation year as key predictor variables and utilized public data sources from the CDC (WONDER, NHANES, BRFSS) and the EPA. Additionally, preliminary analysis has led us to consider measures for obesity other than simple BMI, such as waist circumference, based on literature indicating that abdominal obesity may have a higher correlation with lung cancer mortality than BMI. We are carrying out this analysis comparing models from several methodologies: difference-in-difference, GLM, PAR(p), and ARIMA. Monte Carlo simulations will be utilized to propagate uncertainty from the predictor variables through these models. We expect to determine the impact of ACA on lung cancer mortality and provide a quantitative tool for analyzing public healthcare policy.

Zantia King

TX - Midwestern State University

Discipline: Environmental Science and Sustainability

Authors:

#1 Zantia King

#2 Elizabeth Elkins

#3 Kashif Mahmud

Abstract Name: Advancing Urban Forestry: Enhanced Biomass Estimation Using Terrestrial LiDAR

Above-ground biomass (AGB) is a key metric for evaluating carbon storage in terrestrial ecosystems, particularly in urban environments where trees deliver significant ecological benefits. Accurately quantifying AGB in urban areas is complex due to the wide diversity of tree species, varying morphologies, and intricate land cover. This study leverages Terrestrial Light Detection and Ranging (LiDAR) technology to enhance AGB estimation for urban trees, providing a precise, non-invasive alternative to traditional methods. LiDAR data collected at Midwestern State University (MSU Texas) was used to extract individual tree point clouds, enabling the calculation of critical structural parameters such as tree height, diameter at breast height (DBH), volume, and surface area. Advanced segmentation and geometric modeling techniques were applied, and model outputs were validated against field measurements, including harvested biomass and DBH from campus trees. Focusing on North Texas species like Red Oak, Live Oak, Cedar Elm, and Pecan Hickory, this research refines a tailored AGB prediction model. Additional steps, such as scanning leafless trees for improved AGB estimates and incorporating tree height as a new attribute for analysis, aim to strengthen the accuracy of predictions. Furthermore, the TLS2trees algorithm will be utilized to automate individual tree segmentation from the LiDAR point cloud. The findings underscore the utility of LiDAR in advancing urban tree biomass assessment and support more reliable urban forestry management strategies for sustainable carbon management.

McKenzie King

OK - University of Central Oklahoma

Discipline: Art History

Authors:

#1 McKenzie King

Abstract Name: History of the Japanese Kimono and the Transformation in Modern Designs

Kimonos have a rich history in Japan, originating during the Heian Period. Initially designed as a twelve-layer formal garment for nobility, kimonos evolved into simpler styles for everyday use, influenced by the Western expansion of trends and innovations, including the introduction of chemical dyes and advancements in silk production. The motifs woven into the fabric carry various meanings and reflect the changing seasons. The opening of Japan's borders in 1639 allowed Western ideas to reshape everyday attire, particularly during the Taisho and Showa periods, which saw kimonos transition from traditional designs to more Westernized interpretations.

McKenzie King

OK - University of Central Oklahoma

Discipline: Art History

Authors:

#1 McKenzie King

Abstract Name: Buddhism During the Heian Period: Great Wisdom Sutra (Daihannya-kyō) from the Chūsonji Temple Sutra Collection (Chūsonji-kyō)

In Japan, the period spanning the seventh to the eleventh century is known as the Heian period. During this time, the shift from traditional Kami beliefs to Buddhism significantly changed the monastic school system, establishing eight distinct schools for Buddhist monks. The religion profoundly impacted the society's culture and politics, including educational institutions, military organizations, and the ascendance of monks to higher social ranks. This study demonstrates how Buddhists appropriate the traditional Kami beliefs to Buddhist values to deal with the pollution of their lands. The examines the scroll of The Great Wisdom Sutra (Daihannya-kyō) from the Chūsonji Temple Sutra Collection (Chūsonji-kyō), reflecting concepts of both Kami and Buddhism, depicted on opposing sides of the battlefield, as one side seeks the emptiness embodied in a scroll of the Chūsonji Temple. This text aims to clarify the historical journey of Buddhism into Japan, provide context for the Great Wisdom Sutra (Daihannya-kyō) from the Chūsonji Temple Sutra Collection (Chūsonji-kyō), and include a formal analysis of the artwork in question.

Zadria King

OH - Defiance College

Discipline: Biology

Authors:
#1 Sabrina Brown
Karrie Smith
Jazmine Hoffman

Abstract Name: A Long-Term Assessment Study On Water Quality Of The Rivers Around Defiance, Ohio USA.

The Maumee River begins in Fort Wayne, Indiana and flows through a number of large cities, including Defiance, Ohio, before draining into Lake Erie. The Maumee River watershed covers more than 6,500 mi² and two of its largest tributaries, the Tiffin and Auglaize Rivers, enter the Maumee in Defiance, Ohio. The goal of this research is to establish a long-term assessment program of the water quality in the Upper Maumee Watershed using chemical analysis, streamflow, and bioassessment utilizing diatom assemblages. Here we provide preliminary results from a field collection of sites on the Maumee River and tributaries conducted from 2021-2023. Four collection sites were sampled over three subsequent six-week periods from May-June 2021, 2022, and 2023. Sites included the Tiffin and Auglaize Rivers, tributaries of the Maumee; a site along the upper Maumee, prior to the confluence of the Tiffin, and a Maumee site past the confluence of the Auglaize. On average, the Maumee River prior to the confluence of the Tiffin, had the least turbid water with the highest levels of dissolved oxygen over the course of the sampling period. The Auglaize had the most turbid water with the lowest average levels of dissolved oxygen. This site also had the highest levels of nitrates, nitrites, and ammonia, and exhibited a lower average streamflow than both sampling sites on the Maumee. The diatom assemblages were dominated by *Fragilaria*, *Aulacoseira*, and *Navicula*. Results indicate that the Tiffin River site had the highest diversity in diatom and macroinvertebrate communities with diatom species indicative of high nutrient availability. Plankton tows at the Auglaize had a high percentage of benthic species present, indicating relatively turbid conditions. Both Maumee River sampling locations had similar species compositions, dominated by *Aulacoseira*, with an influx of *Stephanodiscus* indicative of nutrient runoff at the end of the sampling period.

Lucia King

PA - University of Pittsburgh School of Nursing

Discipline: Nursing and Public Health

Authors:
#1 Lucia King
#2 Myeong-ga Cho
Myeong-ga Cho

Abstract Name: Social Determinants of Cognitive Function among Women in Menopausal Transition: Scoping Review

Background and Aim: Approximately 60% of middle-aged women experience cognitive decline during the menopausal transition, with the impact of multiple factors including social determinants of health (SDOH). However, little has been known regarding the role of SDOH on cognitive function among women during the menopausal transition. Therefore, this scoping review aims to synthesize the available evidence on SDOH in associations with cognitive function in this population. Methods: Based on the methodological framework proposed by Arksey and O'Malley, literature was obtained from PubMed, MEDLINE, CINAHL, and APA PsycINFO. Studies were included if they were published from January 2014 to January 2024, written in English, and conducted in community-based setting, whereas studies on the population with chronic psychiatric conditions, neurological conditions, or chronic disease were excluded. Identified SDOH were categorized into biological, psychological, and social dynamics with the guidance of the biopsychosocial framework. Results: Out of 251 studies searched, 27 were eligible for this review. 74% of studies reported

multiple SDOH and 15% reported interaction effects of SDOH on cognitive function. Biological dynamics included obesity and reproductive factors. Psychological dynamics include stress and occupational demand. Social dynamics included physical activity, childhood experiences, education level, socioeconomic status, race and ethnicity, and immigration status. Interaction effects were identified between obesity and stress, education and parity, and socioeconomic status and parity. Higher educational level was most consistently reported with better cognitive function, although the affected domains and measurements for cognitive function varied. Conclusion: Our findings highlight how individual-level biological dynamics interact with psychological and social dynamics to shape cognitive function, underscoring the importance of a multidimensional approach to understanding cognitive changes with roles of SDOH in women during menopausal transition. Implication: We suggest future studies investigating the interaction effects of SDOH and developing comprehensive assessments embracing SDOH to better understand cognitive function in this population.

Emma King

OH - Miami University

Discipline: Psychology

Authors:

#1 Ryan Rakoczy

Abstract Name: Preliminary Evidence Psilocybin Alters mPFC Circuitry to Restore Neural Balance in Depression

Demand for more rapid acting and efficacious antidepressants has led to a reevaluation of psychedelics for their therapeutic utility. Psilocybin, the psychoactive compound found in “magic” mushrooms, has been demonstrated to swiftly and chronically reduce symptoms of major depressive disorder. However, identifying neural correlates of therapeutic actions has proven difficult. Herein, we provide preliminary evidence of psilocybin’s ability to alter neural activity in a brain region implicated in the pathogenesis of major depressive disorder, the medial prefrontal cortex (mPFC). Augmented circuit-level signaling in the mPFC has been correlated with depressive symptoms, such as rumination, and theorized to be mediated by excessive glutamatergic signaling. Preliminary in vivo electrophysiological recordings of mPFC neurons in awake and unrestrained rodents treated with psilocybin, suggest two key changes in mPFC activity during administration of psilocybin: 1) GABAergic-like signals exhibited increased firing frequency, and 2) glutamatergic-like signals exhibited reduced firing frequency during psilocybin administration, compared to baseline. Preliminary evidence supports the hypothesis that psilocybin alters the excitation-to-inhibition signaling ratio in the mPFC which may, in part, mediate therapeutic effects. Furthermore, psilocybin may induce synaptogenesis within the mPFC leading to restoration of inhibitory signaling and potentially correlate with long-term resolution of symptoms of depression; this will be assessed in future experiments.

Emily Kinney

CA - Chapman University

Discipline: Political Science

Authors:

Abstract Name: The Not-So-Silent Fourth Branch: Media’s Impact on Voter’s Trust in the Government

In a democracy, trust is essential to the function of government; voters must trust that their vote holds value,

that those they elect are working in their best interests, and that the government cares about their well-being. This trust in government, however, is at an all-time low, risking the very foundation of American democracy. Using the 2020 American National Election Survey and the Chapman Survey of American Fears, representative national samples of U.S. adults, this paper aims to determine how different types of media, such as various outlets and social sites, impact American's fear of the government, measured using a variety of scales like fear of corrupt government officials, fear of fraudulent election results, and overall distrust of the government itself. Current literature highlights the relationship between echo chambers and the beliefs about government held by those in said chambers, and this paper uses regression analysis and crosstabs to determine if specific factors such as CNN vs. FOX news consumption, time on X/Twitter, or contact with print newspapers increase or decrease a respondent's fear of the government. I expect to find that the more time a respondent spends on non-mainstream news channels and on "fringe" social media, engaging with those who hold viewpoints similar to their own, the more likely they are to distrust the government, no matter their party affiliation. As media moves further away from serving the public and towards serving their bottom lines, it is essential to understand media's ever-growing impact on our faith in democratic systems.

Kaitlyn Kinslow

VA - Christopher Newport University

Discipline: Biology

Authors:

- #1 Ethan Hoffman
- #2 Megan Bowers
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- #4 Jamie Martin
- #5 Joy Kanapala
- #6 Ryan Caterbone
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- #8 Trent Kirchoff
- #9 Sanai Williams
- #10 Grady Fleming
- #11 Grady Fleming
- #12 Haley Dewitt
- #13 Ellie Barry
- #14 Sara Chaari
- #15 Jack Medlin
- #16 Andrew Velkey

Abstract Name: DYNAMICS OF DOSE-RESPONSE OF ZEBRAFISH (DANIO RERIO) PREFERENCE FOR UNDISTURBED SHOALS OVER SHOALS EXPOSED TO THE SYNTHETIC ALARM SUBSTANCE HYPOXANTHINE-3-N-OXIDE (C5H4N4O2)

Zebrafish (*Danio rerio*) are a common model organism for behavioral neuroscience due to their complex social behavior, which includes shoaling. Shoaling occurs when members of a group loosely congregate without synchronization of movement. Previous research has shown that zebrafish prefer an established social environment and can detect subtle movement differences among group members in forming shoaling preferences during the 3-chamber open-tank free-swim task (OTFST). In the present study using the OTFST, single subjects in the center tank were provided simultaneous visual exposure to a shoal exposed to synthetic alarm substance in one flanking tank and a shoal that remained unalarmed in the other flanking tank. The dose of the synthetic alarm substance delivered to the tank holding the alarmed shoal resulted in a final concentration of 1.5nM, 3nM, or 5nM of C5H4N4O2. The movement of each subject was recorded using MediaRecorder and EthoVision XT16 was used to summarize positional data for each subject as a heatmap. Across the heatmaps, subjects demonstrated three specific response patterns—social contagion (avoiding the alarmed shoal), social buffering (affiliating with the alarmed shoal), and boldness (multiple cross-tank

excursions between the two shoals). There was more variability among subjects responding to the shoal exposed to 1.5nM compared to 3nM. Subjects responding to a shoal exposed to a 1.5nM concentration spent more time in the top half of the tank compared to subjects responding to a shoal exposed to a 3nM concentration. This suggests that subjects responding to a shoal exposed to a higher concentration showed more anxiety-like responding. Data on subjects exposed to a shoal exposed to the 5nM concentration are pending. This study promises to advance the understanding of mechanisms that produce distinct social behaviors and anti-predation responses in zebrafish.

Eva Kinwel

KY - Thomas More University

Discipline: Chemistry

Authors:

#1 William Wetzel

Abstract Name: A Novel 3-D Printed Device for Spectrochemical Titrations

Titration is utilized in a variety of areas of chemistry because of their simplicity, low cost, versatility, and ability to selectively and accurately quantify a target analyte of interest. Although acid-base titrations are most commonly investigated, titrations can also be used to probe redox, precipitation, complexation, and a variety of other reactions of interest. Because many chemical reactions involve clear reactants and products, indicators are frequently employed to provide a colored species that indicates the endpoint of a titration. There are limitations with using indicators, however, because not every indicator has a very obvious color change at the endpoint of a reaction and because human eyes have difficulty distinguishing small shifts in color or weak intensities. A spectrophotometer can detect even the smallest color change, so using this for endpoint detection can improve the quality of the analysis. In this work, various attachments able to contain the reaction volume of a titration were designed and created with a 3-D printer. These attachments were subsequently connected to a spectrophotometer and their performance was evaluated for use in a spectrophotometric titration. Characteristics and specifications of the attachments and their suitability for future titrations will be discussed.

Sierra Kirby

OH - University of Findlay

Discipline: Biology

Authors:

#1 Lauryn Steele

#2 Oleksandra Melnyk

#3 Taylor Ivory

#4 Bethany Hnederson-Dean

Adrienne Kuhlman

Abstract Name: Effects of Phytoremediation on Horizontal Gene Transfer

The increasing global use of antibiotics in human, veterinary, and agriculture practices has led to significant environmental contamination, particularly in aquatic ecosystems. The amount of antibiotic resistant bacteria in local waterways has been increasing due to an increase in antibiotics in runoff going into waterways fostering ecological imbalances and contributing to the spread of antibiotic-resistant bacteria (ARB) and

resistance genes (ARGs). This study investigates the role of aquatic plants, specifically *Vesicularia montagnei* and *Phyllanthus fluitans*, in mitigating horizontal gene transfer (HGT) among bacterial populations in controlled environments. We explore whether these plants can reduce the prevalence of ARGs or inadvertently facilitate HGT. Utilizing in vitro experiments with *E. coli* strains resistant to tetracycline and ampicillin, we assess how plants are affecting the rate/occurrence of HGT. Our findings aim to inform wastewater treatment strategies by evaluating the potential integration of phytoremediation techniques. Understanding the interaction between HGT and aquatic plants is crucial for developing effective measures to combat antibiotic resistance in aquatic ecosystems, ultimately enhancing public health safety.

Chloe Kirk

TN - University of Tennessee at Knoxville

Discipline: Engineering

Authors:

#1 Vivek Chawla

#2 Dayakar Penumadu

Abstract Name: Effects on Environmental Sustainability when Using Basalt Fiber as a Reinforcing Material for Composites in Industrial Applications

Recently, initiatives have been established to promote more sustainable practices and approaches in industry and academia. This work aims to find more cost-effective and sustainable industrial applications within the scope of reinforcing materials in composites. In the past two decades, various natural fibers such as lignin fibers, basalt fibers, etc., have been investigated to replace carbon and glass fibers to reduce the carbon footprint. Basalt fibers are natural fibers made from crushed basalt- a volcanic rock. In applications requiring high ductility and where stiffness is not the prime design criterion, like the glass fiber applications, basalt-based fibers have shown promise because of their feasible mechanical performance and ability to react with carbon dioxide and form stable carbonate minerals. Basalt fibers also offer a significant economic advantage, requiring less energy to produce than glass fibers, making them a practical choice for sustainable materials. This study used the continuous stiffness measurement (CSM) technique to evaluate the single fiber tension properties (modulus, yield, and strength) of various basalt fibers made from different source rocks and processing parameters. We then employed Weibull statistics to understand the size-dependent properties of these fibers and compared them to commercial glass fibers. The results of our study are promising, suggesting that basalt fibers could replace glass fibers in a more economically feasible and environmentally sustainable manner. In addition, these findings could be instrumental in understanding the structure-property-processing relationship for basalt fibers.

Taylor Kissiah

NC - Western Carolina University

Discipline: Political Science

Authors:

#1 Taylor Kissiah

Abstract Name: In Favor of Retrospective Learning in Political Science

How can we ensure that learning is cumulative? Retrospective learning refers to the idea of inspecting a past event, action, or decision and reevaluating based on events that have occurred after they have occurred it also

includes utilizing newly gained knowledge and resources since the past event, action, or decision. For example, a college freshman is evaluating the Israel and Palestine conflict. They would then engage in Retrospective Learning by reevaluating the assignment years later as a senior in college with newly gained knowledge and new events that have occurred since. How does retrospective learning influence the retention and understanding of complex concepts, and what role does it play in fostering self-directed education among college students? This will be answered by analyzing journal articles on teaching and learning, empirical studies on retrospective learning retention rates, and political science journals on methods of learning. A distinctive feature of this research is its focus on Political Science, a field that blends the rapid developments and contemporary dynamics of today with theoretical foundations rooted in ancient Greek thought. This type of research provides valuable insight into how retrospective learning can be used to help students understand complex concepts, as well as foster self-directed learning. Additionally, this research will provide insight into how retrospective learning can be implemented in the classroom to support student learning.

Taylor Kissiah

NC - Western Carolina University

Discipline: Political Science

Authors:

#1 Taylor Kissiah

Abstract Name: The Degradation of the Senate: Polarization and the Rise of Executive Power

Over the last few decades, the Senate has been degraded and become increasingly polarized, leading to an unprecedented increase in executive power. This paper aims to demonstrate the alignment and contrasts between the constitutional framework and the practical reality of the relationship between the legislative and executive branches. Using a case study approach explore how this degradation and polarization of the Senate has increased the executive's power, this can be seen based on congressional opinion on rule XXII and the changing tactics of minority and majority parties. As a result of the degradation of the Senate and the resulting destruction of democracy, I expect to find that the decay of the Senate is linked to the growing power of the executive branch. This research is important because it seeks to explain a growing problem in our democracy and present democratic solutions to this problem to help us walk away from the ledge that is polarization.

Kandle Kitchens

TX - Lubbock Christian University

Discipline: Interdisciplinary

Authors:

#1 Doug Darby

Abstract Name: Ethical Perceptions and Impacts of Generative AI in Faith-Based Higher Education

Generative Artificial Intelligence (GAI) is a rapidly evolving technology with various models that challenge existing ethical modalities and thought processes, particularly in educational settings. Higher education institutions are especially being shaped and transformed by this; faith-based higher education has additional facets of consideration, especially in regard to faith and morally aligned mission, vision, and standards of education. This study explores the perceptions of various stakeholders at a small faith-based institution in West Texas, examining current and future spiritually-oriented considerations of GAI integration and

policymaking. Initial research highlights distinct ethical challenges, including conflicts and incompatibilities with current GAI models. To investigate, a survey was conducted of 1,858 participants, including students, faculty, staff, and administrators, followed by 23 qualitative interviews based on volunteer participant feedback during the survey. The study's findings reveal nuanced perspectives on GAI integration, highlighting both opportunities and challenges. On initial examination of the data, it appears that stakeholders recognize the potential and opportunities from GAI technologies but anticipate concerns with institutional integration and potential biases from AI-generated content. The findings from this study will aim to contribute to the overall discourse on AI ethics, and guide and inform both local and overall considerations for both institutional stakeholders and GAI developers in the refinement of policies and procedures, and technological development, respectively. With additional analysis and fine-tuning of the research instruments and methodology, this study can be expanded to encompass a wider range of faith-based higher education institutions. Employing a mixed-methods approach with quantitative survey data and qualitative interview responses allows for a comprehensive understanding of how institutions may achieve ethical GAI integration without infringing on their overarching goal of faith integration.

Jacqueline Kizabi

UT - Westminster University

Discipline: Business

Authors:

Abstract Name: How Does War Impact Individuals and Businesses in the Democratic Republic of Congo?

This project investigates the multifaceted challenges businesses and individuals face in the conflict-ridden environment of the Democratic Republic of Congo (DRC). In a country where ongoing conflict disrupts lives and creates an atmosphere of insecurity, this study seeks to understand why many businesses fail and how these failures impact the Congolese people. The research will explore the lived experiences of business owners whose enterprises collapsed or were harmed due to the war. The study highlights issues such as infrastructure damage, supply chain disruptions, and the struggle for stability in a post-conflict setting marked by limited access to essential services like clean water, food, healthcare, and education. Additionally, the research will explore gender-specific challenges, including sexual harassment and early marriage, to understand how these issues intersect with business and personal resilience. Through semi-structured interviews, ethnography, and autoethnography, the project will shed light on the nuanced experiences of those affected by conflict, emphasizing the need to address both economic and gender issues to promote peace and improve the environment for businesses and communities in the DRC. By tackling these interconnected challenges, the study aspires to contribute to a more comprehensive understanding of post-conflict recovery and inform policies that support sustainable development and gender equity in the region.

Kody Klein

PA - Pennsylvania State University

Discipline: Biology

Authors:

#1 Kody Klein

#2 Lynne Beaty

#3 Adam Simpson

#4 Samuel Nutile

Abstract Name: Determining How Space Use Affects Exposure and Toxicity of Two Common Use Insecticides

Insecticides play a crucial role in advancing agriculture, yet their runoff poses environmental risks to non-target areas. Evidence from laboratory and field toxicity assessments confirms the harmful effects of insecticides on diverse aquatic species. However, existing evaluations of insecticide toxicity often assume uniform exposure, an assumption that not accurate under field conditions. It is increasingly recognized that behavioral patterns can influence toxicity in the context of insecticide contamination, an aspect that remains understudied. Therefore, the objective of this study was to explore how space use influences toxicity of two widely used insecticides, bifenthrin and permethrin, on sediment toxicity to *Hyaella azteca*. Glass beakers were modified with steel rings to create exposure arenas with contaminated sediment placed either inside, outside, or both inside and outside the ring, resulting in three unique conditions for 48 h toxicity tests with *H. azteca*. For both bifenthrin and permethrin, pesticide placement influenced exposure and resulting toxicity to *H. azteca*. Placing pesticides within the steel ring resulted in higher lethal concentration 50 (LC50) values, indicating reduced mortality rates. Conversely, lower LC50s were recorded when contaminated sediment was placed outside or both inside and outside the ring. This suggests that *H. azteca* preferentially spend time in contact with the outside edge of the beaker, leading to higher exposure and increased toxicity when insecticides were placed outside the steel ring. As such, our results suggest space use is a major factor in predicting insecticide exposure and toxicity and should be considered in the development of laboratory toxicity tests.

Andrea Klein

MI - University of Michigan - Ann Arbor

Discipline: Engineering

Authors:

#1 Andrea Klein

#2 John Sayut

#3 Brandon Hardy

#4 David Nordsletten

Abstract Name: Quantifying the Biomechanics of the Heart in Severe Mitral Valve Prolapse

Mitral valve prolapse (MVP) is a common heart condition where the mitral valve billows into the left atrium as the left ventricle contracts, allowing oxygenated blood to regurgitate backwards rather than properly flow into the body. The leaky valve changes the forces and strains in the heart muscle wall and the papillary muscles that anchor the valve. It is hypothesized that these abnormal forces cause inflammation and scarring known as cardiac fibrosis, weakening a patient's heart function and leading to negative outcomes such as sudden cardiac death. In this project, cardiac magnetic resonance (CMR) imaging and echocardiography will be employed to characterize the heart anatomy and blood flow. Echocardiography measurements will include mitral regurgitation and end systolic and diastolic volumes. CMR images will be used to identify fibrosis and segment the mitral valve, as well as measure the four-dimensional (4D) blood flow through the heart. A new algorithm will be employed to obtain patient-specific transvalvular pressure data from the 4D Flow MRI. This novel multimodal data approach will allow a more comprehensive understanding of the multiple biomechanical processes underlying MVP. Relationships between echocardiography parameters and fibrosis will be examined for six MVP patients. It is expected that the cardiovascular biomechanisms will differ significantly between patients with and without fibrosis. In particular, the mitral valve surface area and valvular pressure gradient are expected to be higher in patients with fibrosis. The proposed pipeline will be instrumental in finding connections between patient-specific biomechanical properties and fibrosis, allowing the identification of MPV patients most likely to have negative outcomes. This information will also develop the scientific understanding of the root causes of fibrosis, informing the development of future interventions.

Haley Klingenberg

MN - Minnesota State University - Mankato

Discipline: Education

Authors:

#1 Haley Klingenberg

Abstract Name: Baseline Intercultural Competence of Students Entering Social Science Academic Majors at a Mid-size Midwestern Public University

Intercultural competence is the capability to accurately understand and adapt behavior to cultural differences and commonality. Developing this competence requires increasing cultural self-awareness by gaining insight into the experiences, values, perceptions, and behaviors of individuals from various cultural backgrounds. Then actively adjusting one's perspectives and actions to navigate cultural differences effectively. For higher education institutions to provide curriculum to match the baseline ICC level among different academic majors, it is necessary to first investigate the differences among undergraduate academic majors. This study began with an archived data set that included more than 2000 undergraduate students who completed the Intercultural Development Inventory during the past 15 years. This instrument is based on the Intercultural Development Continuum theory, and research has found that it has strong validity and reliability across diverse cultural groups. The theory names five stages of orientation to cultural differences: denial, polarization, minimization, acceptance, and adaptation, ranging from an ethnocentric to an ethnorelative mindset. Investigators conducted a random stratified sample to select data for 100 undergraduate students who pursued academic majors in psychology, education, or sociology at the university. The data set included age, gender, education completed, and college of academic major. The data was de-identified and exported to Excel and SPSS for analysis. The study was intended to describe the baseline ICC of undergraduate students by academic major. With more attention drawn to this subject, more action may be taken to counteract conflicting intercultural competencies. The findings of this study provide information to campus administrators and practitioners. The application of results may include implementing culturally sensitive classes and material in higher education curricula, so that diverse students can be served and grow.

Kayla Klinkenberg

MN - Hamline University

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: Wanhi Yukan / Grand Meadow Chert Quarry Lithic Debitage Analysis

While time often strips away the organic aspects of our material culture, stone artifacts, like tools and the debris generated in their manufacture and maintenance, remain preserved and are frequently recovered at archaeological sites. Often considered of little value at the time they were discarded, the stone waste flakes struck away during flintknapping (the shaping of lithic artifacts) carry critical information on both raw material choices and the intentions of the craftsperson who made them. Grand Meadow Chert (GMC), a high quality, sedimentary toolstone from a very defined source, Wanhi Yukan/Grand Meadow Chert Quarry (GMCQ) in Southern Minnesota, has been recovered in abundance in the form of endscrapers in archaeological sites across the Midwest. Endscrapers are tools primarily used to remove soft tissue and fur when processing animal hides. While recent studies have investigated flaking attributes (physical traits) of the production debris of other stone tool types, little attention has been paid to those coming from endscraper manufacture. Large quantities of GMC waste flakes have been recovered during archaeological projects at GMCQ, but the flintknapping activities that occurred there are undocumented. The knappers may have

focused on testing raw nodules, but could have also produced tools like endscrapers. This study explored the flaking attributes of GMC endscraper production by analyzing experimentally created flake sets. After attribute data was collected from experimental endscraper production, it was compared against that of other chipped tool manufacturing experiments. Flaking trends diagnostic of endscraper production were identified. With established tool production data as a guide, the flake assemblage recovered from GMCQ reflected endscraper and general core/flake production occurring at the site. These flakes, physical traces of human being, guide the interpretation of this location; supplying a voice for the significant relationship between endscrapers, the quarry, and communities who contributed to its physical record

Gavin Klipfel

OR - Willamette University

Discipline: Chemistry

Authors:

#1 Allen Dunham

#2 Nate Rutter

#3 J. Charles Williamson

Abstract Name: An Assessment of Complete Scaling Theory Applied to Nitrobenzene + n-Alkane Liquid-Liquid Systems

The study of partially-miscible binary liquid systems is valuable to separation science in terms of describing phase behavior. Coexistence curves show phase transitions of liquid-liquid systems for a range of temperatures as a function of system composition. Complete Scaling Theory (CST) is frequently used to fit these coexistence curves. The analytical method and the synthetic method are two different approaches to collecting phase transition data in liquid-liquid systems. The residuals from CST fits of analytical-method literature data of nitrobenzene + alkane data show the presence of systematic, symmetrical deviations. These discrepancies either reveal limitations of CST, or are due to artifacts of the analytical methodology. To answer this question, phase diagrams of the nitrobenzene + n-hexane (NBH), n-decane (NBD), and n-tetradecane (NBT) systems were measured using the synthetic method. Over twenty samples of each system were made in flame-sealed ampules, and their coexistence curve temperatures (T_{cx}) were determined from laser-light scattering data. Critical compositions were found by fitting 90° light scattering data, and CST coexistence curves were fit to the T_{cx} data. Our results for the NBH coexistence curve show that the literature data are incorrect, likely due to the challenges of determining phase composition with the analytical method. The CST fit to our NBH data yields random residuals, and no systematic deviations. For the NBD and NBT systems, our coexistence curves are in excellent agreement with literature data, and show the same symmetrical and systematic deviations in the residuals of CST fits. This indicates that the CST model does require further development for improved data fitting.

Sara Knox

PA - Duquesne University

Discipline: Engineering

Authors:

#1 Sara Knox

#2 Merve Ertas Uslu

#3 Melikhan Tanyeri

Abstract Name: Microfluidic Fabrication of Monodisperse Alginate-based Hydrogel Microparticles

Alginate hydrogels are used in a wide array of applications, such as drug delivery vehicles for chemotherapeutic agents, wound dressing, and tissue engineering, due to their biocompatibility and structural similarity to extracellular matrices in tissues. Here, we present a microfluidic method for synthesizing monodisperse alginate microparticles using flow-focusing emulsification techniques. In this method, two side channels carrying the continuous oil phase intersect with a central channel containing the dispersed aqueous phase, facilitating the formation of uniform droplets where the continuous phase pinches off the dispersed phase into droplets. The microfluidic devices were fabricated using standard soft lithography techniques. A 2% sodium alginate solution, containing sodium EDTA and calcium chloride, was emulsified into ~70 μm droplets. Introducing acetic acid into the oil phase caused a pH reduction within the droplets, disrupting the EDTA–calcium complex and releasing free calcium ions, which induce alginate gelation. After polymerization, a chemical demulsifier was applied to retrieve the aqueous phase containing the hydrogel microparticles, which was subsequently washed and stored in a buffer solution for later use. With modifications to system design and protocol techniques, this method can produce hydrogel microparticles averaging 20-30 μm in diameter, while retaining physical characteristics analogous to cellular structures. This approach holds significant potential for biomedical applications, including targeted drug delivery and regenerative medicine.

Isabel Knuteson

FL - The University of Tampa

Discipline: Environmental Science and Sustainability

Authors:

#1 Daniel Huber

#2 Grace Magnacca

Maria Kershner-Leon

Rory Caskey

Abstract Name: Feeding biomechanics and native and invasive fish species in the Florida Everglades

Everglades conservation is critical to both the well-being of Everglades biodiversity and the communities surrounding this unique ecosystem. Factors such as the management of water resources, agriculture impacts, and invasive species all affect the viability of the Everglades. The success of invasive species can often be attributed to their ability to outcompete the native species in their niches. To investigate the success of invasive cichlid fishes in the Everglades and their ecological impact on native centrarchid fishes, bite force and suction pressure were investigated over ontogeny using biomechanical modeling. Invasive Mayan cichlids *Mayaheros urophthalmus* (14 - 29 cm TL) had an oral jaw mechanical advantage of 0.36, bite force of 5.3 N, epaxial mechanical advantage of 0.24, and suction pressure of 1.9 kPa. Invasive Nile tilapia *Oreochromis niloticus* (12 - 26 cm TL) had an oral jaw mechanical advantage of 0.42, bite force of 1.6 N, epaxial mechanical advantage of 0.19, and suction pressure of 0.9 kPa. Native bluegill sunfish *Lepomis macrochirus* (10 - 15 cm TL) had an oral jaw mechanical advantage of 0.37, bite force of 0.7 N, epaxial mechanical advantage of 0.31, and suction pressure of 2.7 kPa. Preliminary analyses suggest that bluegill have lower bite forces but higher suction pressures, suggesting that any extent to which the bluegill is being outcompeted by these invasive cichlids may not be attributable to deficits in feeding performance. Future analyses will examine scaling patterns of feeding biomechanics and add sampling of additional native (redear sunfish *Lepomis microlophus*, spotted sunfish *Lepomis punctatus*, warmouth *Lepomis gulosus*) and invasive (oscar *Astronotus ocellatus*, jewel cichlids *Hemichromis bimaculatus*) species.

Lilianna Kocai

GA - Kennesaw State University

Discipline: Chemistry

Authors:

#1 Carl Saint-Louis

Abstract Name: Pre-Twisted Molecular Geometry's Effect on the Optical Properties of Nitrophenyl Substituted Polycyclic 1,2-BN Heteroarenes

Incorporating a three-coordinate boron center into the structure of polycyclic aromatic hydrocarbons by replacing one of the sp^2 C=C bonds with a boron-nitrogen bond creates flat-structured heterocycles known as aromatic azaborines (AAs). AAs are widely recognized for their unique optoelectronic properties including photochemical stability, high molar absorption coefficient, and high fluorescent quantum yields, as well as large Stokes shifts and tunable absorption/emission spectra, making them excellent candidates for a wide range of applications, including organic light-emitting diodes (OLEDs). Adding a -NO₂ group as a strong electron-withdrawing group to the scaffold of aromatic AAs, particularly pyrrolinone-fused-1,2-azaborines (PFAs), in an effort to redshift their absorbance and emission wavelengths and create electron-deficient n-type organic conjugates, results in significant emission quenching due to intersystem crossing. Another issue with -NO₂ substituted PFAs also tend to aggregate at high concentrations due to strong intermolecular π - π stacking interactions. In turn, aggregate formation results in emission quenching, also known as Aggregation-Caused Quenching (ACQ). This practical limitation poses significant challenges for -NO₂ substituted PFAs' use in many applications. We hypothesized that increasing the steric interactions through the PFA scaffold by incorporating a twisted molecular geometry by including bulky moieties such as methyl group will result in -NO₂-phenyl substituted PFAs with aggregation-induced emission (AIE), aggregation-induced emission enhancement (AIEE), solvatochromic and thermochromic properties. These findings will help to improve future AIE-active PFAs and better understand how molecular geometry effects these compounds' optoelectronic capabilities.

Anna Kochan

PA - Mercyhurst University

Discipline: Psychology

Authors:

Abstract Name: Marijuana Usage Risk

Marijuana has become legal for recreational use in half of the fifty states. An important thing to consider when legalizing marijuana for recreational use is the effect on the college population. The purpose of this study is to use self-report methods to examine the relationship between marijuana use and academic performance. Arria et al., (2015) found a negative association between marijuana use and the number of classes skipped. Smith et al., (2022) focused on college students' self-report on side effects of marijuana, with 44 % reporting impaired cognition as a side effect of usage. However, there has been no recent research that focuses on the relationship between the amount of marijuana consumed and overall academic performance. In this study, we will survey college students using a combination of our own questions, the Cannabis Abuse Screening Test and The Academic Performance Scale. The CAST is one of the most widely used screening tools for cannabis abuse (Sznitman, 2017). The CAST will split the participants into three groups: low risk, moderate risk, and high risk. The Academic Performance Scale has proven reliability and validity (Birchmeier et al., 2015). After collecting data, a one-way ANOVA will be used to examine potential differences between the three groups. Arria et al., (2015), found a negative association only between marijuana use and number of classes skipped, and according to the data collected by Smith et al., (2022),

most college students report no impaired cognition. After examining previous research, we hypothesize that there will be no significant differences between the low, moderate, and high-risk cannabis abuse groups.

Timothy Kochany

VA - George Mason University

Discipline: Biology

Authors:

#1 Jane Flinn

#2 Nelly Zabala

#3 Vincenzo De Lillo

Abstract Name: The Effects of Young Blood Plasma on Neurofilament Light Chain (NfL) and Glial Fibrillary Acidic Protein (GFAP) following Traumatic Brain Injury Administration in Wild-type Mice

Glial fibrillary acidic protein (GFAP) and neurofilament light chain (NfL) are proteins that act as biomarkers that can be detected in blood to observe astrocyte activation and axonal integrity (Fang et al., 2024). Previous studies have shown that traumatic brain injuries (TBIs) can induce neuronal death and contribute to neurodegeneration (Kundu and Singh, 2023). GFAP is a protein expressed by astrocytes that is involved in the injury repair of brain tissue. Elevated GFAP levels have been shown to correlate with lesion volume and TBI severity (Ahmadi et al., 2023). Neuroinflammation is a factor that contributes to neurodegeneration (Zhang et al., 2023). This is pertinent because GFAP has been known to reflect glial responses to neuroinflammation (Leuzy et al., 2022). NfL is a protein found in the axon of neurons and is released into the plasma when injury or neurodegeneration is present. NfL is involved with structural support and improves the conduction speed of action potentials (Narayanan et. al, 2021). In previous studies, elevated levels of GFAP and NfL have been shown to signal the progression of neurodegeneration (Fang et al., 2024). TBIs are a risk factor for neurodegenerative disease (DeKosky and Asken, 2018). Previous research demonstrated that young blood plasma transfusions may reverse factors of neurodegeneration in older populations (Villeda et al., 2014), those with Alzheimer's Disease (Middeldorp et al., 2016), and those with TBIs (DeKosky and Asken, 2018). The proposed study seeks to perform plasma analysis using Enzyme-Linked Immunosorbent Assay kits to test for concentrations of GFAP and NfL in the plasma samples obtained from a previous study. The current project seeks to expand on a Master's thesis by Nelly Zabala and Vincenzo De Lillo. Plasma from four groups of mice will be tested: TBI and plasma-treated, TBI and saline-treated, non-injured and plasma-treated, and non-injured and saline-treated mice.

Emma Kochenderfer

CA - Chapman University

Discipline: Psychology

Authors:

Abstract Name: An Analysis of Factors in Pilot Aircraft-Assisted Suicides

The Federal Aviation Administration (FAA) puts in place medical requirements with the aim of increasing air safety. Several of these medical requirements relate to factors impacting mental health, such as pilot usage of selective serotonin reuptake inhibitors (SSRIs). This paper studies factors that are present in pilot aircraft-assisted suicides. These factors are important in order to create policies that are effective in risk mitigation while still giving a space for pilots to come forward with honesty about their mental health issues and receive

the help that they need. Existing literature indicates that pilots often feel compelled to misrepresent their mental health situation and avoid seeking treatment or communicating treatment to the FAA out of fear of losing their medical certificates, upon which their hobbies or career might depend. From the period of 1989–2021, the National Transportation Safety Board (NTSB) database contains 43 aircraft-assisted suicides initiated by the pilot. This study investigates a variety of factors, ranging from class of certificate, age, gender, medication, negative life events, and alcohol usage.

Madeleine Koetke

IN - Valparaiso University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Superhero(ines): How the World's Most Profitable Film Industry Portrays Women in Post-#MeToo

For the entirety of the 21st century, superhero movies have largely defined popular cinema, with Marvel becoming the most profitable film franchise in history. Despite their wide audience, films in this genre remain almost entirely male-focused, with few to no women as key characters. In the aftermath of #MeToo, superhero films made an effort to create female-focused, feminist movies. While several of them are highly praised, they all feature varied amounts of “negotiation”, or purposefully pulling away from the feminist potential to present a greater general appeal for the consumer. One such film is 2017's Wonder Woman, which received high praise as the first of its kind having a female superhero lead. This film may look feminist on the surface but continues to fall into the same, limiting portrayals of gender, noticeably with a man acting as the wise and worldly guide, and a twist at the end that not only re-writes the lore of the character, but also undermines the heroine's abilities and removes the importance of a featured community of women. Contrarily, 2020's Birds of Prey had an underwhelming cinematic release, but continues to receive praise as a third-wave feminist film, placing heavy importance on the diverse, complicated, and genuine portrayals of women and the community that can form between them. Birds of Prey also offers a refreshing view of femininity being a crucial form of self-expression. While this film is not perfect, and once again has bizarre moments of re-writing the further diversity of the source material, its discussions of feminine intersectionality offer a much-needed step forward for the genre. At a time when fatigue for superhero films is prominent, examining these films offers a valuable look at what needs to change for the sake of the audience, the industry, and the stories themselves.

Chanel Koh

NV - University of Nevada, Reno

Discipline: Computer Science

Authors:

#1 Bashira Akter Anima

Abstract Name: Expanding Human-Robot Collaboration in Multiple Task Solution Scenarios

Human-robot collaboration (HRC) has been used in a wide range of applications, such as industry, healthcare, and even in daily household activities to assist humans with tasks such as cooking and cleaning. To make HRC more adaptable to real-world environments, robots must be able to interpret explicit and implicit instructions from environmental cues, then communicate solutions to effectively mimic human teamwork.

While advancements have been made in training robots with more flexible teamwork skills, there are still challenges in implementing more human-like collaboration where robots can understand implicit verbal contexts and work through cases with multiple solutions. Previous work by Dr. Bashira Akter Anima at the University of Nevada, Reno used a collaborative architecture where robots act on word associations and respond accordingly for one-solution scenarios. For instance, the robot would begin making tea if the human said phrases such as, "I am thirsty" or "It is cold outside." This work extends the hierarchical robot control architecture from Dr. Anima's work by introducing a new skill to handle scenarios with multiple solutions available in the environment. To help the robot work through multiple solutions, it will be given a sample dialog structure with a modified task architecture that considers a human answer to choose the correct skill to perform. By the end of this work, the humanoid robot Baxter is expected to engage in dialogue with humans to resolve ambiguities and determine the preferred task, mimicking human teamwork. Using this extended task architecture, Baxter will execute agreed actions, enhancing adaptability in real-world environments. For example, if a human says, "It's hot outside," the robot might suggest cold tea or sunscreen, discuss options, and perform the chosen task while adhering to constraints.

Namhyuk Koh

NY - Cooper Union for the Advancement of Science and Art

Discipline: Engineering

Authors:

#1 Jabeom Koo

Abstract Name: A High-Gain, Low-Noise RF Downconverting Passive Mixer with Cross-Coupled Topology Negative Resistance Techniques

This paper provides a way to save one's life in an emergency by bringing a method to minimize battery consumption during satellite SOS wireless communication. This is done by employing a high-gain, low-power, low-noise passive mixer circuit for wireless communication. A mixer is a circuit that is necessary for wireless communication. The paper introduces multiple mixer circuit designs that can increase its output and efficiency. One of the topologies expanded its input and output to a differential structure using a Metal-oxide Semiconductor Field-Effect Transistor (MOSFET), making the topology a double-balanced design. The double-balanced design increased the output from $1/\pi$ to $2/\pi$ making a 2 times more significant improvement. Not only this, but the design also increases efficiency by eliminating thermal noise components. The paper also introduces a cross-coupled transistor pair in addition to the double-balanced design. The cross-coupled pair gives negative resistance. The negative resistance increases output by reducing parasitic values in the double-balanced topology. By combining the two MOSFET designs, the final design gave 254.96 m dB of conversion gain in RF amplitude sweep, 2.12 dB of gain in RF frequency sweep, and 8.36 dB of noise figure. The research significantly boosts gain and reduces noise in wireless communication. The findings of the paper lay the foundation stone for future advancement in high-frequency wireless communication analog circuit design.

Naisha Kohli

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Isabel Scarinci

#2 Adrian Harsono

Abstract Name: Factors Associated with HPV Vaccine Uptake Among Rural Parents in Alabama

The human papillomavirus (HPV) has emerged as the most prevalent sexually transmitted infection and the primary cause of cancers including cervical cancer. In the U.S., HPV vaccination is recommended for 9 to 26 years of age. Despite all major efforts, HPV vaccination uptake continues to be relatively low, especially among rural and low-income residents and higher among racial/ethnic minorities. Hence, we sought to examine the association of HPV vaccine uptake and awareness of a vaccine to cancer with parental demographic characteristic, child's health insurance coverage and if they have a regular source of healthcare. We used a cross-sectional study, cluster sampling, population-based survey in Escambia County, AL. The parents of children aged 9 to 18, who have received HPV vaccinations were surveyed to determine their understanding about HPV. Demographic factors, questions about awareness of a vaccine to prevent cancer, if parents have ever heard of HPV, and child HPV vaccine uptake were obtained from the parents. A total of 357 parents were surveyed in this analysis. There is a difference of parent's not having knowledge of a cancer prevention shot and their child not receiving the HPV vaccine versus parent's awareness of HPV. Therefore, there is an association between parents' awareness of HPV, parental age, gender, and self-reported child's uptake on HPV vaccination. Moreover, older, female parents, and who have heard of HPV were more likely to report that they got their children vaccinated against HPV than younger, male parents, and who indicated they had not heard of HPV. This study shed a light of factors associated with HPV vaccination among children under 19 years of age residing in a rural county, which can inform the development, implementation, and evaluation of strategies or intervention to promote HPV vaccination. Further research is necessary to ensure an increase to HPV vaccine uptake.

Ku'ulei Koko

HI - Chaminade University of Honolulu

Discipline: Social Work and Human Services

Authors:

#1 Ku'ulei Koko

#2 Willis Moore

Abstract Name: Feeding Hawai'i's Future: Evaluating the Effectiveness of Culturally Tailored Diet Programs for Indigenous Hawaiians

The state of Hawai'i faces a severe food crisis, with over \$800 million annually accrued healthcare costs linked to chronic, diet-related conditions. Food insecurity disproportionately affects the native Hawaiian, or kānaka maoli, community, which exhibits higher diabetes and heart disease mortality rates and the shortest life expectancy of any major ethnic group in the state. One approach to addressing this challenge has been implementing culturally tailored, traditional Hawaiian diet (THD) programs. Since the launch of the first Hawaiian diet intervention program in 1987, THD programs have fostered supportive environments, reintroduced traditional foods, and promoted cultural values to enhance Hawaiian well-being. However, many of these interventions have yet to yield long-term benefits and behavior changes in native Hawaiian communities. This research investigates not only the components of cultural diet intervention programs that may provide short-term benefits to native Hawaiian health but also the barriers that may prevent such programs from achieving long-lasting results. A literature review was conducted utilizing various databases and peer-reviewed journals including but not limited to ResearchGate, EBSCOhost, National Institutes of Health, Sage Journals, Hawai'i Medical Journal, and Pacific Health Dialog. Key terms employed during searches included but were not limited to: diet, health, intervention, diet programs, colonization, biocultural sovereignty, food sovereignty, food insecurity, traditional diet, Hawai'i, indigenous Hawaiian, and Native Hawaiian. From this comprehensive review, it was discovered that cultural diet programs show great potential for serving the indigenous Hawaiian people. By reintroducing traditional foods, adopting a holistic approach

to health and wellness, fostering a community spirit, and providing educational opportunities, THD programs aim to empower native Hawaiians to make healthier dietary choices. However, inadequate funding, limited accessibility, a failure to address systemic inequalities, and dissatisfaction with prescribed foods hinder the long-term success of these programs.

Yassin Kolley

MN - University of Minnesota - Rochester

Discipline: Biology

Authors:

#1 Amerti Guta

#2 Nellie Campbell

#3 Lewis Roberts

Abstract Name: A Comparative Analysis of Capture ELISA Assays for Detecting SULF2

Background: SULF2, a heparan sulfate endosulfatase, is overexpressed in various cancers, including hepatocellular carcinoma, breast cancer, and non-small cell lung cancer (NSCLC), where it has been associated with prognosis and potential as a blood biomarker. Beyond oncology, SULF2 has shown promise as a serologic biomarker for liver cirrhosis. However, standardized methods for measuring SULF2 levels in plasma or serum remain undeveloped, and the comparative performance of existing assays is not well understood. This study aims to compare the performance of a commercially available SULF2 ELISA kit with an in-house ELISA assay for SULF2 detection. Methods: Conditioned media was collected from cell cultures prepared using a standardized protocol and analyzed for SULF2 concentration. The commercial ELISA kit followed a multi-step protocol, including incubation with detection reagents and substrate solution, followed by absorbance measurement at 450 nm. The in-house assay utilizes two newly developed monoclonal antibodies in a sandwich ELISA format to measure SULF2 levels in the sera of healthy individuals and cirrhosis patients. Findings: Preliminary findings from the commercial ELISA kit revealed SULF2 concentrations of 15.27 ng/mL, 32.25 ng/mL, and 13.33 ng/mL across three conditioned media samples. These results establish baseline data for comparison with the in-house assay, which will be implemented in future studies. Future Directions: The outcomes of this investigation will inform the relative advantages and limitations of the two ELISA methods, providing insights into their applicability for research and clinical diagnostics. Future directions include optimizing and validating the in-house assay to evaluate its sensitivity and specificity compared to the commercial alternative.

Neeharika Kolli

PA - University of Pittsburgh

Discipline: Environmental Science and Sustainability

Authors:

#1 Kate Zettl

Abstract Name: Healthcare Greenhouse Gas Inventory Calculator Evaluation

Hospitals and the healthcare industry have a substantial impact on the environment. Their energy use intensity, waste generation, and pollution, contribute significantly to global greenhouse gas emissions. A greenhouse gas inventory (GHG inventory) is the first step to lowering the carbon footprint of hospital systems. GHG inventories consist of a list of emission sources and the associated emissions, quantified using

standardized methods. This is a review of existing carbon emission calculation tools for healthcare facilities, describing their reporting inputs/outputs and informing more standardized healthcare specific emissions calculations. We created a set of guidelines for evaluation of current calculator tools based on existing methodology for carbon footprint calculator evaluation. We screened 12 calculators, identifying 3 for inclusion. Evaluation was conducted based on the established metrics, including number of inputs for Scope 1 and 2 emissions, and normalization factors, such as building sq ft. There were differences in reporting practices between each calculator, both in data normalization metrics and input categories. Further analysis showed that there is a limited number of calculation tools available to hospital systems, and no standardized practices between tools. A greater emphasis on consistent reporting standards would improve the quality, comparability, and usefulness of carbon emissions calculators. From the evaluation done on existing tools, we developed a new GHG emissions calculator to fit with the established literature criteria. This calculator is customizable, easy to use, and is able to convert data from energy and transportation bills to associated emissions. The data populated and managed in this calculator tool can also help to identify key opportunities for energy reduction in both individual buildings, and at a portfolio level. As healthcare systems look to improve their climate strategies, utilizing an accurate and streamlined greenhouse gas calculation tool will make all the difference.

Emily Komerska

NH - University of New Hampshire

Discipline: Interdisciplinary

Authors:

#1 William Stine

Abstract Name: Luminance Contrast Sensitivity in Motion Induced Blindness and Perceptual Filling-In

In psychophysics, motion induced blindness (MIB) is a visual phenomenon where an object in one's periphery will disappear from their visual field in the presence of motion. Perceptual filling-in (PFI) is essentially the opposite of this; a gap in our periphery will be filled in by information in the surrounding environment (i.e., our blind spot). These phenomena, and the relationship between them, are poorly understood. In 2006, Hsu et al. posited the common mechanism hypothesis, which linked MIB and PFI together by suggesting they shared the same neural mechanism, which is widely debated. The role of contrast in the occurrence of MIB and PFI has also been disputed; last year, my research showed that low contrast variables increased occurrence of MIB only, which is discrepant from previous contrast studies and does not support the common mechanism hypothesis. This present study would aim to further clarify the role of contrast and the validity of the common mechanism hypothesis, while also adding a new component: within and between channel manipulations. A 2021 study observed that when all the variables in a display were kept consistently all increment or all decrement (meaning all brighter or all darker than the background)—a within channel manipulation—then there would be a higher occurrence of MIB. This study will use software-based stimuli to create a contrast threshold model to understand more specifics about the role of contrast in MIB and PFI compared to previous studies that did not use this model, and to show how within and between channel manipulation influence their occurrence as well. Based on previous research, I expect to see an increase in sensitivity (lower threshold) with low contrast variables and within-channel manipulations, and if the common mechanism hypothesis is true, then the same pattern of results should be seen for both MIB and PFI.

Zoe Kondiles

TX - Lone Star College

Discipline: English and Literature

Authors:

Abstract Name: American Cold Equations: An Analysis of Science Fiction's Response to the Space Race

This research investigates how science fiction literature addresses the tensions between scientific rationality and moral values with an aim to evaluate the impact of the Space Race on American education and pop culture. First, a review of the American government's response to the Space Race in the 1950s provides context for education reforms that resulted in an emphasis on STEM in the classroom; this review includes C.P. Snow's seminal essay "The Two Cultures and the Scientific Revolution" which warns against emphasizing STEM at the expense of the humanities. Then, a close read of "Cold Equations," a 1954 short story by science fiction writer Tom reveals that this modern-era short story captures the human cost of a society that prioritizes science over the warmth of human compassion. This research connects early debates about the tensions between scientific rationality and moral values during the Space Race to more recent discussions on the societal impacts of technological advancement, including AI's influence on college education in the 2022 essay "The College Essay is Dead" by Stephen Marche. Ultimately, the study suggests that science fiction served as a critical medium for engaging with the social implications of rapid scientific progress, foreshadowing ongoing concerns about AI's role in depriving academic work of human creativity and critical thinking, and the need to bridge the divide between the sciences and humanities.

Caleb Konecek

AZ - University of Arizona

Discipline: Biochemistry

Authors:

#1 Isaiah Toth

#2 Pascale Charest

Abstract Name: Role of Rap1 versus PIP3 in the Regulation of mTORC2

Chemotaxis is a directed cell migration in response to external chemical stimuli that is critical for biological processes like development and immune response. Chemotaxis dysregulation has been linked to disease spread like cancer metastasis, but its disruption isn't fully understood. Research has shown that the mechanistic Target of Rapamycin Complex 2 (mTORC2) is crucial for chemotaxis regulation and cytoskeleton structural protein rearrangement. Despite mTORC2's implications in chemotaxis, its precise role and regulation are unclear. Recently, we have identified the small GTPase Rap1 as a binding partner of the SIN1 component of mTORC2, and experiments have linked Rap1 overexpression to increased mTORC2 activity in mammalian cells. Additionally, evidence suggests that the membrane phospholipid PI(3,4,5) (PIP3) similarly regulates mTORC2 activity by binding it to the plasma membrane with experiments demonstrating decreased activity following inhibition of PIP3 production. Although Rap1 and PIP3 positively regulate mTORC2, there is a critical gap in understanding their relationship in its regulation and localization to the plasma membrane. Our research attempts to clarify their relationship as binding partners of SIN1 to provide insight into chemotaxis and disease processes. We hypothesize that Rap1 and PIP3 independently regulate mTORC2 activity in HEK293 cells by playing similar roles in its localization. To test this, we over expressed Rap1 and used a PIP3-production inhibitor, examining their effects on mTORC2 activity in HEK293 cells in response to stimulation by insulin, a strong activator of mTORC2. So far, our research shows no significant difference between the effects of Rap1 and PIP3 on mTORC2 activity.

Alison Koons

AR - Lyon College

Discipline: Biology

Authors:

#1 Alison Koons

#2 Maryline Jones

#3 Brittany Florkiewicz

Abstract Name: Enriching Education & Animal Welfare: Assessing the Impact of an Animal Enrichment Course

Our study aims to explore the relationship between student learning outcomes and interdisciplinary classes. These classes can enhance student enjoyment, boost job prospects, and improve graduate program acceptance rates. Existing research on interdisciplinary coursework has focused on human health, leaving unclear whether similar benefits apply to non-human animal courses. We developed a course called Animal Enrichment, integrating biology and psychology to teach students how to enhance zoo-kept animals' well-being. To develop this course, we created research approval forms, an IRB form, and completed a test-run of the course. We expect that students will find our course more effective than traditional courses in enhancing their understanding of animal biology and behavior. We also anticipate improvements in skills such as communication, critical thinking, and problem-solving. During the class, students will pick one species to work with and create an enrichment project. Throughout the class, students will learn about creating, troubleshooting, and evaluating the effectiveness of enrichment. At the end of the course, students will complete a survey comparing their experiences in this class with unidisciplinary courses. Due to the smaller sample size of this study, our results will primarily be presented as descriptive statistics. We will present the average responses to Likert-scale questions for each item and identify trends in students' experiences in our class. Our course will provide students an opportunity to interact with the animals as well as create long lasting connections with the zoo staff. An increasing number of students are pursuing animal related careers, so establishing these connections will likely benefit students in their career paths. It will also provide the zoo with new enrichment items to enhance the quality of life for their animals. Finally, our findings on student experiences will aid Lyon College and other liberal arts institutions in developing interdisciplinary courses in animal studies.

Claire Kooy

FL - University of South Florida

Discipline: Education

Authors:

#1 Lindy Davidson

Abstract Name: Caption Action: Addressing Video Accessibility for Deaf Students in Academia

Deafness, whether total or partial hearing loss, impacts over 700 million people. The World Health Organization defines deafness as the inability to hear any noise that is under 35 decibels in the better ear. Deaf individuals face a multitude of barriers in their daily lives; however, deaf students experience additional challenges. This project investigated deaf accessibility in education through a literature review of published journal articles, a content review of healthcare organizations' websites and blogs from deaf individuals, and a 12-person survey of current university students. Findings indicate barriers deaf students face led to a disparity between the graduation rates of deaf and hearing students. One significant challenge is the lack of consistent and accurate closed captioning on academic videos. Despite ADA requirements, many university classes fail to provide captioned videos, and existing captions often contain mistakes due to issues with ASR. The lack of accurate captioning hinders deaf students' ability to fully understand and learn content in classes, leading to

lower test scores and graduation rates. To address the identified challenge and improve graduation rates, this project recommends the creation of student-based volunteer groups that manually add captions to university course videos. This project addresses the United Nations Sustainable Development Goals 4 and 10, quality education and reduced inequalities.

Luke Kopco

TN - Vanderbilt University

Discipline: Biochemistry

Authors:

#1 Luke Kopco

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Abstract Name: Uncovering MAGE-B2 function using unbiased proteomics and interactome analysis.

Melanoma antigen genes (MAGE) are a group of tumor specific genes that are normally expressed in male germline cells and aberrantly expressed in a wide range of cancers. Cancers expressing MAGE-B2, a member of the MAGE family show poor patient prognosis. Studies highlight MAGE-B2 to have high tumor inducing potential in mouse xenograft studies. The functional basis for MAGE-B2's tumorigenic, pro-proliferative effect is unclear and has been sparsely investigated. We seek to establish a mechanistic basis for MAGE-B2 function and understand the biochemical role of the MAGE family of proteins. To this end we designed recombinant expression constructs of MAGE-B2 with single and tandem affinity tags for generation of heterologous cell lines. We used cell lines with robust expression of MAGE-B2 to perform unbiased proteomics and generate a global protein interactome for MAGE-B2. Our list of MAGE-B2 interacting proteins is highly enriched in RNA binding proteins (e.g., KHSRP, ELAV1 and AUF1) and enzymes involved in protein turnover (DCUN1D5, UBE2NL and PCMT1). First, we used a coupled in vitro transcription and translation assay to enable rapid pairwise screening of interactors to ascertain validity of binding. Second, we performed coimmunoprecipitation (co-IP) experiments with candidate binding partners to triangulate domain specific binding. MAGE-B2 provides non transformed cells with a pro-proliferative advantage, and we are investigating if any of the validated interactions can recapitulate this proliferation using heterologous cell line expression and CRISPR/Cas9 gene knockout strategies.

Micah Koppang

IN - Valparaiso University

Discipline: Interdisciplinary

Authors:

Abstract Name: Turning Angels into Devils: A Look into Christianity in Anime

Although Christian characters and themes appear fairly frequently within western media, this occurs less so with Japanese media. The population of Christians in Japan has remained fairly consistent in the past century, occupying approximately one percent of the population. For centuries prior to the Meiji Restoration (1868), Christianity was made illegal by daimyō Hideyoshi. As a country with a miniscule Christian population—as well as a history of Christian persecution—Japanese media tend to have a much more surface level of understanding of Christianity, if Christianity is even referenced at all. Popular Japanese media (particularly anime, the focus of this research) tends toward the aesthetic use of Christianity, but within those uses, as well

as the more significant uses of Christian characters and themes, we can observe the underlying cultural attitudes toward Christians and Christianity. These cultural attitudes, outside of the aesthetic, tend toward negative portrayals and thus a general negative perception of Christianity, although the extent of negativity broadly correlates with the level of power an individual or entity has within the Christian hierarchy. For instance, laypeople exist on the spectrum of somewhat sympathetic yet naïve victim characters to abusers, while supernatural entities like angels exhibit broader levels of corruption and debauchery, if their corruption does not extend to wanting to destroy humanity. While it remains unclear if the negativity of these portrayals exists as purposeful decisions by the stories' creators or unintentional happenstances, they reflect the persistence of negativity toward Christianity from the time of Jesuit missionaries and the anti-Christian edicts of daimyō Hideyoshi.

Precious Kortu

AZ - Northern Arizona University

Discipline: Nursing and Public Health

Authors:

#1 Haymee Cordero Lopez

Desirae Bain

Melvita Nez

Abstract Name: Improving Awareness of Lactation Services in Underserved Populations

Project Purpose: High Country Lactation Center (HCLC) works to eliminate health disparities by promoting access to quality healthcare, providing education and support, and advocating for policies that protect and enhance the health of mothers and children. The purpose of our project was to improve awareness of the resources and information that HCLC provides to lactating women. **Background:** Common lactation issues are insufficient milk supply, latching difficulties, mastitis, and nipple pain. In the U.S., about 50 percent of mothers have reported insufficient milk supply as their reason for stopping breastfeeding. It has been reported that only 24% of infants in Arizona are breastfed exclusively through 6 months, despite the breastfeeding initiation rate being 85%. Lactating individuals in Coconino County are at a vague awareness level when it comes to understanding the recommendation of breastfeeding exclusively for the recommended 1 to 2 years. **Methods:** The aims of this project were to (1) host a fundraiser for HCLC to provide breastfeeding resources to underserved lactating individuals, (2) improve awareness of the resources available from HCLC, and (3) provide attendees with health education and activities for relaxation. The fundraiser event consisted of four stations to promote relaxation: massage, health education, crafting, and yoga. We used social media and fliers to promote our event. Post-surveys were used to assess program satisfaction, and a raffle drawing was used to incentivize participation. **Conclusions:** We met our goal by increasing the awareness of HCLC, and we were successful in getting a total donation of \$320. Overall, our post-test results indicated positive feedback, with 86% of responses being favorable and 14% marked as non-applicable. By the end of the fundraising session, we successfully met our objective of 9 mothers attending the event.

Lukas Kosel

MT - Montana State University - Bozeman

Discipline: English and Literature

Authors:

Abstract Name: "Miscegenation" in the Rocky Mountain West

Coined in 1863 in an anonymously published article from New York, the word “miscegenation” began its life in an attempt at bolstering the abolitionist movement. However, the term quickly took on a similar role to its antebellum counterpart, “amalgamation,” used to justify and promote racist ideals and fears of Black-and White relations throughout the United States. For example, John H. Van Evrie’s *White Supremacy and Negro Subordination* posits that “mulattoes are abnormal,” and speaks on “amalgamation and its consequences.” Such hateful, unfounded rhetoric was common throughout mediums of public-facing media in the 19th century, but what defined portrayals and usages of “miscegenation” through the 20th century, and how did that affect perceptions in the particularly isolated Rocky Mountain West? My research utilizes resources from a combination of physical and digital archives throughout the Rocky Mountain states (Montana, Idaho, Wyoming, Utah, and Colorado); and it identifies how the term “miscegenation” and the rhetoric surrounding it affected mixed-race communities. Writing on the anti-miscegenation laws in the United States is well established, and scholarly research exists on this rhetoric in the Southern and Eastern United States as well. However, there is little scholarship on this topic in the rural West, as this region has historically small non-caucasian populations compared to other parts of the U.S., according to census data. This data, which contributes to the unique nature of discrimination surrounding mixed relations, only reinforces misconceptions about the affected communities in these states. General trends in my research indicate that the word “miscegenation” was used in the Rocky Mountain West throughout the 20th century to perpetuate unique yet derivative fears of interracial people and relations that contribute to contemporary misconceptions of these communities. The ramifications of the rhetoric persist through the expectations and prevailing misconceptions about mixed-race people in the Rocky Mountain West.

Lauren Koster

NC - Western Carolina University

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: The Intersection of Homeless Shelters and Historic Preservation for Community Engagement

Due to policy failures, the U.S. faces a quickly growing homelessness epidemic and housing crisis, leaving many people without their basic needs met. The issue is then aggravated by the stigma surrounding homeless people, which for many people justifies the decision not to help them. Ending homelessness requires dedicated policy reform and strategies to close the economic gap in the U.S., but this cannot be done without changing public opinion. So, existing systems for housing and shelters must be examined to determine their shortcomings and what must be changed. This research is being conducted to determine how historic preservation and third place theory can impact homeless shelters. Ray Oldenberg's third place theory—the idea that the in-between place, outside of the home and workplace, can benefit socialization and relaxation and can draw people together, as seen in community centers—can easily be applied to destigmatize homelessness. Community centers benefit their users and provide an opportunity to encourage humanization of homeless individuals. Likewise, historic preservation, which focuses on the preservation of aesthetics and history, can provide educational experiences, bringing in locals and tourists. Also, historic preservation projects offer tax credits as an incentive, which can help lower the costs associated with historic building projects, which would prove beneficial. The intended outcome of this research is to create a homeless shelter with the mission to improve the lives of its tenants and the surrounding area, which can be supported by historic preservation and third place theory. Thus, this project shall conduct a comparative research study to analyze the effectiveness of similar projects, determined by their impact on the homeless population. Ideally, the effect of the study would be identifying choices made at homeless shelters that helped their tenants in specific ways, which will inform this project and be reflected in later stages.

Anshi Kothari

CA - BASIS Independent Silicon Valley

Discipline: Biochemistry

Authors:

Abstract Name: Optimizing Plasma-Induced Deacetylation of Chitin for Sustainable Chitosan Production

This project investigates the effect of dielectric barrier discharge (DBD) plasma treatment on chitin's structural properties by quantifying changes in the degree of acetylation (DA). Chitin ($C_8H_{13}O_5N$) is a structural molecule derived from crustacean shells and it is one of nature's most abundant polymers. The deacetylated form, chitosan ($C_5H_{10}N_2O_3$), is valuable for biomedical applications due to its enhanced solubility and antimicrobial properties. While chitin is primarily known for its strong structural properties, its transformation into chitosan unlocks a wide range of applications in drug delivery, wound healing, and tissue engineering. However, converting chitin into chitosan by removing acetyl groups is inefficient, requiring large amounts of NaOH and heat. Our hypothesis is that plasma treatment may offer a non-chemical and energy-efficient approach for modifying chitin's structure, making it a promising alternative to conventional chemical methods. The study focuses on exposing chitin to DBD plasma (helium, 5-8kV, 30-40 kHz) at varying operating conditions (10-15 slpm flow rate, voltage, distance from torch) and analyzing the treated material to calculate its properties. The plasma-treated chitin samples are subjected to acid hydrolysis, releasing acetic acid, which is quantified through titration to calculate the DA. This experimental design

allows for assessing the relationship between plasma treatment and chitin's chemical modification across varying concentrations. Preliminary results demonstrate a moderate reduction in DA after plasma exposure (2 minutes), with a correlation between the degree of acetylation and chitin concentration. More experiments are required to find the optimal plasma parameters for achieving maximum DA reduction while preserving chitin's integrity. Understanding how plasma treatment parameters influence the DA of chitin is necessary to optimize this technology for efficient chitosan production and potential applications in biotechnology and medicine.

Aakash Kottakota

PA - University of Pittsburgh

Discipline: Engineering

Authors:

#1 Aakash Kottakota

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#6 Timothy Chung

Abstract Name: AI-Enabled Predictive Modeling: Tracking the Morphological and Wall Stress Changes in Abdominal Aortic Aneurysms

Abdominal aortic aneurysm (AAA), the 13th leading cause of death in the United States, is an often-fatal condition where the terminal aorta begins to balloon and can rupture. Clinicians typically intervene on patients when the diameter of the AAA reaches a maximum diameter (5.0 cm for women and 5.5 cm for men). However, the maximum diameter criterion is an antiquated system as 5.6% of men and 11.5% of women suffered ruptures below the operable limits. To address this, our research group is leveraging artificial intelligence tools known for their abilities to detect and track subtle patterns to track and analyze the morphological and stress changes of the aneurysm as it grows over time. Establishing a neural network trained with patient data and medical imaging allows for the creation of a novel method for tracking the progression of AAA growth over time. This approach leverages data-driven capabilities to establish a more precise predictive model. Afterwards, the resulting forecasting model would be coupled with a neural net trained to associate wall stresses with aortic geometries to create a 3D growth model capable of depicting the morphological and stress changes of the aortic aneurysm over time. The model, through machine learning, accurately maps and predicts aneurysm growth and stress changes based on patient-specific data, guiding the timing for optimal medical intervention, ultimately aiming to reduce rupture rates and improve patient outcomes.

Shivani Kottantharayil

WA - University of Washington - Seattle

Discipline: Biochemistry

Authors:

#1 Shivani Kottantharayil

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Abstract Name: Boolean-Logic Based Hydrogels for Drug Delivery

Hydrogel biomaterials have many applications in tissue engineering and drug delivery. Stimuli-responsive hydrogels allow for controlled drug release, dependent on a user-defined trigger. However, current stimuli-responsive hydrogels are case-specific and cannot be used for broader applications, such as targeted disease treatment. Most hydrogels can only respond to one input, making them difficult to use in treating diseases with multiple markers. We developed a fully recombinant protein-based material with protease degradable cross links that follow Boolean logic (YES/AND/OR) in response to multiple inputs to allow for user controlled material degradation and drug release. The protease degradable sequences can be easily switched out before expression depending on the application, making our hydrogel generalizable. The hydrogel will be crosslinked with Boolean logic constructs, each of which are flanked by a click-like chemistry protein system. This allows the crosslinks to be covalently ligated to a linker made from elastin-like polypeptides (ELP), which holds the hydrogel network together. The crosslinks and ELP were expressed recombinantly in *E. coli* and purified on an ÄKTA Pure (Cytiva). A degradation study was conducted by adding different combinations of proteases to prove that material degradation is dependent on the combination of proteases added. We then conducted rheometry to determine the mechanical properties of the hydrogels, and verified that material stiffness followed the expected logical operation, where correct inputs resulted in material degradation. Finally, we tested the hydrogel's ability to release drugs by incorporating human epidermal growth factor (hEGF) into the gel and measuring activation of the ERK signaling pathway through a Western Blot. The Western Blot showed activation of the ERK pathway only when the correct combination of proteases was added, indicating release of a bioactive protein drug. If successful, this hydrogel could be used for therapeutic delivery of drugs and broader tissue engineering applications.

Niati Kottury

VA - Virginia Commonwealth University

Discipline: Biology

Authors:

#1 Katy Scarlett

Abstract Name: The Utilization of Machine Learning in the Field of Healthcare: Type II Diabetes Early Prediction and Diagnosis

Type II diabetes mellitus is a disease that can be influenced by an individual's genetic and environmental factors as they display insulin resistance. There is currently no cure for diabetes, and if not diagnosed early, diabetes can have a significant impact on an individual's life. Through the rise of artificial intelligence and technology, machine learning models can help increase the early-stage detection and diagnosis of type II diabetes mellitus. The human gut microbiome plays an integral role in identifying factors of diabetes, as patients with type II diabetes tend to have less gut diversity than people with normal glucose tolerance levels. The algorithms XGBoost and LightGBM successfully identified and predicted common factors of the development of type II diabetes as an alternative to traditional diabetes screening methods. They concluded that utilizing these models in the healthcare system could relieve the financial burden of diabetes test screening. Additionally, CNNs, through deep learning, have the potential to diagnose diabetes and offer personalized diabetes management plans and were able to do so with 90.2 percent accuracy. However, one of the hesitations of implementing machine learning into healthcare is data privacy and ethical issues. Federated learning is offered as a solution to these problems as the data is not compiled in a centralized location. Federated learning models with varying accuracy rates successfully predicted diseases like COVID-19, multiple types of cancer, and cardiovascular disease, to name a few. The continued development of the FLEA model utilized for glucose prediction and a federated learning approach for other models can overcome the limitations of implementing artificial intelligence in a healthcare setting and successfully predict and prevent type II diabetes.

Nirav Kottury

VA - Virginia Commonwealth University

Discipline: Sociology

Authors:

#1 Joshua Barton

Abstract Name: The Army of Cards: Blending Warfare and Poker Strategy

In the dynamic arena of poker, players continuously vie for strategic advantage, as if pursuing Sun Tzu's timeless wisdom in "The Art of War." As such, a comparison between strategies in both poker and warfare should be drawn. Professional players exhibit disciplined, measured behavior, contrasting with the risk-taking tendencies of recreational counterparts. Evolutionary algorithms mirror expert strategies, emphasizing controlled aggression as a key determinant of success. Insights from learning dynamics highlight the immediate benefits of strategic instruction, underscoring the pivotal role of education in enhancing player performance. Furthermore, studies on gender interactions and testosterone levels shed light on the nuanced interplay between biology and decision-making in poker, emphasizing the need for players to navigate both the psychological and physiological dimensions of the game. However, amidst the strategic complexity lies the challenge of misinformation and imperfect information. Players must adapt to contingencies and the possibility of deceptive tactics, necessitating them to sharpen their ability to discern truth from deception amidst the chaos of gameplay. The findings underscore poker's multifaceted nature as a strategic battleground, where players must balance aggression with caution, leveraging psychological tactics and strategic prowess to emerge triumphant in poker.

Anna Kovalchuk

WI - University of Wisconsin-Eau Claire

Discipline: Economics

Authors:

#1 Thomas Kemp

Kate Thompson

Abstract Name: The Relationship of Skateparks' User Perceptions of Quality and Non-user Community Attitudes.

Community parks are often seen as valuable assets that benefit everyone, whether they actively use the park or not. However, skateparks—also known as wheel parks—often face pushback from the community when introduced into these spaces. This raises an important question: can skateparks be designed in a way that fosters a positive perception among both users and nearby residents? To explore this, we interviewed skatepark users to rate the quality of 16 small-to-mid-sized skateparks. At the same time, we conducted an online survey of households within half a kilometer of these parks to understand how neighbors view them. By combining these perspectives, we aimed to uncover how skatepark design and upkeep influence both direct and indirect community experiences. We set out to determine whether skateparks that users rate highly also leave a positive impression on the surrounding community. The concept is that well-designed, well-maintained skateparks foster a sense of ownership and pride among users, which can strengthen relationships between them and nearby residents. This research contributes to the field in two significant ways. First, it offers an objective method for assessing skatepark quality, providing a standardized framework for evaluating these facilities. Second, it presents evidence supporting the potential of well-designed skateparks to improve community relations, challenging the skepticism they often face. Ultimately, this study underscores the

importance of investing in skatepark quality to ensure they serve as inclusive and appreciated components of community parks.

Andrei Kovalchuk

PA - Lafayette College

Discipline: Economics

Authors:

Abstract Name: Trust as a Foundation for Collective Action: A Case Study of Ravine Park and Moldova's Economic Transition

Like many post-socialist countries, Moldova faces the complex challenge of transitioning from centralized command to a market economy. This transformation gained momentum in 2022 when the EU granted Moldova a candidate status. A critical factor in this shift is the development of trust and social capital between citizens and institutions. Through a case study of Ravine Park located in Razeni, one of Moldova's rural communities, this paper explores optimal cooperation for the management of common resources that are inescapably shared, as well as the circumstances under which such cooperation becomes challenged. Drawing on game theory concepts and building on Elinor Ostrom's past research, I argue that efficient resource management provides mobility for solving Moldova's local and global challenges. In the process, the role of trust, social capital building, agency, and democratic voice is examined.

Grace Kovalcik

PA - Duquesne University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Grace Kovalcik

#2 Heather Rusiewicz

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Heather Rusiewicz

Abstract Name: The Effect of Gesture Size and Gesture Type on Young Adults' Perception of Frustration

In any kind of professional setting, communication between a client and a professional is extremely important for making progress in the patient's wellbeing but is not always a perfectly smooth process. Hand gestures are one of many supplemental tools we can use to communicate and understand others' non-verbal messages, ultimately being a great tool for professionals trying to understand their patients on a deeper level and identify emotions present in therapy sessions. Frustration is an especially prominent feeling that may arise in medical, therapeutic, and educational settings and can be a great factor in an individual's motivation and subsequently the level of impact of a therapy session. This study presents research from an experimental investigation of the relationship between frustration and different sizes and types of hand gestures, specifically large and small gestures, and iconic and beat gestures. Twenty-four participants were seen for a single session in which they watched videos and engaged in a subjective frustration-rating task. Task responses collected from participants have been analyzed using descriptive statistics. Calculated average ratings of level of frustration for videos featuring no hand gestures, small beat gestures, small iconic gestures, large beat gestures, and large iconic gestures are 2.23, 2.48, 2.13, 2.60, and 2.38, respectively. These values are derived from ratings on a 5-point Likert scale, with 1 being "not at all frustrated" and 5 being "extremely

frustrated.” The standard deviations for each respective value are 1.14, 0.90, 0.97, 0.90, and 1.00. Having the ability to identify emotions, namely frustration, nonverbally would benefit professionals in a variety of fields, including speech-language pathology (SLP), potentially leading to an enhanced effectiveness of sessions.

Maddie Kowalczyk

MN - Minnesota State University - Mankato

Discipline: Sociology

Authors:

#1 Maddie Kowalczyk

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#3 Ryuto Hashimoto

Abstract Name: ‘Til Death Do Us Part...Or Not, I Really Don’t Care: A Thematic Analysis of Sexual Minority Transgender Young Adults’ Marital Aspirations

Although young adults in the US increasingly delay entry into marriage until later ages, studies suggest that most still want to marry and even further, that marriage is an important life goal for most. However, research is needed that examines the marital attitudes and aspirations of transgender young adults specifically, who have thus far been overlooked in the empirical literature. To address this, in this paper, we draw upon qualitative data from a mixed-methods survey of sexual minority young adults, focusing specifically on data provided by a subsample of transgender young adults (n=48). The results of our thematic analysis suggests that although a slightly majority do report wanting to marry someday, the transgender respondents in our sample are largely indifferent toward marriage. Some did describe circumstances under which they would feel compelled to marry, including if their partner desired marriage or they needed financial/legal benefits associated with marriage. However, many respondents described marriage as unnecessary, for themselves, for a relationship, and/or for society. Finally, respondents cited several significant influences on their attitudes toward marriage, including norms or values from family and queer community.

Harish Koyya

GA - Georgia State University

Discipline: Biology

Authors:

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Abstract Name: The Effects of Preclinical and Prodromal Alzheimer’s Disease and Heart Failure on Cardiac Function and Myocardial Amyloid- β Accumulation.

Alzheimer’s disease (AD) is a neurodegenerative disease accounting for ~70% of dementia cases with no cure available. AD pathogenesis involves hallmark features of amyloid- β (A β) plaques and tau hyperphosphorylation. Earliest AD pathology appears decades before clinical symptoms of dementia during the preclinical period. Subtle signs of mild cognitive impairments emerge during the prodromal period.

Understanding the mechanisms underlying risk factors during these early AD stages may help reduce AD prevalence and burden. Cardiovascular diseases are common AD comorbidities and are amongst the leading causes of death in dementia patients. Previously, postmortem autopsies of AD patients revealed increased myocardial A β levels; it was speculated that A β peptides leak from the brain and deposit in the heart due to blood-brain barrier (BBB) breakdown. Heart failure (HF) disrupts BBB integrity. However, it is not known whether AD-related cardiac pathology develops during early AD. Therefore, our objectives are to determine whether heart function is disturbed during preclinical and prodromal AD and whether HF during early AD increases myocardial A β levels in TgF344-AD rats. TgF344-AD rats express mutant human APP, PSEN1, & PSEN2 genes, and appear to be the most comprehensive preclinical AD model available with a protracted preclinical/prodromal period. We hypothesize that early AD alters the myocardium through A β accumulation and HF exacerbates AD-associated cardiac pathology. To test our hypothesis, we performed sham or left anterior descending coronary artery ligation (i.e., HF-inducing) surgeries on 2-month-old wild-type and TgF344-AD rats during their preclinical AD stage. After 7 months, we performed echocardiograms during the prodromal stage and found that the HF surgery but not early AD impaired cardiac function. We plan to measure myocardial A β using ELISA to determine whether HF during early AD increases myocardial A β deposition. These results may reveal novel HF and early AD-associated cardiac manifestations that could facilitate early diagnostic interventions.

Isaac Kraenbring

PA - Elizabethtown College

Discipline: Chemistry

Authors:

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#2 Jeffrey Rood

Abstract Name: Synthesis of Metal-Organic Frameworks Combined with Luminescent Osmium (II) Complexes: Photophysical Properties and Anion-Dependent Emission Upon Uptake of Aqueous Solutions

Luminescent transition metal coordination complexes involving polypyridyl ligands have numerous applications for the detection of small molecules in solution. Far less is known about the ability to incorporate these compounds into solid-state materials without losing their luminescent properties. This project explores methods to integrate a luminescent osmium complex into a metal-organic framework (MOF) and study the resulting material's photophysical properties of the porous solid. MOFs are a system of metal centers that coordinate with organic ligands to form extended porous structures. MOFs have been of interest due to the host of properties they possess like high stability, crystallinity, surface area, and the flexibility to be modified. These properties can lead to numerous applications, one of which is ion detection via fluorescence emission. When a small amount of luminescent osmium complex, Os(dcphen)(CO)₂(Cl)₂, is added to differing zirconium-based MOFs the solid-state material retained both the photophysical properties of the osmium complex and intended MOF structure. The luminescent properties of both the osmium complex and the MOF systems were studied in aqueous solutions containing cyanide, nitrate, or halides. Photophysical characterization of the Os(dcphen)(CO)₂(Cl)₂ in solution and in a modified MOF showed the emission of the complex was quenched when in the presence of iodide and cyanide. The osmium complex is unique as there are two mechanisms by which anion interaction could affect emission: chloride ligand exchange or non-covalent luminophore interaction. Both could alter the HOMO-LUMO gap which would change the emission of the osmium complex. Computational and crystallization studies to probe these effects were carried out and investigation into the effect of linker and pore size of the MOF on the observed quenching were studied.

Natalie Krahulik

PA - Grove City College

Discipline: Engineering

Authors:

#1 Rachel Kohler

Abstract Name: Fabrication of PDMS-based Organ-on-Chips

Organ-on-chips (OoCs) are microfluidic chips that contain small channels that liquids flow through and areas that cells grow in. These chips can be designed to mimic specific environments, making them beneficial for laboratory testing. Polydimethylsiloxane (PDMS) has many properties that make it an ideal material for OoCs, but fabrication is difficult because OoCs are often made in parts that are then bonded together, and PDMS does not bond well to itself. This research aims to formulate a method that uses PDMS and 3D-printed molds to fabricate OoCs. In this method, the OoCs are designed as multiple layers with PDMS membranes added to regions. Molds for these layers are 3D-printed by CADWorks3D ProFluidics 285D. PDMS is cast into molds, and then the layers and membranes are plasma bonded together with Elveflow's Plasma Bonding Pen. As seen in other studies, issues arise in getting the PDMS to bond. The surface quality of the molds and the method for using the bonding pen affect the success of a bond. The surface quality of the mold is affected by post-printing cleaning processes. From experimentation, it was determined that rinsing the molds in a 99% Isopropyl Alcohol (IPA) bath and then airbrushing the molds with IPA results in the best surface quality. From experimentation, it was determined that holding the pen 4 millimeters above the PDMS surface and holding it at each spot for 6 seconds is the most effective treatment. When these determined techniques are used, bonding between layers improves, but this bonding is not adequate for fabricating OoCs. However, when this technique is used to bond PDMS membranes to layers, it consistently bonds. With these findings, our lab aims to use the techniques found in this study to add membranes to OoCs but explore other techniques for bonding PDMS layers together.

Grace Krajewski

MI - Michigan State University

Discipline: Dance

Authors:

Daniel Trego

Abstract Name: Revolutionizing Dance Education: The Role of Augmented Reality in Remote Choreography Instruction

Recent developments in artificial intelligence and augmented reality are modernizing how society functions, especially regarding education. These technologies enable more efficient speeds of learning, as well as personalized learning experiences (Vall & Araya, 2023). Yet, most of the current research on this topic focuses on using these technologies in traditional education settings. There is limited research regarding what role these innovations might have in the education of the arts, such as dance. Of the research that does exist, it has been concluded that, compared to traditional methods of dance education, the use of artificial intelligence and Augmented Reality (AR) may serve to provide students with a deeper understanding of technique and enhance motivation and self-discipline in the process of learning dance (Wang, 2024). This study aims to evaluate the effectiveness of Augmented Reality in the remote teaching of dance choreography to young dancers. A group of experienced dancers ages 11-13 were divided into two groups: one tasked with learning dance choreography from a traditional video of an instructor, while the other learned the same choreography by watching the movements presented by an avatar through AR. After instruction, dancers were recorded performing the piece and completed a survey examining their experience. The accuracy of all dancers' performances was compared to the original choreography, and their perceptions of learning were assessed and scored. Preliminary results from this study suggest that, overall, the use of AR in learning dance

choreography is comparable to traditional video instruction. Some outcomes suggest that AR technology may be slightly more effective than traditional methods for teaching mechanics and sequences of movements. In contrast, traditional videos tend to have better outcomes in terms of musicality. These results provide insight into how AR may be implemented to enhance the virtual instruction of dance choreography.

Ava Krall

UT - Brigham Young University

Discipline: Psychology

Authors:

#1 Wendy Birmingham

#2 Mike Brugger

Abigail Williams Olsen

Kelsie Minga

Abstract Name: Striking the Balance: How Supervisor Support Shapes working mothers' Work-Family Balance

Background: Nearly three-quarters of women with children under age 18 work outside the home. These mothers may experience tension as they attempt to balance responsibilities at work with responsibilities at home (work-family balance). A supportive work environment, with supportive supervisors, can help mothers to find optimal work-family balance. However, working mothers may experience mixed feelings during their daily interactions with their supervisor, who may be supportive and helpful sometimes (positive) and who may be demanding, critical, and condescending at other times (negative). Such mixed feelings (ambivalence) can lead to feelings of unpredictability and distress. Research has shown that work distress can spill over into family situations (Thompson et al., 2020), and this could impact the balance working mothers are trying to obtain, which has been associated with poor self-rated health and mental well-being. Hypothesis: Working mothers who view their supervisor with mixed feelings during daily interactions will be less likely to find balance between their workplace responsibilities and their family responsibilities. Methods: 112 working mothers were recruited from the community and the university campus. Mean age = 33.28 (SD 7.41; range 22-57). Most were college educated (75.2%), and white (88.5%). Each completed surveys on how mixed and conflicted they felt regarding the behavior from their supervisor and how they viewed their work-family life balance. Results: Linear regression models showed that the more mixed and conflicted mothers felt about their supervisor during daily interactions, the less they reported the ability to achieve work-family balance ($B = -.746$, $SE = .313$, $t = -2.387$, $p = .019$). Conclusions: Mothers who view their supervisor with mixed feelings are less likely to achieve work-family balance. Because poor work-family balance is also associated with poorer health, companies need to help train their supervisory employees to be more consistent in their supervision and provide an environment conducive to work-life balance.

Lauryn Kramer

MN - College of Saint Benedict/ Saint John's University

Discipline: Chemistry

Authors:

#1 Lauryn Kramer

Abstract Name: Synthesis of potential pharmaceuticals for Endometriosis

Endometriosis is a painful disorder in which tissue similar to the uterine lining grows outside the uterus, often on nearby organs such as the ovaries, fallopian tubes, and the outer surface of the uterus. This misplaced tissue behaves like the uterine lining, thickening, breaking down, and bleeding with each menstrual cycle, which can lead to excruciating pain, especially during menstruation. In addition to pain, endometriosis can cause complications such as the formation of cysts and can also contribute to infertility. Currently, the treatments available for endometriosis are primarily focused on managing symptoms or involve surgery. Still, neither option offers a permanent solution, as the uterine lining tissue will continue to grow outside the uterus over time. Collaborators at Truman State University have discovered 5 molecules computationally that are good candidates for medications to prevent the growth of the uterine lining outside the uterus. My research project aims to synthesize these molecules via a Diels-Alder reaction. Once these molecules are successfully synthesized, we will send them for efficacy testing in protein binding studies, which will help determine their potential as treatments for preventing the growth of endometrial tissue outside the uterus. The long-term aim of this research is to develop more effective and lasting therapies for individuals suffering from endometriosis.

Sascha Krause

WI - University of Wisconsin-Madison

Discipline: Psychology

Authors:

#1 Hannah Kramer

Abstract Name: What Information Children Prioritize Whilst Interpreting Another's Emotion

Smiling or frowning, amongst actions such as screaming and laughing, are primary indicators of emotion that young children rely on. Children begin to incorporate external features into emotional understanding at ages 4-5. To reason about another's emotion with greater accuracy, the capacity to put together different pieces of information is developed. By approximately 8-9, children demonstrate a more complex perspective on interpreting how people feel, once in varied contexts. Older children and adults use both the physical expression of an individual alongside contextual knowledge to provide complete perceptions of how someone else feels. While previous research has focused on external cues, such as facial expressions, less work has been done on how internal information may also influence emotion reasoning. This study seeks to develop an understanding of how emotions are perceived from the combination of external elements with internal information that could not be determined from first glance. In a survey presenting 14 possible pieces of information to know when trying to understand someone else's emotion, children aged 4 through 9, select their preference to be revealed out of two immediate choices. Potential choices may include contextual information, such as a person's normal behavior, or visual cues, such as what this person is doing with their body. To illustrate, a child observes an image of a person walking into a room, and is tasked with discovering how this individual feels inside. The child may prefer knowing someone's current life situation as opposed to their physical status. The findings of this study will shed light on how children of younger or older ages alike mature in their empathetic development. Moreover, this study will improve understanding of emotional perception across varied ages, allowing for a deeper grasp on how children express their own emotion based on environmental influences.

Dylan Kresak

PA - Westminster College

Discipline: Criminology/Criminal Justice

Authors:

#1 Dr. Andrew Bain
#2 Tyler Young

Abstract Name: Policing Local Communities: Using Q Methodology to Study Policing Perspectives

In the latest study by Ward et al. (2024) it was noted that rural areas often experience higher rates of police use of force than urban areas. Recent history has provided for high-profile cases of police use of force and police misconduct in both rural and urban areas, which has resulted in a closer examination of police practice. Indeed, Premkumar et al. (2021) note that while the scrutiny of police practice can provide for positive change, it can also result in a loss of public trust—something of greater importance in localized communities, which can add to a sense of “us vs. them”. With these points in mind, this study set out to examine the perceptions of policing within a small Mid-Atlantic community, and made use of Q Methodology, a qualitative technique that captures subjective attitudes (Rhoads, et al, 2021). Participants were drawn from three groups: college students, community members, and criminal justice professionals. Following the Rhoads et al. (2021) approach, a Q-sample of 30 statements reflecting contemporary policing issues (CPI), was gathered for participants to rank. Findings suggest three factors of importance: (1) there was a strong sense of support for the police, which we termed “Back the Blue”; (2) a more “Critical Conservative” group which acknowledged the burden that comes with policing, yet emphasized concern for racial disparity; finally, (3) a group that identified a strong sense of community concern and displayed the significance of community reflection within the police. This final group was determined to closely identify with Sir Robert Peel’s policing principles. The conclusion, in this instance, would seem to be that there is a greater sense of support for policing practice in localized rural communities than initially reported by Ward et al. (2024), or Premkumar, et al. (2021).

Alexandra Kretsch

MN - Hamline University

Discipline: Law and Legal Studies

Authors:

#1 Leondra Hanson

Abstract Name: In an Abortion Safe Haven: Post-Dobbs Landscape Impacts Abortion in Minnesota

In 2022, the US Supreme Court ruled in *Dobbs v. Jackson Women's Health Organization* that the Constitution does not give a federal right to abortion – triggering new and activating dormant state-level restrictions on abortions. Minnesota is a “safe haven” abortion state, protecting the right to abortion through legislation and case law. However, Minnesota is in a unique position spatially as all of Minnesota’s neighboring states have abortion restrictive legislation. With the ruling of *Dobbs*, it is not known how other states’ abortion restrictions may impact abortion prevalence in “safe haven” states, especially in places like Minnesota situated amongst restrictive states. Further, the ruling brings new questions regarding criminal and civil jurisdiction, the right to intrastate and interstate travel, and general access to abortion in Minnesota. To examine the changes in both in- and out-of-state abortion prevalence in Minnesota post-*Dobbs*, we compiled abortion data from 2019-2023, finding that there has been a rise in both in- and out-of-state abortions since *Dobbs*. Given the increase in abortions, we supplement this analysis with an abortion case law and legislation survey of Minnesota and abortion restrictive states to understand how other states’ abortion restrictions affect access to abortion in Minnesota in terms of the right to travel and jurisdiction, finding that Minnesota protects its residents, its physicians, and out-of-state abortion seekers from being civilly or criminally punished for abortion care. However, there is no guaranteed protection for out-of-state patients once they go back to their home state. These findings illustrate that abortion prevalence may continue to increase in “safe haven” states with the activation of additional neighboring state restrictions. We can also expect to see continued legal barriers for out-of-state abortion seekers via the restriction of travel and/or punishment for obtaining out-of-state abortions.

Alexandra Krieger

IL - Elmhurst University

Discipline: Education

Authors:

#1 Joshua Rodriguez

Abstract Name: The Importance Of Music In Special Education

This research opportunity presents the dire need for systemic changes in our school music programs across America. I am researching the importance of providing students with disabilities with the opportunity to have equal access to music education. At the moment, many special education students face discrimination in regard to participating in music classes, often due to a lack of resources or inclusive programs. By examining a special education choir-specific program (an affordable and effective way to include all students, regardless of ability), I will research how educational institutions can meet the musical needs of students who have disabilities. This research will include a review on national studies on the discrimination these students encounter, interviews with music therapists on how music supports therapeutic development, and field research in schools that have a special education choir. Through surveys that record musical growth and student feedback, I will provide evidence that students with disabilities not only have the right to have access to music education, but that these students enjoy these opportunities. This research will give a voice to those who are being discriminated against. I aim to encourage schools to make changes, such as introducing adaptive music, accommodative resources, training for educators, and expanding on inclusive music programs to allow all students, regardless of ability, to experience a proper music education.

Shreya Krishnakumar

CA - Aspiring Scholars Directed Research Program

Discipline: Interdisciplinary

Authors:

#1 Angela Li

#2 Sofie Budman

Adithi Aia

Abstract Name: Ensemble Learning Algorithms to Predict Scaffold/Matrix Attachment Regions

Scaffold/matrix attachment regions (S/MARs) are places in the genome that bind to the nuclear matrix and are responsible for organizing genetic material into structural and functional domains. S/MARs are key to processes such as cancer metastasis and are hotspots of retroviral integration, meaning improved detection of S/MARs could lead to therapeutic benefits. Previous studies have compiled DNA motifs of S/MARs but there is yet to be a complete, definitive database for the human genome. Furthermore, previous attempts to use computational methods to identify S/MARs have had limited accuracy. An identification of S/MAR sequences could be a valuable resource for scientists studying cancer and other diseases. Our purpose is to develop an R-package that uses machine learning techniques and algorithms to provide a reliable method of S/MAR identification. Our objectives include using modern machine learning techniques and algorithms and using existing data from our literature review. We obtained HeLa cell S/MAR start and end positions from the ENCODE project, and then used an API call to the UCSC genome search tool to acquire the full S/MAR sequence. We then compiled this data and created a train/test split for the model. Our algorithm incorporated

the motifs from our literature review as features. We used confusion matrices and area-under-the-curve graphs to measure the performance of each model. In conclusion, we have produced 3 algorithms: our Random Forest model yielded a 88.5% accuracy rate; the XGBoost model had a 100% accuracy rate; and the K-Nearest-Neighbors model yielded a 93.3% accuracy rate. In the future, we will address imbalances in our data (more positive than negative samples). Our finalized R-package would increase the accessibility of S/MARs related research, significantly improving potential studies on retroviral hotspots and metastatic cancers.

Akshay Krishnan

PA - Pennsylvania State University

Discipline: Interdisciplinary

Authors:

#1 Henry Snyder

Abstract Name: In Silico Exploration and Evaluation of Candidate Cancer Drugs

This research investigates the application of virtual screening techniques in cancer drug development, specifically targeting Polo-Like Kinase 1 (Plk-1), a key protein associated with tumor progression. The primary objective was to evaluate the drug-likeness and therapeutic potential of five lead molecules and nearly 100 structural derivatives, ultimately identifying top candidates for experimental and clinical validation. By employing computational tools to streamline the drug discovery process, this study seeks to address the inefficiencies of traditional methods, contributing to the development of precise and cost-effective cancer therapies. Advanced computational methodologies were utilized to assess the molecules' ADMETSD properties- absorption, distribution, metabolism, excretion, toxicity, stability, and docking. Quantum chemistry simulations and scoring mechanisms enabled a robust evaluation of molecular characteristics, resulting in a shortlist of 10 candidates with superior drug-like qualities. The research underscores the effectiveness of integrating computational screening techniques to prioritize molecules with therapeutic potential. This study demonstrates that virtual screening can enhance the efficiency and precision of early-stage drug discovery, reducing the time and resources required to identify promising drug candidates. Importantly, the research highlights limitations in current scoring methods, advocating for refined computational models that better balance parameter importance and therapeutic relevance. These advancements could improve the inclusion of medicinally significant molecules while maintaining a rigorous evaluation standard. The findings have broad implications for the future of targeted cancer therapy, offering a scalable approach to accelerate drug development.

Hasun Krisht

TX - Southern Methodist University

Discipline: Biology

Authors:

#1 Yuanna Wu

#2 Zhihao Wu

Abstract Name: Identification of Ribosome-associated Quality Control (RQC) genes associated with human diseases via in-silico data analysis and biological validation

The Ribosome Quality Control (RQC) pathway is a mechanism that cells use to ensure the quality of the proteins synthesized by ribosomes. Any issue that arises in translation is subject to a check by the RQC

pathway, especially when ribosomes stall on defective mRNA. Aging is a complex biological process associated with a decline in cellular function and increased susceptibility to diseases, including cancer. Recent studies have highlighted the importance of the Ribosome Quality Control (RQC) pathway in maintaining protein homeostasis and its potential implications in aging and cancer. The RQC pathway monitors and resolves translation errors, ensuring that defective proteins do not accumulate in cells. This project aims to investigate the relationship between the RQC pathway, aging, and cancer by leveraging data science to analyze large-scale datasets from public databases: The Cancer Genome Atlas (TCGA) and the Gene Expression Omnibus (GEO). We will identify candidate genes implicated in these processes and validate their functions through various biological experiments. Using the TCGA and GEO databases, we will gather the data and focus on cancer types, as well as the age demographics of the patients. The data will be processed to be compatible with different datasets. Then we will analyze the data to identify potential genes that are significantly altered in cancerous tissues compared to normal tissues during the aging process. We will use this to understand the relationships between gene expression, aging, and cancer. We will focus on genes that show significant changes in expression and have established roles in the RQC pathway.

Caleb Kroeger

MN - University of Minnesota - Duluth

Discipline: Economics

Authors:

#1 Neil Wilmot

#2 Caleb Kroeger

Abstract Name: Economic Impact of Sustainable Practice in the Airline Industry: A Comprehensive Analysis

Sustainability is our society's ability to exist and develop without depleting all of the natural resources needed to live in the future. The airline industry accounts for 12% of all CO₂ emissions produced per year. There is limited research addressing how certain airline companies can implement sustainable airline practices under economically profitable conditions. We investigated the implementation of sustainable airline practices including the implementation of sustainable aviation fuels, electric ground power systems, and research towards the demographics of sustainable conscious customers. For the implementation of sustainable aviation fuels, a DCF model was created to project the ten year value of investing in said fuels. A cost benefit analysis was created to explore the potential profitability of implementing electric ground support equipment. Finally we conducted market research to determine the demographics of sustainable conscious consumers, and reviewed the sustainable practice participation of the ten largest airlines. We found that within five years sustainable aviation fuels cross the threshold into profitability and continue to increase by around 10 million dollars per year. Our cost benefit analysis showed an upfront implementation cost of 55 million dollars, with a decreasing cost in further years to under 10 million dollars per year. Market research showed that out of the 10 airliners, the largest contributors to sustainability were Delta Air Lines, FEDEX Freight, and SAS Airlines. Looking at the demographics of sustainable conscious consumers, our research found that the majority of consumers included females over the age of 40 years old with a household income of 40,000-60,000. These findings create an economic view on how airliners could potentially implement sustainable practices into their everyday functions. Further research is needed to determine how these practices will affect the short and long term functioning of airliners.

Brock Kraska

IL - Governors State University Honors College

Discipline: Business

Authors:

Abstract Name: The Evolution and Impact of Artificial Intelligence in Accounting

Will artificial intelligence one day replace accountants entirely? This question has only grown in popularity in recent years, even though artificial intelligence has existed since the 1950s. Originally coined in 1955 by John McCarthy, “artificial intelligence” (AI) has steadily evolved to develop new techniques that are revolutionizing everyday tasks in nearly every profession. Today, AI is adapting and learning how to process big data while developing deep learning and cloud computing technology. These advancements have already started to form the foundation of many of our accounting software programs. Although AI appears to be a threat to human jobs, current research challenges these threats, emphasizing that AI’s true potential lies in supplementing human capabilities instead of replacing them. This study follows the development of AI, starting with the earliest foundations and working its way up to the innovative technology that AI has become today. After tracking the emergence of AI, the study will focus on AI’s current impact on the accounting industry, stressing the importance of how AI has enhanced efficiency and accuracy in accounting practices. With AI’s implementation in today’s workforce, the study will address critical questions surrounding the ethical use of AI and its influence on accountants’ roles. Finally, the study considers AI’s potential to revolutionize predictive decision-making in the accounting industry. The research will look at how AI can advance sustainability initiatives and redefine professional roles through human-AI collaboration in the future. By diving into AI’s history, analyzing AI’s current effects on the accounting industry, and envisioning future applications of AI for accounting, this study contributes to the understanding of AI’s evolving role in accounting. Offering valuable insights for professionals while advocating for strategic, ethical adoption of AI ensures that AI-driven technology complements human expertise in the accounting industry but does not replace human capabilities.

Brock Krska

IL - Governors State University Honors College

Discipline: Business

Authors:

#1 Nayeli Zambrano

Abstract Name: The Generational Spectrum: Analyzing Color Preference Shifts Between Gen Z and Millennials in Social Media Advertising

In today's digital landscape, understanding generational color preferences has become crucial for marketing success, particularly as Gen Z emerges as a dominant consumer force alongside Millennials. While previous research has extensively documented Millennial color preferences in marketing, Gen Z's distinct aesthetic sensibilities – characterized by their preference for muted pastels and '90s-inspired palettes – suggest a significant shift in color psychology across generations. This study investigates how color preferences in social media advertising differ between Gen Z (born 1997-2012) and Millennials (born 1981-1996), with particular attention to engagement rates, purchase intent, and brand perception. Through a systematic review of recent marketing campaigns, consumer behavior studies, and social media analytics, this research examines the evolution of color trends and their effectiveness across platforms like TikTok, Instagram, and YouTube. The findings aim to provide marketers and designers with actionable insights for creating generation-specific color strategies that enhance campaign performance and brand resonance. Understanding these generational color preference shifts will help brands better target their visual marketing efforts and adapt to evolving consumer aesthetics in the social media age.

Cole Krudwig

NE - Creighton University

Discipline: Computer Science

Authors:

#1 Cole Krudwig

#2 Izzie Nielsen

#3 Macy Callahan

#4 Dean Magara

Izzie Nielsen

Macy Callahan

Abstract Name: Advanced Deepfake Detection Using Quantum Neural Networks

In this research, we propose a novel quantum convolutional neural network (QCNN) model for deepfake detection, integrating quantum mechanics within the convolutional neural network framework to enhance detection capabilities. The QCNN operates by embedding small regions of the input image, such as 2×2 pixel patches, into a quantum circuit through parameterized rotations applied to qubits initialized in their ground states. The significant advantage of QCNN over traditional methods lies in its ability to generate highly complex kernels via quantum circuits, potentially performing computations that are classically intractable. To evaluate our QCNN approach, we trained and tested models using both traditional CNN and QCNN architectures. We started by taking 10 original videos and generated 10 fake videos using the commercial website DeepfakesWeb. For testing, we employed a new deepfake dataset generated using the Roop method. In this test scenario, we observed approximately a 30% improvement in QCNN performance compared to CNN. Our QCNN model was implemented using the PennyLane quantum simulator library. We next intend to use IBM's quantum computer and simulator, demonstrating its practical applicability. By integrating quantum computing with neural network architectures, the QCNN model is designed to adapt effectively to the complexities of deepfake data, utilizing quantum computational advantages to handle high-dimensional data spaces and perform complex transformations. This approach aims to significantly enhance both detection accuracy and processing efficiency against increasingly advanced generative AI-generated deepfake videos.

Gabriella Krull

MD - Naval Academy

Discipline: Biochemistry

Authors:

#1 Melonie Teichert

#2 Leighanne Basta

Abstract Name: Evidence-based Development and Assessment of Biochemistry Integrated Laboratory Experiments

The Integrated Laboratory (IL) curriculum at the United States Naval Academy (USNA) was originally implemented to provide a more cohesive, four-semester learning experience for our chemistry majors. In many cases, there is overlap between the concepts taught in various chemistry courses; the IL curriculum accounts for this overlap, connecting the interlinked concepts through completion of laboratory experiments. For example, experiments conducted in IL3 integrate topics across physical chemistry and biochemistry like enzyme kinetics and the thermodynamics of DNA melting. While increasing in popularity, Integrated Laboratory curricula are not yet widely implemented across undergraduate institutions. At USNA, the IL curriculum was introduced more than 20 years ago. While there are many strengths to this laboratory

sequence, little of the program has changed since it was implemented; feedback from the IL3 course evaluations in the Fall 2024 academic year highlighted two key concerns among 2/C midshipmen (junior-level students): 1) there is a lack of biochemistry-centric content, and 2) there is insufficient integration of topics with concurrent lecture courses (Physical Chemistry I: Thermodynamics and Kinetics, and Biochemistry I: Macromolecular Structure and Function). To address these points, it is crucial to properly align laboratory content with the material presented in lecture courses. This project aims to evaluate and assess integration of topics across chemistry subdisciplines, analyze the current alignment of major course content, and implement changes to the curriculum, including the development of new biochemistry labs and the refinement of existing ones.

Molly Krupa

WV - West Virginia University

Discipline: Engineering

Authors:

#1 Trieu Nguyen

Abstract Name: Designing 3D Microfluidic Cell Culture Devices for Advanced MRI Diagnostics of Breast Cancer

Microfluidic chips are an emerging technology that is revolutionizing the field of biomedical research. These devices contain systems of three-dimensional channels that are designed to manipulate fluids at a microscale. When equipped with human cells, microfluidic chips can simulate a patient's potential reaction to a new drug or treatment method. When used for this purpose, they are referred to as "organ-on-a-chip (OoC)" devices. Because they mimic the human body at a cellular level, they also produce more accurate results than a live animal subject or a 2D culture. Although 3D chips are excellent at replicating the complexity of human physiology, there is currently no standard design for the magnetic resonance imaging (MRI) of tumor models. In this ongoing study, we aim to develop an OoC for the MRI of breast cancer tumor cells and Nano-Encapsulated Manganese Oxide (NEMO) nanoparticles, which are contrast agents. A custom chip fabricated in-house will be compared to a chip that was commercially manufactured. Microscopic imaging and experimental analysis will be performed. From these results, we will determine the most efficient and economical chip design for MRI purposes. Using our easily replicable design, both big and small laboratories will be able to create MRI-ready OoCs. This will not only reduce the cost and speed of clinical drug trials and medical diagnostics, but also the need for expensive live animal models.

Eshika Kudaravalli

AL - University of Alabama at Birmingham

Discipline: Nursing and Public Health

Authors:

#1 Moses Okombo

#2 Salome Ogola

#3 Janet Turan

#4 Evelyne Owengah

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#7 Lynae Darbes

#8 Abigail Hatcher

#9 Kevin Owuor

#10 Elizabeth Bukusi
#11 Elizabeth Bukusi
#12 Anna Helova

Abstract Name: Review of Behavioral Interventions to Build Resilience and Improve Coping Skills of Health Workers in Africa

Southwestern Kenya remains a critical focus area for HIV research and service provision for pregnant/postpartum women with HIV (PPWH). Kenyan health services are often affected by societal crises, and the COVID-19 pandemic underscored the adverse impact of community crisis and prolonged health service disruption on health outcomes among PPWH, their infants, and health workers (HWs). Interventions that target the resilience and coping skills of HWs are needed to strengthen Kenyan health systems and improve health outcomes. This review aimed to identify existing interventions in African contexts with evidence on effectiveness in improving HWs' coping skills and resilience, to inform future interventions. Journal articles in PubMed, EMBASE, APA PsycINFO, and PTSDpubs were screened to identify relevant studies from inception to July 2024. The search terms "Africa," "resilience and coping skills," "HWs," and "behavioral intervention" were utilized in combination. The review included studies that met the following criteria: (1) study participants were HWs (2) interventions were behavioral with a focus on resilience and coping skills (3) the setting was in Africa (4) studies were primary research with full-text access in English. From an initial search of 388 articles, 17 studies met criteria. Results show that long-term, systematic interventions that addressed HWs' practical challenges (e.g. long work hours, access and availability of services to HWs) and educational/social needs (e.g. disease stigmatization, self-protection, work-life balance) were most effective in improving HW's resilience and coping skills. The few interventions found to produce long-term impact on HW resilience integrated participant personalized plans, mindfulness training, and small group training. While existing interventions are limited, these promising strategies will serve as a foundational framework for the larger Resilience Amid Challenges in Healthcare (REACH) study, focused on future intervention development for strengthening resilience and preparedness of HWs for PPWH amid service disruption in Kenya.

Ronald Kuehn

MN - University of Minnesota - Duluth

Discipline: Psychology

Authors:

#1 Ronald Kuehn
#2 Maryanna Schabert
#3 Laura Howe
Maryanna Schabert
Laura Howe

Abstract Name: Correlation between Biological Sex, Sexual & Emotional Jealousy, and Personality

In recent decades there has been an increase in psychological study in both personality dimensions and the subjective experience of jealousy. In addition to this, there have been many studies recently showing that using electroencephalography (EEG) data to track neural activity during emotional processing can produce data that can accurately predict certain personality dimensions. The current study hopes to combine these two areas of research by examining how personality, as defined by the HEXACO model, influences neural responses to jealousy-inducing scenarios. The HEXACO model consists of Humility/Honesty, Emotionality, eXtraversion, Agreeableness, Conscientiousness, and Openness to experience. Participants will listen to scenarios describing both sexual and emotional infidelity, eliciting emotional responses while their neural activity is recorded. The EEG will record alpha waves from both the left & right hemispheres. By comparing alpha activity in the right and left hemisphere, a ratio, which represents the emotional processing

in the respective cortices, will be produced. The right hemisphere is associated with negative emotionality, while the left hemisphere is associated with positive emotionality. We will control for the confound produced by sex of researcher by having half of the participants listen to a male researcher, and the other half listen to a female researcher. The data provided by these measures will be analyzed using a Stepwise Multiple Regression model to evaluate how personality dimensions affect the neural processing of both sexual and emotional jealousy. Our experimental hypothesis is that jealousy is positively correlated with emotionality and conscientiousness, and inversely correlated with openness, agreeableness, and humility. It is believed that there will be no correlation with jealousy and extraversion levels. Additionally, it is hypothesized that men are more affected by sexual jealousy while women are more affected by emotional jealousy, potentially reflecting broader evolutionary factors.

Paul Kuehnert

NY - Finger Lakes Community College

Discipline: Biology

Authors:

#1 Jessica Halliley

#2 James Hewlett

#3 Matthew Brooks

#4 Tully Jewett

Asa McKaig

Abstract Name: Upcycling Organic Waste Streams for the Submerged Fermentation of Mushroom Mycelia: A Sustainable Solution for Global Nutritional Challenges

In response to increasing challenges related to global food security, innovative strategies are required to enhance the resilience and sustainability of food production systems. The cultivation of *Ganoderma lucidum*, a mushroom known for its nutritional and therapeutic properties, represents a compelling opportunity to address these needs by repurposing organic waste into feedstocks for growing nutrient-dense mushroom mycelia in liquid fermentation systems. The primary benefit of leveraging liquid feedstocks over traditional solid-state systems is that submerged systems allow for the complete extraction of mycelial biomass without leaving any of the substrate attached, leading to increased efficiency and lower production costs. Upcycling organic waste streams to produce feedstocks represents a sustainable strategy for producing biomass at scale, while further limiting the cost of production. The current study focused on substrates derived from hydrolysates of municipal solid waste, corn stover, corn steep liquor, and hemp. *G. lucidum* was cultivated in shake flasks and lab-scale stirred-tank bioreactors utilizing a variety of experimental media formulations. Batch runs lasted from 7-10 days. Upon termination, each batch was analyzed to measure biomass yield and exopolysaccharide content. Preliminary findings identified municipal solid waste as the most effective substrate for mycelial growth, producing 23.5g/L of biomass on average. Beyond its commercial applications, this approach addresses critical waste management challenges by converting underutilized residues into high-value products. Future research will focus on refining cultivation techniques, optimizing nutrient formulations, and minimizing batch variability to ensure consistent and enhanced yields. By integrating sustainability with innovation, this study aims to advance resilient food production systems capable of addressing global demands in increasingly complex scenarios.

Alana Kuhlen

MI - Northern Michigan University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Heather Isaacson, Ph.D., CCC-CLP

Abstract Name: Exploring Interrater Reliability in Teleassessment of Speech Sound Disorders: A Case Study

The purpose of this study is to investigate interrater reliability among undergraduate students using teleassessment to score the speech sound production of children diagnosed with speech sound disorders. Given the increase in the use of teleassessment in the field of speech-language pathology understanding the scoring among different evaluators is essential for ensuring reliable and valid diagnostic outcomes. The research focuses on comparing the assessments made by undergraduate students to determine the level of agreement between their evaluations, which can inform best practices for training in clinical settings. This study utilized Fleiss' Kappa to determine the interrater reliability of three undergraduate students utilized a two-way scoring system to evaluate the speech sound production of three separate children with a speech sound disorder captured through the administration of words selected from a widely recognized and commonly used speech sound assessment tool. The average of the undergraduates' reliability scores for the three children's teleassessments using the Fleiss' Kappa was 0.5279, which falls under moderate agreement. A questionnaire was administered to the undergraduate students to gain perspectives on telehealth. In the questionnaire, two out of three respondents were "somewhat likely" to use teleassessments, while one was "unlikely." Attitudes varied, with one student having a "strongly positive" attitude and the others "moderately positive." Regarding skills, responses ranged from "extremely unskilled" to "slightly skilled," and all rated themselves as "moderately unknowledgeable" about teleassessments. The questionnaire responses identified perspectives on teleassessments, offering insights for enhancing the Social Construct of Teletherapy (SCOTele). Analyzing individual speech sound assessments revealed strong agreement in two cases and poor agreement in one, with variations based on the severity and type of speech sound disorder. The study indicates that novice clinicians can achieve some level of agreement, but they may lack interrater reliability, as seen in more experienced certified clinicians.

Ashlynn Kuijpers

PA - Commonwealth University - Bloomsburg

Discipline: Nursing and Public Health

Authors:

#1 Carolyn Reid-Brown

Abstract Name: Building Resilience: Empowering Nursing Students to Thrive Under Pressure

The National Library of Medicine states that "...three in four college students self-reported feeling stressed, while one in five college students reported stress-related suicidal ideation" (Barbayannis et. al, 2022, p. 2). Nursing students, while experiencing the typical stresses of college life, face a unique set of stressors including rigorous academic schedules, emotionally demanding clinical rotations, and the pressure of mastering life-saving skills. These challenges, if left unaddressed, can lead to burnout, poor academic performance, and a diminished ability to provide quality patient care. Nurses play an important role in identifying when a patient is experiencing stress and assist them to keep it under control. As such nursing students need to also recognize the signs and symptoms in themselves, and practice ways to mitigate it. Resilience—the ability to adapt and thrive in the face of adversity—offers a powerful framework for equipping nursing students to navigate these pressures effectively. This presentation explores the critical importance of resilience for nursing students and its role in fostering both personal and professional growth. Drawing on an extensive review of current research and real-world examples, it highlights the psychological and physiological impact of stress on nursing students and its implications for their academic success and long-term career sustainability. Attendees will gain insights into evidence-based strategies for building resilience, such as cognitive reframing, canine therapy, art and dance interventions, and peer support systems.

Special attention will be given to practical applications, including the use of reflective practices during clinical rotations. Through an interactive format, this session aims to empower college students, nursing students, educators, and administrators with actionable tools to cultivate resilience. The goal is to create a supportive educational environment where nursing students not only manage stress effectively but also develop the mental fortitude necessary to excel in the demanding field of healthcare.

Alexandra Kukucka

NY - New York University

Discipline: Environmental Science and Sustainability

Authors:

#1 Jianhong Ren

Henry Crawley

Abstract Name: Analysis of Water and Sediment Quality Around the Nueces/Corpus Christi Bay Area

Concentrations of nutrients and pesticides are highly influential on marine health and industries. This is particularly important to South Texas, where industries such as fisheries and sustainable agriculture are crucial. However, there has not been a substantial classification of these contaminants in the Coastal Bend of Texas to the present. This study proposes various chemical extraction procedures to target particulate and dissolved nutrients and pesticides in water and sediment samples from five South Texas coastal areas. Ion chromatography is suggested to detect the levels of nitrates, nitrites, and phosphates in environmental samples. Solid phase microextraction is recommended to isolate organochlorine pesticides from field samples for analysis by gas chromatography equipped with an electron capture detector. Preliminary research was completed on sediment and water samples from five sites around the Nueces and Corpus Christi bays. Water quality parameters of pH, temperature, conductivity, total dissolved solids, and salinity were measured on site using the ProDSS Multiparameter Digital Water Quality Meter. Sediment moisture content was determined by utilizing a ratio of wet to dry sediment mass, and sediment porosity was calculated using dry sediment mass and volume. The average suspended sediment concentration at each site was found through vacuum filtration with a minimum particle size limit of 0.45 μm . This work contributes essential baseline data to HydroShare and builds a Delft3D model of the South Texas coastal area, enabling enhanced access for communities and stakeholders. Using machine learning, we identified potential pollution hotspots, underscoring areas in need of further monitoring and policy action to safeguard marine health.

Aditi Kulkarni

MI - Wayne State University

Discipline: Chemistry

Authors:

#1 Andrew Lipchik

#2 Souvik Roy

Abstract Name: Characterization of a Cadmium-Specific Hexapeptide Chelator for Detoxification of Cadmium

Heavy metals including arsenic, cadmium, lead, mercury, and chromium are among the most concerning chemicals to public health. Metal chelation therapy (MCT) is the primary treatment for heavy metal toxicity and poisoning, which requires the administration of small organic molecules to remove the toxic metal of

interest. However, current MCT suffers from several limitations including the inability to distinguish between the toxic metal of interest and essential physiological metal. These limitations result in inefficient removal of toxic metals and deleterious disruption of metal homeostasis as essential metals are also removed. Therefore, the development of new metal chelators that are specific to the target metal is necessary for treating heavy metal exposure. Ideally, chelating agents should have aqueous solubility, high affinity and specificity for the target metal, the ability to cross tissues and cell membranes, and the ability to be eliminated. Peptides can achieve all these criteria. Recently, we have identified a peptide chelator with specific cadmium binding. The binding properties and contributions of individual amino acids of this peptide to cadmium chelation remain uncharacterized. Here, we present the characterization of cadmium binding to this hexapeptide using biochemical, biophysical, and analytical methods to determine the contribution of each amino acid to cadmium binding. Our analysis identified histidine, serine, and lysine as critical residues for cadmium binding and detoxifying properties. These results provide insight into the interplay between cadmium coordination and the apo-peptide structure. Defining the overall metallo-peptide interactions with cadmium provides important insights for the development of future highly efficient and cadmium-specific chelators for use in MCT.

Abigail Kulkarni

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Kaveri Goel

#2 Natalie Gassman

Abstract Name: UNG1 Overexpression Alters Mitochondrial Function and Therapeutic Resistance in Castration-Resistant Prostate Cancer

Prostate cancer (PCa) represents the second most common cancer worldwide and the fifth leading cause of cancer deaths in men. Upon diagnosis, patients are typically treated with androgen deprivation therapy (ADT). While ADT is initially effective, prolonged use contributes to a more aggressive and lethal form of PCa, known as Castration-Resistant Prostate Cancer (CRPC). Thus, identifying specific factors contributing towards CRPC has become imperative for developing personalized treatments. Our lab previously determined some DNA repair enzymes are dysregulated in PCa tumors. Uracil DNA Glycosylase (UNG), a base excision repair enzyme that removes uracil from DNA, was overexpressed in PCa. The UNG gene encodes for two isoforms: UNG1, localized in the mitochondria, and UNG2, localized in the nucleus. Most reports group these isoforms as UNG. However, examination of UNG protein levels in cancerous and normal prostate cell lines revealed that UNG1 is upregulated in advanced CRPC cell models. Therefore, to characterize the effects of UNG in CRPC, we constructed a UNG knockout and UNG1 overexpression C4-2B cell line using CRISPR/CAS9 and ectopic overexpression, respectively. Using immunoblotting and qPCR, we confirmed that UNG1 overexpression significantly decreased mitochondrial DNA copy number and altered mitochondrial metabolism proteins, suggesting UNG1 alters mitochondrial function. Moreover, when exposed to the anti-androgen Enzalutamide, UNG depletion increased cell sensitivity, while UNG1 overexpression increased resistance. Given UNG's role in DNA repair and genomic stability, we also examined the response of the depleted and UNG1 overexpressed cell lines to the ATR inhibitor Elimusertib. C4-2B cells were sensitive to Elimusertib, with the UNG depletion showing no enhancement of that sensitivity, while UNG1 overexpression showed increased sensitivity. Therefore, Elimusertib may offer a treatment strategy for CRPC patients with elevated UNG1 and resistance to enzalutamide. Further, these data suggest that UNG1 overexpression impacts mitochondrial function, which should be explored as a therapeutic target.

Karishma Kulshrestha

PA - Carnegie Mellon University

Discipline: Psychology

Authors:

#1 Karishma Kulshrestha

#2 Abhishek Dedhe

#3 Steve Piantadosi

#4 Jessica Cantlon

Abhishek Dedhe

Abstract Name: Hierarchical Structure Generation in Pre-School Children and Adults in Two Ecologically-Valid Tasks

Hierarchical structures are central to language, mathematics, music, and theory of mind. Much remains unknown about the cognitive development of hierarchical reasoning, a knowledge gap we address. One limitation of existing methods is their low ecological validity. We present data from high ecological validity tasks with 3-to-6-year-old children. The first task—the Russian Nesting Dolls task— featured dolls decreasing in size, nested within each other. Participants were instructed to “complete the puzzle” with no additional instructions. The second task—the Drawing Task—included a photograph of houses arranged from left to right, each with windows and doors in similar positions. Participants were instructed to “draw what you see” with no additional instructions. We coded the sequential behavior of participants as symbolic strings. We conducted qualitative and quantitative classifications of behavior into two categories: linear and hierarchical. Qualitative classifications were based on local structures with less nesting (linear) and global structures with more nesting (hierarchical). Other features such nesting depth and accuracy of reproducing “canonical” structures (well-nested dolls and accurately placed architectural elements) were also coded. Quantitative classifications were based on: a) path analysis of structures unfolding over time and b) complexity analysis of final structure configuration. We used Bayesian modelling to infer the cognitive algorithms—linear or hierarchical—underlying structure generation. This modelling incorporated computational operations over discrete tokens like the puzzle pieces or the architectural elements. Furthermore, we measured correlations between hierarchical ability and visuospatial working-memory capacity (Corsi block-tapping task). Finally, we compared the performance of children to that of adults. Our results show that both 3-to-6-children and adults possess the capacity to engage in hierarchical mechanisms. However, younger participants and those with lower working-memory used linear mechanisms. These results point to the gradual unfolding of psychological mechanisms from linear to hierarchical across cognitive development.

Arun Kumar

MI - Wayne State University

Discipline: Biology

Authors:

#1 Ryan Thummel

Abstract Name: The Role of *nr2e3* in Retinal Regeneration in Zebrafish: Implications for Therapeutic Strategies in Retinal Degenerative Diseases

Purpose: This study investigates the critical role of the *nr2e3* gene in retinal regeneration in zebrafish, with a specific focus on its impact on progenitor cell proliferation and differentiation following acute high-intensity light-induced damage. Insights from this research aim to inform therapeutic strategies for human retinal degenerative diseases, in which natural regenerative processes are limited. Methods: Adult albino zebrafish

siblings were used to investigate the role of Nr2e3 in retinal regeneration. Following a 5-day dark adaptation, the experimental group received morpholino injections to suppress Nr2e3 expression, while the control group received a non-targeting morpholino. Both groups then underwent acute high-intensity light treatment involving a brief 100,000 lux light followed by continuous exposure at 12,000 lux for 3 days. Post-treatment, zebrafish were euthanized, and their eyes were harvested, cryosectioned, and analyzed using immunohistochemistry with anti-PCNA antibodies to assess progenitor cell proliferation. Fluorescence intensity was quantified using ImageJ, and statistical differences were evaluated with ANOVA followed by Tukey's HSD test. Results: Suppression of Nr2e3 significantly reduced progenitor cell proliferation, demonstrated by a marked decrease in PCNA fluorescence intensity in the experimental group compared to controls. Statistically significant differences were observed between experimental and control groups ($p = 0.046$) and between experimental and untreated right eyes ($p = 0.010$). These findings underscore the critical role of Nr2e3 in sustaining progenitor cell populations during retinal regeneration. Conclusions: The nr2e3 gene is essential for regulating progenitor cell proliferation and differentiation during retinal regeneration in zebrafish. Suppressing Nr2e3 leads to premature differentiation and a reduction in the regenerative capacity of the retina. These findings have important implications for developing gene therapy-based treatments for retinal degenerative diseases in humans, where enhancing nr2e3 activity could potentially activate regenerative outcomes. Further research exploring Nr2e3's role across various stages of regeneration will be essential to fully utilize its therapeutic potential.

Titus Kurian

PA - University of Pittsburgh

Discipline: Computer Science

Authors:

#1 Daniel Mosse

#2 Nathan Ong

#3 Raja Krishnaswamy

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Jessica Hsin

Abstract Name: Automated Extraction of Course Concepts from Lecture Materials

Information on the concepts covered in specific course materials has the potential to enhance the quality of education, but manually extracting such concepts is a time-consuming and laborious task. In addition, since, to our knowledge, there are no publicly available datasets of concept-labeled course presentations, there is a dearth of data available. To this end, this work compiles a novel dataset based on computer science lecture presentations from the University of Pittsburgh that is annotated with concepts using the BIO span-labeling framework. This dataset is comprised of a mix of human-expert labeled and automatically labeled data, which alleviated the heavy workload of manually annotating the new dataset. We leveraged large-language model (LLMs) to generate automatically labeled data which were chosen due to their language comprehension abilities. This work presents a machine-learning system trained on this dataset to automatically extract various computer science concepts from course presentations, a task similar to Named Entity Recognition. Various experiments will be performed to compare across different baseline models as well as an ablation study to better understand what features are most important for improving the model's performance. The findings from this research aim to contribute to the development of more efficient methods for automatic concept extraction, ultimately supporting the creation of educational tools that enhance learning experiences. Additionally, the insights gained from this work could pave the way for more scalable and accurate systems for automated content analysis in educational settings.

Kate Kurotani

MN - University of Minnesota - Rochester

Discipline: Nursing and Public Health

Authors:

#1 Jessica Bell

Abstract Name: Pulmonary Vascular Remodeling In Relation to the Social Determinants of Health

Pulmonary Arterial Hypertension (PAH), a type of pulmonary hypertension, is an acute incurable condition that occurs when pulmonary artery pressure is greater than 20 mm Hg and is further induced by pulmonary vascular remodeling. While this can be prompted by direct causes like congenital heart defects or drug misuse, there are a multitude of other factors that should be considered like the Social Determinants of Health (SDOH). This project investigates the relationship between the SDOH through the BIG GEMS factors and pulmonary vascular remodeling. The overarching purpose of this study is to provide a collective insight into the factors that should be considered when approaching pulmonary vascular treatment and prevention, which may heavily involve large-scale changes related to the SDOH. An SDOH score was utilized to assess the effects of social risk factors into quartiles of increasing disadvantage. Information collected and experiments reviewed in this study were obtained from published studies using the NCBI database, published text, and clinical trials. The correlation analysis of the Social Determinants of Health and pulmonary vascular remodeling was conducted using data from a retrospective cohort study on 2229 patients at the University of Miami Health System who answered an SDOH survey from September 2016 to September 2017. The results on the SDOH quartile showed that individuals with Hispanic backgrounds, unemployed, higher Framingham Risk Scores, long-term smoking habits, and lack of physical exercise belonged to the upper quartile of SDOH scores and were, therefore, more likely to develop cardiovascular diseases like pulmonary hypertension. Recommendations to reduce healthcare disparities and improve pulmonary hypertension treatment outcomes in underrepresented minorities include non-pharmacological methods like community outreach and public health programs, increasing representation in major trials, recognition of social determinants of health, improving access to care, earlier recognition and diagnosis, and improving the treatment of related conditions.

Kate Kurotani

MN - University of Minnesota - Rochester

Discipline: Health and Human Development

Authors:

#1 Ibrahim Elmadbouh

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Abstract Name: MicroRNA-29b-mediated Voltage-gated Potassium Channels 1.5 (Kv1.5) in PASMC from Patients with Pulmonary Hypertension

BACKGROUND: Pulmonary Arterial Hypertension (PAH) is a type of pulmonary hypertension that leads to higher lung blood pressure levels. It is a rare incurable disease that affects approximately 1% of the global population. In the lungs, the downregulated expression and activity of potassium (K⁺) channels in pulmonary artery smooth muscle cells (PASMC) from idiopathic PAH (IPAH) patients have been associated with the development of prolonged pulmonary vasoconstriction and vascular remodeling. However, the precise mechanism is unknown. MicroRNA (miRNA), a small non-coding RNA that binds to the 3'-untranslated regions of the mRNAs, regulates gene expression posttranscriptionally. We hypothesized that the increased

level of miRNA-29b-downregulated Kv1.5 channels contributes to increased PASMC proliferation and development of PAH. METHODS: We used human PASMC isolated from healthy subjects or IPAH patients in this study. Normal PASMC were exposed to normoxia or hypoxia for 72 hours. PASMC were transfected with miRNA-29b mimic for 6 hours. KCNA5 was measured by PCR, qPCR, or Western blot. The miRNA-29b level was measured by qPCR. RESULTS: The protein level of KCNA5 was lower in PASMC isolated from IPAH patients compared with PASMC isolated from healthy subjects. MiRNA-29b level was significantly higher in IPAH-PASMC than in normal. Transfection with miRNA-29b mimic resulted in a 45-fold increase in miRNA-29b expression compared with scrambled-transfected or control cells. Gel electrophoresis and western blot images show that KCNA5 mRNA and protein levels are decreased in PASMC overexpressed with miRNA-29b. Western blot images display that KCNA5 is lower in cells exposed to hypoxia than in cells exposed to normoxia. CONCLUSIONS: Together, these results demonstrate that increased levels of miRNA-29b decreased expression levels of KCNA5 in PASMC isolated from IPAH patients. Hypoxia-induced decrease in KCNA5 expression can be linked to increased cell proliferation. Inhibition of miRNA-29b can be utilized to potentially create new treatment strategies for IPAH patients.

Lynn Kutch

PA - Kutztown University of Pennsylvania

Discipline:

Authors:

Daniel Nunez

Lily (Lee) Gradin

Abstract Name: The Passion Project and FYS Wonderfest!: A Collaborative Student-Faculty Curricular Model and a Culminating Campus Celebration of First Year Innovation

A majority of faculty members acknowledge advantages of involving undergraduate students in research, but a far smaller percentage, many of whom teach First Year Seminar (FYS) courses, think about embedding research practices in these required general education environments. The hesitation is understandable: FYS courses happen early in students' academic careers before they are ready to engage in quality research experiences, or so the argument goes. This faculty/student joint presentation presents a field-tested curricular model for The FYS Passion Project—a collaborative faculty and first-year student design—that breaks the research process down into gradual, bite-sized, and FYS-appropriate chunks, allowing for introducing steps in the research process as early as the first semester. The scaffolded activities culminate in an on-campus conference by FYS students for FYS students called FYS Wonderfest, A Campus Celebration of First Year Innovation. Setting this model apart is the fact that the faculty member created the pedagogical plan and products in close cooperation with two first-year students. The newly redesigned and reimagined model piloted in Fall 2024; and I can confidently say that it offered level- appropriate support and training in research practices at first-year-student level. The presentation showcases the step-by-step approach, which also includes periodic electronic check-ins that allow students to assess their relationship to and feelings toward the research and creativity process along the way. The presentation also reports on the planning, implementation, and impressions of FYS Wonderfest, an on-campus mini-conference, where students shared their research with peers and invited guests in a welcoming and friendly environment. The presentation's aim is that the student involvement in the curricular design, as well as the overwhelmingly positive results from the fall 2024 pilot, can help convince especially (often reluctant) FYS instructors to adopt and adapt similar models for use in their classrooms.

Amruta Kuthe

MI - Wayne State University

Discipline: Psychology

Authors:

#1 Zawadi Mwangale

Abstract Name: Examining the Moderating Role of Birth Outcomes on the Relationship between Maternal-Fetal Attachment and Infant Sensory Processing

Maternal-fetal attachment (MFA), a crucial component of prenatal bonding, has been linked to developmental outcomes, though its specific associations with sensory processing remain underexplored. Alhusen et al. (2013) demonstrated that mothers with lower quality of MFA were associated with an increased risk of developmental delays in children, while women with higher quality of MFA showed improved early childhood developmental outcomes, suggesting that the attachment formed during pregnancy can have lasting effects. This study investigates the moderating role of birth outcomes on the relationship between MFA and infant sensory processing at 4 months of age in a predominantly low-income, Black/African American population. Data from 134 maternal-child dyads were analyzed, using the Maternal-Fetal Attachment Scale (MFAS) to assess MFA and the Infant/Toddler Sensory Profile (ITSP) to measure infant sensory processing. Birth outcomes, including gestational age at birth, birth weight, and head circumference, were evaluated as potential moderators. Regression analyses conducted in SPSS showed that gestational age had a main effect on MFA and ITSP scale rating ($\beta = .22$, $t = 2.541$, $p < .05$). However, no significant moderators were identified, and the main effect of gestational age did not hold when the outliers were removed. MFA was not correlated with either ITSP Low Threshold ($r = -.020$, $p = .815$) or ITSP Low Registration ($r = -.010$, $p = .904$), nor was it significantly correlated with any of the three birth outcomes. These findings highlight the complex relationship between prenatal attachment and infant sensory processing and underscore the need for further research, particularly in diverse populations. Future research should consider multiple time points and larger sample sizes to better understand how birth outcomes may influence the relationship between MFA and sensory processing.

Lydia Kutzer

PA - Duquesne University

Discipline: Engineering

Authors:

#1 Adam Lewis

#2 Heran Pradhan

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Abstract Name: High-throughput Bioprinting of Cell-laden Droplets for Scalable Organoid Biomanufacturing

Organoids are 3D cell culture systems mimicking actual human organs and are generated from human induced pluripotent stem cells (hiPSCs). Efficient and scalable biomanufacturing of organoids holds significant potential for disease modeling, drug discovery, personalized medicine, and regenerative therapies. However, current methods for producing cell-laden microdroplets—a critical step in organoid generation—are labor-intensive and prone to variability. To address these challenges, we developed a semi-automated, high-throughput bioprinting system designed to streamline and standardize the production of alginate-based droplets. This research focuses on automating the droplet generation and processing system to improve efficiency, reproducibility, and reduce human intervention. Our system integrates air-jetting technology with a custom Python-controlled Raspberry Pi interface to automate key processes, including droplet generation and

washing. The system uses a syringe pump to dispense alginate bioink and peristaltic pumps for wash cycles, minimizing contamination risks. Comprehensive optimization was performed on printing parameters, including airflow rate, alginate concentration, and crosslinking medium, to enhance droplet uniformity and integrity. Key findings demonstrated that higher airflow rates and CaCl₂ concentrations improved droplet sphericity, while specific alginate formulations enhanced droplet stability. The automated system achieves a production rate of approximately 50 droplets per second, generating 27,000 droplets within 10 minutes with minimal user oversight. This automation not only ensures consistency in droplet size and quality (300–500 µm) but also significantly reduces manual labor and the likelihood of errors, making it ideal for scaling up organoid production. Encapsulated cells exhibited high viability, aggregation, and differentiation during culture, confirming the efficacy of our optimized protocol. Future work will focus on increasing throughput to enable large-scale production for clinical applications. This advancement represents a significant step toward scalable, efficient biomanufacturing of organoids, offering transformative potential for regenerative medicine.

Alexandra Kwiat

PA - University of Pittsburgh School of Nursing

Discipline: Nursing and Public Health

Authors:

Abstract Name: Von Hippel-Lindau Disease: Manifestation and Treatment of Rare Genetic Condition

Von-Hippel Lindau (VHL) disease is a rare genetic condition that predisposes individuals to abnormal tumor growth throughout the body. VHL disease is a mutation of one's VHL gene, a crucial tumor suppressor gene found in the body. Living with this gene mutation allows your body to repeatedly promote tumor growth in the brain, retina, inner ear, spinal cord, adrenal glands, kidneys, and pancreas. To diagnosis VHL, a healthcare provider would conduct a blood test that could potentially identify a VHL pathogenic variant. Early diagnosis and implementation of treatment has had a great effect on the lifespan of VHL patients. However, there is still no cure and the disease effects 90% of those with the gene mutation. The tumors of this genetic condition tend to be noncancerous and continue to regrow all throughout life. However, tumors found in the kidneys are generally cancerous, making renal cell carcinoma the leading cause of death in these patients. Surgical interventions are a common form of treatment for VHL tumors, specifically those of the central nervous system (CNS), adrenal glands, and kidneys. Surgeries utilized to treat VHL include general, robotic, or laparoscopic surgeries. There are also instances where devices are placed into the patient to help mitigate tumor effects and growth. The use of immunotherapy, chemotherapy, radiation therapy, and prescription drugs are all seen in practice as well. Great effects are continuing to be seen in patients effected by this disease as the VHL treatment landscape continues to improve and evolve.

Megan Kwiatkowski

PA - Duquesne University

Discipline: Interdisciplinary

Authors:

#1 Abraham Nofal

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Abstract Name: Modeling Spatial Variation of PKC- δ and cFOs Neurons of the Amygdala: Implications on

Neuropathic Pain Output

Neuropathic pain is a result from injury to the nervous system and involves a region of the brain known as the central nucleus of the amygdala (CeA). Within the CeA exists a population of neurons expressing protein kinase c-delta (PKC- δ). PKC- δ are generally pro-nociceptive (increase pain); however, a subpopulation of PKC- δ neurons is activated by the inhaled anesthetic isoflurane and provide anti-nociceptive output (decrease pain) when activated. In other words, these two subgroups of PKC- δ neurons play opposing roles in pain output. We developed a 3-D computational model of PKC- δ and cFOs (the marker of activated neurons) and used this model to investigate the impact of anterior to posterior (A --> P) variation in neuron-level properties on pain output from the CeA. Our model stimulates the behaviors and interactions of 10,000+ PKC- δ (pro-nociceptive and anti-nociceptive) neurons and produces an emergent measure of pain. Neuron-level parameters (e.g. location, firing rates, connectivity) were estimated from wet-lab data indicating variation along the A --> P axis. Results from the model show how pain is influenced by spatial heterogeneity in these neuron properties. Our modeling framework provides a tool for exploring impact of neuron-level parameters on system-level pain output. Using this tool, we aim to explore the impact spatially targeted activation and inhibition of PKC- δ neurons on pain output from the CeA. This work highlights the importance of computational modeling in studying biological systems and further development of wet-lab experiments.

Brooke La Fuente

NC - North Carolina State University

Discipline: Biology

Authors:

#1 Carlos Goller

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Abby Studnek

Abstract Name: Understanding the Relationship Between Gut Microbial Communities and Saliva Enzymes Present in *G. mellonella* to Degrade Polyethylene and other Plastics

Plastic is ubiquitous, with approximately one-third of global plastic production being polyethylene, a thermoplastic resin commonly used in packaging applications such as plastic bags, films, containers, and bottles. The overproduction of plastic, particularly single-use plastics, and current disposal methods underscore the urgent need for environmentally sustainable solutions, such as biodegradation by insects and microorganisms. Recent studies have identified bacteria and saliva enzymes capable of bio-degrading polyethylene in Greater Wax Moth larvae (*Galleria mellonella*). Evidence suggests that the chemical similarities between their natural diet of honeycomb and polyethylene enable the larvae to degrade the plastic. Four saliva enzymes—Cora, Ceres, Demetra, and Cibeles—have been identified as responsible for plastic oxidation. Additionally, research has shown that gut microbes allow waxworms to digest polyethylene and potentially polystyrene. Strains of *Fibrobacter*, *Pseudomonas*, and *Bradyrhizobium* have been associated with polyethylene and polystyrene diets in waxworms, suggesting that these bacteria may possess mechanisms for plastic polymer breakdown. However, further studies are required to confirm these mechanisms. While four saliva enzymes have been identified and crystallized as plastic oxidizers, the genetic regulatory mechanisms behind their function remain poorly understood. Notably, Cora is the most abundant enzyme in waxworms, making it a promising candidate for further research. It is also unclear whether the microorganisms in the waxworm gut complement the saliva enzymes in the biodegradation process. In this study, we will identify prominent gut microbes through isolation, culturing, and DNA extractions of selected colonies. Bacterial stocks will allow us to study these microorganisms more closely. We will grow selected organisms on various plastic media such as polyethylene, polystyrene, and polypropylene to determine their tolerance and plastic

biodegradation capabilities. Phenotypic characterization of isolates will be complemented by genomic studies to identify potential genes and pathways involved in plastic degradation.

Jessica Lacap

CA - University of the Pacific

Discipline: Psychology

Authors:

#1 Jessica Lacap

#2 Carla Strickland-Hughes

#3 Abby Frea

#4 Carolina Altamirano

#5 Rahma Saleh

Abstract Name: You're Multiracial? I Thought You Were Mexican!: A Systematic Review Into the Racial Categorization of Multiracial Faces

With rising racial diversity in America, blurred distinctions of race lead to issues of misidentification and perpetuation of racism. This pre-registered, non-interventional systematic review aims to synthesize patterns of racial categorization (i.e., mental placing of people into racial groups based on a physical basis), according to observer race, face race, and aspects of the facial stimuli. For example, the review compares racial categorization (i.e., concordance/discordance frequency, label usage, latency) of real and computer-generated faces of different races between monoracial and multiracial observers. Following NIRO-SR guidelines, we applied a committee-approved search query in databases (e.g., PsycINFO, ProQuest) to identify laboratory-based studies with adults published after 1990 using an experimental paradigm where participants racially categorize faces. We are currently screening studies and will present synthesized results. Aligned with social identity theory, we expect faster and more concordant racial categorization of multiracial faces by multiracial perceivers. This work will inform better study of racial categorization of multiracial individuals.

Paige Ladowitz

PA - Duquesne University

Discipline: Biology

Authors:

#1 Sophie Kopyar

#2 Daniel Fromuth

#3 Eli Collavo

#4 Joseph McCormick

Abstract Name: Do Mutations in a Nucleoid-Associated Protein Gene Suppress a Defect in Cell Division?

Streptomyces are filamentous, Gram-positive bacteria that provide antibiotics and biologically active compounds for medical purposes. A *Streptomyces coelicolor* *ftsQ* mutant (with a deletion of an important gene regulating cell division and efficient sporulation) accumulates multiple spontaneous suppressor mutations over time. One group of those suppressor mutations is in *lsr2*, but those strains have additional mutations in other genes. *Lsr2* is a nucleoid-associated protein (homolog to *Escherichia coli* H-NS) that organizes DNA and acts as a transcription factor. The main goals of this project were to demonstrate that *lsr2* suppresses a deletion of *ftsQ* by deleting *lsr2*, deleting *ftsQ*, and then integrating a copy of *lsr2* as point

mutant alleles at a non-native location. Some methods used to achieve these goals include interspecies conjugation, polymerase chain reaction (PCR), and agarose gel electrophoresis. All strains will be analyzed via PCR and phase-contrast microscopy to determine if *lsr2* does suppress a deletion of *ftsQ*.

Samuel Lagos

VA - Christopher Newport University

Discipline: Chemistry

Authors:

#1 Frank Gupton

#2 Madaline Farina

#3 Somantika Pradhan

#4 Nishat Salsabil

Abstract Name: An Investigation of the Effects of Microwave-Only Reduction on a Supported Palladium Catalyst in Suzuki-Miyaura Reactions

The Suzuki-Miyaura reaction is a cornerstone of many pharmaceutical production processes. These reactions occur when an organoborane and an aryl halide interact in the presence of a palladium metal catalyst and a base to form biaryls. The support for the heterogeneous catalyst used in this project consisted of industrially produced, readily available alumina beads. These beads were coated with nitrogen-doped reduced graphene oxide to enhance electrical conductivity and nickel-tipped carbon nanotubes to prevent graphene sheet stacking. Wet impregnation was then used to decorate the surface of the support with palladium nanoparticles. Typically, the catalyst is reduced at high temperatures in a hydrogen gas atmosphere. However, it was hypothesized that reduction using only microwave radiation would produce a functional catalyst. It was also hypothesized that varying the temperature, time, and stirring rates during microwave treatment would influence the catalyst's activity. Four samples of unreduced catalyst were microwaved under different conditions, and their activities were compared. Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES) was used to determine the exact amount of palladium deposited on each catalyst after microwave reduction. This allowed for the addition of catalyst based on the molar concentration of palladium rather than catalyst weight, resulting in a fairer and more consistent assessment of catalyst activity. Each catalyst variant was then tested in its own Suzuki-Miyaura reaction to determine its individual activity. A Gas Chromatography/Mass Spectrometry (GC/MS) system was employed to quantify product and byproduct yields from each Suzuki-Miyaura reaction. Data collected in this experiment suggest that microwaved catalysts are highly active in these reactions; but specific microwave conditions did not significantly affect their performance.

Katherine Laird

PA - Villanova University

Discipline: Psychology

Authors:

#1 Benjamin Sachs

Abstract Name: The Effects of Early Life Stress on Depression- and Anxiety-Like Symptoms in Both Sexes of Adult Mice: A Novel Behavioral Model

Anxiety and depression are leading causes of mental illness, and 25% of adults will be diagnosed with mental illness at some point in their life. The causes of these disorders remain unknown, but studies reveal a connection between early life stress (ELS) and psychopathological development. Some reports suggest that ELS is sufficient to induce depression- and anxiety-like behavior in mice. However, substantial evidence shows that traditional models of ELS inconsistently induce significant alterations in commonly used behavioral tests of depression- or anxiety-like behavior. This project tested a novel behavioral model and

analyzed the effects of maternal separation in later post-natal days (PND) compared to previous studies, aiming to develop a more consistent and realistic understanding of the relationship between maternal separation and its long-term effects. This study tested 73 subjects in a 2x2 design (sex x ELS). Maternal separation occurred on PND 10-20. On PND 21, all subjects were weaned. Once 8 weeks old, all subjects underwent the light-dark emergence test (LDE) followed by an active versus passive primary reward preference test (sucrose water vs. running wheel) (AvP). The LDE test showed that stressed females took less time to enter the light portion of the light-dark box compared to stressed males. Females had increased entries and distance traveled in the light box under stressed and unstressed conditions compared to males. Following stress, females displayed impulsive-like behavior relative to males, who appeared to exhibit more of an anxious phenotype. The results of the AvP test show that control mice increased their running each day of the test, unlike stressed mice. There were no significant differences in the amount of sucrose drank. These findings suggest that the running test is a more sensitive measure of stress effects than the sucrose preference test. Future work will analyze the molecular mechanisms behind these findings.

Duncan Laird

CO - University of Colorado at Boulder

Discipline: Chemistry

Authors:

#1 Pray Shah

#2 Nicole Labbe

Abstract Name: Reducing Jet Engine Reignition Delay Time through Computational Molecular Analysis of Jet Fuel Ignition

Computational chemistry is a resource efficient way to predict reaction behavior over a wide variety of environments. Fuel design is a field particularly well suited for computational chemistry applications due to the extreme conditions experienced in combustion. In this work, we explore jet engine flame out, a sudden extinguishing of flame which leads to a loss in propulsion. Developing an accurate kinetic mechanism to predict reignition speeds of common cyclic jet fuels under high-altitude and low-pressure conditions is valuable for mitigating flameouts by minimizing reignition delay times. Current kinetic models of jet fuel ignition do not account for stereochemical effects. Furthermore, there exists little data for ignition delay time at low pressures, and especially for low pressures experienced at high altitudes. These challenges make computational chemistry a perfect tool to address shortcomings in jet fuel modeling. In this work, we use computational tools to create new jet fuel models. These tools include Kinbot, which predicts all unimolecular reaction pathways for fuel combustion, Gaussian, which calculates molecular geometries and energies, and Master Equations System Solver, which uses master equation theory to compute pressure and temperature dependent rate constants. Through performing computational analysis on each of these fuel combustion pathways for common jet fuels JP-10 and n-heptane, more accurate reaction rate constants can be determined to better predict reignition speeds at pressures relevant to flameout. Developing a computational mechanism for jet fuel ignition at high altitudes and low pressures, complemented by experimental validation, can enhance flameout mitigation by providing accurate predictions of ignition delay times. This combined approach utilizes advanced modeling tools and supercomputing to improve engine reliability and safety.

Keerthana Lakshmanan

FL - Florida Atlantic University

Discipline: Psychology

Authors:

Abstract Name: Visual Examination of Own- and Other-Race Faces and Implicit Racial Bias in Children and Adults

Previous research has examined how implicit racial bias can influence face recognition. By influencing how individuals visually process faces from one's own race, it may lead to heightened attention toward faces of one's own-race group. Past research has struggled to provide consistent results of how individuals scan or categorize certain faces, and there is a lack of research on potential factors (e.g., implicit racial bias) driving these inconsistent findings. Furthermore, children's implicit racial biases in relation to their recognition and visual scanning of own- and other-race group faces has yet to be examined. This study aims to examine adults' and children's implicit racial biases in relation to their duration of looking at own- and other-race facial features. Participants will complete two recognition tasks with White and Asian faces. In each recognition task, participants will be presented a sequence of eight faces in an encoding/learning phase. In the test phase, participants will be tested for recognition in a sequence of 16 faces (8 target, 8 distractor). Participants will complete the Implicit Association Test (IAT) and select pairings of White and Asian faces with "nice" and "not-so-nice" images. Eye tracking data will be collected during the face recognition tasks to measure the duration of looking. Implicit racial biases will be compared by analyzing the difference in response times for the combinations of pairings in the IAT. We predict that children with higher implicit biases will examine their own-race's facial features longer, and show avoidance of other-race's eye regions and facial features. Any differences at the level of visual perception might influence social interactions with own- and other-race individuals. This research aims to provide a better understanding of the social-cognitive processes in individuals facing their own- or other-race groups. Our findings can potentially contribute to our understanding of intergroup relations.

Meera Lakshmanan

FL - University of Central Florida

Discipline: Health and Human Development

Authors:

#1 Eunkyung Lee

Abstract Name: Differences in Health-Related Quality of Life Among Breast Cancer Survivors by Hispanic Origin in a Cross-Sectional Study

Breast cancer is the second leading cause of cancer-related death among American women. Research has examined health-related quality of life (HRQOL) among breast cancer survivors, finding that Hispanic women report lower levels of HRQOL compared to non-Hispanic White women. However, Hispanics are not a homogeneous population, and varying socioeconomic statuses and lifestyle factors may cause differences in HRQOL. This study examined differences in HRQOL by Hispanic origin among breast cancer survivors using data collected for the 'Hispanic breast cancer study' at the University of Central Florida. Patient contact information was obtained from the Florida Cancer Data System. Eligible patients were sent an invitation letter and response form to indicate interest. Following state-mandated recruitment procedures, a second mailing was sent if no response was received. Surveys were then sent to interested participants according to their preferred method (mail or online) and language (English or Spanish). The Functional Assessment of Cancer Therapy – Breast (FACT-B) was utilized to assess five domains of HRQOL: physical, social, emotional, and functional well-being, with a breast-cancer subscale. Utilizing the scoring manual, the FACT-B total score and HRQOL domain scores were calculated for each Hispanic subpopulation, with higher scores indicating a better HRQOL. From September 2023 to February 2024, we received complete surveys from 165 eligible participants (18 Colombians, 10 Cubans, 11 Dominicans, 10 Mexicans, 95 Puerto Ricans, and 21 from other Hispanic backgrounds). The mean FACT-B total score was 102.6 across all groups. Cubans

reported the highest mean score (116.3), while Dominicans reported the lowest mean score (97.8). Additionally, participants' smoking status, alcohol consumption, marital status, laterality of cancer, cancer stage, treatment type, and surgery type all proved to have specific correlations with HRQOL. These findings may help to increase awareness and explain the disparities in HRQOL impacting Hispanic breast cancer patients.

Ishaan Lal

CA - Yerba Buena High School

Discipline: Engineering

Authors:

#1 Shreeya Kurapati

Disha Pamukuntla

Faizi Zaidi

Abstract Name: Sensor-based Robotic Cars with Onboard Microprocessors to Perform Swarm Movement for Specific Tasks

Swarm robotics involves the coordinated motion of multiple robots working collectively to complete tasks efficiently. We hypothesize that integrating an advanced software interface to program and coordinate individual robots can significantly enhance swarm movement. In the initial phase of our project, nine EV3 robots were assembled, each equipped with an infrared (IR) sensor. These robots demonstrated homogeneous motion by utilizing information about their surroundings to move collectively. In the second phase, Lafvin robots were used to implement line tracking and obstacle avoidance methodologies, utilizing IR sensors and a Python-based control program integrated with Arduino microcontrollers. Motion analysis was conducted to evaluate the robots' behavior, plotted as a function of their positions. The results showed that 85% of the robots successfully reached their destination, but overall swarm movement efficiency was only 50%. Building on these findings, the project is being further refined to achieve more synchronized and effective swarm behavior. Initial tests suggest that software enhancements will support the desired improvements in movement coordination. Currently, we are developing an app to facilitate effective communication among robots using the HC-06 Bluetooth module. This communication framework enables the robots to interact dynamically, improving their line tracking and obstacle avoidance capabilities. The app is being developed using MIT App Inventor, allowing for seamless integration of backend and frontend software. The app is designed to receive data and send signals to the robots, optimizing their swarm movement. Detailed descriptions of the hardware and software components, as well as experimental results, will be presented at the upcoming conference. This interface is expected to serve as a powerful tool for improving swarm robotics performance.

Wayne Lam

NY - City University of New York - Hunter College

Discipline: Biology

Authors:

#1 Michael Duffy

Abstract Name: Single-Cell Multiome Bone Marrow Atlas in Young and Geriatric Samples

Bone marrow is a highly diverse organ that undergoes compositional changes over time. Age-related changes

in stem cells contribute to conditions like osteoporosis and immunosenescence. Mesenchymal stem cell differentiation favors adipogenesis over osteoblastogenesis while hematopoietic stem cells undergo lymphoid-to-myeloid skewing and senescence. The cellular events that trigger these changes are not completely understood. We use single-nucleus RNA sequencing (snRNA-seq) and assay for transposase-accessible chromatin (ATAC-seq) to profile the transcriptomic and epigenomic landscape of bone marrow from samples representing young and geriatric populations. We also analyze the cell-cell interactions that drive mesenchymal stem cell differentiation. Mesenchymal stem cells have been shown to regulate hematopoietic stem cell self-renewal and differentiation. We determine if the epigenetic regulation of mesenchymal stem cells is linked to mesenchymal regulation of hematopoietic stem cells. This multiome bone marrow atlas will provide a reference to investigate cell-cell interactions that control aging.

Kara Lamoreux

MN - Hamline University

Discipline: Biology

Authors:

#1 Michael Schuster

Abstract Name: Active Restoration of Buckthorn Invaded Communities Can Disrupt Litter Decomposition Feedback Mechanisms and Promote Ecosystem Function

Common buckthorn (*Rhamnus cathartica*) is an invasive shrub that is widespread throughout deciduous forests of North America. Major impacts of buckthorn include altered leaf litter decomposition. Buckthorn produces nitrogen-rich litter that decomposes faster than most co-occurring native plants. Increased decomposition can be a part of a self-reinforcing mechanism of invasion since buckthorn benefits more from increased nitrogen availability compared to many native competitors. Active restoration of plant communities following buckthorn management can help resist future invasion. However, little is known about how buckthorn leaf litter affects the decomposition of native grasses used in forest restoration or how those interactions may change over the course of restoration. I asked 1) How does buckthorn affect decomposition of native grasses used in understory restoration? 2) Does the impact of buckthorn litter on grass litter depend on the environment? I investigated these questions through a litterbag experiment in an oak-maple woodland. I decomposed litters of buckthorn, wild rye, and mixtures of both species together in three settings representative of different stages of forest restoration: intact buckthorn stands, areas where buckthorn was removed, and areas where buckthorn was removed and native species were actively restored. Litterbags were collected after 166 and 265 days. By 256 days, I found buckthorn litter had 6% mass remaining compared to 63% for wild rye and that regardless of species, litters decomposed 5% faster in intact buckthorn stands compared to areas where buckthorn was removed. Interactions between litters were also dampened in intact buckthorn stands and in unrestored areas, whereas litter mixtures decomposed synergistically in areas where native plants had been actively restored. My findings suggest that actively restoring plant communities can interrupt some feedback loops between buckthorn abundance and litter decomposition and promote healthier ecosystem function following management.

Emma Landefeld

PA - Duquesne University

Discipline: Physics and Astronomy

Authors:

#1 Earl Scime

#2 Eric Reynolds

Abstract Name: Electron Beam Pumped Laser Induced Fluorescence

While laser induced fluorescence (LIF) is relatively straightforward in low temperature argon plasmas, measurements of the ion velocity distribution in low temperature helium plasmas have been problematic. Not only is the ionization energy of helium much greater than that of argon, the lowest energy metastable helium ion state (the 2s state) lies 40.8 eV above the ion ground state. Therefore, in low temperature helium plasmas ($T_e \leq 5$ eV), the metastable ion population is quite small and there is only a small target population available for LIF. Another challenge is that the excited states of helium ions are degenerate and therefore, most excited states have a very strong return directly to the ground state through deep UV and soft x-ray emission. To maintain a sufficient metastable population for two photon absorption LIF (TALIF) in helium, we inject a low energy (~ 100 eV) electron beam into a low temperature helium plasma. Here we explore the ability of an electron beam to pump the 2s helium ion state, which is reflected in the increased intensity of helium's spectral lines. Preliminary data and further discussion on electron beam pumped TALIF is also presented.

Jane Landrum

AR - University of Arkansas

Discipline: Environmental Science and Sustainability

Authors:

#1 Brad Peter

#2 Wei Lun Tay

Abstract Name: Environmental and Societal Impacts of Agricultural Land Abandonment in Indonesia

In the past decades, Southeast Asia has faced one of the highest urbanization rates globally, with land conversion, agricultural land abandonment, and deforestation simultaneously occurring. High population growth rates have also led to increased food insecurity, which has increased the need for agricultural production. In Indonesia, high rates of urbanization on the island of Java have historically promoted governmental policy solutions aimed at population redistribution and agricultural extensification (rather than intensification). The cost of this conversion of lands to agriculture often falls on the environment, with peatlands and forested lands being converted to large scale farms. This leads to myriad environmental problems, as peatlands are important carbon stores, and their disruption can lead to large-scale climate disasters. This research proposes to address the question: What are the socioeconomic and biophysical drivers of agricultural land conversion, deforestation, and urbanization in Indonesia? This research additionally proposes to, through bibliometric and population-based analyses, (1) establish the historical context of agricultural land abandonment in Indonesia, (2) report the predicted extent of the effects of agricultural land abandonment, which is closely linked to urbanization, and (3) identify the scholarly interest in these issues, across disciplines, time, and place. By identifying the trends in existing research regarding both the effects and impacts of agricultural land abandonment in Indonesia, gaps in knowledge and areas that require further investigation will be identified.

Simone Lang

TX - Texas Woman's University

Discipline: Engineering

Authors:

#1 Simone Lang
#2 Shiru Lin

Abstract Name: Low-Dimensional Materials for Spacesuit Applications

Modern Space Suit materials maintain properties that shield astronauts from radiation, severe lunar temperature, and microparticles; while upholding lightweightness, flexibility and tensile strength on long space missions. Most spacesuit materials are made from nylon, synthetic fabrics and synthetic polymers. High density polyethylene (HDPE) is a popular polymer for space applications due to their resistance properties from secondary radiation exposure and their richness in hydrogen atoms. However, HDPE lacks tensile strength, therefore causing urgency to find a material that will absorb well and maintain excellent properties with HDPE. In this project, low-dimensional materials, including graphene, graphene oxide and boron oxide are explored for spacesuit material additives HDPE, because of their successful electrostatic, thermal and mechanical properties. Density Functional Theory (DFT) computations are used to investigate the adsorption interactions between low-dimensional materials with HDPE with the variable of angle dependence. Moreover, exploring their ability to maintain radiation resistance, thermal cycling and electrostatic properties. Ab initio Molecular dynamics simulations (AIMD), are used to examine the behavior of new materials under severe temperatures and harsh pressure conditions.

Ava Lang

PA - Susquehanna University

Discipline: Environmental Science and Sustainability

Authors:

#1 Dan Ressler
#2 Matt Wilson

Abstract Name: Using Index of Biotic Integrity (IBI) scores to predict potential stream restoration success in Pennsylvania

The U.S Environmental Protection Agency set goals in the Chesapeake Bay Watershed Agreement that Pennsylvania must cut 69% of nitrogen outputs, but this target has not yet been met. The Susquehanna River basin that flows to the Chesapeake is largely agricultural communities that have the potential for excess nutrient runoff and sediment pollution. Of the 69% of nitrogen production that Pennsylvania is responsible for, 80% are the byproducts of agriculture. Pennsylvania's delisting stream initiatives are efforts to reduce the number of agricultural streams that are considered in poor health and thus impact the bay. For a stream to become listed as impaired, its Index of Biological Integrity (IBI) score must be less than 50. This score indicates the stream has a high level of disturbance with a predominance of benthic macroinvertebrate species that are tolerant to poor water quality. Using the PA Department of Environmental Protection's IBI scores from 1991 to the present, along with the federal National Land Use/Land Cover Dataset (NLCD), we can predict which streams are likely to improve with restoration. We plan to use the state-wide DEP data to map trends in sub-watershed stream quality based on IBI scores. In addition, we have conducted case studies of specific stream reaches where the Freshwater Research Institute projects have given us a complete history of stream restoration efforts and timing. Using these case study results, we can make predictions about other watersheds that might be good candidates for new stream restoration projects. A choice-informed decision-making model will be utilized to reinforce rapid delisting strategies. We hope to provide some insight into trends associated with water quality and restoration in streams, contribute to efforts to delist streams in Pennsylvania, and accelerate the restoration of the Chesapeake Bay.

Mary Langer

NC - William Peace University

Discipline: Biology

Authors:

#1 Mary Langer

Abstract Name: PAH Concentrations in Communities with Different Socioeconomic Profiles in St. Petersburg, Florida and the Impact of Climate Change

Polycyclic aromatic hydrocarbons (PAHs) are a class of Persistent Organic Pollutants (POPs) formed by the incomplete burning of coal, crude oil, and gasoline. PAHs are known carcinogens and mutagens associated with infertility and birth defects (Gopinath et al., 2024). Rising temperatures due to climate change cause PAHs to evaporate into the air and spread globally. Preliminary studies in Pinellas County showed disparities in air quality among neighborhoods due to redlining, which resulted in higher traffic flow and heavy industry sites in low-income, predominantly black communities (Alegria et al., 2024). This study aims to measure the levels of PAHs in soils of neighborhoods with different socioeconomic profiles in St. Petersburg. It hypothesizes that marginalized communities will have a higher concentration of PAHs in their soil compared to affluent neighborhoods. The methodology comprised four major steps: sampling, extraction, cleanup and fractionation, and mass spectrometry/gas chromatography analysis to extract and evaluate the pollutants from the soil. The results did not support the hypothesis as the PAH concentration in the neighborhoods did not show any statistically significant differences. However, 63% of 22 samples were classified as heavily contaminated based on the methodology from Maliszewska-Kordybach. All neighborhoods will be affected by rising temperatures, causing PAHs to become airborne and increase human exposure. This study urges remediation such as source removal, emission reduction, and bioremediation (Bharatkumar Patel et al., 2020). Further research needs to be conducted with more samples over a greater period for a comprehensive evaluation of St. Petersburg's PAH pollution rate.

Thomas Langford

DC - American University

Discipline: Political Science

Authors:

#1 Thomas Langford

Abstract Name: Understanding the 'Two Lefts': Exploring Causal Dynamics of Latin America's Political Shift During the Pink Tide

This paper uses a cross-national comparative case analysis to understand the economic divergence, commonly known as the "two-lefts" during the Pink Tide in Latin America. The Pink Tide was a political shift from right-wing to left-wing government that swept the region between the late 1990s and the 2000s. This research seeks to address the question: Why did Latin American countries experience divergent leftist shifts during the pink tide of the late 1990s and 2000s? Four countries were analyzed: Bolivia and Nicaragua, which elected far-left leaders, and Panama and Guatemala, which chose more moderate candidates. This study investigates key factors influencing this divergence, such as economic inequality, social spending, legal protections, and public perception of economic and social issues. Economic inequality was measured by the Gini coefficient, social spending levels were derived from GDP percentages, legal protections for marginalized groups were assessed through various indexes, and public perceptions were gauged from Latinobarómetro survey data. Surprisingly, the analysis shows that economic conditions, inequality levels, and legal protections had little influence on the degree of leftist politics embraced by each country. Instead, the perception of social mobility and confidence in the existing government emerged as critical factors.

Countries with lower trust in their current governments and less optimism about the future tended to elect more leftist leaders. Although these findings suggest that public trust and hope for the future played a pivotal role in shaping political choices, the study calls for further research to confirm these patterns across the region. This research builds on previous research about the causes of the Pink Tide by examining the reasons for its divergence.

Gianna Lanno

OK - University of Central Oklahoma

Discipline: Education

Authors:

#1 Teresa Pac

Abstract Name: Fighting with Graffiti: A Comparative Study of Graffiti Usage in Palestine and Ukraine

Throughout history, many societies have used art to support their ideologies of war and conquest. This paper is a comparative study of graffiti usage in Ukraine and Palestine in the 21st century, both societies targeted by military conflict. I argue that Palestinian, Ukrainian, and global graffiti are similar in content, depicting resistance, hope, strength, and culture while including culturally specific markers such as the flag, but do not reflect the difference between military conflicts and their atrocities. First, a brief introduction to the use of the art of graffiti in war and conquest is provided. Second, I will discuss the history of the Israeli occupation of the Palestinian people and the Russian invasion of Ukraine, emphasizing the difference in the military contexts and its atrocities. Third, I will discuss the Palestinian and Ukrainian artists who use graffiti as an expression of resistance to military occupation, genocide, and war, including artwork of Palestinian artist Majd Abdel Hamid's artwork, "Land Art" and artwork of two Ukrainian artists, Olexiy Kislov's artwork, "Renaissance" and Sasha Corban's artwork, "Golden Thread." Fourth, I will also demonstrate how global artists, such as Banksy, provide a global view of both Palestine and Ukraine's tragedy of war and resistance. This study is based on historical art and research and primary sources, such as images of graffiti and their formal and cultural meaning. Although graffiti is the most visible and quick art form for inspiring survival in Ukraine and Palestine with the continuing war and genocide, they do not express the social trauma and the tragedy of the Palestinian and Ukrainian people. While scholars discuss the graffiti by the Palestinian, Ukrainian, and global artists, they don't compare how the artists use graffiti and do not discuss the extent to which graffiti reflects the social traumas.

Addison Lanthier

WI - University of Wisconsin-Stout

Discipline: Interdisciplinary

Authors:

#1 Mitch Ogden

Abstract Name: SMARTArt Development and Curation: Salvador Dali's Inferno

In this project, we will deploy a Stout-developed augmented reality app (SMARTArt) to display interactive and informative interpretive content for Salvador Dali's Inferno paintings in his Divine Comedy series. This research advances innovation in art curation by utilizing augmented reality as an emerging technology. It also draws upon and contributes to the research on Dali's 100-print collection, offering interpretative insights to his work in context of Dante's epic poem. This project is a demonstration of the digital humanities,

intersecting digital technologies with rich humanities content to create innovative understandings and experiences. Furthermore, this project includes user testing on the SMARTArt app, improving the user experience in the emerging field of augmented reality through mobile devices.

Julia Lantner

NY - University of Rochester

Discipline: Biology

Authors:

#1 Peter Girardi

#2 Gail Johnson

Abstract Name: Mitochondrial Dysfunction Precedes the Development of Tau Pathology in P301S tau (PS19) Mice

Alzheimer's Disease (AD) is the most prevalent form of dementia affecting nearly 6.7 million Americans. A major hallmark of this disease is the accumulation of pathologic forms of the protein tau, which eventually form intracellular neurofibrillary tangles. Previous research using tauopathy mouse models has shown reductions in electron transport chain complex activity and ATP levels, although the exact mechanisms behind how mitochondrial dysfunction influences pathologic tau accumulation have still yet to be defined. Here, we explore mitochondrial parameters, specifically bioenergetics and dynamics, in primary neurons isolated from either wild-type or P301S tau (PS19) mouse embryos before the onset of pathologic tau accumulation. The PS19 mice are a well-studied tauopathy mouse model that express mutant, pathologic human tau five-fold more than endogenous mouse tau. Preliminary data suggests that neurons isolated from the PS19 mice have reduced mitochondrial membrane potential and ATP levels as measured by live cell imaging of biosensors TMRM and ATP Red respectively. Additionally, we assessed mitochondrial dynamics using immunoblotting markers linked to fusion and fission of the mitochondria, such as mitofusin 2 (MFN2) and dynamin-related protein 1 (DRP1) respectively. We show that basal phospho-DRP1 levels, which reflect active fission of the mitochondria, may be increased in the PS19 neurons compared to wild-type. However, the levels of the mitochondrial fusion protein MFN2 remained unchanged between PS19 and wild-type neurons. Future studies will examine the function and health of mitochondria before the presence of pathologic tau. These studies will provide insights into a mechanistic role for mitochondria in the progression and prevention of pathologic tau accumulation.

Madelena Lapinski

PA - University of Pittsburgh

Discipline: Linguistics and World Languages

Authors:

#1 Madelena Lapinski

Abstract Name: The Silence Speaks Volumes

Brazil, the fifth largest country in the world and home to more than 230 Indigenous languages, has only one official language: Portuguese. Like English and French, Portuguese is a European language that gained dominance during colonization and maintains that power. Through literature reviews and interviews, this work aims to investigate how European, dominant languages expressed their power over African and Indigenous languages, and people, in Brazil. It is apparent that governments, especially dictatorships in

Brazil, use language policy as a tool to enforce inequality. This is demonstrated in sectors of globalization and education and enacted through the myth of racial democracy and cultural silencing. Specifically noted in this work, the desire for global influence contributes significantly to unjust policies. Education, which is seen as a path to power, is particularly affected. Indigenous and African languages are replaced by dominant languages in schools. Further, certain opportunities are restricted to those who are privileged enough to have access to the resources needed to speak said languages, which creates a cascading negative effect. This affects the present and will continue to influence the future, but it is important to understand the historical background of this trend. An Interview with Dr. Keila Grinberg revealed how the Black experience, including a history of oppression and a legacy of cultural influence, has been delegitimized by Brazil's government. Overall, language policy in Brazil strips power from African and Indigenous populations in favor of European dominance. It attempts to erase and delegitimize the value and influence of African and Indigenous language speakers, stripping them of power.

Elizabeth Lappano

WI - University of Wisconsin-Milwaukee

Discipline: Theatre/Drama

Authors:

#1 Ralph Janes

Abstract Name: Neurodivergence in the Arts: How A Neurodivergent Brain Creates, Performs, and Designs

The present study explores the ways neurodivergent artists create, perform, and design their work. It investigates the relationship between certain brain functions and how those functions affect artistic expression. By comparing neurodivergent and neurotypical people's coping mechanisms and their methods of creation we can conclude the different pathways taken by each artist to get the same result. Working with disability organizations on campus and beyond, we will be able to get firsthand insight into the different ways neurodivergent artists achieve their goals, and what extra steps might need to be taken. Through these organizations, we can also link certain behaviors and patterns together. Our research was inspired by the University of Wisconsin Milwaukee's upcoming semester's show, "The Curious Incident of the Dog in the Night-time", a novel turned play by Simon Stephens, in which the main character, Christopher, displays many neurodivergent and autistic tendencies. At our showing of "Curious Incident of the Dog In the Night-Time", there will be a presentation of famous performing artists with neurodivergence, as well as pre-recorded interviews conducted with students and faculty at our school who either identify as neurodivergent or who have worked closely with students on the spectrum. Along with this, our research focuses on a topic not heavily discussed. While there may be some previous research about neurodivergent artists, no true solutions have been enforced. To compare, our research hopes to create change on a wider level, providing artists with neurodiversity a better chance of success. This research will lead to better accommodations for neurodivergent actors and crew members, and by finding solutions to everyday problems faced by neurodivergent artists, we can promote solutions that will truly make the arts industries more inclusive for all.

Gracia Larsen-Schmidt

MN - St. Olaf College

Discipline: Interdisciplinary

Authors:

#1 Martha Zillig

#2 Emily Mohl

#3 Hannah Hampton

Abstract Name: Investigating Local Adaptation vs. Climate Adaptation with Milkweed Plants

In recent years, people around the United States have begun planting milkweed (*Asclepias syriaca*) in response to growing awareness of monarch butterfly population decline. This grassroots effort raises timely and compelling questions about best practices in plant conservation, such as, are seeds as successful in their non-native environments? If milkweed plants show evidence of local adaptation, a process by which organisms grow best in the environment where they originate, then seeds should be planted near their native source. To investigate this question, data on milkweed plants was collected in a three-year provenance trial with plants sourced from 20 locations of varying latitudes across the United States. Seeds from all 20 locations were then planted at three sites with different climatic environments. We modeled the effect of latitude or distance from the original source site on combined stem height (the added height of all stems from the plant in centimeters). A model with latitude (taken from the origin site of the plant) tested for evidence of climate adaptation. A model with distance tested for evidence of local adaptation. We accounted for differences in growth prior to the initiation of the experiment by including baseline stem height in our model. Our model additionally accounts for two random effects: one with a plant ID nested within plant source (where a plant originates from) and one with plot ID (plants' site and plot number). These random effects help account for differences based on natural site and plant heterogeneity. Preliminary results suggest strong evidence of climate adaptation with Southern plants growing larger, but no evidence of local adaptation in milkweed plants. Future research will investigate the role of herbivory in milkweed plant growth. Through this research we aim to produce information about how to best approach conservation efforts addressing declining milkweed and monarch butterfly populations.

Amanda Lask

IL - Governors State University Honors College

Discipline: Biology

Authors:

#1 John Yunger

Abstract Name: Effects of Logging on Black Bear Habitat Preference in the Upper Peninsula of Michigan

Large carnivores tend to be keystone species due to their effect on ecosystems. In Michigan's Upper Peninsula, a northern coniferous hardwood forest, black bears (*Ursus americanus*) are a vital species due to their role in structuring ecological communities. Understanding how this species interacts with a changing environment due to logging and interspecific interactions are critical for conservation ecology on a landscape scale. I hypothesize that black bears will prefer later successional stage forests, that there is an inverse relationship between top predators, and that competitive exclusion influences coyote density. Over a two-month duration, 30 camera traps were used to quantify occurrence rates of carnivores, being set on trees 1.5-m above ground, and along roads at randomized intervals. I evaluated sight occupancy rates to determine interspecies interactions and understand the influence of both logging and habitat fragmentation on a diverse community. R Studio was used to analyze sight occupancy data among 12 distinct habitats over 75-km². Black bears were found to prefer mixed coniferous and wetland habitats, with moderate usage of different kinds of early successional forested areas resulting from logging. Contrary to my hypothesis, they avoided mid and late successional forests, instead aligning with the Intermediate Disturbance Hypothesis where some disturbance is required for a diverse ecosystem. Although not significant, there appears to be a positive association between bobcats and coyotes. These results emphasize the importance of conserving both old growth and medium disturbance areas to support a healthy and diverse ecosystem that rely on a variety of habitats to thrive.

Laurel Latt

CA - Chapman University

Discipline: Computer Science

Authors:

#1 Trudi Qi

Alexandra Fomina

Quillan Gee

Abstract Name: Real Steps, Virtual Worlds: Enhancing VR Walking with Adaptive Motion Algorithms

The integration of virtual reality (VR) systems and motion tracking represents a transformative opportunity for both immersive simulations and physical therapy, yet a disconnect remains between real-life movement and VR experiences. This gap poses challenges in both entertainment applications and therapeutic practices, particularly in gait rehabilitation, where smooth and naturalistic motion feedback is critical. Without accurate gait speed data derived from frame-by-frame positional analysis and validated thresholds, avatar movement becomes jerky, inducing motion sickness and reducing the effectiveness of therapeutic exercises. This work focuses on improving the user experience by reducing motion sickness and enhancing immersive walking in VR on a self-paced treadmill. To achieve this goal, we developed a detailed understanding of how our program collects data from VR and wearable motion sensors, ensuring smooth transitions between real-life walking and treadmill use. We designed an algorithm that simulates real-time foot movement based on frame-by-frame positional data and personalized gait elevation metrics, comparing these measurements against validated thresholds to reduce inconsistencies in motion sensor data. The measurements drive avatar and camera movement, synchronizing with built-in VR headset and motion tracking mechanics. Preliminary tests, conducted using Mocopi motion tracking systems with Unreal Engine (UE) VR, indicate improved avatar movement accuracy and reduced motion sickness compared to default systems. The algorithm, now integrated with obstacle avoidance, has paved the way for an ongoing user study to further evaluate its impact on user-avatar synchronization and immersive walking experiences in VR. Future work includes refining and expanding motion algorithms and conducting user studies with physical therapy participants to evaluate the system's effectiveness in gait training and rehabilitation scenarios.

Wey Hom Lau

OK - University of Central Oklahoma

Discipline: Engineering

Authors:

#1 Wey Hom Lau

#2 Gang Xu

#3 Melville Vaughan

Abstract Name: 3D Printed Mini-Funnel for Improved Control of Microindentation on Engineered Tissue under Optical Coherence Tomography

Fibroblasts play a vital role in shaping the extracellular collagen matrix by exerting traction forces that influence its structural and mechanical properties. This study investigates the interdependent changes in both cellular processes and mechanical properties of the fibroblast-populated collagen matrices (FPCM) during development, focusing on probing the elasticity with well-controlled microindentation. To improve measurement consistency, a mini funnel system was developed and 3D printed to ensure consistent delivery of mini-beads onto the FPCM for indentation testing. This system enabled precise and repeatable tissue deformation measurements of the matrices before, during, and after indentation with the optical coherence

tomography (OCT) imaging. We observed a progressive increase in FPCM elastic stiffness, correlating with fibroblast-mediated matrix compaction and contraction. These findings emphasize the importance of cellular activities in driving structural and mechanical changes during tissue development. By combining improved experimental control with advanced imaging techniques, this study provides new insights into the biomechanics and mechanobiology of cell-dependent tissue remodeling during development and fibrosis.

Kaitlyn Lauer

PA - Saint Francis University

Discipline: Business

Authors:

#1 Madison Perry

#2 Christine Covello

#3 Levi Villarrial

Abstract Name: Banquet Hall Marketing; Understanding Customers' Preferences

This study explores consumer preferences for banquet halls, focusing on amenities and marketing strategies that most influence booking decisions. Customers prioritize flexibility, multi-functional spaces, and unique amenities that cater to various event types, including weddings, corporate gatherings, and informal events like birthday and graduation parties. Recent research highlights the importance of factors such as accessibility, sustainability, and inclusivity in event planning. Additionally, services such as catering, parking, and equipment play an important role in consumer decisions. This paper explores what amenities are most desired by customers when booking a banquet hall and analyzes how people use social media and websites to find these spaces.

Osaretin Lawani

VA - University of Virginia

Discipline: Biology

Authors:

#1 Ukpong Eyo

#2 Abigayle Duffy

Abstract Name: Microglial Dynamics and Microglia-Vascular Interaction in Respiratory Infection

Microglia are brain-resident macrophages that serve as key regulators of neuroinflammatory processes in cerebral pathology. They have valence on virtually all areas of the cerebral landscape, one locus of particular intrigue being the vasculature. However, microglia-vascular interactions in respiratory infection have been understudied. Given that microglia respond to systemic infection by altering associations with vasculature, it remains of interest to determine whether respiratory infection modulates microglia-vascular interactions. This study investigates (i) the manner in which microglia associate with cerebrovasculature, the role they play in regulating (ii) cerebral blood flow (CBF), and (iii) capillary size using intratracheal lipopolysaccharide (IT-LPS) injection as a model of respiratory infection. This will be investigated through three aims. Firstly, to quantify capillary-associated microglia (CAM) density, CX3CR1-GFP mice treated with IT-LPS injection will be used to measure changes in CAM density. Secondly, to evaluate microglial regulation of capillary size, microglia deficient mice consisting of both (i) FIRE knockout mice that lack microglia and (ii) PLX3397 (PLX) treated mice to pharmacologically eliminate microglia will be used. Subjects will be treated

with IT-LPS injection to measure capillary diameter. Capillary size will be measured using vasometrics. Lastly, to evaluate microglial regulation of CBF, microglia deficient mice treated with IT-LPS injection will be used. CBF will be measured via red blood cell flux through line scans as a readout for blood flow. Images in all studies will be obtained through in-vivo two photon microscopy. In CX3CR1-GFP mice, microglia are expected to become increasingly ramified and exhibit greater levels CAM density. Decreases in capillary diameter and CBF are also expected. In microglia deficient mice, it is expected to see no microglia-vascular interaction. No significant changes to capillary size and CBF are expected. By studying these interactions, novel relationships between microglia and vasculature relevant for brain function in pathology can potentially be revealed.

Sarah Lawlis

MI - Oakland University

Discipline: Music

Authors:

#1 Sarah Lawlis

#2 Melissa Hoag

Abstract Name: Composing "The Little Leaf": Expanding my Compositional Style

In February 2024, I set my original poem "The Little Leaf" as a Classical art song for a Theory IV post-tonal composition project. I saw this project as an opportunity to broaden my compositional style by incorporating Impressionistic style characteristics. The song's form was determined by the poetic form: three stanzas with subtle changes in word choice to reflect the season and the viewpoint of the protagonist (the "little leaf"). Like Lili Boulanger's *Clairières dans le ciel* song cycle, which features a reharmonization of the main melody in each section, each stanza of "The Little Leaf" comprises a single musical phrase with piano introductions and transitions that reflect each seasonal change. While the melody and rhythm of each verse are retained, each section modulates to a new key, mode, and time signature to reflect each season. For example, stanzas one and two maintain eight eighth notes in each measure; however, when the leaves fall off the trees in the winter, stanza three loses three eighth notes per measure, and the meter changes to 5/8. I designed my accompaniment to feature motion used in Impressionism, such as planing and parallel voice-leading. Additional references to Impressionism occurred in stanza two, which uses only added-note chords, and stanza three, which uses only extended tertian chords. Writing "The Little Leaf" challenged my identity as a composer, and expanded my range of compositional tools. Performing "The Little Leaf" challenged me vocally because I performed in a difficult area of my vocal range and sang more difficult modes. Ultimately, I had my compositional debut in October 2024, when I premiered "The Little Leaf" at my solo recital. "The Little Leaf" Score: https://drive.google.com/file/d/1vz9_vTTxIapNJMy3cLP3UGZhCXB89xS_/view?usp=sharing "The Little Leaf" Performance: <https://www.youtube.com/watch?v=wTPsKdeXQsQ>

Courtney Lawmaster

IN - Purdue University Main Campus

Discipline: Interdisciplinary

Authors:

#1 Jason Ware

Vincent Palmerio

Abstract Name: The Lafayette Greatriarchs: Using History to Strengthen a Community

Inspired by the Martindale-Brightwood neighborhood's Greatriarch Project in Indianapolis, the Lincoln Neighborhood Greatriarch Project includes two students from Purdue University's John Martinson Honors College collaborating with the city of Lafayette, IN to select and interview long-time residents of the Lincoln neighborhood. Short biographies of each Greatriarch will be written to share their stories. The city requested the collection of oral histories to preserve the past of the Lincoln neighborhood, and the constructed, 60-minute interviews will provide the city with qualitative data as part of its redevelopment plan. Inspired by Ruut Veenhoven's text, "The Four Qualities of Life," we aim to incorporate the following identified qualities into this neighborhood: livability, life-ability, utility of life, and appreciation of life. Our goal is to better understand what once made residents happy to live in the Lincoln neighborhood to help the city improve the "livability of the environment" as well as explore residents' "appreciation of life" (their perceived quality of their past and current lives in Lafayette). Veenhoven suggests that variety and experiences can enrich someone's appreciation, so we are beginning our artistic component of the Greatriarch Project; we have commissioned a local artist to collaborate with community members in the creation of murals of the Greatriarchs. This spring, we will work with her to host workshops for resident involvement in the design and painting process. We hope that engagement opportunities will improve residents' perceived happiness within their communities. The murals will also beautify the neighborhood, improving its reputation and potentially attracting permanent residents—another aspect of the city's redevelopment plan. Our research question is: Through participatory research, can we identify what motivated certain residents to move to and stay in the Lincoln neighborhood, and can we apply this knowledge to improve quality of life and increase resident permanency?

Kylie Lawver

WI - University of Wisconsin-Eau Claire

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 David Jones

#2 Tomomi Kakegawa

Abstract Name: J-Pop Going Global: The Impact of Fandom and Popular Music on Japan's Globalization Efforts

This research highlights the differences between Japanese pop music from American pop music and examines Japan through the lens of their most popular music genres in the context of globalization. This in-person research conducted in Japan analyzes the impact of The United States and Japan's relationship on the music industry. Examining the growth of J-Pop and J-Rock on a global scale highlights the exchange of musical influences between America and Japan since the rise of J-Pop in the 1960s. Included in this research is also a comparison between the fan culture of Japanese pop music fans and non-Japanese pop music fans. J-Pop's uniqueness can be attributed to the Japanese music industry's emphasis on appealing to a domestic audience instead of reaching out overseas. The central question of this research are how Japanese and American fandoms differ, what these differences reveal about cultural exchange, and how Japan's relationship with the U.S. has affected this exchange. Fan communities and data from album and concert sales of J-Pop and J-Rock artists were analyzed in order to evaluate the reception of these genres in domestic and foreign markets. This research considered the context of the historical relationship between Japan and the United States before and during the development of these genres. This study provides new insight into Japan's global cultural identity by showcasing globalization in Japan through the lens of the Japanese music industry. Japan's history with the U.S. sheds a new perspective on the pop culture breakout of Japanese media and the growing collaborative relationship with the United States. From using weapons of war to culturally influencing one another, this research lends insight to the changing relationship between these two countries.

Sandra Le

VA - George Mason University

Discipline: Geography/Geology

Authors:

#1 John Qu

#2 Xianjun Hao

Abstract Name: Spatiotemporal Analysis of Vegetation and Water Dynamics in Libya's Extreme Flood Event 2023 Using Remote Sensing and Google Earth Engine (GEE)

Satellite remote sensing (RS) observes the Earth's atmosphere and surface regularly, provides consistent, long-term measurements with vast spatial coverage, and plays a key role in monitoring extreme weather events, especially over regions where ground truth data may be unavailable. The September 2023 flooding in Libya was estimated as a 1 in 300 occurrence where the in-land city of Al Bayda recorded the highest 24-hour rainfall rate in the region's history, and the failure of two dams along the Wadi Derna river released 7.9 billion gallons of water into the coastal city of Derna. Current studies have reported the social conditions of the community, yet few mentioned the environmental impacts of the disaster. Regional disputes have made it difficult for scientists to collect in-situ data. This case study uses spatiotemporal analysis to examine changes in vegetation and water in Libya's cities, Al Bayda and Derna, from August to November 2023 and across an 11-year September time series to understand the flood's impact on the Libyan environment. The study focuses on three climate indices: the Normalized Difference Vegetation Index (NDVI) and two Normalized Difference Water Indices (NDWI), identified using Google Earth Engine (GEE) cloud computing platform. Data were collected from the Landsat-8 satellite provided by NASA and the USGS through the GEE data catalog. Results revealed that Gao's NDWI was more effective in detecting water presence as compared to McFeeters' and accurately reflected high values in Derna at the time of the flood. A positive correlation between NDVI and Gao's NDWI anomalies in both cities' September time series indicated parallel increases in biomass and plant-water content. Vegetation recovery was quicker in Al Bayda than Derna. For regions where in-situ approaches and ground truth data are unavailable, the study suggests RS technology is invaluable to monitoring coastal floods and assessing their post-disaster impacts.

My Le

IL - North Central College

Discipline: Biology

Authors:

#1 My Le

#2 Madison Lange

#3 Jonathan Visick

Abstract Name: The Role of PCM in Gene Expression and Stress Survival in Escherichia coli During Stationary Phase

Protein damage, particularly isoaspartyl modifications, can impair cellular function and contribute to aging and diseases. In Escherichia coli, the enzyme L-isoaspartyl protein carboxyl methyltransferase (PCM) repairs isoaspartyl damage, preserving protein integrity during stress. In this study, we used RNA sequencing to identify genes that might be up- or down-regulated in the absence of PCM, potentially revealing its importance in protein maintenance and stress survival. We focused on *ibpA*, a heat shock protein, and *ybcN*, involved in DNA mismatch repair, hypothesizing that deleting these genes would impair stress survival in Δpcm mutants. Gene expression was quantified by qPCR at the onset of stationary phase and after two days

in long-term stationary phase. The *ibpA* gene was significantly under-expressed in Δ pcm mutants, while *ybcN* was over-expressed, contrary to initial expectations. Survival assays showed a Δ ibpA Δ pcm double mutant successfully rescued survival of a Δ pcm mutant under heat shock and oxidative stress. Although *ybcN* was upregulated in Δ pcm mutants, it did not significantly influence survival under UV stress. Because IbpA helps mitigate protein aggregation, disaggregating toxic damage proteins may reduce survival of PCM-deficient cells. YbcN might compensate for other stress-related damage but is not essential for survival under UV stress. Our results show the complex relationships between PCM, IbpA, and YbcN, revealing how their interactions contribute to stress survival and the maintenance of protein integrity in *E. coli*.

Nancy Le

OK - University of Central Oklahoma

Discipline: Art History

Authors:

Abstract Name: Herbert Bayer: A Gifted Designer with a Complex Legacy

Herbert Bayer is an icon in design, who is known for his contributions to typography, graphic design, and exhibition design. He employed a unique method of blending simplicity and clarity to enhance design. This approach was evident in his typography. His approach deeply influenced American design. Despite his achievements, Bayer's legacy is convoluted by personal and moral controversies. In his early career, he accepted commissions from Nazi Germany. In addition to that controversy, he was a serial womanizer. While his design achievements are distinguished, some of his past decisions deter some of Bayer's legacy.

Gia Bao Le

MA - Northfield Mount Hermon School

Discipline: Biochemistry

Authors:

#1 Gia Bao Le

#2 Kennard Liong

#3 Artiom Peshkur

#4 Porter Beaulé

#5 Helena Mactier

#6 Sam Zhong

Artiom Peshkur

Porter Beaulé

Abstract Name: In Silico Design of Novel Acetylcholinesterase Inhibitors as Potential Therapeutics for Alzheimer's Disease

AChE (Acetylcholinesterase) is a heterodimer protein that terminates neurotransmission at the cholinergic synapse by hydrolyzing acetylcholine into acetic acid and choline. Because AChE's activity is found to be elevated in Alzheimer's patients, drugs used in Alzheimer's treatments, such as donepezil, rivastigmine, and tacrine, primarily target AChE. However, the demand for new drugs to be developed persists due to drawbacks in existing drugs that reduce their bioavailability. In this paper, we designed novel, non-toxic, competitive inhibitors targeting AChE via computational techniques such as molecular docking on UCSF Chimera, chemical analysis using the RDKit Python package, molecular modification using Avogadro, and

molecular dynamics (MD) simulation via GROMACS. We screened a library of 947 drugs to 5 of the most promising lead compounds based on docking score as a measure of thermodynamic favorability and inhibitory strength, drug-likeness based on Lipinski's Rule of Five, and pharmacokinetic tests through the pkCSM web server. We identified a positive correlation between hydrophobicity and ligand binding affinity. Since AChE's binding site contains active residues that possess aromatic side chains, we hypothesized that adding aromatic R-groups to ligands would lead to more hydrophobic interactions, thereby increasing the thermodynamic favorability of protein-ligand binding and, hence, AChE inhibition. In addition, drugs that yield high binding affinity were found to possess high molecular weights, logP, and molar refractivity, indicating the favorability of hydrophobic interactions in the AChE binding site. Moreover, we identified drugs that were predicted to have a low oral rate chronic toxicity (LOAEL), high blood-brain barrier permeability, and high intestinal absorption to potentially be validated further through ADMET (absorption, distribution, metabolism, excretion, and toxicity) tests in vivo. Herein, we present a novel in-silico study developing new AChE inhibitors that exhibit promising bioavailable, non-toxic characteristics to be further tested through in-vivo experiments.

Sawyer Leahy

NE - Creighton University

Discipline: Health and Human Development

Authors:

#1 Joy Doll

Abstract Name: Exploring the Impact of a Housing Navigator on Healthcare Utilization and Cost.

The purpose of this project was to evaluate the impact of a navigator program for patients receiving healthcare services identified with significant social needs. The team aimed to evaluate the impact of healthcare utilization and associated costs over a three-year period exploring the impact across different utilizer groups (i.e., low, medium and high). The intervention involved pairing patients with a navigator after being referred to a housing support organization. The study, conducted from 2019-2022, assisted 372 patients with navigation services, including 92 who received additional financial support (i.e., bus tickets, rent assistance, housing placement, etc.). This analysis examined the impact of utilization, costs, and potential return on investment. Addressing social determinants of health, such as housing insecurity, is pivotal to healthcare outcomes and costs. A cleaned and matched dataset from the housing support organization and an electronic health record was used to complete a retrospective data analysis. Categories that were broken down to review included patient demographics, referral dates, diagnosis, codes, total charges, and pre-, during-, and post-intervention totals. Based on the provided data, significant cost reductions in Years 1 and 3 yielded a return on investment of over 18 times the initial investment of the navigator and financial services. Year 2 showed less favorable outcomes, particularly among high utilizers. Challenges identified during this process included inefficient referral processes, data gaps, and high costs associated with specific chronic conditions. This proposed poster will summarize the outcomes and data collected throughout the program. The findings emphasize the impact of the navigator program across a various set of utilizer groups and highlighted the need for process advancements and earlier intervention, specifically for at-risk patients, to boost cost reduction and patient outcomes. These recommendations will have a long-term impact on the program's efficiency and sustainability.

David Lebaillif

TX - Stephen F. Austin State University

Discipline: Engineering

Authors:
#1 David Lebaillif

Abstract Name: Tilting Tiles A Stewart Platform Array

Tilting Tiles, a research project focused on developing a kinetic art sculpture that merges modern manufacturing techniques with electronics design, consists of a series of interconnected triangular modules. Each module, a reduced range of motion Stewart platform, is capable of tilting in two axes and translating horizontally. These platforms, mounted to a wall, collectively form an interactive dynamic surface that displays preprogrammed animations or alternatively responds in real-time to inputs from sensors, cameras, or web-based systems. The development of Tilting Tiles explores urethane casting and injection molding processes to ensure durable, scalable plastic components. Early prototypes use 3D printing for rapid iteration, while the final version relies on production-grade casting. Each module features custom electronics, including multiple printed circuit boards for power management and microcontroller functionality. The main control unit orchestrates animations through the modules wirelessly. The system is scalable, allowing for installations ranging from twenty-four to several hundred units, making it suitable for large-scale interactive displays in spaces like science museums, offices, or other institutional settings. Throughout the research, I explore challenges in efficient C algorithm development, inverse kinematics for Stewart platforms, wireless communication protocols, and reducing noise of multiple asynchronous pulse-width modulation signals. Additionally, the project involves designing assembly jigs for rapid, large-scale production. The result, a versatile and visually compelling kinetic art installation, integrates cutting-edge electronics with refined manufacturing techniques. Tilting Tiles, a comprehensive investigation into the intersection of art, engineering, and technology, contributes new methodologies for kinetic sculptures and interactive installations. In Progress Related Research Papers: Inverse Kinematics of 3-DOF Stewart Platforms or 3-RPS Parallel Manipulators Avoiding Singularities in 3-DOF Stewart Platforms Urethane Casting Design Guide Reducing Noise of Multiple Asynchronous PWM Signals Additive Manufacturing: Precision for Practical Components

Mary LeBoeuf

OK - University of Central Oklahoma

Discipline: Art History

Authors:
#1 Mary LeBoeuf

Abstract Name: Mosque Mamluk Lamps and The Adoration of the Magi: A Symbol of Cross-Cultural Exchange Between The Mamluk Empire and Italy

This paper is a comparative analysis of a Mosque Mamluk Lamp and the painting The Adoration of the Magi. By doing a comparative analysis instead of a study on a single artwork one can get a broader cultural context and understanding of the both artworks. In researching two pieces of art from different cultures but the same time period, I will demonstrate a cross-cultural exchange that took place between Islam culture and Christian Europe, often underestimated by scholars. First, there is an introduction to Mosque Mamluk Lamps and the painting The Adoration of the Magi. Second a brief cultural overview on how Italy and the Mamluk Empire interacted is provided. Third, there is a formal analysis of The Mosque Lamp, followed by a historical analysis. Fourth, there is a formal analysis on The Adoration of the Magi, and a historical analysis of cross-cultural interaction between the Mamluks and Italians as demonstrated in a Mosque Lamp depicted in an Italian painting. Fifth, the paper will conclude with an analysis of the cultural appropriation utilized by Mantegna. This paper creates a more well rounded view of art in the 1400's and European Renaissance.

Cole Ledger

MD - Salisbury University

Discipline: Nursing and Public Health

Authors:

Abstract Name: Understanding Multiple Sclerosis (MS): Exploring the Etiology and Progressive Impacts of an Unpredictable Autoimmune Disease

Multiple sclerosis (MS) is an immune-inflammatory disease that attacks the central nervous system (CNS) and causes intensive neurological impairment. This autoimmune disease mistakenly attacks healthy tissue, causing disruption between the brain and the body. According to the National Multiple Sclerosis Society, there are almost 3 million people with MS worldwide, with nearly 1 million residing inside the United States, making it the most prevalent neurological disability. MS is labeled as one of the most unpredictable diseases as it can not be passed from person to person and the pathophysiology is not fully understood. As technological and diagnostic breakthroughs occur, treatment has started on average at an earlier stage than it did in previous decades due to earlier discovery. Earlier detection of multiple sclerosis can be crucial to an individual's mental and physical outcomes, as most people diagnosed start with a relapsing-remitting type of MS before eventually falling into a progressive condition with symptoms gradually worsening over time. I have seen firsthand what this condition can do to an individual, with my mother being diagnosed with multiple sclerosis in 1996 and have witnessed the progressive impacts it has had on her from a physical and mental standpoint. This paper aims to explain the etiology and epidemiology behind MS and share the risk factors and progressive impacts of MS on the brain and the body, with an ultimate goal of educating individuals and bringing light to the number one disabling disease of young adults.

Cole Ledger

MD - Salisbury University

Discipline: Exercise Science and Nutrition

Authors:

Abstract Name: Preventing Acute Malnutrition: The Role of Energy Expenditure and Postnatal Nutrition Among Infants

Although malnutrition among children under the age of three has decreased over the last few decades, the decline has started to plateau, leading to the fear that malnutrition goals set by the World Health Organization will not be reached by the end of the decade. There are various reasons behind this plateau including the global increase in food insecurity and other economic, environmental, and social factors. While parent and caregiver education has started to address the issue of infant malnutrition, there is still additional education and assistance necessary to lower rates of overall infant malnutrition. An infant's nutritional outlook can be impacted as early as the prenatal months, with the mother's nutritional intake during pregnancy having a considerable impact on both positive and negative outcomes related to fetal health. Adequate nutrition in the first twelve months is vital as infants see their most significant growth and weight gain occur in the first year postnatal, as they can triple their body weight and grow almost a foot in that time period. Although there are multiple recommended guidelines pertaining to postnatal nutrition, specific socioeconomic and cultural impacts can lead to adjusted or altered diet patterns, making it more challenging to meet requirements, especially in low-income neighborhoods that show high prevalence of malnutrition. Common complications caused by malnutrition can include weak immune systems and impaired cognitive development, among others. This paper aims to learn how energy expenditure influences nutritional outcomes, review the dietary needs of infants in the first twelve months postnatal, and examine the impacts of primary and secondary acute

malnutrition with an ultimate goal to increase awareness and implement assisted nutrition programs in low-income communities.

Maria Ledin

NC - Elon University

Discipline: Chemistry

Authors:

#1 Julia Bell

#2 Karl Sienerth

Julia Bell

Abstract Name: The study of quenching of perylene by explosives to determine rate and binding constants for collisional and static quenching.

Analysis of crime scene samples associated with explosives are backlogged at crime laboratories. On-site sample analysis might provide investigators with early leads in such cases. To be practical, however, analyses must be done using non-hazardous solvents; most published studies involve hazardous solvents, such as acetonitrile or dichloromethane, which are not safe to use outside of a laboratory. Our studies focus on luminescence quenching by explosives in aqueous buffers and ethanolic solutions. Quenching basically relates to how much luminescent light is snuffed out/blocked by explosives in otherwise transparent solutions. One challenge encountered in the development of this method is that, in studies thus far, the quenching relationship is often observed to be nonlinear. The hypothesized source of this nonlinear behavior is the occurrence of both static and dynamic quenching, which occur at different quencher concentration ranges. In other words, the molecules responsible for quenching both bind directly to the luminescing molecules (static quenching) and also cause quenching by colliding dynamically with the luminesces (dynamic quenching). Both of these processes likely happen simultaneously, but typically dynamic quenching plays a greater part at low concentrations and static quenching assumes greater predominance at higher concentration. We will report on our work to determine the concentration ranges of static and dynamic quenching, as well as the transition range in between, using a combination of fluorescence quenching and time-correlated single photon counting (TCSPC). TCSPC allows us to extrapolate the decay time (τ , t_0), with which we can separate contributions by dynamic and static quenching. The quenching behavior of di- and tri-nitrophenol (TNP and DNP) and dinitrotoluene (DNT) as a model compound, as well as TNT and PETN as real explosives, on the perylene (PER) have been studied in this manner. From the Stern-Volmer and τ plots we determined the relative contribution of both quenching modes.

Sophie Lee

UT - Weber State University

Discipline: Economics

Authors:

#1 Sophie Lee

Abstract Name: Price at the Pump: Comparing Gasoline Costs in the U.S. and Germany

This study examines the applicability of the Law of One Price (LOOP) to gasoline prices in the United States and Germany from 2015 to the present. The LOOP suggests that, in an efficient market without trade barriers, identical goods will converge to the same price across countries when adjusted for exchange rates. By

analyzing gasoline, a globally traded and essential commodity, this research explores whether the LOOP holds true in real-world energy markets. Gasoline prices in major economies like the U.S. and Germany influence energy policy, consumer costs, and global trade. Previous studies show that LOOP is not always consistent, with short-term deviations arising from factors like transportation costs, exchange rate fluctuations, and local market conditions. Using monthly gasoline price data from the International Energy Agency (IEA) and exchange rate data from the Federal Reserve Economic Data (FRED), I will compare gasoline prices in the two countries to test the LOOP, using the following formula: $q_{US/Germany} = (E\$/Euro * P_{Germany}) / P_{US}$. I will plot the value of q with respect to time and analyze its deviation from $q=1$ as suggested by the LOOP. In addition to examining if the LOOP holds between the U.S. and Germany, my results will shed light on the relative strength of the U.S. dollar and Germany's currency, euro. I hypothesize that gasoline prices between the U.S. and Germany will show short-term deviations from the LOOP condition due to factors such as, different types of trade barriers, and supply chain disruptions. However, in the long run, I expect price gaps to close due to market forces and arbitrage opportunities.

Alice Lee

NV - University of Nevada - Las Vegas

Discipline: Biology

Authors:

#1 Alice Lee

#2 Tyrell Pratt

Tyrell Pratt

Abstract Name: Distinct glial functions are associated with Alzheimer's disease based on cell type- and pathway-specific polygenic risk score analysis

Background: Alzheimer's disease (AD) is a complex neurodegenerative disorder characterized by progressive cognitive decline and extensive brain pathology, including amyloid plaques, neurofibrillary tangles, and neuroinflammation. While much research has focused on neuronal dysfunction in AD, emerging evidence suggests that glial cells—astrocytes, microglia, and oligodendrocytes—play crucial roles in the disease's pathogenesis. This study aims to identify any glial cell type-specific pathways associated with AD. Methods: We first investigated the correlation between AD and the genetic risk of glia-specific pathways using pathway-based polygenic risk score (PRS) with PRSet software in the discovery data (ADc1234ADA) adjusted by the top two principal components (PC1, PC2) (Model 1), followed by additional adjustment with sex, age, and APOE ε4 count in Model 2. Further PRSet analyses were replicated in independent data (ADNI) if a nominal association ($p < 0.05$) was found in the discovery data. Tentative associations were determined via meta-analyses of both discovery and replication datasets with Bonferroni correction. Finally, a competitive p-value test was used to determine the significance of each pathway within each glial cell type. Results: In model 1, we identified six pathways significantly associated with astrocytes with the immune system on the top, six pathways associated with microglia with antigen processing on the top, and five pathways associated with oligodendrocytes with transport & trafficking on the top. In model 2, five pathways in astrocytes and four pathways in oligodendrocytes were found to be significant. However, none of the pathways in microglia remained significant. Conclusion: Our findings demonstrate a glia-specific polygenic contribution to AD risk, especially in the immune system, highlighting the significance of PRSet analysis in uncovering cell-type specific and pathway-specific biological mechanisms for diseases.

Caden Lee

IL - Northwestern University

Discipline: Biochemistry

Authors:

#1 Madison Strong
#2 Radoslav Pavlovic
#3 Federico Lancia
#4 Liam C. Palmer
#5 Samuel I. Stupp

Abstract Name: Binding and Mobility of Bioactive Peptides on Peptide Amphiphile Nanofibers Measured by Nuclear Magnetic Resonance Spectroscopy

Inhibition of specific receptors by membrane-permeable peptides has been shown to be effective at promoting axonal growth in animal models of spinal cord injury. The Stupp Laboratory has recently developed a supramolecular system in which bioactive peptides bind electrostatically to the surface of supramolecular peptide amphiphile (PA) nanofibers. This strategy is particularly attractive because the binding of peptides to PA nanofibers may prolong the lifetime of these molecules and enable fine-tuning of supramolecular motion, which has been shown by the lab to increase the bioactivity of some signals. Current insights indicate degrees of peptide mobility on nanofibers correlates with measured bioactivity in vitro. P-PA supramolecular interactions likely determine the regenerative potential of the system, yet these interactions are poorly understood. We hypothesize that enhanced association of peptide to nanofibers correlate with enhanced neuroregenerative potential. To test this hypothesis, we investigate here the binding and translational motion of four different peptides associated with supramolecular PA nanofibers using multiphase and multinuclear nuclear magnetic resonance (NMR) spectroscopy. Solution-phase ¹H NMR of all four peptides revealed sharp peaks consistent with high molecular mobility. In contrast, spectra of the peptides mixed with the PA nanofibers showed a significant loss of peptide signal, indicating severely decreased peptide motion. We then turned to high-resolution magic-angle spinning (MAS) NMR to study the peptides in this semi-solid phase, where we anticipate visibility of solution-NMR-invisible peptide signals. This would yield data on naturally occurring ¹H spins and ¹³C cross-polarization NMR for solid-phase analysis. We anticipate these techniques will enable the investigation of supramolecular motion and interactions. Linking the structure and mobility of peptides on nanofibers with their bioactivity in vitro will aid in future design of enhanced regenerative medicine. Understanding the structure-dynamics-function relationships in these systems will help guide the design of supramolecular assemblies with enhanced bioactivity.

Wen Yu Lee

UT - University of Utah

Discipline: Film/Photography Studies

Authors:

#1 Leandra Hernandez

Abstract Name: InterSEXionality: Analyzing Media Perpetuation of Feminine Stereotypes in Romantic Comedies Among Women of Color

The genre of romantic comedy films is a rare occasion where women shine and dominate in the media, but there is a glaring discrepancy in the representation of women of color. Intersectionality of gender and race grows increasingly crucial to the female identity, yet the film industry struggles to accurately depict these concepts and create substantial films without having proper representation or falling back on classic stereotypes. This thesis seeks to answer the question: How does film portrayal of the feminine character in the romantic comedy genre contribute to contemporary understandings of female sexuality and racial identity? Current research contains a broad coverage on varying gender and racial stereotypes observed in movies. There are plenty of studies conducted on women in the romance genre, and women of color in the general film industry. A huge gap lies in a lack of how these concepts are so inescapably related and their

corresponding ties in romance. Female sexuality and racial identity cannot be discussed without acknowledging the other - something that both the film industry and current research do not adequately examine. This thesis begins to bridge this gap by honing in on primary data from 100 major romantic comedy films, spanning a century since the genre's induction in 1934. Films were curated based on factors including: mainstream popularity, diversity, and relevance. Further data provides analysis on demographics, statistics on audience perception, and qualitative information on plot patterns. Preliminary data review supports a significant divide between the representation of white women and women of color. Observed differences in actress typecasting, character arcs, and common relationship trends contribute to realized effects in awards won and box office statistics. Ultimately, this thesis strives to synthesize existing research and modern data to reveal the importance of feminine intersectionality and representation in romance and film.

Evan Lee

CA - University of California - Merced

Discipline: Economics

Authors:

#1 Kanchana Khat

#2 Crhystian Marquez

#3 Todd Sorensen

Abstract Name: Beyond Wages: Investigating Occupational Segregation and Labor Market Discrimination

Researching the fundamentals of discrimination in the job market helps us better understand injustices in the workplace. We build on Foote, Whatley, and Wright's (2003) work, which highlighted Ford Motor Company's exploitation of labor market inequality by concentrating black workers in unpleasant foundry jobs in the 1920s-1940s. This indicated that wage alone is not a conclusive indicator of labor market discrimination. We expand this analysis to a broader set of jobs across three firms. Our study measures occupational segregation using Stata to examine archived employee records from Ford, A.M. Byers, and Pullman, classifying workers by occupation and measuring the degree of segregation.

Greta Lee

MN - University of Minnesota - Rochester

Discipline: Biology

Authors:

#1 Arvind Panday

Abstract Name: Investigating SETD1A as a Suppressor of Genome Instability in Triple-Negative Breast Cancer

Triple negative Breast cancer (TNBC) is an aggressive form of women cancer. It is one of the leading causes of cancer deaths among women. The hallmark of breast cancer cells is replication stress mediated genome instability. Consequently, they develop compensatory mechanisms through which they alleviate the level of genome instability necessary for their continued existence. The main predictors of death include late-stage diagnosis and the development of drug resistance. Therefore, there is an immediate need to find new treatments for ovarian cancer. Our preliminary data shows the upregulation of SETD1A protein in TNBC. In healthy cells, we found SETD1A maintains genome stability and acts together with BRCA1 to suppress

TNBC biomarker – “tandem duplications” (TDs) which is specific to stalled replication fork. Therefore, we hypothesize that in TNBC, SED1A protein has compensatory role to reduce genome instability and maintain their viability. In this proposal, our objectives are to determine the compensatory mechanism facilitated by SED1A in TNBC and investigate the role and underlying mechanism of SetD1A mediated epigenetic alterations in generating TNBC biomarker TDs at the stalled forks. We will also determine how SETD1A-mediated epigenetic modifications affect the patterns of TDs hotspots and influence drug sensitivity in TNBC. For this aim, we will conduct a thorough analysis of TDs by initially reducing the levels of SETD1A in cells derived from BRCA1 mutant TNBC patient derived xenografts (PDX), and then isolating genomic DNA from single-cell suspensions followed by whole genome sequencing. Given our observation that SetD1A promote homologous recombination (HR) at stalled forks, we will investigate SETD1A in vivo response to treatment with PARP inhibitor. Overall goal is to identify SETD1A as a new biomarker for BRCA1-mutant breast cancer, with the goal of developing targeted therapeutic interventions.

Eunjae Lee

NV - University of Nevada - Las Vegas

Discipline: Biology

Authors:

#1 Hayley Ho

#2 Jingchun Chen

#3 Tingwei Liu

#4 Faria Tavecchi

#5 Alice Lee

Abstract Name: Association Between Polygenic Scores for Brain Structures and Alzheimer's Disease

Alzheimer's disease (AD) is a progressive neurodegenerative condition and the most common type of dementia. Research has shown that volumetric changes in subcortical brain structures, which make up roughly 25% of the brain's total volume affect many physiological functions. This research project aims to investigate the genetic association between brain structures and AD. GWAS data of eight different brain structures (ICV, accumbens, amygdala, caudate, hippocampus, pallidum, putamen, and thalamus) were used to create polygenic scores (PGSs) in a discovery (cases/controls = 2,651/2,768) and replication dataset (cases/controls = 553/644). We utilized PRSice-2 software to generate PGSs and assess genetic correlations using two models: Model 1 adjusted for principal components (PC1 and PC2), and Model 2 adjusted with additional covariates, including sex, age, and APOE e4 allele count. Meta-analyses were conducted for discovery and replication samples with Bonferroni corrected p-value < 0.05 being significant. Further, we conducted Mendelian Randomization (MR) analyses between the brain structures and AD. As a result, we found that the PGSs of three brain structures—amygdala, hippocampus, and pallidum—were significantly associated ($p < 0.0133$) with AD, implying that a higher volume of these structures is less likely to have AD. However, the association did not remain significant for the hippocampus after being adjusted for additional covariates, suggesting that the association between the hippocampus and AD may depend on sex, age, or APOE e4 allele count. In addition, MR analysis indicated a smaller hippocampal volume had a causal effect on AD. Overall, our study suggests there is a strong correlation and possible causal effect between AD and brain structures, especially hippocampus, underscoring the critical role of the hippocampus in the development of AD.

Jessica Lee

MA - Boston University

Discipline: Interdisciplinary

Authors:

Abstract Name: Using Visuals to Combat Language Barriers in Mental Health Care: Drawing on Information Graphics and Graphic Medicine to Support Mental Health of Patients with Limited English Proficiency

Though the United States of America has the largest immigrant population globally, language barriers remain a critical issue in the medical field. Interpreters are often not professionally trained for medical jargon or readily available in medical facilities, especially for languages not as commonly used, and patients often have difficulty asking additional questions to understand the providers fully. As a result, the language gap leads to worse clinical outcomes for this vulnerable population, particularly with behavioral health services, which immigrants and refugees often seek due to inevitable trauma and stress. However, language and cultural barriers in the mental health care field cause care and treatments to be challenging. For example, providers must communicate with sensitivity while patients must understand and remember their conditions and treatments for effective care. Sensitive communication in this case refers to using careful, deliberate, and nuanced words to suit the needs and thought processes of the listener for the primary goal of effective patient care. Therefore, this study advocates for the use of graphics—drawing from information graphics and graphic medicine—as an effective knowledge translation (KT) tool to address these challenges. Specifically, the visual aids proposed are images with minimal text to bridge the gap in understanding and conveying medical language and information between providers and patients. The primary goal of this study is to demonstrate strong evidence to support using graphics to improve mental health outcomes for people with limited English proficiency (LEP).

Chao-Chun Lee

VA - Virginia Military Institute

Discipline: Interdisciplinary

Authors:

#1 Barry Cobb

Abstract Name: Algorithm Performance Comparison on Housing Data

This project focuses on the comparative performance evaluation of various machine learning algorithms applied to housing data. Utilizing a dataset from Kaggle consisting of 1,460 entries with 80 features, both numerical and categorical, the study aims to model housing prices effectively through regression analysis. The workflow includes data preprocessing, such as imputing missing values, encoding categorical variables, and implementing Principal Component Analysis (PCA) to standardize the data. Algorithms evaluated include Ordinary Least Squares (OLS), XGBoost, and Decision Tree regressors. Key performance metrics—Mean Absolute Percentage Error (MAPE), R-Squared, and Accuracy Score (with a threshold of 0.2)—are used to assess model efficacy. The project offers insights through variable importance plots, highlighting the most influential features for predictions and guiding improvements in housing price estimations. The results underscore the interplay between data preprocessing and algorithm selection in achieving robust and interpretable regression models.

Chao-Chun Lee

VA - Virginia Military Institute

Discipline: Computer Science

Authors:
#1 Chao-Chun Lee

Abstract Name: Analyzing Choice Overload Behaviors in AI-Generated Recommendations

This paper presents an analysis of how generative AI, specifically ChatGPT, influences user experiences in decision-making contexts prone to choice overload. It investigates the effects of varying recommendation set sizes (10, 30, and 60 options) on user satisfaction and decision satisfaction across two scenarios: travel recommendations and fundraising advice. Using survey data from a sample of 19 U.S. adults, the study reveals a preference for selecting options from the initial portion of recommendation lists, especially in larger sets. Results indicate that while users may experience choice overload with high option counts, their satisfaction and likelihood of action are paradoxically higher when presented with more recommendations in complex decisions. This research contributes to understanding AI-driven choice overload and suggests strategies to enhance user experience by balancing recommendation set sizes based on decision complexity.

James Lee

OK - Oklahoma State University

Discipline: Engineering

Authors:
#1 James Lee

Abstract Name: Nitrates in Oklahoma Well Water

Nitrate is a naturally occurring colorless, odorless chemical usually safe at low levels. However, levels exceeding 10 mg/L can lead to irreversible health effects due to nitrate's ability to block oxygen in the blood. Our research samples wells across Oklahoma to understand where nitrate concentrations are the highest and the causes of those concentrations. Our team collected water across Oklahoma and at events such as county fairs, Oklahoma residents brought bottles of their well water which we tested using a Hanna Nitrate Photometer. Our team used a 10 mL sample of their water to get a base clarity of the water and added a reagent that reacted with nitrate to change the color of the water, with darker samples corresponding to higher concentrations of nitrates. The photometer gave us a reading in mg/L of nitrate which we reported to the residents. We then compiled a map using Arc GIS and R-script to see where nitrates are the highest and compared our map to a different map created using historical USGS nitrate concentration data. Both maps showed that western Oklahoma had higher average nitrate concentrations than eastern Oklahoma. Abnormally high concentrations (>700 mg/L) were examined and all were next to an animal facility such as a pig farm or a cattle ranch. This could be because animal waste carries high concentrations of nitrates. Because western Oklahoma has less rainfall annually, we hypothesize that the region has a larger nitrate concentration because there is less water to dilute concentrations. Our research provided Oklahomans with knowledge of what is in their water through free water testing and showed factors that cause high nitrate concentrations. This research will be used to develop a comprehensive model of Oklahoma's nitrates so that residents are best protected if they are in a high-risk area.

Grace Lee

VA - George Mason University

Discipline: Linguistics and World Languages

Authors:
#1 Carrie Bonilla

Abstract Name: The Medical Interpreter's Dilemma: Patient Advocacy and Professional Boundaries

This study investigates the role of patient advocacy in medical interpretation, addressing two key questions: (1) What actions by the medical interpreters constitute patient advocacy? (2) Should advocacy be included in their scope of practice? There is ongoing controversy over whether advocacy aligns with the professional scope of medical interpreters. Some ethical codes and healthcare institutions encourage interpreters to advocate for patients, while others explicitly prohibit advocacy to preserve objectivity and professionalism. Current research on this topic, conducted through interviews and surveys with medical interpreters, healthcare professionals, and professional interpreter associations, conclude that no clear consensus exists regarding the definition of advocacy and whether it should be a core function of medical interpreters. This research seeks to define advocacy by analyzing linguistic patterns and practical applications of advocacy in medical interpreting. Research methods include (a) a linguistic analysis of 20 codes of publicly available medical interpreter ethics, protocols, and standards of practice; (b) thematic analysis of 33 medical interpreting case studies drawn from an academic interprofessional clinic; and (c) meta-analysis of 15 interview excerpts regarding advocacy in medical interpreting. Findings reveal that 27% of official documents promote advocacy, 40% prohibit it, and 33% remain neutral. Words frequently associated with pro-advocacy documents include "cultural broker," "access," and "health literacy," while those in anti-advocacy documents include "impartial," "transparency," and "conduit." Case studies partly defined advocacy as ensuring health literacy, speaking up against cultural biases, and comforting patients. Collectively, these findings indicate that there are many variations in how advocacy is defined, as well as a need for a standardized definition of advocacy to determine whether advocacy should be included or excluded within a medical interpreter's scope. This research is valuable for establishing a clear and actionable definition of patient advocacy in medical interpreting, ultimately improving equity and professionalism in healthcare communication.

Zackary Lee

SC - Coastal Carolina University

Discipline: Music

Authors:

#1 Philip Powell

Abstract Name: Impact and legacy of minstrel music on the United States

The American Minstrel show was a spectacle of American culture, reaching its height from 1848 to the late 19th century, in which it popularized African-American spirituals and other songs. The form itself was disparaging to the African-American community, using racist actions such as black face, aristocratic speech, ragged clothes, and dances to create the image of a “Happy Ducky.” Acknowledging the art forms racist connotations and intentions, it did ultimately promote African-American culture to the national stage. It brought the spirituals of African-Americans to concerts which only white people could attend, and in many instances allowed them to perform in front of white audiences for the first times in American history. However it also reinforced racial stereotypes, abetted segregation and other discriminatory laws such as Jim Crow. Through this presentation I will explore the minstrel show, spanning from the 1830s to the early 1900s, and the cultural and political impacts it left on the United State

Alessandro Lee

CA - Loyola Marymount University

Discipline:

Authors:

#1 Alessandro Lee

#2 Neel Patel

#3 Noah Stiker

#4 Can Cagler

Neel Patel

Noah Striker

Abstract Name: Effective use of spray cooling in high-heat flux electronics

The purpose of this research is to explore the feasibility of microdroplet spray as a cooling method for electronic components in data centers. Conventional cooling methods in data centers, such as air or liquid cooling, may not be as effective as directly spraying components with microscopic amounts of liquid. Spray cooling is one of the most effective ways to remove heat; however, the lack of control of the spray rate can cause dry-out or excessive liquid accumulation. These issues occur if the spray rate is too low (causes a dry spot in the middle of the spray cone) or too high (causes a liquid puddle). This project aims to develop a pulsing control for the spray rate to maintain a desired surface temperature while mitigating those issues. Our research group has previously explored the impact of single microdroplets on a heated surface to measure the evaporation rate at different impact conditions and surface temperatures. A heated surface using an aluminum block with inserted type-K thermocouples was designed to measure temperature spatially at different radial and axial locations. A LabJack T7 was used to record all the thermocouple data simultaneously. A low-flow nozzle and a water pump were utilized to spray water on the heated surface. A hot plate was used to heat the aluminum block from the bottom. The evaporation rate data from single microdroplet impact research was used to approximate the pulse width and frequency. The initial surface temperature, nozzle flow rate, pulse width, and frequency were independently varied, while the instantaneous surface temperature was monitored

carefully. It was observed that the pulse width and frequency highly depended on the initial surface temperature and the nozzle flow rate. Higher flow rates at lower temperatures required a small width at a low frequency.

Meng-Shan Lee

PA - Duquesne University

Discipline:

Authors:

#1 Meng-Shan Lee

#2 Elena Donoso Brown

Elena Donoso Brown

Abstract Name: Fostering interprofessional collaboration through undergraduate mentored research experiences: Modeling the way

Interprofessional education is a critical component of professional development, fostering collaboration and understanding from various healthcare disciplines. However, opportunities for students to engage in interprofessional development are often limited due to various challenges, such as compacted curricula required for their degrees and different clinical training schedules. This session will discuss the potential of undergraduate mentored research as a unique and sustained opportunity for interprofessional education. This collaborative project originated from a meeting between two faculty members at a national rehabilitation conference, where they discovered a shared interest in dyad intervention post-stroke. This initial connection led to the development of a collaborative research project within the Occupational Therapy (OT) program, which was later expanded to include Music Therapy (MT) students. The collaboration provided a structured framework for undergraduate students from both disciplines to engage in joint research activities. Throughout the project, students have the opportunity to work closely with peers from different professional backgrounds, enhancing their understanding of interprofessional role and responsibilities. They have participated in various research activities, including establishing survey tools, understanding the needs and potential challenges during recruitment, practicing recruitment scripts, and will gain future experience collecting data. These hands-on experiences allowed students to develop not only research-related skills but also essential professional competencies such as communication and teamwork. This collaborative project highlights the value of undergraduate research in fostering interprofessional education. This experience underscored the how undergraduate mentored research offers a valuable platform for interprofessional education, providing students with extended opportunities to collaborate, learn, and grow professionally. This approach can substantially enhance the traditional research experience, fostering the professional development of more competent and collaborative healthcare professionals.

Emmanuelle Legerme

FL - Florida Gulf Coast University

Discipline: Psychology

Authors:

#1 Terence Leary

#2 Senthil Girimurugan

Abstract Name: The Evolution of Evil: An Overview of Serial Killer's Classification, Motivations, and Hope for Recovery

The Federal Bureau of Investigation characterizes “serial killers” as offenders who have murdered two or more victims in separate events, with some cooling off time in between, accompanied by a specific intent to terrorize, intimidate, or injure. Dr. Burgess’s pioneering collaboration with the FBI in the 1970’s revealed a systematic approach to serial killing in which criminal profiles included offenders’ childhood experiences, their similar and atypical patterns of behaviors, and their dysfunctional longing for connection. While Dr. Burgess’s work revealed two primary types of serial killers (organized and disorganized), the transformation of offenders’ modus operandi in recent years exposed a combined set of maladaptive characteristics that required novel forensic categories, coupled with an understanding of the impacts of technological advancements in manipulating and capturing victims. This comprehensive review of the progression of serial killing throughout the years aims to clarify the evolutionary stages of criminal behavior, provide an explanation for the potential circumstances leading to serial killing, increase awareness about the methods of predation, and highlight the corrective power of community in rehabilitating troubled adolescents with maladaptive behaviors. Keywords: Federal Bureau of Investigation, Serial Killer, Pioneering, Progression, Adolescents, Maladaptive Behaviors.

Emmanuelle Legerme

FL - Florida Gulf Coast University

Discipline: Psychology

Authors:

#1 Nate Pipitone

Abstract Name: Exploring How Previous Harassment Experience, Empathy, and Phylogenetic Relatedness Determine Responses to Emotionally Distressful Situations in Humans

Empathy refers to the ability to vicariously experience a person’s feelings, emotions, and thoughts, in the past or present by solely relying on the empathizer’s imaginative adoption of the target’s emotional state. Empathy does not necessarily motivate helpful action, but often elicits personal distress, which may result in action. Previous studies have supported the idea that empathy and emotional distress derive from components of neurobiology, phylogeny, and vulnerability, but how humans respond to emotionally distressful situations based on previous harassment experiences and empathy levels has yet to be explored fully. Here, we investigate people’s responses to an emotionally distressful situation by manipulating the targeted individual in an assault scenario; namely, different types of animals and people based on genetic relatedness (phylogeny, inclusive fitness). We will assess how participants’ previous harassment experience, levels of empathy, and gender impact levels of distress, among several other variables. Participants read assault scenarios based on different targets and provided past experiences in dealing with visual, physical, or verbal harassment and rated their empathy levels using the Toronto Empathy Scale. Results showed that emotional distress to assault scenarios does change depending on who the victim is and was specifically related to genetic relatedness and the sex of the rater. Those who reported previous harassment experiences also scored higher in levels of empathy. Other results will tell us how empathy and emotional distress vary for individuals demonstrating unpleasant behaviors or adopting different methods of drug ingestion.

Rei Lehmann

MN - University of Minnesota - Rochester

Discipline: Nursing and Public Health

Authors:

Abstract Name: Health Outcomes in Urban vs. Rural Populations: A Planned Analysis Using BRFSS Data

Geographic disparities in health outcomes have significant implications for healthcare planning and policy development. This study seeks to explore differences in the prevalence of hypertension between urban and rural populations using data from the Behavioral Risk Factor Surveillance System (BRFSS). The central research question is: Are there significant differences in hypertension prevalence between urban and rural populations? The planned analysis involves extracting relevant BRFSS data, including variables for geographic classification (urban vs. rural) and health outcomes (e.g., hypertension prevalence). Data will be imported into statistical software for organization and analysis. A Chi-Square Test of Independence will be performed to assess whether hypertension prevalence differs significantly between the two groups. The analysis will report key statistical outputs, including the Chi-Square test statistic, degrees of freedom, and p-value. Expected results include identifying potential disparities in hypertension prevalence between urban and rural populations. These findings will be presented in the context of observed versus expected counts and statistical significance. The results are anticipated to inform discussions on geographic health disparities, with implications for targeted healthcare interventions and resource allocation. This project emphasizes the value of using large-scale public health datasets, such as BRFSS, to identify and address disparities in health outcomes. By investigating these differences, this study aims to contribute to the broader understanding of how geographic factors influence public health and support evidence-based policymaking.

Marshall Leininger

WI - University of Wisconsin-Stout

Discipline: Visual Arts

Authors:

#1 Marshall Leininger

#2 Tamara Brantmeier

#3 Amy Fichter

Abstract Name: Sing Into My Mouth: Evaluating the Intersection Between Nature and the Internet

I am an interdisciplinary artist that makes work about the natural world and how the internet has changed our relationship with it. I am interested in the connection between photography and painting, especially the replication of digital technologies through a historic medium. Using painting, collage, photography, and sculptural practices, the work I create is raw, bold, awkward, and grimy. Much of my practice is based on photographs, whether that be imagery found online, AI-generated images, contemporary and historical artwork, or my own photos. My School of Art and Design faculty selected my proposal to have the honor of a solo thesis exhibition in our Student Gallery 209. This project examined how my exposure to the internet changed my relationship with the natural world and how the idea of the image has changed in our current era. My research is based on experimentation, trial and error, and artist research. My experimentation includes combining different mediums and styles along with trying different color palettes and techniques. Some artists I have recently found inspiring have been Nan Goldin, Ally McIntyre, Susan Rothenberg, Phillip Guston, and Rae Klein. I also find inspiration in taxidermy, early internet culture, folk art, and alternative photographic processes. I aim to create work that subverts traditional notions of craft and skill. I focus on intuitive processes and conceptual ideas to drive my practice. This research has allowed me to explore the use of raw materials, learn new techniques image transfers and sculptural work, and expand my concepts greatly. My future work will continue to address animal subjects, the replication of digital technologies, and how the internet has changed how we view the world around us. This large body of work served as my thesis for my BFA and will provide me skills to continue working towards my research goals.

NGWE LEKU

PA - Allegheny College

Discipline: Biochemistry

Authors:

#1 David Almeida

#2 Mahita Kadmiel

Mitchell Devore

Abstract Name: Increasing Diversity Of Clinical Trial Population via Mobile Clinics

Underrepresentation in clinical trials remains a significant issue, prompting the FDA to urge researchers to implement strategies to raise awareness and provide access to clinical research to diversify clinical trial participation. This summer, at Erie Retina Research (ERR), we launched mobile retina clinics to meet all kinds of communities in our tri-state area to raise awareness of retinal diseases and to detect early signs of disease. The mobile retina clinics were done utilizing a specialized handheld retina imaging device (EYER). We hosted screenings at various community events and health fairs in underrepresented demographics. The images captured during the screenings were reviewed by an ophthalmologist, and participants requiring further evaluation were offered no-cost follow-up visits and enrolled if found eligible for any of our clinical trials. About 180 participants were screened free of charge. Among them, 55.06% were above the poverty line, while 43.84% were below it. Of those below the poverty line, 33.71% were from areas of persistent poverty—a 20% increase compared to previous trials at ERR. Regarding racial diversity, 83.48% of participants were White, and 12.17% were Black or African American. This represents a substantial improvement over earlier ERR trials, where 95% of participants were White and only 1.7% were Black or African American. Additionally, these figures surpass Erie County's racial demographics (87% White and 8% Black or African American). Our results demonstrate that our mobile clinic approach was effective in improving access to clinical research in underrepresented communities. This approach offers a valuable model for addressing disparities in healthcare access and representation in clinical research.

Sebastian Lema

MI - Hope College

Discipline: Sociology

Authors:

#1 Rodrigo Serrao

Abstract Name: Beyond Ethnicity: Experiences of Racism and Perceptions of Belonging Among Latina/o/x Students at an HWCU

The Latino population in the United States has grown significantly, contributing to 52% of the nation's population growth in the past decade, according to the Pew Research Center. While research often focuses on the Latino population's ethnicity, it often overlooks the diverse spectrum of racial identities within this community, leading to a homogenized understanding of their experiences. This study challenges this by examining how Latina/o/x students at Hope, categorized as White-identifying (WI), non-White-identifying (NWI), and international students (IS), perceive their racial identity in the context of privilege, racism, colorism, and belonging. Our total sample is 55 students (20 WI, 20 NWI, and 15 IS), but this presentation is based on an initial analysis of 25 coded interviews (10 WI, 10 NWI, and 5 IS). An additional 30 interviews are currently being transcribed and organized. This study aims to shed light on the complexities of racial identity and belonging within the Latino community at Hope College, offering valuable insights for fostering a more inclusive campus environment.

Sophia Lemmons

PA - Villanova University

Discipline: Environmental Science and Sustainability

Authors:

#1 Peleg Kremer

Abstract Name: Assessing Community Garden Activity and Land Precarity in Philadelphia, PA

Urban community gardens offer many environmental and communal benefits, from reducing CO2 levels and the urban heat island effect to promoting public health, connectivity, and food security. The Philadelphia Garden Data Collaborative (PGDC), formed in 2016, partners with local organizations to collect and maintain data on community gardens in Philadelphia. PGDC aims to preserve land and empower growers, particularly in low-income areas facing food insecurity and gentrification. PGDC has created a comprehensive inventory of gardens and land parcels, which is crucial for evaluating urban agriculture's value and preventing adverse sales of garden land. Data collection was last completed in 2019. To maintain this database, a data collection campaign was conducted in the summer of 2024. A group of researchers from Haverford and Villanova universities visited 719 sites previously logged as gardens to survey each site. Utilizing 123 Survey and ArcGIS technology, the study offers a complete census of garden activity, including identifying the garden spatial footprint, garden type, public access, and water access. In addition, each garden was associated with all of the city parcels on which it is located to allow for analysis of garden tax delinquency and land precarity. The results illustrate the abundance and spread of urban community gardens, offering critical insights for tracking land parcel ownership and tax records to prevent foreclosures and preserve these spaces.

Eleah Leng

PA - Grove City College

Discipline: Biology

Authors:

#1 Kieran Harvey

#2 Kayla Bieser

#3 Alysia Vrailas-Mortimer

#4 Jacob Kagey

#5 Julie Merkle

#6 Lisa Antoszewski

Danika Sudar

Abstract Name: Genetic mapping and phenotypic analysis of the 6E.29 mutation in *Drosophila melanogaster*

Cancer, a collection of diseases characterized by uncontrolled cell proliferation, wreaks havoc on the lives of millions of individuals worldwide. Combating this devastating disease requires an understanding of the intricate genetic control that leads to ordered cell division. To identify genes important for cell growth and proliferation, a forward genetic screen was performed in *Drosophila melanogaster*. Males carrying an FRT site on the right arm of the second chromosome were mutagenized with EMS and mated to females carrying a similar FRT site along with a transgene expressing the FLP recombinase under the control of the eyeless promoter. Homozygous mutant clones were generated in the adult eye and marked by the absence of pigmentation. The 6E.29 mutation, identified in this screen, resulted in overgrowth of mutant tissue

suggesting the normal role of the affected gene is to control cell growth or proliferation. To determine the gene altered by this mutation, deficiency mapping was performed to narrow down the region of interest. This was followed by sequencing of potential candidate genes. To complement this molecular analysis, further characterization of the mutant phenotype was performed in larval tissues. Genetic mapping of additional mutations generated in this forward genetic screen was conducted by numerous undergraduate students at a variety of institutions of higher education as part of “Fly-CURE,” a research coordination network developed to provide undergraduate students with authentic research experiences in the classroom. Initial work on the 6E.29 mutation was performed by undergraduate students in the laboratory component of a developmental biology course at Grove City College.

Alexis Leo

CA - The Harker School

Discipline: Biochemistry

Authors:

#1 Ulf Dettmer

Abstract Name: Determining the Abundance of α -synuclein in Rat Erythrocytes and Brain Homogenates - A Step Towards Non-invasive Detection of Parkinson's Disease

Parkinson's Disease (PD) and related synucleinopathies are characterized by the aggregation of alpha-synuclein (α S), a presynaptic protein implicated in vesicle trafficking. Although abundant in neurons, significant amounts of α S are also found in erythrocytes. The role of α S in erythrocytes is less understood, but elevated levels of oligomeric α S in erythrocytes have been associated with PD. This study aims to measure the abundance of α S in rat brain homogenates and erythrocyte lysates to explore the feasibility of using α S as a biomarker for PD. Rat brain homogenates and blood samples were collected post-mortem. Samples were spun at 20,000g for 30 minutes, and supernatants were kept for analysis. Protein concentrations were determined by BCA assays, and samples were adjusted to 1 μ g/ μ L. Lysates were run on NuPAGE 4-12% Bis-Tris gels and incubated with primary antibodies. The abundance of α S in erythrocytes relative to total α S in rat brain lysates was determined. A gradient of recombinant α S and rat brain lysate was analyzed by Western blot using an α S-specific antibody. Immunoblot analysis of rat erythrocyte lysates was compromised by the high abundance of hemoglobin. Native gel analysis was used to separate α S from hemoglobin, allowing for efficient α S detection. α S abundance in rat whole brain lysates was 0.9 +/- 16 ng/ μ L, compared to 0.0948 ng/ μ L in erythrocytes. α S levels were approximately 169 times higher in neurons than in erythrocytes, potentially explaining why α S aggregates in neurons, and not erythrocytes. These novel findings also support the hypothesis that α S in neurons is a more reliable biomarker for PD progression in comparison to erythrocyte lysates. Further studies could explore other methods to enhance sensitivity and specificity of α S quantification, and help pave the way for less-invasive, antemortem ways to diagnose PD.

Gianna Lepore

PA - Westminster College

Discipline: Psychology

Authors:

#1 Gianna Lepore

#2 Eric Fields

Abstract Name: The Role of Sleep in Emotional Memory Encoding and Retrieval

The present study aimed to investigate the role of pre-encoding and pre-retrieval sleep in the emotional memory trade-off effect. The emotional trade-off effect is the tendency to remember negative stimuli at the expense of the neutral. Specifically, when negative or neutral objects are presented on neutral backgrounds, negative objects are remembered better than neutral objects, but the neutral background is remembered worse when it is paired with a negative object. Previous research suggests that sleep preferentially consolidates negative emotional stimuli, with many studies examining sleep between encoding and retrieval (pre-retrieval sleep). In the present study, participants (N = 45) tracked their sleep for two nights prior to memory encoding and two nights after encoding and prior to memory retrieval. In the encoding task, participants viewed 34 images of a neutral object on a neutral background and 34 images of a negative object on a neutral background and rated their perceived valence. During the retrieval task, participants saw objects and backgrounds presented separately. Participants rated whether each image had been presented during the encoding task and how confident they were in that decision. Results replicated the emotional trade-off effect. There was some evidence that participants who got more sleep before encoding displayed a stronger emotional trade-off effect, although this pattern was not statistically significant. These results suggest that future research should further investigate the role of pre-encoding sleep on emotional memory biases.

Mackenzie Leszczynski

PA - Duquesne University

Discipline: Biochemistry

Authors:

#1 Mackenzie Leszczynski

#2 Yin Zhu

#3 Christian Fernandez

Abstract Name: Constitutive Expression of PNPLA3 in Mice Leads to Sex-Dependent Liver Injury

Background: The genetic basis of liver injury remains poorly understood, with only a few determinants identified. Among these, a variant in the PNPLA3 gene (I148M) has been associated with the development of fatty liver and drug-induced liver injury. Mice with constitutively active LXR have been developed to investigate liver-related pathologies. By breeding these mice with those harboring the PNPLA3 I148M variant, we aimed to generate a novel mouse model with constitutive expression of PNPLA3 to elucidate the mechanisms of PNPLA3-driven liver injury. **Methods:** Twenty-four-week-old mice were acclimated in our facility and sacrificed following a 6-hour fast. Serum, kidney, liver, and white adipose tissue samples were collected post-sacrifice. Liver samples were fixed and stained for histological evaluation using hematoxylin and eosin (H&E) staining. Serum was analyzed for indicators of hepatotoxicity and liver injury and hepatic triglyceride levels were measured. Additionally, mRNA and protein expression levels of PNPLA3 and related genes were quantified from liver samples. **Results:** We successfully generated mice with constitutive expression of PNPLA3. Analysis of liver samples demonstrated that LXR activation led to mild hepatic steatosis, which was exacerbated in mice expressing the PNPLA3 I148M variant. However, when the results were disaggregated by sex, we found that male mice carrying the variant exhibited a statistically significant effect, whereas female mice did not. Gene expression analysis revealed that female mice expressed 5-fold higher PNPLA3 mRNA levels than males, despite similar expression levels of SREBP1c, its transcriptional regulator. **Discussion:** We hypothesize that the high levels of PNPLA3 expression in female mice may mask phenotypic differences between variant and non-variant genotypes. In contrast, a variant-specific phenotype was observed in male mice, characterized by significantly lower PNPLA3 expression. This raises the possibility that PNPLA3 is regulated differently at the transcriptional level between sexes or that epigenetic factors contribute to the observed phenotypic differences.

Michael Levin

PA - University of Pittsburgh

Discipline: Linguistics and World Languages

Authors:

#1 Michael Levin

Abstract Name: Food for Thought: A Quantitative Study Between Asian/Non-Asian Pittsburgh Neighborhoods & Chinese Menu Translation Methods

This study investigates differences in the frequencies of Translation Method Categories (TMCs) as defined by Amenador and Wang (2022) in menus from Chinese restaurants in Pittsburgh neighborhoods with varying Asian population densities. Amenador & Wang (2022) TMC classifications include: Retention, Literal Translation, Neutralization (D, P, G), Amplification, Intercultural Adaptation, Substitution and Omission. Neighborhood selection involved Class A (high Asian population) and B (low Asian population) assignment based upon publicly available census data. Restaurants were randomly selected from each neighborhood using Yelp filtering criteria. Quantitative TMC comparisons were conducted on Chinese to English menus including frequency (f), composition ($f/N_{total} * 100$) and cross-class composition averages ($\bar{x}$). Class A restaurants yielded a significantly higher average Literal Translation composition ($\bar{x} = 34.5\%$); however, Class B restaurants had a higher average Retention composition ($\bar{x} = 30.2\%$). Furthermore, treemap figures indicate a majority Neutralization (D, P, G) composition between both Class A and B. Class A incorporated significantly less instances of Intercultural Adaptation than Class B ($\bar{x} = 6.2\%$ vs $\bar{x} = 0.5\%$). Wade-Giles romanization appeared more frequently throughout Retention cases in Class B. Observed differences between Class A and B TMC frequencies correlate with differences in American Chinese versus Authentic Chinese dishes served. Yet, further analysis may be required to establish a clear correlation between translation preference and customer ethnicities.

Hannah Levingston

OK - Southwestern Oklahoma State University

Discipline: English and Literature

Authors:

Abstract Name: The Black Mirror's Origin: The Ergodic Atmosphere of 2001: A Space Odyssey

Stanley Kubrick's enigmatic aesthetic developed due to his meticulous eye for detail and pursuit of alternative forms in filmmaking for each cinematic undertaking he produced. This experimental attitude toward form parallels a key characteristic within an exploratory literary genre: Ergodic Fiction. Ergodic novels make their stories a puzzle for readers, refer to themselves as characters, and play with the idea of what constitutes a "book." It requires active engagement from its readers, often compelling them to partake in "side quests," namely, reassembling a non-linear story, adjusting the orientation of the novel's physical form while reading, and locating extraneous chapters or imperative narrative components within either the text or the real world. These techniques aspire to involve readers in the story itself, test audience fastidiousness, and push the limitations of how narratives are delivered. This primes the genre for meditation on ideas of human nature, the narrative's existential purpose, and the act of reading's alteration of the story. Since film genres are defined comparatively to literature, the contemporary acceptance of film as an equivalent to a novel begs the question whether they may too be classified as Ergodic. This study aims to analyze the narratological method in Kubrick's 1968 science fiction epic, 2001: A Space Odyssey, specifically to characterize the film as an example of Ergodic literature as the term is defined in Espen J. Aarseth's 1997 book, *Cybertext: Perspectives on Ergodic Fiction*. Close reading and textual analysis of the film's salient constituents, such as traditional

elements of filmmaking (like sound and color theory), the film's narrative structure, the Monolith's presence and juxtaposition as screen iconography, symbolism in Bowman's Stargate room, and repeated imagery mimicking Michelangelo's Creation of Adam form an argument for the viewer's non-trivial participation in the film. Consequently, reclassifying the film as Ergodic imparts Kubrick's intended philosophical message.

Carlos Rafael Levy Lanado

NC - Elon University

Discipline: Communications

Authors:

#1 Carlos Levy Lanado

#2 David Bockino

David Bockino

Abstract Name: The Effectiveness of Major League Soccer (MLS) Social Media Strategies

This project examines the effectiveness of Major League Soccer (MLS) social media strategies in engaging college students around global soccer tournaments, using the dynamic digital landscape of international events like Euro 2024, Copa America 2024, and the 2022 FIFA World Cup as a lens. Conducted within Elon University's Sports Media Lab in partnership with Charlotte FC, this study investigates the content MLS teams produced during these major events to understand the role and resonance of their digital outreach on platforms like Instagram, TikTok, and YouTube. Drawing on established research in sports media and marketing, this project evaluates the strategies MLS employs to capture the attention of young audiences, especially college students, during these high-visibility moments. Data collection will involve both content analysis of past social media posts and thematic analysis, which will inform our understanding of the type and tone of messages that succeed or falter in reaching the target demographic. The research process begins with the fall semester's content analysis, categorizing social media posts into thematic groups that highlight key messaging and engagement tactics. In spring, focus groups with college students will gauge perceptions and reactions to MLS's social media efforts during international tournaments, exploring the impact of various content themes. Findings will be compiled into an executive summary in December, and a comprehensive report with recommendations will be presented to Charlotte FC in spring 2025. This research aims to enhance MLS's understanding of effective social media outreach strategies and contribute insights to sports media practices targeting younger audiences during globally significant soccer events.

Maggie Lewandowski

MN - St. Catherine University

Discipline: Biology

Authors:

#1 Jared Fine

#2 Samuel Swanson

#3 Katherine Faltesek

Abstract Name: Effects of Intranasal Medicine on Recovery in Mice & Rat Models of Traumatic Brain Injury

Traumatic brain injury (TBI) has long-term impacts on memory and executive functioning, yet there are no approved pharmacological treatments for managing post-TBI symptoms. This project aimed to determine if intranasal insulin (mouse study) or intranasal deferoxamine (rat study) are effective therapeutics to treat TBI

symptoms. Intranasal administration of medication avoids drug metabolism and bypasses the blood-brain barrier. In our lab, intranasal insulin has been shown to reduce motor and memory dysfunction in models of neurodegenerative diseases. It also has a notable impact on decreasing inflammation in the brain and reducing recovery time. Intranasal deferoxamine has the ability to chelate iron, which plays a large role in brain inflammation. This medication has also been shown to improve memory and motor deficits between healthy rats and models of neurodegenerative diseases. In these studies, we performed a controlled cortical impact on mice and rats to model TBI. At one week post-op, intranasal insulin was administered to mice everyday for a week. Rats were dosed with intranasal deferoxamine at four hours post-op and once a day for nineteen days. Brain tissue was collected from both mice and rats for immunohistochemistry. TBI symptoms were successfully modeled in mice and rats as evidenced by large deficits in behavioral testing between the sham and TBI groups. After the insulin dosing period, there were no obvious early changes in the mice behavioral assays in Morris Water Maze, Neurological Severity Score, Elevated Plus Maze, and Open Field. The rat behavioral assays in Morris Water Maze and Tapered Balance Beam also showed no obvious early changes with the deferoxamine dosing. The brain tissue of both the rats and mice will be analyzed to see if there were any changes on a cellular or tissue level. Overall, this research contributes to an ongoing effort to develop novel TBI therapeutics.

Autumn Lewis

VT - Norwich University

Discipline: Biology

Authors:

#1 Allison Neal

Abstract Name: Comparing Bacterial Communities in Echinostome Infected Snails vs Not Infected Snails

A genome includes all DNA that is found in an organism. A metagenome is a collection of genomes from multiple organisms that inhabit the same place. Studying metagenomes provides information on the community's makeup, structure, and functions in a specific environment. My advanced parasitology course tested the microbiome of snails and whether trematodes can alter that microbiome. Trematodes are a parasitic flatworm that infects snails and humans. Specifically, we aimed to find out if there was a difference in species diversity and composition in the bacterial communities of trematode infected snails vs not infected snails. We collected 53 viviparid snails from a pond in central Vermont. We tested these snails for infection by looking for cercarial shedding and performing a dissection on the snails. We chose 4 infected and 4 non-infected snails and extracted their DNA. We ran a full length 16S PCR and sequenced the DNA using a MinION Sequencer. We performed data processing on a high-performance compute core with a quality check, filtering, and classifying step. We did all data analysis in R to compare our bacterial communities including differential abundance, alpha diversity, and beta diversity. We found there to be a significant difference in differential abundance of four bacterial families between infected vs. non-infected snails in the snail tissue that trematodes live in, but no differences in alpha or beta diversities. There was no significant difference in bacterial communities seen by the data in all three measures for the pre-dissection control samples. The trematodes could have been suppressing bacterial communities by eating the snail tissue and leaving less habitat and resources for the bacteria that naturally live there. This research may help us understand how the bacterial communities in snails may affect trematode transmission to humans.

Andy Lewis

GA - Kennesaw State University

Discipline: Interdisciplinary

Authors:
#1 Andy Lewis

Abstract Name: Think You Can Fake It? We'll Make You Verify It: Utilizing Follow-up Surveys to Detect and Prevent Fraud in Online Crowdsourced Data

Online survey platforms enable faster and more cost-effective data collection across public, private, and academic sectors, but they also introduce opportunities for fraud. The persistent, evolving nature of fraud requires constant adaptation to preserve data quality. Our prior research examined data quality amongst the leading pay-for-data collection platforms, where only 10.2% of MTurk respondents provided acceptable-quality data. This study aims to demonstrate how follow-up verification surveys can improve the security and efficiency of incentive payouts by verifying respondent demographic information to reduce fraud. An orthopedic activity level assessment survey was disseminated via MTurk, incorporating updated quality checks to refine fraud detection, yielding over 5,000 responses. The survey administrator received emails regarding survey compensation issues, prompting a standardized follow-up survey designed to verify previously reported demographic information sent in response to email communications. Responses from the original survey were match merged with the follow-up survey data, and a descriptive comparative analysis was conducted to identify inconsistencies. The preliminary findings indicate that follow-up surveys can successfully identify fraud. After omitting duplicate emails and survey submissions, 28 emails were received regarding issues with incentives. Of those, only 50% of respondents completed the follow-up survey. Among those who completed, 1 had a zip code discrepancy, 2 had birth year discrepancies, and 1 had an email inconsistency, compared to previously reported information. Of the 13 who did not complete the follow-up survey, nearly half of the distinct MTurk Worker IDs shared the same email in the original survey. While minimal discrepancies were found among respondents who completed the follow-up survey, more substantial fraud was evident among those who initiated contact for incentives but failed to complete the follow-up survey. This study reveals the potential of follow-up surveys serving as secondary checks to detect fraud, allowing practitioners to implement automated demographic consistency checks before releasing incentives.

Samantha Lewis

NC - North Carolina State University

Discipline: Environmental Science and Sustainability

Authors:
#1 Angela Allen

Abstract Name: Assessing the Impact of Trash Accumulation on Water Quality: Environmental Justice and Urban Wetland Management

At the bottom of the Walnut Creek Watershed lies Southeast Raleigh, housing predominantly African-American communities. Over the years, this low-lying area has become known for intense flooding and stormwater runoff. A group of concerned residents formed what is called the Partners for Environmental Justice (PEJ) to address the issues of environmental injustices in the area. Since the mid 1990's, the damage of constantly using the area as a dumping ground, as well as, the increase in development and impervious surfaces from upstream of the watershed has led to the concerns of how the accumulation of trash impacts the quality of surrounding creeks and streams. Previous land management practices, including the use of rubber tires in streambanks to reduce erosion, might have temporarily served its original purpose however now present issues concerning the leaching of toxic chemicals into nearby creeks. In this study, we analyze the effectiveness of the installation of a Trash Trout Entrapment Device placed in Little Rock Creek located within the Walnut Creek Watershed, specifically the impact on water quality based on trash collected over time. Through field sampling and in-lab experimental data, weekly water quality measurements including pH, dissolved oxygen, conductivity, nutrient testing, turbidity, and E. Coli provides an understanding of how

synthetic material in waterways impacts overall water quality. The correlation between trash type and parameter most affected will lead to better management practices and guardianship within the urban wetland environment.

Adam Lewis

PA - Duquesne University

Discipline: Engineering

Authors:

#1 Lydia Kutzer

#2 Miranda Pokler

#3 Ipsita Banerjee

#4 Kimberly Williams

#5 Bin Yang

Abstract Name: Semi-automation of a High-throughput Bioprinting Process for Biomanufacturing of Organoids

3D bioprinting has transformed tissue engineering by allowing the accurate creation of cellular structures. In our lab, air-jetting cell encapsulation techniques have been developed to produce cell-laden droplets for organoid generation, offering high precision and throughput. However, the manual processes involved in cleaning and maintaining equipment during batch production are labor-intensive and prone to error, highlighting the need for a semi-automated solution to improve efficiency and consistency. To address these challenges, we developed a semi-automated system for high throughput bioprinting, focusing on syringe pump control for droplet generation and an automated wash station for droplet cleansing. A Raspberry Pi 4 serves as the system's brain, running a Python based control script that integrates open-source libraries such as NESP-Lib for the New Era Syringe Pump and PyQt5 for the GUI design. The system controls a syringe pump for droplet generation and two peristaltic pumps for wash cycles, all managed through a custom touchscreen interface housed in a 3D-printed enclosure. The touchscreen allows for parameter customization through text input along with manual/cycle control of both the syringe and peristaltic pumps. Extensive testing verified the system's performance, ensuring precise pump control and seamless integration of the wash cycles. The resulting system significantly enhances workflow efficiency, enabling researchers to generate droplets at a consistent rate and automate cleaning processes between batches. Benchmarking showed reliable performance in both droplet production and wash station operation, reducing human error while maintaining cell viability and differentiation. This semi-automated approach streamlines the bioprinting process, allow for a more scalable organoid production. While currently used for thymic organoids, the system's design holds potential for applications across various organoid types. Future improvements will focus on enhancing automation by using a membrane strainer to hold droplets, reducing the wash time.

Brianna Lewis

IN - Purdue University Main Campus

Discipline: Engineering

Authors:

#1 Shailee Mitra

#2 Brett Meyers

#3 Pavlos Vlachos

Abstract Name: Assessment of Cardiac Function using Echocardiography for Predicting Mortality in Sepsis

Sepsis, a life-threatening condition caused by the immune system's exaggerated response to infection, is a leading cause of mortality in intensive care units, affecting approximately 1.7 million people each year in the United States. A common complication associated with sepsis is cardiac dysfunction, caused by increased pressure and strain on the heart due to fluid overload. If not treated promptly, sepsis can lead to a series of severe symptoms, including decreased blood pressure, organ failure, and potentially death. In this study, we employed novel in-house algorithms to evaluate cardiac biomarkers in sepsis patients. These biomarkers were obtained from B-mode and color Doppler echocardiographic data from the Medical Information Mart for Intensive Care (MIMIC)-IV database, which contains deidentified medical records from the Beth Israel Deaconess Medical Center (2008–2022). In our analysis of B-mode scans, we found that mitral annulus velocity biomarkers showed significance between sepsis and septic shock groups, while conventional volume and strain biomarkers did not. Through further analysis of computed hemodynamic measurements derived from color Doppler scans, we aim to uncover significant correlations between cardiac dysfunction and mortality in sepsis. Our findings may help determine how cardiac biomarkers can be used by clinicians to better predict mortality in sepsis, leading to more effective treatment strategies and improved patient outcomes.

Dan Li

NJ - Kean University

Discipline: Computer Science

Authors:

#1 Dan Li

#2 Daehan Kwak

Abstract Name: Public Discourse During COVID-19: Analyzing Keyword Variations in Twitter Data

Understanding public sentiment during crises like the COVID-19 pandemic is crucial for policymakers and researchers. This study emphasizes the challenges and methodologies of analyzing COVID-19-related tweets, focusing on categorizing and tracking keyword trends to reflect dynamic changes in public sentiment and discussions over time. The study leverages a data pipeline for collecting, processing, and categorizing tweets. Using Selenium, tweets were collected over several months by navigating individual URLs with a headless browser. The extracted data was stored in a structured MySQL database. To prepare the data for analysis, preprocessing steps, such as text classification and stemming, were conducted to organize tweets by topic. A central challenge in this analysis lies in the variation of keyword usage. For example, references to “vaccine” appear as terms like “vax,” “vaxed,” or brand names such as “Pfizer” and “Moderna.” Similarly, “mask” includes variations like “N95” and “face covering,” while references to public figures exhibit diverse naming conventions. To address these challenges, a large language model (LLM) was employed to group such variations under unified categories, enhancing keyword recognition and enabling precise time-series analysis. Keyword trends were analyzed through time-series visualizations, reflecting shifts in public sentiment. LLMs were utilized to identify and group keywords into broader concepts, ensuring accurate categorization. For example, terms like “shot” and “jab” were associated with “vaccine,” while alternate spellings and references were integrated seamlessly. The analysis uncovered trends in public discussions, such as a surge in vaccine-related mentions during rollout phases and varying sentiment towards mask mandates and social distancing policies. The study’s framework provides a scalable and adaptable approach to analyzing public sentiment dynamics, offering valuable insights for future crises. By addressing keyword variation challenges and integrating advanced NLP techniques, this framework highlights public sentiment trends during COVID-19, supporting data-driven decision-making and public policy planning.

Dan Li

NJ - Kean University

Discipline: Mathematics

Authors:

#1 Abootaleb Shirvani

#2 Dan Li

Abstract Name: Optimizing Financial Sector Portfolios: A Quantitative Analysis of S&P 500 Financial Companies

这个项目是我学术旅程中的重要一步，因为它让我沉浸在优化金融领域投资组合的领域中。我专注于分析著名的标准普尔 500 指数中金融公司的表现，我很高兴能够构建和完善一个金融股票投资组合，以更深入地研究影响金融行业的市场动态、监管变化和经济状况的复杂性。通过对历史股票数据和风险指标进行细致的定量分析，我准备获得宝贵的见解，这将有助于我制定专门针对金融行业多面性的稳健投资组合管理策略。我的目标是解开市场力量和金融股票表现之间的复杂关系，加深对金融服务行业资产配置和风险管理实践的理解。这个项目不仅为我提供了一个将尖端量化金融技术应用于投资组合优化的实践机会，而且还成为提高我在金融市场动态格局中导航的分析技能的途径。最终，我将这次努力视为一次变革性的经历，它让我全面探索了不断发展的金融服务领域的投资组合管理原则，从而使我掌握了在竞争激烈的金融领域制定成功投资策略所需的知识和敏锐度。

Songlin Li

IL - Northwestern University

Discipline: Economics

Authors:

#1 Songlin Li

Abstract Name: Cheating as a Bluffing Game: An Information Economics Analysis of Academic Integrity

I examine the dynamics of academic honesty among students through a multi-method approach involving game theory, dynamic optimization, and agent-based modeling (ABM). The primary research question explores how peer effects and institutional strategies can influence students' decisions around cheating, aiming to enhance ethical behavior in educational contexts. Building on existing literature in game theory and peer analysis, I introduce an information-theoretic perspective that considers monitoring effectiveness and the potential impact of institutional bluffing on cheating behavior. Traditional peer-based studies focus primarily on factors like class size; in contrast, my work emphasizes the role of perceived monitoring through a novel ABM approach inspired by Schelling's checkerboard model and dynamic optimization principles. My methodology includes mathematical modeling and simulations within NetLogo to explore the cascading effects of peer influence on cheating behaviors. Notably, percolation occurs in the presence of peer effects, where heightened perceptions of cheating detection significantly reduce dishonest actions. The dynamic optimization model suggests that conventional educational interventions may be less impactful than enhanced surveillance, particularly when institutions publicly share monitoring information as a deterrent. Moreover, an information-theoretic model evaluates the instructor's optimal incentive to inflate reported cheating statistics, providing a bluffing strategy that leverages dynamic programming and control theory to curb cheating more effectively over time. Results indicate that manipulating students' beliefs about detection rates can reduce cheating, and the strategy's effectiveness hinges on maintaining institutional credibility. The study concludes that while inflated perceptions of monitoring can deter dishonesty, long-term success depends on strategic,

time-sensitive interventions that balance enforcement with institutional trust. These findings offer new insights for future research on academic integrity, suggesting further exploration into behavioral factors such as peer pressure and the broader implications of institutional reputation on student conduct.

Sixian Li

GBR - Cambridge Centre for International Research

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Sixian Li

Abstract Name: Greta Gerwig's Barbie (2023): A Commercial Product or Feminist Masterpiece?

The essay discusses the cultural impact of the Barbie doll and how Greta Gerwig's Barbie (2023) addresses contemporary issues related to gender roles and social expectations in U.S. society. This paper also critically examines and highlights how this film reflects the social expectations of beauty through attitudes of patriarchy and harassment and the film's commercial core. The central questions revolve around: To what extent does Gerwig's Barbie balance its feminist ideals with its role as a commercial product? And how does the film navigate the tension between critiquing gender norms and perpetuating consumerist ideals? This research seeks to fill the gap in the feminism discourse by examining the significance of feminism in popular culture using scholarly work on Barbie, movie reviews of the film, and the Barbie movie. The paper discusses the film's story, characters, marketing strategies, and public acceptance; it contextualizes these elements in a broader discussion of gender studies, feminist movements, and capitalist systems. Ultimately, the film serves as both a reflection and perpetuation of gender inequalities, illustrating the tension between commercial interests and genuine feminist discourse in shaping society. Although it undoubtedly introduces conversations about gender studies, the movie demonstrates the limitations of mainstream media's capacity to critique the systems from which it profits fully. The essay highlights the need for more nuanced representations of feminist movements beyond commercial imperatives, thereby contributing to a broader conversation about gender, media, and capitalism.

Jiaxiog Li

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

Abstract Name: From Retreat to Reality: How Does a Weeklong Mindfulness Retreat Impact Adolescents' Social and Emotional Lives One Month Later

Research on mindfulness training with adolescents has proliferated in recent years and has shown it can help adolescents manage stress, improve relationships, and foster greater emotional well-being. However, less is known about how they apply skills and mindsets learned during mindfulness training into daily life. In this mixed methods study, I explore how adolescents integrate skills and mindsets learned during a weeklong intensive mindfulness training retreat to navigate social and emotional challenges. Data were collected from 15 self-selected adolescents (Mage = 16.73 years; range = 14–19 years; 73% girls, 27% boys; 7% East Asian, 7% African American, 53% White, 33% Multiracial) who participated in the mindfulness retreat. At one-month follow-up, adolescents completed a 30-minute semi-structured interview and shared insights into their mindfulness practice, its perceived benefits, and difficulties in daily life. I used a phenomenological approach

to identify common themes in adolescents' experiences and provide a deeper understanding of how adolescents apply mindfulness to manage emotions and navigate social interactions. Data analysis remains ongoing, but preliminary results show that adolescents used many skills to handle intrapersonal challenges, including self-awareness (e.g., greater awareness of thoughts and sensations, using intentional speech), self-acceptance (e.g., being less self-critical) and having a broader perspective (e.g., realizing what really matters). They also described using a range of skills and mindsets to address interpersonal problems, including social awareness (e.g., more perspective-taking & empathy), compassionate communication (e.g., better listening skills and comforting others), and social connection (e.g., being less socially anxious). By examining the real-world application of mindfulness practices from a youth-centered perspective, this research contributes valuable insights into how mindfulness interventions can better meet the developmental needs of adolescents beyond clinical or school settings. Implications for adolescent development and contemplative science will be discussed.

Jessica Li

IN - Purdue University Main Campus

Discipline: Engineering

Authors:

#1 Fatemeh Azimi

Abstract Name: Predicting Wildfire Events Using Synthetic Aperture Radar

Each year, over 70,000 wildfires occur nationally, resulting in billions of dollars in damage and impacting countless lives. As a result of population growth and global changes, an increasing number of individuals are at risk in areas susceptible to wildfires. Many factors contribute to wildfire ignition and spread, including available fuel, canopy density, topography, and soil moisture. Soil moisture is particularly important because low soil moisture increases the probability of wildfire ignition and the speed at which it spreads. A great technology for monitoring soil moisture is synthetic aperture radar (SAR). SAR can operate in almost all-weather conditions and penetrate through cloud and vegetation canopies. SAR sensors emit signals at a specific frequency, enabling researchers to assess the target's characteristics through backscatter analysis. This research develops a model to estimate soil moisture using Sentinel-1 data for wildfire prediction. The data includes satellite imagery from three months before to one month after certain wildfires in the US and Canada over the past five years. The time series data from wildfire-affected and unaffected regions will be analyzed to assess and quantify the differences in backscatter variation across different polarizations. Previous research has demonstrated the effectiveness of the radar vegetation index in monitoring wildfires and determining thresholds for distinguishing between burnt and unburnt areas. Therefore, this study will incorporate radar vegetation indices and thresholding techniques to estimate wildfire probability. To enhance the model's performance, ancillary data like temperature data from NOAA weather stations, LiDAR, and/or RGB imagery will be used. The model will be tested and validated using in-situ soil moisture data from the National Soil Moisture Network. The expected result of this model is the ability to accurately predict wildfires across different terrains using space-borne SAR data.

Amanda Li

TX - Texas Woman's University

Discipline: Music

Authors:

#1 Fanarelia Guerrero

Abstract Name: Building Focus in Beginner Piano Students: Strategies for Effective Practice

In a world where the average human attention span has diminished due to the rapid pace of modern life, fostering focused practice in piano students has become increasingly challenging. As educators, it is essential to address this issue by equipping students with effective strategies to maintain concentration and maximize their practice time. This presentation is designed to address these challenges by offering practical techniques and strategies specifically tailored for beginner students. Its objective is to equip piano teachers with effective methods to help students enhance their focus during practice sessions, making their practice time more productive and enjoyable. This, in turn, will increase their efficiency and overall progress. By the end of this presentation, attendees will understand the challenges beginner students face regarding focus and attention, learn practice, age-appropriate strategies to improve students' concentration during practice, and observe a demonstration of effective practice techniques and how to apply them. By fostering a more engaged and structured practice routine, educators can help their students develop the focus and resilience necessary for long-term success in their musical studies.

Cynthia Li

AL - University of Alabama at Birmingham

Discipline: Interdisciplinary

Authors:

#1 Sahaj Patel

#2 Krishin Yerabolu

#3 Priyank Baria

#4 Abdulla Shahid

#5 Nirav Patel

#6 Garima Arora

#7 Pankaj Arora

Abstract Name: Computationally Efficient Detection of End-Diastolic and End-Systolic Phases for Left Ventricular Function Assessment Using 3D Convolutional Neural Networks

Accurate assessment of left ventricular (LV) function is critical in echocardiography, with End-Diastolic (ED) and End-Systolic (ES) phases serving as key points in the cardiac cycle for calculating LV volumes and ejection fraction (EF). Traditional methods for ED and ES detection rely on deep learning models to segment LV volumes across all frames of echocardiographic studies. While effective, these workflows require processing entire multi-frame sequences, leading to significant computational and memory overhead, which can hinder scalability in clinical and research settings. To address these limitations, we present a 3D Convolutional Neural Network (3D-CNN)-based approach that directly identifies ED and ES image pairs by classifying each frame within the cardiac cycle as ED, ES, or non-ED/ES. This method eliminates the need for full-sequence segmentation, optimizing resource utilization while maintaining accuracy. Our dataset consisted of echocardiographic studies from 407 patients focused on the LV view, with an 80:20 split for training and testing. The proposed model achieved an Area Under the Curve (AUC) of 95.89%, outperforming existing methods. This streamlined approach holds potential for enhancing clinical workflows by reducing computational demand while preserving diagnostic precision. By enabling direct detection of ED and ES frames, it simplifies EF calculation, making it more accessible and efficient for real-world applications in echocardiography.

Lucas LiaBraaten

MN - Hamline University

Discipline: Interdisciplinary

Authors:

#1 Lifeng Dong

#2 Diego Luna Gutierrez

#3 Shelby Phillips

#4 McKenzie Wagner

Abstract Name: Optimizing Eco-Friendly Nanoparticle Synthesis for Lead Detection in Drinking Water

Lead contamination in drinking water remains a critical issue across the United States. Efficient and cost-effective detection methods are essential for both municipalities and individuals in order to prevent exposure to contaminated water. This research focuses on developing an economical and green lead detection method using bismuth nanoparticles in a surface-enhanced Raman spectroscopy (SERS) system, as a substitute for the more expensive silver and gold nanoparticles. Bismuth was selected due to its advantageous properties, including cost-effectiveness, safety, and minimal environmental impact compared to other heavy metals. Our synthesis of bismuth nanoparticles utilized lemon juice as both a reducing and capping agent, optimizing parameters such as pH (above 12), temperature (80°C or higher), and bismuth precursor concentration (approximately 10 millimolar). The nanoparticle purification process involved a two-stage centrifugation: two rounds of 10 minutes using a larger, slower centrifuge, followed by a single 10-minute round in a smaller, faster centrifuge. Characterization via scanning and transmission electron microscopy confirmed that the nanoparticles are approximately 50 nanometers in diameter. With consistent synthesis, we are now exploring and optimizing the application of these nanoparticles for lead detection. This work will serve as a foundation for future outreach initiatives in the Hamline-Midway neighborhood and the whole of Saint Paul.

Olivia Lien

MN - St. Catherine University

Discipline: History

Authors:

#1 Madeline Bjonskaas

#2 Olivia Lien

Madeline Bjonskaas

Abstract Name: Welcoming the Dear Neighbor?: The Legacies of Neighborhood Segregation in Ramsey County

During the 1960s, the St. Paul Public School district faced a significant challenge: the threat of being sued by the Federal Government for not meeting the requirements of *Brown v. Board of Education*. The *Brown* decision in 1954 ruled that separating children by race in public schools was unconstitutional because segregated schooling resulted in unequal educational outcomes for students of color. While the SPPS District recognized that some of their schools were segregated, they also claimed that this segregation was not the result of district policies or prejudice, but rather neighborhood segregation. Racial covenants, redlining, zoning, and lending policies had worked together for over fifty years in St. Paul to claim some neighborhoods for white people and push people of color into less desirable neighborhoods; leaving school populations to reflect the neighborhood residents. Our research seeks to understand how the SPPS district attempted to meet the mandate to desegregate when it was largely the neighborhoods that were segregated, not the public schools directly. We utilized archival and census data research to investigate how the SPPS attempted to desegregate. To address desegregation, SPPS tried permitting open enrollment, creating learning centers, consolidating schools, redrawing boundary lines, and even attempting different bussing strategies. We find

that none of their efforts were fully successful at desegregating SPPS because they did not address the root cause of school segregation in the district. This research provides insights into the challenges of desegregation in the north, of the presence of persistent racism in neighborhoods across St. Paul, and suggests the ways that segregation in the past has significant legacies in the present. The St. Paul Public School District avoided being sued in the 1970s, but their efforts at integration were not successful in completely undoing the school segregation brought about by decades of persistent neighborhood segregation.

Henry Limbo

AL - Auburn University

Discipline: Biology

Authors:

#1 Vander LeKites

#2 Natasha Grabau

#3 Daniel Kroeger

Abstract Name: The Impact of Age and Sex on Tau and Beta-Amyloid Pathology in 3xTg Mice

Alzheimer's disease (AD) affects an estimated 6.7 million individuals aged 65 and older in the United States. At the molecular level, AD is marked by the accumulation of beta-amyloid (A β) and tau proteins, leading to neurodegeneration. While traditional research has focused on the role of insoluble A β and tau aggregates in AD pathology, recent studies suggest that their soluble forms, which are present earlier in AD pathology, may also play a critical role in disease progression. 3xTg mice have been used extensively to study AD, expressing both tau and A β . While the pathology of these mice has been described before, recent research suggests that previous characterizations of 3xTg pathology may be incomplete (e.g. lacking the quantification of soluble vs insoluble AD biomarkers, and adequately assessing differences in AD pathology between males and females). In this study, we will characterize the age- and sex-related changes in these biomarkers using the 3xTg mouse model of AD. We will quantify changes in soluble and insoluble tau and A β levels in 3xTg and control mice at 3, 8, and 13 months using western blotting (WB) and immunohistochemistry (IHC). WB will provide semiquantitative data on overall levels and molecular weights of tau and A β species in the hippocampus. IHC will examine the localization of tau and A β in various brain regions across ages. Antibodies targeting soluble, insoluble, and total tau and A β will be used in both WB and IHC. We hypothesize that aging will be associated with an increase in soluble and insoluble tau and A β with older brains becoming more enriched in the insoluble forms. Future aims will use information collected from this project to refine the timing of sleep interventions aimed at reducing tau and A β and improving cognitive outcomes.

Nayeli Limon

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: Home Sweet Home: Enhancing Family Life Through Thoughtful Home Construction

This project aims to enhance the quality of life for a family of four by building a home for Liam, a surgeon and the head of the household; Amelia, a stay-at-home mom diagnosed with diabetic retinopathy; and their two-year-old twins, Amir and Luna. The research highlights the importance of creating a safe and welcoming environment, which can significantly improve the family's daily life and help them feel more comfortable and

secure in their home. Diabetic retinopathy is a condition that can lead to vision loss and blindness by affecting the blood vessels in the retina, the light-sensitive tissue at the back of the eye. Common symptoms include leaking and bleeding blood vessels, abnormal tissue growth in the eye, floaters, flashes of light, and severe visual loss. In the United States, up to 21% of patients with type 2 diabetes show signs of retinopathy at the time of their diabetes diagnosis, and most will develop some degree of retinopathy over time. Vision loss from diabetic retinopathy occurs due to various mechanisms. The research for this project primarily focuses on case studies that explain how contrasting furniture and finishes can help individuals with partial blindness see better. Additionally, interviews were conducted with stay-at-home moms of toddlers to identify potential dangers their children might face, enabling adjustments to enhance safety. The outcome of this project is "Home Sweet Home," a house designed with consideration for all its occupants. Construction involves meticulously selecting materials, colors, room layouts, and unique features. The home can serve multiple purposes by understanding the family's needs: providing a retreat after work, creating a safe environment for daily activities, and fostering a nurturing space that promotes children's safety and growth.

Nayeli Limon

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: "Project Coral Reef: A Playful Solution to Ocean Pollution

Project Coral Reef aims to develop a unique playground that addresses the pressing challenge of ocean pollution and serves as a vivid reminder of our responsibility to protect our oceans. This initiative emphasizes the importance of adopting a practical and proactive approach to removing plastic from the sea, alongside creating new products from recycled materials. By fostering a sense of optimism, Project Coral Reef inspires individuals and communities to believe in their collective ability to tackle this critical issue. Recent studies highlight a staggering statistic: the United States generates approximately 624,700 metric tons of waste daily, translating to over 7 pounds per person. Alarming, around 69 percent of this waste ends up in landfills, where, unfortunately, it can leak into the ocean, posing threats to marine life and coral habitats. This unsettling trend underscores the urgent need for effective recycling initiatives, especially considering that only about 10% of plastic currently exists in recycling processes. This scenario serves as a wake-up call for everyone. The inspiration from research conducted for this project has culminated in the design of "Project Coral Reef," a playground structure crafted entirely from 100% recycled materials. The design resembles an octopus, creatively reflecting the theme of marine life. Not only does this playground offer a tangible solution to the issue of ocean pollution, but it also stands as a symbol of inclusivity and affordability. By being made entirely from recycled materials, the playground encourages people to collect plastic waste, knowing it can be repurposed and kept out of a landfill. Ultimately, Project Coral Reef ensures that families from all social backgrounds can enjoy quality family time in a safe space where children can play and thrive, regardless of their economic circumstances.

Michelle Lin

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Michael Russell

#2 Liou Sun

Abstract Name: Observing effects of taurine supplementation in longer lived worms

Taurine is a sulfur-containing amino acid that plays a critical role in cellular homeostasis, development, and stress response. In mitochondria, taurine acts as an antioxidant, helping to reduce oxidative damage by neutralizing reactive oxygen species (ROS) in the mitochondria. Deficiency in taurine can lead to impaired reproduction, neurological dysfunction, and reduced lifespan in various organisms. Previous studies have shown that taurine supplementation promotes longevity and, but little is known if this same effect is observed in long lived models. To determine if taurine supplementation during adulthood affects lifespan in other long lived-models and physiology, we used the nematode model *Caenorhabditis elegans* (*C. elegans*) *daf-2* mutant to determine the effects (Kenyon et al 1993). Wild-type and the long-lived model *daf-2* were supplemented with various concentrations of taurine (10 μ M, 50 μ M, 100 μ M, and 150 μ M) were incorporated into nematode growth media, and various assays were used to determine the physiology (egg-laying, locomotion and muscle imaging). Lifespan analysis revealed a dose-dependent effect, with higher concentrations of taurine significantly extending mean and maximum lifespans in wildtype worms and improving physical function of the organism. This extension is attributed, in part, to taurine's ability to mitigate oxidative stress by enhancing cellular antioxidant defenses and reducing the accumulation of reactive oxygen species when placed at higher temperatures. The studies suggest that taurine modulates both metabolic pathways, offering insight into its potential as a dietary intervention for aging and health maintenance in *C. elegans*. Further investigations may elucidate conserved mechanisms of taurine's role in longevity and reproduction across species.

Karen Linares Mendoza

MD - Johns Hopkins University

Discipline: Health and Human Development

Authors:

#1 Karen Linares Mendoza

#2 Alyssa DeRonda

#3 Stewart Mostofsky

Abstract Name: The Relationship Between Verbal and Non-Verbal Imitative Learning, Gesture Production, and Social Communication in Children with Autism Spectrum Disorders.

Autism Spectrum Disorders (ASD) is a neurodevelopmental condition characterized by social communication (SC) impairments. Evidence has revealed a potential relationship between motor development, imitative learning, and SC, supported by observations of impaired gesture production and imitation in individuals with ASD. This study aimed to investigate the relationship between complex gesture, imitative learning, and SC impairments present in children with ASD. Participants included 8–12-year-old English-speaking children diagnosed with either comorbid ASD+ADHD ($n=72$), ASD-only ($n=72$), or ADHD-only ($n=38$), and typically developing (TD; $n=125$). Participants completed a version of the Florida Apraxia Battery for children (PRAXIS), assessing accuracy of transitive (involving a tool), intransitive-meaningful (communicative/no tool), and intransitive-meaningless gestures under different 3 different conditions (to-command, to-imitation, with-tool use). SC was assessed using the parent-reported Social Responsiveness Scale (SRS). Four-group, between-subjects ANOVAs revealed a consistent pattern across PRAXIS conditions and movement types, with post-hocs revealing that children with ASD, both those with ASD+ADHD and with ASD-only, showed significantly worse PRAXIS (more movement errors) compared to both ADHD-only ($p<.001-.037$) and TD children ($p<.001$), with moderate-to-large effect sizes ($d=.59-1.66$). Further post-hoc comparisons of ASD groups revealed that children with ASD+ADHD showed significantly worse PRAXIS compared to ASD-only ($p<.001$) with marginal effect sizes ($d=.19-.61$). Pearson's correlations including all participants revealed significant correlations of PRAXIS performance with SRS Total t-score (higher scores=more social impairment) and PRAXIS total errors ($r=.361$, $p<.001$). These findings emphasize that

children with ASD, regardless of the presence of comorbid ADHD, show significantly impaired praxis compared to TD and ADHD-only children. However, results suggest that among children with ASD, the presence of comorbid ADHD confers additional praxis impairment. Across all children, impaired praxis was related to higher parent ratings of SC impairment, proposing a clear association between praxis and SC development.

Alicia Linder

NY - Long Island University Global

Discipline: Political Science

Authors:

Abstract Name: Innovative Political Strategies in the European Union for Combating Sexual Violence: A Feminist Approach

Sexual violence is a growing global issue requiring innovative solutions for effective prevention and response. This research investigates innovative political strategies across the European Union to address sexual violence at a local level, with a focus on their potential application elsewhere. The data was gathered through interviews and surveys with individuals involved in relevant projects connected through the Innovation in Politics Awards. In collaboration with The Innovation in Politics Institute based in Vienna, Austria, and guided by feminist theory that highlights marginalized voices affected by sexual violence, the study utilized participant observation, interviews, and surveys. Care was taken to ensure that research participants were not from vulnerable populations, and ethical guidelines were followed to protect individuals from harm while ensuring that their voices were heard in a respectful and responsible way. A 90-day internship in Vienna provided direct insight into EU stakeholders' work, while interviews and surveys gathered perspectives on local impacts and adaptability. Primary source analysis, including reports, webinars, and forums, revealed key patterns and gaps, which were analyzed through archival and documentary research. This analysis contributed to the academic discussion on effective global strategies by drawing on secondary sources to help situate and make sense of the findings in the case study. The main findings highlight that local interventions show that person-centered care is key in addressing gender-based violence. Success depends on adapting strategies to local needs and cultural contexts. This research concludes that local strategies can contribute to global solutions for sexual violence, aligning with human rights standards of dignity, equality, and justice.

Kiara Lindo

NY - Brooklyn College

Discipline: Communications

Authors:

#1 Kiara Lindo

Abstract Name: Perception of Autism Spectrum Disorder Amongst US Immigrant Families

What are the perceptions of Autism Spectrum Disorder (ASD) among immigrant parents and families? Specifically, how aware are they of the symptoms and causes of ASD? What cultural beliefs, backgrounds, and economic factors shape their perceptions, and how do these perceptions influence their responses to professional advice and early intervention strategies? This study highlights the importance of understanding nuanced perspectives on ASD within immigrant families of diverse cultural backgrounds, focusing on their

attitudes and experiences with children diagnosed with ASD. Previous research shows significant variability in how immigrant parents perceive ASD. Some parents associate communication difficulties, social challenges, and behavioral issues with autism, while others view these as temporary developmental delays or external influences. A smaller group highlights their child's strengths, expressing little concern. Building on these findings, this study examines how immigrant families of children with ASD perceive their child's condition, the challenges the family faces, and their interactions with professionals and external opinions. The research follows a systematic review methodology utilizing the PRISMA guidelines. Qualitative data from questionnaires and interviews are analyzed to explore parents' perspectives on their child's condition, the daily challenges they encounter, and their experiences with healthcare providers and societal attitudes. Participants originate from diverse regions, including Latin America, the Caribbean, Asia, Africa, the Middle East, and Europe, all of which face common difficulties including language barriers, stigma, and limited access to services. The study is expected to reveal the need for culturally sensitive communication and tailored support systems to bridge the gap between immigrant families and healthcare providers. These findings aim to reduce strain on families, improve engagement with professional services, and emphasize the importance of interventions that respect cultural and economic contexts.

Faith Lindsay

KY - University of Kentucky

Discipline: Art History

Authors:

Abstract Name: Connecting Creatives: Fostering Community Among Visual Artists in Central Kentucky

Collaboration is essential for artistic growth, yet many artists face isolation in their artistic and professional endeavors. The demanding nature of working as a professional artist often limits opportunities for connection, and emerging artists, in particular, face additional challenges in establishing connections and finding opportunities within their local communities. This project seeks to understand the dynamics of community-building through the development of a website that will allow emerging visual artists in Central Kentucky to find arts opportunities and connect with artists who have experience applying for and participating in those programs. By creating an artist directory, the website will enable artists to share insights about arts opportunities, offer creative feedback, improve financial transparency, and support each other in navigating the complexities of the arts industry. Although art organizations publish their own opportunities and share postings from other organizations, a well-organized, centralized location for these opportunities does not exist in Central Kentucky. Further, there is no artist directory that currently exists for emerging artists to easily connect with other emerging and established artists. Seeking to fill this void, the website will benefit emerging artists in their professional and artistic endeavors by enhancing their support systems within Central Kentucky's artistic community. This project developed out of working with the Tuska Studio records archival collection—housed at the University of Kentucky Special Collections Research Center—which underscores the significance of creative networks and community-building for artistic success. Creation of the website will involve consulting with arts organizations and connecting with artists and arts administrators to find exhibitions, art fairs and markets, residency programs, and grant opportunities, as well as to establish the artist directory. By creating a space for artists to share knowledge and experience, this project will consider how opportunities for dialogue and connection among artists impact their artistic practice.

Madison Ling

IL - Trinity Christian College

Discipline: Biology

Authors:

#1 Madison Ling

#2 Lorena Arnett

#3 Clayton Carlson

Lorena Arnett

Abstract Name: Characterization of β -lactam Antibiotic-Susceptible *Providencia alcalifaciens*: Ecological Insights and Genomic Perspectives

Antibiotic resistance is a growing problem in environments around the world; however, resistance rates tend to be greater near human populations. One such area is the Navajo Creek, a suburban waterway near southwest Chicago that flows through neighborhoods and forest preserves. Among bacteria isolated from the creek, resistance to six different antibiotics has been discovered, and metagenomic analysis of these populations shows diversity among the microbes. Water samples collected from suburban waterways over the course of several months indicate that *Providencia alcalifaciens* is widespread, both geographically and temporally. Whole-genome sequencing of *P. alcalifaciens* reveals a wide variety of resistance genes that allow it to survive in the presence of antibiotics, but the interplay between these genes and the corresponding antibiotics is still being determined. Bacteria are being grown in the presence of different antibiotics, and gene expression will be measured using qPCR. Growth assays are also being done to determine the bacteria's resistance in different concentrations of antibiotics. The bacteria has been shown to exhibit varying susceptibility to a range of β -lactam antibiotics, including oxacillin, amoxicillin + potassium clavulanate, and carbenicillin. The combination of amoxicillin and potassium clavulanate, a β -lactam/beta-lactamase inhibitor, showed superior antibacterial activity compared to amoxicillin alone. This suggests that the presence of clavulanate, which inhibits β -lactamase enzymes responsible for β -lactam antibiotic degradation, enhances the bactericidal effect, potentially overcoming the bacterial resistance mechanisms. Overall, this project offers ecological and genomic analysis of a highly resistant microbe and potential pathogen that has been isolated from local waterways.

Shemara Ling

TN - Trevecca Nazarene University

Discipline: Psychology

Authors:

#1 Shemara Ling

#2 Mary Moroz

#3 Jasmine Martinez

Jasmine Martinez

Mary Moroz

Abstract Name: A Study of the Predictors of Stress and Burnout via Mindfulness

This study aimed to identify predictors of burnout and stress in undergraduate students. Previous research has shown connections between mindfulness, stress, and burnout. For example, there has been a significant negative correlation between stress and the five facets of mindfulness: observing, describing, acting with awareness, non-judging, and non-reactivity. Additionally, mindfulness has been shown to negatively correlate with the following factors of burnout: emotional exhaustion and personal efficacy. One hundred and twenty-six (N= 126) undergraduate students participated in the current study. Four hypotheses were constructed based on the information from prior literature. Hypothesis 1: Scores of observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience predict emotional exhaustion scores. Hypothesis 2: Scores of observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience predict depersonalization scores. Hypothesis 3:

Scores of observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience predict loss of personal accomplishment scores. Hypothesis 4: Scores of observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience predict stress scores. The Five Facets of Mindfulness Short Questionnaire, the Maslach Burnout Inventory, and the Perceived Stress Scale were utilized to collect the necessary data needed to test the four hypotheses. Multiple regression analyses were performed via SPSS software. Results showed that non-reactivity and acting with awareness negatively predicted emotional exhaustion. No significant results were found between observing, describing, acting with awareness, non-judging, and non-reactivity to inner experience and depersonalization. Results showed that observing and describing negatively predicted loss of personal accomplishment. Lastly, results showed that non-reactivity and acting with awareness negatively predicted stress. The limitations this study encountered were the population, as it was limited to a small, private, Christian university in the southeast, and that the majority of the sample consisted of freshmen.

Sriya Lingamaneni

VA - Virginia Commonwealth University

Discipline: Biology

Authors:

Abstract Name: Using Anti-oxidative and Anti-inflammatory Properties of Ginger to Temporarily Relieve Respiratory Symptoms from Flavored Vaping Pods

Despite the extensive research conducted on the respiratory implications of e-cigarette usage, a significant research gap persists regarding treatments to minimize the adverse effects of respiratory dysfunction induced by flavoring pods within e-cigarettes. Among the range of vapes available, vanillin emerges as a prevalent flavor choice and has been associated with a reduction in antioxidant efficacy, potentially escalating lung inflammation and oxidative stress. Vapes, regarded as a solution for heavy smokers, are promoted as a safer substitute for tobacco, yet evidence suggests the contrary. Commonly prescribed for e-cigarette-induced respiratory issues, corticosteroids exhibit detrimental effects upon prolonged usage, including osteoporosis, myopathy, and temporary side effects. The introduction of an alternative treatment devoid of symptomatic implications could substantially benefit individuals grappling with respiratory dysfunction stemming from e-cigarette flavoring chemicals. Ginger, renowned for its potent anti-inflammatory and antioxidative properties, offers a multifaceted spectrum of health benefits, aiding in digestion, alleviating inflammation-linked conditions like arthritis and nausea, fortifying the immune system, and contributing to cardiovascular wellness. Widely used in Eastern and alternative medicinal practices, ginger serves as a remedy for various health concerns, encompassing digestive problems, respiratory issues, and headaches. This research initiative endeavors to explore the potential of ginger extract as an alternative remedy for vanillin-triggered respiratory dysfunction. Ginger's antioxidative and anti-inflammatory attributes position it as a promising candidate to mitigate vanillin-induced oxidative stress while potentially minimizing associated side effects. To mitigate the negative respiratory effects of vaping, such as lung damage and respiratory distress, ginger could be used as an alternative treatment because of its anti-oxidative and anti-inflammatory properties.

Madeline Little

VA - Longwood University

Discipline: History

Authors:

#1 Yulia Uryadova

Abstract Name: The Hujum Campaign in Uzbekistan and its Consequences

The Hujum Campaign (meaning “attack”) was an attack on veils worn by Muslim women between 1927-1929. This campaign started in Uzbekistan, the most conservative part of Central Asia, and was led by the Zhenotdel, the women’s department of the Soviet Union. The Soviets felt that they had to liberate women in Central Asia to fix what they saw as a backwards society. To the Soviets, casting off the veil would be the same as casting off the rules of the past, creating new opportunities for women and bringing in new members of the Communist party. However, what began as the Hujum “attack” on the veil as a symbol of female repression, resulted in thousands of women being victims to violence and even death. Uzbek women were worse off due to the severe violence they faced as a direct cause of the Hujum campaign, and they did not see positive results until years later. Women who unveiled had to live in fear for their life, whether in the form of violence from strangers or relatives. This research uses primary accounts from women who participated in and experienced the Hujum campaign, as well as accounts from the Soviet government itself. It also uses secondary sources which analyzed the Hujum campaign and its outcomes.

hangjay liu

WI - University of Wisconsin-Madison

Discipline: Psychology

Authors:

#1 hangjay liu

#2 Allyson Bennett

Abstract Name: Exploring Auditory/Visual Environmental Enrichment for Rhesus Monkeys

Environmental enrichment plays a vital role in improving the welfare of captive non-human primates (NHPs). While more research has been done on tactile, dietary, and social enrichment, audiovisual enrichments like radio and television have been less explored. This study looks at how these tools might benefit rhesus monkeys (*Macaca mulatta*), focusing on their preferences and responses to different television programs (such as naturalistic scenes, animations, and static imagery) and auditory stimuli (including natural sounds, classical music, vocalizations, and other radio content). By looking at the time spent engaging with these stimuli and analyzing behavioral change, we will be able to examine how the different stimuli affect the subjects. Audiovisual enrichment is projected to promote species-typical behaviors, reduce stress, and enhance overall mental well-being. A study by Donna Platt found that Rhesus monkeys tend to favor videos featuring unfamiliar subjects or frequent angle changes, suggesting that television could serve as effective enrichment. However, another study by Linda D. Harris yielded inconclusive results, with only 2 out of 8 subjects showing interest in TV, casting doubt on its effectiveness as enrichment. These previous studies on audiovisual enrichment have been inconclusive and little has been done beyond 2016. This study seeks to bridge that gap, offering new understandings of how audiovisual tools can enhance animal welfare, minimize stress, and inform about better future enrichment strategies.

Hanlin Liu

WI - University of Wisconsin-Eau Claire

Discipline: Economics

Authors:

Abstract Name: Examining a Farmers' Market Match Incentive Program - Using SNAP Shopper Survey Data from 2023-2024

Food insecurity is a significant issue facing many American households. The Supplemental Nutrition Assistance Program (SNAP) provides increased access to food for families in need. Additionally, fruit and vegetable (FV) consumption has been shown to improve health and reduce the risk of chronic disease. However, poor nutrition among children and adults, including low FV intake have contributed to rising rates of obesity. It is particularly challenging for low-income households to purchase/eat the recommended amount of FV. Farmers' markets (FM) offer a wide variety of fresh, local and healthy foods, especially FV, but data show that low-income households are less likely to shop at FM. The Eau Claire Downtown Farmers' Market (ECDFM) sponsors a Market Match Program (MMP) incentivizing SNAP households to shop at the ECDFM. Administrative transaction data show that, despite robust utilization of the MMP, most shoppers visit the ECDFM infrequently yielding little evidence that shoppers build the ECDFM MMP into their regular shopping routine. This presentation uses survey data from 2023–2024 to identify reasons why people like shopping at the ECDFM as well as what barriers/obstacles they face, and also what things might enable/encourage them to visit the ECDFM more often to use the MMP. Our findings reveal the number one reason SNAP shoppers come to the ECDFM is buy local healthy FV followed closely by being able to use the MMP. Additionally, we find the main limitations to using the MMP at the ECDFM include inconvenient location/hours, SNAP benefits running out and just not remembering. Correspondingly, the most mentioned things that would encourage more MMP utilization by SNAP shoppers at the ECDFM are expanded locations/hours, a larger match amount and also just being reminded. Flows out of another submission analyzing administrative transaction data from the ECDFM MMP (same community partner, same mentors).

Wanqing Liu

PA - Carnegie Mellon University

Discipline: Physics and Astronomy

Authors:

#1 Wanqing Liu

#2 Mohit Bhardwaj

Abstract Name: Testing the Young FRB Progenitor Hypothesis: A Crossmatch of Catalog-1 CHIME Bursts with Historic Local Universe Supernovae

The origin of the newly found astronomical object, fast radio burst (FRB), remains unknown. We have been motivated to conduct research in hopes of discovering its origin. In 2020, researchers discovered FRB-like emissions originated from SGR 1935+2154. SGR 1935+2154 is a highly magnetized neutron star in the Milky Way formed approximately 20,000 years ago through a Type II supernova event. The fact that FRB-like emissions were found to be originated from SGR 1935+2154 has advocated a potential connection between FRBs and core-collapse supernovae. Several FRB models propose that young (< 100 yrs) and highly magnetized neutron stars can produce FRBs. Our research aims to test the connection between FRBs and supernovae by cross-referencing the positions of historic local universe supernovae with FRBs detected by CHIME.

Brendan Livelyberger

PA - Duquesne University

Discipline: Engineering

Authors:

#1 Kimberly Forsten Williams

#2 Bin Yang

Lydia Kutzer

Mitchell Fox

Abstract Name: Development of an Electrospray Procedure for Production of Microscopic Beads for Biomedical Applications

Mammalian cells thrive in three-dimensional environments, enhancing aggregation and differentiation essential for biomedical applications such as tissue engineering, cell therapy, and regenerative medicine. Alginate beads produced through reversible crosslinking with calcium chloride offer a simple method that has been shown to facilitate cell growth. Our goal is to develop a procedure to mass produce beads with consistent shape and size in sterile conditions, suitable for cell encapsulation and culture that can be used in a bio-manufacturing type procedure. Initial studies in non-sterile environments established feasibility and identified key parameters affecting bead quality. Our process employs electrospraying, with 2.0% sodium alginate delivered at a set flow rate through a charged metal needle positioned above a collection bath of cross-linking solution. Optimized conditions yielded beads under 400 μm in diameter. Variation of field height as assessed by difference between the needle and collection dish as well as applied voltage indicated that higher voltages yield smaller bead diameters while field height had a major impact on bead sphericity, size consistency, and structural integrity. Building on these results, we transitioned to sterile production within a biological safety cabinet. We have been able to produce consistent beads in small petri dishes but noted that significant modifications were needed due to printing within the metal enclosure. For example, the field height of 21.5 cm needed to be reduced to 5 cm. The small spray radius has allowed us to produce beads within tissue culture transwell inserts in an important step towards simplifying the bead separation step essential for production of cell encapsulated beads. This work describes a progression from initial non-sterile trials to a scalable, reproducible method tailored for sterile environments. Future studies would include testing to optimize viability of encapsulated cells, a key step in showing the suitability of our process for biomedical applications.

Nicholas Loehrke

WI - University of Wisconsin-Platteville

Discipline: Engineering

Authors:

#1 Nader Safari-Shad

#2 Owen Bauman

Owen Bauman

Nader Safari-Shad

Abstract Name: Generator Stator Intermittent Ground Fault Test Instrument – Version 2.0

Synchronous generators are critical to the stability and reliability of the power grid, making their protection against electrical faults essential for national security. Among the most common faults is the stator single-phase ground fault, which often begins as an intermittent ground fault (IGF). IGFs are characterized by high transient currents and overvoltages that can cause severe damage to insulation and generator components, potentially escalating into more severe faults and resulting in costly repairs and downtime. To address this challenge, our project aims to develop Version 2.0 of the 87S test instrument, an innovative tool for staging stator IGFs and capturing fault data. Building on the validated success of Version 1.0, as presented at the IEEE 26th International Conference on Electrical Machines, this version enhances the instrument's hardware and software for greater functionality, durability, and usability in industrial environments. The primary

upgrades include redesigning the electronic circuitry to incorporate a custom power supply, battery management, and improved load switch topology. The Arduino UNO microcontroller (MCU) used in the previous version will be replaced with an STM32 MCU, offering increased processing power and flexibility. Additionally, the enclosure will be redesigned using a combination of extruded aluminum and CNC machined panels to ensure resilience to physical stresses. Our methodology combines printed circuit board (PCB) design, power system optimization, mechanical enclosure prototyping, and embedded software design. Student researchers will gain hands-on experience in all of the previously mentioned areas. The expected outcome is a robust and versatile test instrument capable of staging and capturing IGF events with higher precision and reliability. This tool will enable more effective testing and validation of protection algorithms for synchronous generators, contributing to the prevention of catastrophic faults and enhancing grid security.

Lydia Loftus

MD - Salisbury University

Discipline: Anthropology and Archaeology

Authors:

#1 Viktoria Basham

Abstract Name: Cats, Witches, and Demons: The Role of the Animal Familiar in the English Witch Trials

While scholars have previously explored the role of the animal familiar during the English witch trials (1300s-1850), they have not analyzed how familiars served as the missing link between witches and their victims. Peer reviewed research has found that the familiar was scapegoated to be viewed as the witches' demonic companion and was held responsible for executing devious acts such as crop damage, sickness, or natural disasters. Given that an explanation was needed for how a witch cursed their victims from afar, I argue that the popular imagination reinvented the idea of the animal familiar to serve as the conduit between the witches and their victims. As my research has indicated, people feel the need to explain what they do not understand, especially when threatened by an unfamiliar force; the supernatural serves as a tool to fill in the voids in human knowledge. Thus, the familiar served as a much-needed scapegoat during the witch trials, so that those who felt threatened by the presence of witchcraft could regain a sense of control upon the witches' conviction. To the best of my knowledge, this point has not been discussed by scholars. This new example draws a logical link between familiars and the supernatural to explain the inexplicable and contributes to the understanding of the relationship between witches and familiars in the English witch trials.

Ellie Logan

TX - San Jacinto College

Discipline: Education

Authors:

Abstract Name: Exploring Emotional Disturbances in Young Adults: A Personal Perspective

Mental health often takes a backseat in the lives of young adults, a reality that can lead to severe consequences. This project seeks to address the central question: How do borderline personality disorder (BPD), severe anxiety, and depression manifest in young adults, and what strategies can be used to provide effective support and overcome stigma? The purpose of this project is to explore the personal and broader implications of emotional disturbances and to challenge prevailing stereotypes surrounding mental health conditions. Grounded in the lived experience of a young adult diagnosed with BPD, severe anxiety, and depression, this research provides unique insights into the ongoing challenges and emotional complexities associated with these disorders. It seeks to make a meaningful contribution by offering a firsthand perspective that highlights the gaps in diagnosis, treatment, and societal understanding. The research emphasizes the need for accurate representation and stigma reduction when discussing emotional disturbances. The methodology involves an autoethnographic approach, combining personal narrative with an analysis of broader trends in mental health awareness and care for young adults. By sharing personal experiences, this project aims to provide a nuanced understanding of how these disorders impact daily life, relationships, and self-perception. Expected results include shedding light on the realities of emotional disturbances, debunking stereotypes, and advocating for informed mental health education. The discussion will center on how stigma and misinformation exacerbate mental health challenges, while also offering recommendations for fostering empathy and effective support systems. Ultimately, this project underscores the importance of prioritizing mental health and creating spaces where young adults feel seen, heard, and supported.

Sydney Logsdon

MI - Michigan State University

Discipline: Interdisciplinary

Authors:

#1 Lorraine Inman

#2 Carter Brown

Lorraine Iman

Carter Brown

Abstract Name: A Chronology of Controversial Comics: Representations of Queer Desire Amidst American Comic Censorship in the Twentieth Century

This presentation discusses a new project from the Digital Humanities and Literary Cognition Lab that explores Michigan State University's comic book collection, the largest public collection of its kind in the world. Through the metadata listed in this database, we analyze the historical and cultural context of the creation of the Comics Code Authority (CCA), and its lasting effects on the content and reach of taboo works in the landscape of comic creation. In particular, we explore representations of queer desire in American comics over time and how they were affected by the CCA and shifting sexual politics of the twentieth century. Initially, we chart the trends in content preceding the implementation of the code to better observe to what degree moral panics in the 1950s were guided by reactionary ideologies. Then, we observe the effectiveness of the code across the country, with state by state breakdowns of data trends and enforcement of the CCA. Finally, we look to the dissolution of the code, and the effects it had on queer identity and expression in comics. The implementation and effects of the CCA can be compared to the targeted suppression of queer art, expression, and identity throughout history, from Radcliffe Hall and Robert Maplethorpe to modern book bannings and educational policy. By bringing this data to light, we observe historical persecution of marginalized sexual identities in a mass medium reflective of the cultural zeitgeist. Pop culture is reflective of general cultural ideas, and censorship of pop culture may be reflective of mass cultural persecution. Through the interdisciplinary analysis of this data, incorporating both digital humanities methods of visualization and sociopolitical examination of queer theory, we can effectively map the history of queerness and political persecution through comics.

Ginya Lombard

PA - Point Park University

Discipline: Criminology/Criminal Justice

Authors:

Abstract Name: An Exploration of The Growing Demand for Full-Time Forensic Genetic Genealogy Positions in Pittsburgh

Since its emergence in 2018, Forensic Genetic Genealogy (FGG) has rapidly grown, becoming a valuable tool in criminal investigations, particularly in solving cold cases. FGG can uncover new leads and identify previously unknown individuals tied to cases, making it an indispensable asset in law enforcement. This growing science has also contributed to job creation, especially in areas like Pittsburgh. The Bureau of Labor Statistics predicts a 14% growth in the employment of forensic science technicians from 2023 to 2033, far outpacing average job growth. As FGG technology evolves, researchers have made significant advancements.

For example, Erturk et al. developed a proposed strategy that can find close genetic matches ten times faster than the current Benchmark Strategy. These innovations highlight the need for more full-time researchers to improve and harness FGG's full potential. Currently, forensics teams often rely on outsourced experts in genetic genealogy. This presentation explores the demand for a full-time FGG position within Pittsburgh-area police departments. By surveying local law enforcement and interviewing regional experts, the project will provide insights into future job opportunities in the area. Key questions addressed include: (1) How is FGG used in criminal investigations today? (2) What would a full-time FGG position entail (duties, hours, work environment)? Ultimately, the presentation argues that FGG, while still emerging, is a powerful tool that should be incorporated into the criminal justice curriculum and supported within law enforcement. Doing so would allow forensic professionals to explore new opportunities and fully leverage the benefits of this groundbreaking technology.

Martha Londoni

FL - University of West Florida

Discipline: Biochemistry

Authors:

Abstract Name: Assessing the anti-biofilm activity of novel benzo[b]thiophene derivatives with potential antibacterial activity.

Antibiotic resistance occurs when bacteria develop mechanisms that allow them to withstand the effects of antibiotics. This problem can arise from overusing or misusing antibiotics, as well as from incomplete treatment courses. The need for new classes of antibiotics is growing as antibiotic resistance poses an increasing threat to patient care. One major contributor to bacterial resistance is the rising prominence of biofilm-related infections. A biofilm is a complex community of microorganisms, such as bacteria and fungi, encased within a self-produced matrix of extracellular polymeric substances (EPS). Biofilms can form on living tissue, medical devices, and industrial equipment. The EPS matrix can impede the ability of antibiotics to eradicate the microorganisms within the biofilm. Given all these challenges, novel antibiotic classes are crucial in combating the resistance. Benzo[b]thiophene is a compound that exhibits various biological activities, such as acting as an anti-inflammatory, anti-diabetic, and antidepressant agent. Furthermore, it is found in four Food and Drug Administration (FDA)-approved medications, including anticancer, antifungal, and antibacterial drugs. The numerous successes associated with this compound have sparked interest among medicinal chemists, positioning it as a promising candidate for a novel class of antibiotics. This project explores the effectiveness of novel benzo[b]thiophene-derived antimicrobial agents in preventing biofilm formation. The efficacy of these agents is evaluated through Minimum Biofilm Inhibition Concentration (MBIC) biofilm assays. Consistent low MBIC values of these antimicrobial agents would support the development of potent antimicrobial drugs, offering an important tool in alleviating the ongoing antibiotic resistance crisis. By targeting biofilm-related infections, these agents could help preserve the effectiveness of antibiotics for generations to come.

Ian Long

WV - West Virginia University

Discipline: Engineering

Authors:

#1 Cagri Kilic

Abstract Name: Adaptive Locomotion System for Planetary Exploration Robots (ALSPER)

As humanity begins to explore deeper into the universe, the field of robotics has become more crucial than ever. One of the greatest challenges for planetary exploration robots is navigating the variety of surfaces and obstacles that the robot will encounter on its journey. This study investigates the use of an adaptive locomotion system on a quadrupedal robot, combining legs and shape-shifting wheels to improve the robot's mobility performance for a variety of planetary terrains. The shape-shifting wheel, which transforms from a circular wheel configuration to a flattened rim mechanism (FRM), is integrated into each quadruped leg to allow for three primary modes of locomotion: rolling, walking, and FRM/crawling. This approach aims to bridge the gap between traditional single-mobility systems and adaptive movement technology, thus informing and advancing the designs of next generation planetary robots. By utilizing the principles of terramechanics, the system is specifically designed to reduce the possibility of entrapment in soft, deformable soils. During static testing of a single wheel prototype in two planetary soil simulants, it was shown that the FRM configuration is more effective at reducing sinkage than a wheel or foot configuration, so this study aims to investigate those results on a larger scale with the entire quadruped. A sand testing pit will be fabricated inside a Vicon-camera equipped planetary simulation facility, allowing precise motion data to be collected. IMU, force-torque, motor current, sinkage level, wheel slip ratio, and movement speed data will also be collected. This data will be evaluated and compared to the performance of single-mobility systems to determine the effectiveness of an adaptive locomotion system for applications in planetary exploration. The findings of this study are expected to contribute valuable insights into the design and operation of future planetary exploration robots, with implications for both robotic and human exploration missions.

Gabriella Longoria

TN - Lipscomb University

Discipline: Biology

Authors:

Abstract Name: Investigating the Potential Ability of the TLR4-NF- κ B Axis to Reduce Aryl Hydrocarbon Receptor Expression in Intestinal Epithelial Cells

Necrotizing enterocolitis (NEC) is a disease that primarily affects premature infants and is characterized by intestinal necrosis, inflammation, and oftentimes death. Previous studies suggest Toll-like receptor 4 (TLR-4)-induced apoptosis of intestinal epithelial cells is required for NEC development. Upon binding to bacterial endotoxin lipopolysaccharide (LPS), TLR-4 signaling ultimately leads to the nuclear translocation of the transcription factor NF- κ B to initiate expression of inflammatory genes. Treatment with indole-3-carbinol (I3C), a pro-ligand of the ligand-dependent transcription factor aryl hydrocarbon receptor (AhR), prevents NEC in a mouse model by leading to decreased expression of TLR-4, despite decreased AhR expression in the intestine of NEC mice. However, it is unclear if AhR ligands can be used to treat, not just prevent, NEC. Here, we modeled NEC in vitro by treating IEC-6 enterocytes with LPS and investigated the effect I3C administration has on the viability of LPS-treated cells. I3C was unable to reverse LPS-induced cytotoxicity as measured by MTT assay. Next, we sought to elucidate the mechanism behind the decrease in AhR expression we saw in cells treated with LPS. We hypothesized that LPS's stimulation of the TLR-4-NF- κ B axis was responsible for this reduction. We pretreated IEC-6 cells with a TLR-4 inhibitor, C34, for 30 minutes followed by a 6 hour LPS treatment. There was no significant difference in AhR expression between cells treated with LPS and cells pretreated with C34 followed by LPS, suggesting the observed decrease in AhR expression is not dependent on TLR-4. We next used an NF- κ B inhibitor, JSH-23, instead of C34, and found LPS's ability to reduce AhR expression was abolished with JSH-23 pretreatment, suggesting NF- κ B is required for LPS treatment to decrease AhR expression. Elucidating the molecular mechanism behind the reduced AhR expression in NEC patients might increase the efficacy of AhR ligands as novel NEC therapies.

Cloe Loosz

PA - Point Park University

Discipline: English and Literature

Authors:

Abstract Name: Within the Woman Writer: Discussing Dialogism, Adrienne Rich, and the Debate of Deconstructionist Prose

In times of social and political unrest, theorists, historians, and writers provide frameworks for grieving, hoping, and moving forward. Writers, especially, often stand at the crossroads of social unrest, developing essential discourses that enable society to critically examine the world. This session will demonstrate how my research and creative work have combined to contribute to the discourse of feminist writing by offering an overview of the craft essay component of my senior capstone project, which discusses deconstructionist writing. This oral presentation will mainly demonstrate how my senior capstone work engages with conversations in contemporary literature by examining the voices and ideas of revolutionary writers and theorists, focusing specifically on the contributions of Mikhail Bakhtin, Adrienne Rich, and Maggie Nelson. Bakhtin's concepts of dialogism, or "the maintaining of a continual dialogue with other works of literature," and heteroglossia, or speech diversity, serve as driving forces in my craft essay (Paton 2). Bakhtin's theories connect the significance of diverse, continuous discourse to the values inherent in my own feminist writing. The essay will also draw upon the critical works of Adrienne Rich, focusing on her explorations of revision as a method of resistance against dominant cultural narratives. Finally, memoir research prose inspired by Maggie Nelson's *The Argonauts* will highlight the role radical resistance to the status quo has in shaping my literary approach. Overall, insights from these discussions will illustrate how a writer's voice can form in response to and in resistance against social conventions. During the oral presentation, audience members will have the opportunity to review excerpts from my peer-reviewed creative portfolio that will demonstrate how my work is in conversation with these theories. Attendees will leave with a deeper understanding of what revision, reflection, and resistance signify within modern feminist discourse.

Mercedes Lopez

CO - Regis University

Discipline: Biology

Authors:

#1 Mercedes Lopez

#2 Christina Coughlan

Abstract Name: Exploring Exosome Interactions with the Blood-Brain Barrier: Implications for Alzheimer's Disease Mechanisms and Progression

Alzheimer's Disease (AD) affects over 55 million people worldwide, and this number continues to rise annually. While significant research has focused on the mechanisms of the disease, one promising area still underexplored is the role of exosomes. Exosomes are tiny vesicles produced by every cell type and act as messengers between cells. They are gaining attention for their potential influence on the central nervous system (CNS) and the blood-brain barrier (BBB) in particular. The BBB acts as a highly selective barrier between the brain and the bloodstream, which is essential for protecting the CNS and maintaining its function. It is composed of endothelial cells, pericytes, and astrocytes that collectively prevent harmful substances from entering the brain while allowing necessary nutrients and oxygen through. In AD, however, the BBB becomes compromised, leading to increased permeability and reduced selectivity. To investigate the interaction between exosomes and the BBB, we will culture astrocytes, pericytes, and endothelial cells

separately. Then, we will co-culture them in a small microfluidics device to emulate the BBB environment in vitro. Exosomes will be immunofluorescently stained and then applied to individual and co-cultured cells and left in the incubator for 24-48 hours. Morphological changes and cellular uptake will be observed and quantified. Exosomes are known to cross the BBB, however, it remains unclear whether exosomes are actively causing BBB breakdown or if they are acting on an already-compromised barrier. Investigating this relationship could provide key insights into AD progression and uncover therapeutic opportunities to protect or restore BBB integrity.

Dante Lopez

TX - The University of Texas at San Antonio

Discipline: Biology

Authors:

#1 Joseph Romanowski

#2 Daniel Whitefield

#3 Zach Adelman

Abstract Name: Microhomology Mediated End Joining, After CRISPR/Cas9-Induced Double Strand Break in *Aedes aegypti*

Aedes aegypti mosquitoes are notorious vectors of several dangerous diseases, including dengue fever, Zika, chikungunya, and yellow fever, posing a health risk to millions of people worldwide. The emergence of CRISPR technology has revolutionized genetic manipulation, however, its efficiency in producing precise edits varies across species, largely due to differing repair pathway preferences. This study aims to clarify the role of Microhomology Mediated End Joining (MMEJ) in repairing CRISPR/Cas9-induced double-strand breaks (DSBs) in *Aedes aegypti* mosquitoes, by quantifying the frequency and characteristics of MMEJ mediated repair events in comparison to the pathway of choice NHEJ, through targeted sequencing and bioinformatics analysis. Utilizing three mosquito lines with knockout genes that encode key proteins only present in NHEJ (Ku80, DNA-PKcs, Lig4) crossed to a laboratory-generated transgenic line and a control. Following the microinjection of 300 embryos from each line with three different sgRNA/Cas9 complexes, genomic DNA extraction and PCR analysis for the target region were performed. The data was analyzed using three bioinformatic tools: CRISPRessoWGS, Minimap2, and Samtools. The results revealed a significant increase in MMEJ repair events in the Ku80, and DNA-Pkcs knockout lines compared to the wild type, indicating that microhomology mediated repair occurs at much higher frequencies in the absence of these key proteins. In contrast, the Lig4 knockout line did not show this relationship, suggesting that this protein may play a role within the microhomology repair pathway. These findings provide crucial insights into the prevalence of MMEJ as a repair mechanism, providing a foundation for optimizing CRISPR applications for controlling mosquito-borne diseases and enhancing our understanding of genetic resilience mechanisms in insects.

Liara Lopez Torralba

FL - University of Central Florida

Discipline: Health and Human Development

Authors:

#1 Eunkyung Lee

Abstract Name: Examining Fatalism in Hispanic/Latina Breast Cancer Survivors

As fatalism, a person's attitude towards their life, increases, there is a significant level of medical mistrust and avoidance, which can delay cancer diagnoses and affect the prognosis of the disease. Literature has shown that many factors can influence fatalism, including age, race, acculturation, locus of control, education, and fear. However, little research has been conducted on whether fatalism differs independently by Hispanic origin and its associated factors among Hispanic breast cancer survivors. This study used data from the Hispanic Breast Cancer Study at the University of Central Florida. The original study recruited 408 women aged ≥ 20 years, diagnosed in 2015-2022 with breast cancer and living in Central Florida, following the state-mandated patient recruitment procedures. Fatalism was measured using six questions in the Multidimensional Fatalism Measure questionnaire, each being scored using a 5-point Likert-type scale, with higher scores indicating a high fatalistic belief. Fatalism scores will be compared by self-reported Hispanic/Latina origin while controlling for potential confounders in the multivariable linear regression analysis. This research will identify potential confounders in Hispanic/Latina breast cancer survivors that previously were unclear. It is expected that fatalism scores will differ significantly by Hispanic/Latina subgroups independently due to differences in cultural beliefs according to their Hispanic origin. The findings from this research can help physicians gain a deeper understanding of breast cancer survivors' attitudes toward their lives according to their Hispanic origin, which will improve patient care. (A grant from the Florida Breast Cancer Foundation to Dr. Lee supported this study.)

Gabriella Loredo Marquez

NC - Western Carolina University

Discipline: Biology

Authors:

#1 Christopher Ginn

#2 David de Jong

#3 Katie Adams

Christopher Ginn

Abstract Name: The Brief Attitudes Toward Solo Masturbation Scale: Convergent and Divergent Validity

Masturbation is common and normal from childhood to old age. Taken from a representative sample of adult Americans, less than 40% of women and more than 60% of men have masturbated within the past year. For some people, masturbation has many benefits, such as exploring one's sexuality, learning to appreciate one's body, and helping relaxation and sleep. For other people, masturbation is associated with relationship dissatisfaction, beliefs of sinfulness, and feelings of shame. Having a measure of attitudes towards masturbation will help explain why people's experiences with masturbation can be so different. Existing measures of attitudes towards masturbation are outdated, too long, and fail to differentiate between positive and negative attitudes. This study's purpose is to develop an updated and improved scale measuring attitudes towards masturbation. We developed 12 items assessing positive attitudes towards masturbation and 12 items assessing negative attitudes towards masturbation, based on previous research. We are going to conduct an online study in which we will administer 24 attitude items, measures of demographics, religiosity, and other related constructs to a sample of 1,500 adults. As presented by my colleague, Christopher Ginn, we will use exploratory factor analysis to refine the attitude scale. Our goal is to have very brief subscales assessing positive and negative attitudes. Next, we will assess the convergent and divergent validity of the new scale. Convergent validity assesses whether scales that should be related are actually related. Divergent validity assesses whether scales that should not be related are actually not related. For example, we hypothesize that religiosity will be more strongly correlated with negative attitudes towards masturbation than with positive attitudes. This new measure of attitudes towards masturbation will shed light on why people have positive or negative experiences with masturbation.

Elysabeth Lough

WI - University of Wisconsin-Superior

Discipline: Psychology

Authors:

Abstract Name: Relationship Between Big Five Traits and Movie Genre Preferences

This study investigates the relationship between personality traits and movie genre preferences, exploring if Big Five traits and movie genre preferences are correlated. The BF-10 and a movie genre preference survey were combined and sent out to gather data from participants. Three significant results were found. Openness was positively correlated with science fiction movies and fantasy movies, and neuroticism was negatively correlated with sports movies. No other relationships were found between the other Big Five traits. These results support the literature, finding connections between personality traits and movie genre preferences. While this study did not find a connection between all five traits, it supports the correlation between personality and entertainment preferences. This relationship impacts the way we understand films, as our personality is shown to impact what we enjoy or dislike within the entertainment industry.

Kibryn Lovejoy

AL - University of Alabama at Birmingham

Discipline: Psychology

Authors:

#1 Bailey Tollett

#2 Alecia Mercier

#3 Bri Paquette

#4 Wanqin Yu

#5 Celine Li

#6 Jacqueline Chen

#7 Fumiko Hoeft

#8 Caroline Richter

Abstract Name: The Association Between Stigma Consciousness and Internalizing Problems in Children with a Neurodevelopmental Disorder

Neurodevelopmental disorders (NDD) are a group of conditions that have an onset in the developmental period that cause deficits which impair functioning (APA, 2022). This study targets NDD diagnoses including Specific Learning Disorders (SLDs) and Attention-Deficit/Hyperactivity Disorder (ADHD). SLDs are disorders that impact an individual's ability to acquire and use academic skills in areas such as math, reading, and/or writing (APA, 2022). ADHD is defined as persistent and impairing levels of inattention, disorganization, and/or impulsivity (APA, 2022). SLD and ADHD are commonly comorbid disorders (Gnanavel et al., 2019). Previous research indicates individuals with an SLD and/or ADHD experience increased internalizing problems and elevated levels of stigma (Fogleman et al., 2018; Haft et al, 2023). This study aims to address the gaps in literature regarding how stigma consciousness – the extent to which a child expects to be stereotyped due to their NDD identity – might contribute to internalizing problems. Validated self-report measures include the Stigma Consciousness Questionnaire – Learning Disabilities, which assesses stigma consciousness, and the Behavior Assessment System for Children, Third Edition, which evaluates internalizing problems. Data collection for this project is ongoing. The current sample includes 49 children (57.1% female; Mage=12.24 years, SD=1.09), all diagnosed with an NDD (12 SLD, 15 ADHD, 22 SLD+ADHD). NDD status was confirmed through official diagnosis documentation. Descriptive statistics

and bivariate correlation analyses will be conducted. Regression analysis will be conducted with internalizing problems as the dependent variable and stigma consciousness as the independent variable. Child's sex and age will be included as covariates. The moderating effect of sex on the relationship between stigma consciousness and internalizing problems will also be examined. Results will provide insights into the mechanisms through which anticipating stigma may contribute to increased internalizing problems, such as anxiety, depression, and somatization.

Donald Lovett

NJ - The College of New Jersey

Discipline:

Authors:

Abstract Name: Enhancing the Pipeline for Undergraduate Research Participation and Prioritizing Accessibility and Inclusiveness.

The Department of Biology at The College of New Jersey (TCNJ) has a long history of student engagement in mentored undergraduate research. Over 50% of our graduating seniors have a mentored research experience. Several initiatives account for this. In addition to support of summer research opportunities by individual faculty grants, TCNJ also funds an 8-week Mentored Undergraduate Summer Experience. To attract students to mentored research, the department sponsors an annual How to Get Involved in Research Workshop. Our department exposes all students to authentic research through expanded incorporation of Course-based Undergraduate Research Experiences (CUREs) into its curriculum. Our students present their research results to fellow students in an annual campus-wide Celebration of Student Achievement. The department has been successful in attracting undergraduate students to engage in mentored research through the above initiatives, but we have been aware that the level of participation in mentored research has not been equal across the student population. Despite our previous efforts, many students have not had an understanding that they, too, could participate in mentored research. Some students have not had the social capital or the comfort level to approach faculty mentors to request that they might participate in mentored research. Furthermore, with an increase in student participation in research, we no longer have the capacity to offer experiences to all students who express an interest. To address these issues, the department adopted an on-line application process for students to participate in mentored research. This process has removed several barriers. Many students now feel that they have equal access to mentored research opportunities and that the new application process appears to be more equitable and inclusive because it either bypasses possible implicit bias by faculty mentors or it removes barriers to participation by underrepresented students.

Isabella Loxtercamp

MN - Hamline University

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: The Horse as Healer: a Sensory Ethnography of Equine Assisted Therapy

Equine-assisted psychotherapy (EAP) is the integration of horses into human healing practices. Historically horses were assumed to provide benefits primarily through riding, but as psychotherapy began leaning on them in the 1990s we saw an influx of ground-based programs. In this approach, the interactions and relationships with horses are central. This project embraces the value of more-than-human sensory

ethnography and examines ground-based EAP at a wellness center in Forest Lake, Minnesota called Acres for Life. At Acres, the horses are considered vital partners in therapy sessions. This study explores how horses and humans co-create meaning in their interactions. It is important to note that the ‘horse as healer’ philosophy is not new despite only appearing recently in scholarship. Native nations have known about the horse as a healer for far longer. This study seeks to honor Indigenous knowledge through conversation with faculty in the equine studies program at Nueta Hidatsa Sahnish tribal college in North Dakota. It draws on sensory studies, which acknowledge that humans and animals experience reality through their senses. This includes horses in a way that would not be possible if the study focused solely on interview-based methods. Data was collected through interviews with staff members, volunteers, and clients; participation in workshops and trainings; participant observation; shadowing therapy sessions; and an extensive literature review. The resulting ethnography explains the meaning-making process at Acres: beginning with intake of sensory information, then processing based on individual experiences, and finally, application of storytelling mindset for healing. This study has implications for animal ethics by attempting to know the inner experience of horses. It also has implications for empathy and understanding across differences. Finally, this study adds to a growing body of literature that honors Traditional Knowledge relating to animals as equal cohabitants in our environment.

Chang Lu

NJ - Kean University

Discipline: Computer Science

Authors:

#1 Chang Lu

Abstract Name: WiFi based human activity recognition system

Recently, device-free human behavior recognition has emerged as a prominent research area, achieving significant progress across various professional fields. Among these advancements, the rapid development of WiFi sensing has garnered considerable attention due to its potential to address complex applications. By combining WiFi sensing with deep learning methodologies, researchers have been able to tackle numerous challenges in this domain effectively. In this paper, we explore the use of Channel State Information (CSI) from WiFi systems to recognize human behavior in indoor environments. Human body movements affect wireless signal reflections, resulting in unique alterations in CSI features. This study focuses on leveraging these features to detect and classify human behaviors accurately. To accomplish this, CSI tools are utilized to collect reflected signals generated by various human activities. As raw CSI data often contains noise, we preprocess the data to filter out irrelevant information, enabling the extraction of meaningful features. Deep learning techniques are employed to classify these features, while deep learning models are constructed to improve recognition accuracy. Through these methods, human behavioral activities can be effectively identified. We conduct a series of experiments to ensure the models are trained on comprehensive datasets, facilitating robust behavior detection. The study also compares different sensing tasks, evaluating recognition accuracy, computational complexity, adaptability, and trade-offs related to model size. Furthermore, practical applications of CSI-based systems are discussed, along with critical considerations for implementing reliable behavior recognition systems. Finally, this paper addresses open challenges in behavior recognition applications based on CSI and provides suggestions for future research directions. These recommendations aim to enhance WiFi sensing capabilities and expand its applications. Through innovative use of CSI and deep learning, this paper seeks to contribute to the advancement of human behavior recognition technologies.

Kiera Luca

PA - Duquesne University

Discipline: Chemistry

Authors:

#1 Nick Frankos

#2 Jeffrey Evanseck

#3 Thomas Montgomery

Abstract Name: Utilization of density functional theory to optimize the synthesis of N-heterocycles

Computational chemistry has been used to help explain experimental results and determine further courses of action—for example, saving time and money in determining an optimal pathway for a product's synthesis. In this case, examination of the electronic energy, transition structures, and ground state energies was used to determine whether more electron-rich or electron-poor substituents were optimal in driving forward triazolidine synthesis. A wide variety of nitrogen-containing heterocycles have demonstrated bioactivity, and this compound's preliminary biological data shows high levels of cytotoxicity. Density functional theory was used to determine all energies; the density functional used was M06-2X, and the basis set used was mAug-cc-pVTZ. It was chosen for its high accuracy in organic systems.

Luisa Lucigniani

FL - Florida Atlantic University

Discipline: Business

Authors:

Abstract Name: Behind the Screen: How Personalized Ads Shape Your Social Media Experience

In today's fast-paced digital world, companies are constantly striving to capture attention through personalized and generalized forms of advertising. As we dive deeper into the social media era, understanding people's perspectives on these approaches has never been more crucial. Specifically, I'm interested in studying Americans' views on the privacy concerns and user experience of personalized advertisements. Prior to this study, I had hypothesized that female respondents would have a higher frequency of encountering personalized advertisements compared to males, and that female respondents would also purchase from personalized ads more often than males. In order to test the hypotheses, I wrote a 16-question survey and used the platform Amazon mturk to collect 228 completed surveys. I then used IBM's SPSS to analyze the results. Interestingly, the results from the survey yielded some unexpected and significant insights. While I expected that females would be presented with more personalized ads than males which was found to support my hypothesis, it was surprising that my second hypothesis was contradicted by the data showing that males actually purchased statistically more than females at the one percent level of significance. For companies, this finding could implicate a shift in marketing strategies, potentially redirecting their focus towards male consumers in order to maximize profitability.

Anna Ludbrook

MN - Hamline University

Discipline: Chemistry

Authors:

#1 Anna Ludbrook

Abstract Name: System Suitability Assessment of Ciprofloxacin Analysis by HPLC at Hamline University

Medication health fraud, when medications are being marketed with false and misleading information, has become a serious concern in lower-income countries. To assist with this issue, the organization Distributed Pharmaceutical Analysis Lab (DPAL) partners with the World Health Organization and academic institutions across the United States to perform drug quantifications on suspect medications from countries such as Kenya, Uganda, and Nepal. This work describes the first stage of a two-stage system suitability assessment of the DPAL method for analyzing ciprofloxacin, an antibiotic, at Hamline University which will enable future analysis of drug samples. The first stage of system suitability assessment entailed validating the performance of a high performance liquid chromatograph using a certified reference standard. For our analysis, we used isocratic reverse-phase high performance liquid chromatography with a C18 stationary phase and a mobile phase composed of acetonitrile and buffer in a 135:865 ratio, where the buffer consisted of 0.29% v/v phosphoric acid in water, pH 3. A series of assessments were performed to determine the precision, accuracy, and range. A calibration curve for ciprofloxacin was created and the linearity, limit of detection, and lower limit of quantification of the method were determined. In addition to these tests, a control chart was developed to determine the stability of ciprofloxacin at room temperature, which was found to be five weeks. All acquired data fell within the acceptable range that is set by DPAL. The results of this project have enabled us to progress to phase two of testing, involving the assessment of matrix effects and performing a spike recovery. Upon success, we will begin sample analysis of suspect ciprofloxacin tablets to ensure they are safe for public consumption.

Taylor Ludvigsen

WI - University of Wisconsin-Eau Claire

Discipline: Education

Authors:

#1 Taylor Ludvigsen

#2 Ella Williamson

Ella Williamson

Abstract Name: The Role of Middle School Mentor Teachers in Fostering Relationships with Teacher Candidates

Middle school teaching presents unique challenges that require teacher candidates (TCs) to develop specialized skills in classroom management, adolescent engagement, and curriculum adaptation. Mentor teachers (MTs) in middle schools are critical in developing TCs' ability to navigate these nuances. However, little is known about how middle school MTs prioritize, perceive, and foster relationships with TCs during their field experiences. This study focuses on middle school MTs within local school districts, addressing (a) the extent to which they prioritize their relationships with TCs, (b) their expectations and assumptions about mentoring relationships, and (c) the strategies they use to cultivate meaningful connections. This research employs a comparative case study design within a constructivist framework, using semi-structured interviews to explore middle school MTs' mentoring practices. Thematic coding will be applied to determine patterns and align findings with existing literature on effective mentorship. Middle school MTs face the dual challenges of managing a dynamic educational environment and mentoring TCs, making this study critical for understanding how to optimize these relationships in this context. By focusing on the mentoring dynamics specific to middle school MTs, this study provides actionable insights for enhancing teacher preparation programs. The findings aim to inform policy and practice, offering resources and strategies that empower middle school MTs to support TCs effectively, fostering their professional growth and readiness to succeed in diverse classroom settings.

Ava Luedtke

WI - University of Wisconsin-Milwaukee

Discipline: Nursing and Public Health

Authors:

#1 Jessica Nelson

Abstract Name: Oral Histories on Local Nurses

Many people have an eye-opening moment in their childhood that inspired a career in the medical field, whether they were influenced by a family member in that profession or clarity in high school. Oral histories involve conducting interviews with individuals to gather their personal accounts and insights regarding their life experiences or specific historical events. The proposed research question is: How are oral histories used to show patterns in nursing through time? Conducting an oral history requires audio and video equipment for the recording aspect of an interview. After an oral history is completed, time is spent transcribing the interview. Transcription is the process of converting spoken language into written words. All documentation will be preserved for future research within the University of Wisconsin-Milwaukee Archives. The University of Wisconsin-Milwaukee College of Nursing has their own museum of nursing, which contains nursing tools used from WW1 to the different pins from graduated nurses. Understanding nursing history over hundreds of years allows people to better comprehend nursing. For oral histories in this project, a nurse within the Milwaukee community is asked to share their life (education and career) guided by an interview of questions. An example question could be, "How did technology change from the start to the end of your career?" Currently eight oral histories have been conducted and the aim for the following year (2025) is to conduct eight more. The overall significance of completing oral histories on nurses within the Milwaukee community is that it will give people the resources to connect nursing experiences over time, similarities or differences in nurses' personal and work lives. Along with this, research will bring more attention to the UWM Center for Nursing History, publicizing nurses' influence in health care.

Joseph Lusby

MD - Naval Academy

Discipline: Chemistry

Authors:

#1 Joseph Lusby

Abstract Name: Synthesizing Magnetic, Fluorescent, and Biocompatible Nanoparticles for the Purpose of Starfish Larvae Digestive Tract Imaging

In the world of innumerable nanoparticles, iron oxides have held a special place due to their versatility in many unique properties such as magnetic, fluorescent and biocompatible properties. Of all these qualities could be applied to a nanoparticle of less than 100 nm, then those would be used to map the digestive tracks of star fish larva. This magnetic property allows selectively view of a single larva while fluorescence allow to map the evolution of organic materials that is used as nutritional source for developing these invertebrates. Our work starts with determining methods used to synthesize and collect microwave-assisted iron oxide nanoparticles. We focus on a variety of nanoparticles which were synthesized by using polyethylene glycol (PEG), β -cyclodextrin, water, and ammonia. The nanoparticles are characterized using Fourier-transform Infrared Spectroscopy, Transition-Electron Microscopy, and Raman Spectroscopy to further narrow down their unique physical properties before introducing these to the star fish lave.

Carlos P. Luzuriaga

FL - Florida International University

Discipline: Chemistry

Authors:

#1 Carlos Romagosa

#2 Thirunavukkarasu Annamalai

#3 Yukching Tse-Dinh

#4 Joongho Moon

Abstract Name: Investigating Antimicrobial Efficacy and Applications of Carbamoylated Guanidine Modified ϵ -Poly-L-lysine Biopolymer Compounds

The problem of antimicrobial resistance has been an increasing concern for the health and scientific communities for several years. As the availability of complex antibiotics increases, so does the emergence of resistant bacteria known as "superbugs." This research is adding on new systems that can inhibit the growth of antimicrobial-resistant germs through specialized compound modifications. One such compound is ϵ -Poly-L-lysine (ϵ -PLL), a natural peptide commonly known for its biocompatible, biodegradable, and antimicrobial properties, as well as for its applications as a food preservative. Although the active antimicrobial activity of this polymer is well documented against bacteria and plant pathogens, as research progresses, newly edited ϵ -PLL compounds have emerged which seek to enhance various applications, such as protein delivery, anticancer agent enhancers, and drug delivery. Due to the polymer's biocompatible properties, edited ϵ -PLL compounds were synthesized with different ratios of phenyl-, naphthyl-, anisole-, and nitro- carbamoylated guanidine monomers by FIU's Dr. Joongho Moon laboratory. Furthermore, through previously recorded unedited ϵ -PLL testing, moderate antimicrobial activity was observed, which led to the hypothesis of increased levels of antimicrobial activity for the modified ϵ -PLL compounds. This research tests the variations of the modified ϵ -PLL compounds for antibacterial effectiveness as well as each monomer unit of the polymer through Minimum Inhibitory Concentration (MIC) assays against *B. subtilis*, *E. coli*, and *M. smegmatis*. The importance of modified ϵ -Poly-L-lysine compounds is justified, as the effective development of these can aid in identifying promissory concentrations and possibly enabling targeted delivery of antimicrobial products to specific sites. Through our research, we aim to provide valuable insights that could advance therapeutic interventions against resistant microorganisms.

Steven Lycans

KY - University of Kentucky

Discipline: Engineering

Authors:

#1 Rick Honaker

#2 Yucel Ozsoy

Abstract Name: Unlocking Potential for HydroFloat™ Technology: Collector Screening for Enhancing Coarse Particle Recovery

The advancement of HydroFloat™ technology represents a major breakthrough in mineral processing industry, especially in coarse particle flotation, pushing the boundaries of the "Elephant Curve" limitations. This cutting-edge technology has brought significant improvements to mineral separation by enhancing the recovery of valuable minerals from larger ore particles. Despite these advancements, its full potential has yet to be fully harnessed. A key to its success is rooted in the chemical principles of the flotation process, particularly the types of collectors used and their adsorption mechanisms. Enhancing these chemical

interactions has the potential to greatly improve the performance of HydroFloat™ technology. This research highlights the impact of dithiocarbonate (DTC) and dithiophosphate (DTP) collectors, which are commonly employed to boost the flotation efficiency of sulfide minerals. To explore their potential for enhancing flotation performance, eight distinct DTC and DTP collectors, developed and produced by Syensqo, were selected, each featuring unique chemical structures and varying carbon chain lengths. The methodology consisted of controlled flotation tests in which both the type and dosage of collectors were adjusted to evaluate their effects. The primary goal is to boost recovery rates and selectivity in coarse particle flotation by refining the chemical interactions between the mineral surfaces and these collectors. The findings from this research will provide insights into how variations in collector chemistry could influence flotation outcomes. This exploration into the chemical nuances of flotation collectors is poised to contribute valuable data to the field, possibly leading to more effective collector designs tailored for specific mineral types and conditions, thereby enhancing the capabilities of HydroFloat™ technology.

Parker Lynch

OK - University of Central Oklahoma

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Parker Lynch

Abstract Name: Examining Women Pirates During the Golden Age of Piracy and How Sexism Influences History

The recollection of the Golden Age of Piracy (~1650-1730) is viewed as a time of seafaring escapades. The major retellings of this era often recount tales of men navigating the sea in search of adventure. Historically, the lives of women in relation to piracy has been erased from the narrative, their influence during this swashbuckling era has been incessantly disregarded. This researcher seeks to understand the historical and modern influence that sexism has in creating the lens we view female pirates through. By deeply examining the lives of Captains Zhang Yi Sao, Anne Bonny, and Mary Read, and analyzing historical data found in Captain Charles Johnson's primary source *A General History of Pyrates* (1724), the researcher intends to answer the question: What lives did women lead during Golden Age of Piracy, and how has sexism impacted their legacy? This analysis will uncover the complex lives that women lead throughout the Golden Age of Piracy, while also explaining how deeply ingrained sexism is in the recounting of historical periods. The researcher will also explore the modern influence of sexism by analyzing the legacy of female pirates and their depictions in media. By explaining the reasons why female piracy is erased from history, the researcher will emphasize the importance of women's roles in history across all fields of study. In doing so, the researcher will educate those unaware of female pirate Captains and crew members, and the broader historical context of women's lives throughout this age, while affirming the relevancy of discussing minority representation within academia.

Callie Lynn

TX - Stephen F. Austin State University

Discipline: Biology

Authors:

#1 Rachel Moore

#2 Savannah Damiano

#3 Tabitha Gunnars

#4 Daniel Gassen

#5 Zach Yap
#6 Jamey Jacob
#7 Jason Bruck

Abstract Name: Passive Health Assessment of Sea Mammals (PHASM)

Potential anthropogenic (human-caused) stressors on marine wildlife continue to increase, yet how marine mammals fare physiologically under these conditions remains largely unmeasured. For example, noise sources may trigger a stress response in whales and dolphins, which typically causes health and cognitive deficits in other mammals under chronic exposure. Yet, we do not have data of sufficient quality to demonstrate how anthropogenic noise impacts the health of these highly protected and unique species. The objective of this project is to collect health data from dolphin blowhole mucus as animals surface to breathe using a custom uncrewed aircraft system (UAS) developed for cetacean applications. The UAS, or drone, will fly 1-2 meters above the animal and collect a blow sample as they surface to breathe. While rotary-wing drones have been used to collect samples from large whales, smaller cetaceans such as dolphins present a greater challenge for sample collection in the wild. Data from observations indicate that the use of standard commercial drones will result in inaccurate data as the system noise will likely increase stress hormone levels and chase subjects away. Furthermore, rotary wing drones are likely to blow viable samples away through downwash from the spinning blades. However, silent fixed-wing capable drones will enable accurate estimation of stress levels, pathogen load, and microbiological contaminants through the successful collection of blow samples, since dolphins should be unable to hear and see the drone based on observations mapping the dolphin field of vision as well as their sensitivity to different drone sounds. This project summarizes the design, development, and successful demonstration of the PHASM (Passive Health Assessment of Sea Mammals) UAS for the collection of blowhole mucus samples from dolphins.

Hannah Lyons

FL - Embry - Riddle Aeronautical University

Discipline: Health and Human Development

Authors:

#1 Hannah Lyons
#2 Courtney Louderback
#3 Allysa Hayden
#4 Scott Wagner
#5 John French
Courtney Louderback
Allysa Hayden

Abstract Name: Beard Length and the Efficacy of an Aviator Oxygen Mask

Facial hair is prohibited for most airline pilots because of the widespread belief that the seal on oxygen masks might be rendered ineffective, preventing aircrews from performing their duties during emergencies. Continuous oximetry recordings were made every second from 24 volunteers wearing a standard commercial airline mask in one of 3 beard conditions: no beards, short beards (< 10 mm in length) and long beards (> 10 mm in length) in a normobaric hypoxia chamber at 30,000 ft (10,000 m). Masks were worn in the chamber for about 10 minutes before being removed for about 2 minutes to experience hypoxia. Once returned to normoxia, volunteers were exposed to smelling salts held directly under the chin. None of the beard conditions differed in the time to don the masks. There were no differences in the arterial saturation percent of oxygen (SpO₂) between beard conditions for either mask-on or mask-off segments in the chamber. There were significant differences in SpO₂ comparing the mask-on segment to the mask-off segment, indicating that hypoxemic conditions would have been detected had the masks been ineffective. Using a current on-demand airline oxygen mask, SpO₂ levels were never compromised by any of the beard

conditions. Because the highly volatile smelling salts were imperceptible through the masks, smoke and other noxious irritants would not be perceived. These results support the contention that airline pilots with beards of any length would not be impaired by hypoxia or smoke while dealing with an inflight emergency.

Megan Lyons

PA - Duquesne University

Discipline: Biochemistry

Authors:

#1 David Heisler

#2 Morgan McCann

Abstract Name: Identification of Host Substrates for the Secreted Internalin Proteins from *Listeria*

Listeria monocytogenes is a widely distributed environmental bacterium that is an opportunistic, intracellular pathogen for humans and livestock. *Listeria* is commonly used as a model pathogen to better understand mechanisms of disease caused by other foodborne pathogens. Establishing a robust infection in humans requires reprogramming of numerous host pathways by *Listeria* through the expression and secretion of protein-based virulence factors. The internalin family of proteins were named after the first ones identified that initiate invasion into host cells, but there is emerging evidence that they may be important at other stages of infection. *Listeria* encodes more than 20 different internalins, all possessing a N-terminal leucine-rich repeat (LRR) domain that is required for interactions with host proteins. However, the host-interacting partners remain largely unknown. To identify these host proteins, we employed a novel system that allows for the trapping of two interacting proteins. We cloned the LRR domains of the secreted internalins into this system and then expressed, purified, and validated the activity of these new constructs. Next, we optimized conditions for the trapping system to be captured from cell lysates after reacting with host proteins that interact with the LRR domain. Finally, mass spectroscopic analysis was utilized to determine human proteins that interacted with the LRR domain. Here, we identified potential host proteins that interact with the LRR domain of Lmo2445. Future work will validate of these interactions and provide a better understanding of how this promotes *Listeria* pathogenesis.

Ellen Ma

IL - University of Chicago The College

Discipline: Sociology

Authors:

#1 Christopher Kindell

Abstract Name: From Cheap Eats to Fine Dining: Restaurants in the San Gabriel Valley as a Representation of Growing Globalization and Transnational Wealth in Asian Ethnoburbs in the Contemporary Era

Food establishments are essential to building and understanding the social and political dynamics of ethnoburbs, or suburbs mainly composed of one ethnic enclave. Immigrants and restaurants have historically depended on each other, and the availability of ethnic food continually influences immigrant life and builds community belonging. The built environment of main streets and strip malls in the contemporary ethnoburb demonstrates the centrality of restaurants in the daily lives and economies of ethnic enclaves. Existing scholarship focuses on Asian food histories in the US or Chinatowns, a more historical perspective on an urban ethnic enclave where Asian food transformed as tourist attraction fitting an American mainstream. My

study broadens the understanding of food in contemporary ethnoburbs, which is where research is lacking despite many ethnic enclaves now being situated in the suburbs. Further, previous ethnoburb research observed how ethnoburbs were formed through migration and racial politics. I will instead examine current trends in ethnic suburban neighborhoods by performing a case study of two strip malls on the same main street in the San Gabriel Valley, a large cluster of Asian ethnoburbs in Los Angeles County. These strip malls are built 35 years apart, making them a great example of a temporal change in landscape. The contrasting architectural designs and restaurant tenants exemplify how the area has changed in its spatially political and economic landscapes. Findings may be applied to other ethnoburbs across the US affected by similar forces of social mobility, transnational wealth, and racial assimilation.

Zerui Ma

TX - Southern Methodist University

Discipline: Computer Science

Authors:

#1 Michael Hahsler

#2 Peter Moore

Abstract Name: Recommender Systems for University Curriculum Advising

Effective academic advising plays a crucial role in enhancing student success, yet universities face challenges in optimizing advising processes and course enrollment. To address these challenges, recommender systems have emerged as valuable tools for automating personalized academic guidance, due to their capability in deriving recommendations in a wide range of data with only a few user entries. Universities can optimize their course planning and help students make informed decisions for their academic path with recommender systems. This research develops a novel recommender system tailored to undergraduate students, leveraging data on curriculum requirements, prerequisite dependencies, student preferences, and section availabilities. By leveraging data on course offerings, curriculum requirements, prerequisite dependencies, student preferences, section availability, and other relevant factors, this study develops a recommender system that helps universities increase student advising efficiencies and create more intuitive and student-centric curricula. We structured and processed complex curriculum data to foster an algorithm-ready environment, simplifying the relationships between degree requirements and course offerings. This study evaluates multiple algorithms based on recommendation accuracy, computational efficiency, and their ability to meet degree requirements. The system ensures students fulfill all degree requirements while fostering academic engagement. By streamlining course selection and exploring possible degree paths, it helps students graduate on time and navigate complex curricula. This research also collects important metrics to accurately predict class enrollment, enabling college departments to plan their course offerings better. The study significantly benefits university advising offices by reducing advisor workloads and encouraging student engagement, advancing the academic achievement of the entire student body.

William Maass

VA - Liberty University

Discipline: History

Authors:

Abstract Name: The Battle of Ia Drang at LZ X-Ray

The central question of this research was why the United States won the Battle of Ia Drang at LZ X-Ray in November of 1965. The Battle of Ia Drang was the first major engagement of the Vietnam War with new tactics being used on both sides that would come to define the conflict. This battle would be the first time that air cavalry was used with helicopters playing a vital role showing a change in strategy. For this examination of the battle, I looked at a wide range of primary sources in addition to some trustworthy secondary sources. The sources included were the After-Action Report on the Battle of Ia Drang and the book *We Were Soldiers Once....And Young* by Colonel Hal Moore, and Joseph Galloway. In addition to those two sources which were heavily used, I consulted interviews from soldiers who were at the battle. Initially, I used the primary sources to analyze the battle and show why the Americans were successful, then the secondary sources were used to fill in the gaps and provide more context to what happened. The United States was able to win the Battle of Ia Drang at LZ X-Ray because of overwhelming fire support provided by nearby artillery, close air support, and the bravery the men showed against a superior numerical force. While the Vietnam War would ultimately become a failure for the United States, this first major battle proved that strategies and techniques that had never been used before could be successful.

Cory Mabry

PA - Susquehanna University

Discipline: Physics and Astronomy

Authors:

#1 Cory Mabry

#2 Adam Hansell

Abstract Name: Cosmic Flux Dependence on Zenith Angle and Altitude

In the past decade, multiple near surface particle detectors have been deployed to study particle signals and flux from local sources. These detectors must regularly develop methods to precisely eliminate the background signals caused by cosmic rays. Cosmic rays consist of high-energy particles originating from celestial bodies. When these cosmic rays interact with the Earth's atmosphere, they generate secondary particles such as muons which are detectable in scintillating materials. To characterize the surface muon flux for larger experiments, our objective of this research is to measure the muon flux variation with respect to the zenith angle (the angle between the incoming muons and the vertical direction) and altitude. Our study uses the Cosmic Watch Detector Project to assemble a low-cost array of handheld ionizing radiation detection. By orienting multiple detectors to accept only coincident measurements, we select a relatively narrow range of incident muon angles one at a time. A 3D self-printed apparatus is used to hold the detectors at various zenith angles, while a control pair of detectors is used to account for time-correlated muon rate fluctuations (inter-detector inconsistencies also accounted for). This is then compared to the accepted cosine-squared model for rate vs zenith angle. In addition to measuring the angular dependence of the muon flux, we used our detectors to measure the singles ionizing radiation rate at altitudes ranging from 0 to 12,200 meters above sea level during an international flight by comparing timestamped detector data to commercial flight records. The conclusions of both studies offer useful insight on the capabilities of the Cosmic Watch detectors to measure precise information about localized radiation and cosmic ray signals in scintillator detectors.

Gabriela Macias

CO - Regis University

Discipline: Biology

Authors:

#1 Gabriela Macias
#2 Vincent Nguyen
#3 Kellan Shiffer
#4 Duyen Nguyen
#5 Thu Huynh
#6 Trinity Wright
#7 Lucas Bethany
#8 Gena Nichols
#9 Allyson Sterling

Abstract Name: Building His-tagged proteins to assess binding with Nur77, an immune cell molecule

The immune system consists of cells and proteins whose role is to protect the body against pathogens. Among these cells are T-cells that protect from diseases using a protein called the T-cell receptors (TCR), which is important for recognizing and attacking a specific pathogen. Mature T-cells must first undergo a series of steps as immature T-cells, which includes creating a unique TCR that will recognize a pathogen. Nur77 is a protein that is made in increasing amounts after the TCR binds to its target, both during T-cell development and during the function of mature T-cells. Nur77 function has been described in T-cell development, where it aids in cell death, but its role in mature T-cells is currently unknown. Therefore, previously, we used a yeast screen to discover novel protein(s) that can bind with Nur77 in T-cells, finding E2F-associated phosphoprotein (EAPP) and prefoldin subunit 5 (Pfdn5) as binding partners in that assay. To confirm these proteins physically interact with Nur77, we aimed to create versions of the proteins tagged with Histidine to isolate the protein from all other proteins in bacteria. After protein isolation, physical interaction between Nur77 and EAPP or Pfdn5 can be assessed using a pull-down assay. We also aimed to create CD5 as a negative control for binding with Nur77 in this assay. Creation of the His-tagged proteins is ongoing after presenting multiple challenges during the creation of the correct DNA. Confirming interactions with Nur77 will pave the way for future studies examining the impact of these interactions on T-cell function, expanding our understanding of the immune system responses to different pathogens.

Cassandra Macias

CA - California Lutheran University

Discipline: Environmental Science and Sustainability

Authors:

#1 Robert Dull

Abstract Name: Evaluating the California Fire Gap through High Energy Sedimentary Deposits in the Carpinteria Salt Marsh

The Thomas Fire of 2017 burned 281,893 acres in Santa Barbara and Ventura Counties, and the subsequent winter rains of 2018 resulted in numerous mass wasting events (debris flows, mudslides, etc.) emanating from the many streams that descend from the Santa Ynez mountains to the coastline. The Carpinteria Salt Marsh is a rare sedimentary archive of past environmental changes, including wildfires, storm events, droughts, and floods. A 1.5-meter sediment core was extracted from the southern-central basin of the existing marsh in December 2022. One radiocarbon date was collected yielding a modern date of 1954 +/- 1.0 C.E. High-energy deposits, such as sand layers, have been identified in core samples. The origins of these deposits are speculated to be from one of two sources: (1) marine sands washed over the marsh during ocean storms or (2) sediments of terrestrial origin deposited on the marsh as flood deposits during winter precipitation events. Our hypothesis is that some of these high-energy deposits originate from mass wasting events following large wildfires such as the Thomas Fire. Results reported provide a high-resolution record of macroscopic charcoal analysis, aiming to identify the historic fire gap resulting from 20th-century fire suppression, as well as discrete wildfire deposit horizons associated with known historical wildfire events. Five distinct ecological

zones are identified in the 1.6-meter core. Two significant declines in macroscopic charcoal at 94 cm and 64 cm may represent the post-1850 fire gap identified elsewhere in California (Fig. 1). These drops coincide with declines in % organics and magnetic susceptibility (Fig. 1). Future work will focus on establishing chronology using radiocarbon dating and analysis of sediments from a longer core (2.4 meters) collected on June 9, 2023.

Lydia Mack

WI - University of Wisconsin-La Crosse

Discipline: Biology

Authors:

#1 Lydia Mack

Abstract Name: Prevention of Cold Induced Apoptosis in Platelets of Human and 13-lined Ground Squirrels

Platelets are small cells central to our body's defense mechanism against a broad range of ailments. Arguably, their most notable contribution being the ability to induce blood clotting. This ability can be applied in healthcare settings with platelet transfusions which can treat a broad range of patients from those with platelet deficiencies to individuals going through highly invasive surgeries. However, these advantages are hindered severely by the inefficiencies revolving around our current platelet storage conditions. When platelet donations are stored at cold temperatures (4° C), they go through apoptosis (programmed cell death), meaning when they are transfused into the recipient, the platelets are rapidly cleared from the blood stream and provide little benefit. Conversely, when they are stored at room temperature, bacterial growth renders them unusable after three days. However, species of hibernating animals seem to avoid this phenomenon entirely during their prolonged periods of torpor. Specifically, the 13-lined ground squirrel (*Ictidomys tridecemlineatus*). When their platelets are brought back to room temperatures, they are recirculated and function as normal, making them an idea model organism. To determine if there is a component in ground squirrel plasma that functions protectively, both human and squirrel platelets were mixed with human and squirrel plasmas and stored under cold conditions. To measure apoptosis, Annexin binding and flowcytometry were used. The results suggest that there may be a protein in squirrel plasma that gives some resistance to cold storage in platelets. This could lead to improvements in human platelet storage in the cold.

Jabez Mackey

TX - Midwestern State University

Discipline: Engineering

Authors:

#1 Jabez Mackey Mackey

#2 Taikoran Phillips

#3 Taylor Robinson

Abstract Name: The effectiveness of surfactant/alkaline on enhanced oil recovery(EOR) on a mature reservoir

When oil wells get low oil introduce Enhanced Oil Recovery methods to increase oil recovery from mature reservoirs. A chemical called Surfactant/Alkaline can be used to change wettability of the rock and to extract more oil from those reservoirs. The purpose of this work is to understand the effectiveness of a surfactant/alkaline on enhanced oil recovery (EOR) on a mature reservoir. The aim is to find out how different concentrations of surfactants/alkaline change the wettability of mature reservoirs. The approach for

this project is to saturate a core sample 100% with oil and then put it into an Amott Cell with a surfactant/alkaline solution. Core samples were collected from different locations. We confirmed our work results that the permeability of the core samples and enhanced oil recovery has a directly proportional relationship. We see this in both the mineral oil and crude oil. We found out that Surfactant concrete yields a higher oil recovery percentage than Surfactant Gro. This was true in both mineral and crude oil. surfactants and alklines seem to have a positive effect on enhanced oil recovery on a mature reservoir.

Kayla MacKinnon

PA - Villanova University

Discipline: Environmental Science and Sustainability

Authors:

#1 Kayla MacKinnon

Heith Turner

Sade Santana

Abstract Name: The Value of Peer Mentorship in Diversifying the Geosciences: Lessons Learned from the Villanova Environmental Geochemistry Summer Institute

The geosciences are one of the least racially and ethnically diverse STEM fields. However, the geosciences are uniquely positioned to address issues of environmental injustice, such as disproportionately high levels of soil, water, and air contaminations in disadvantaged urban communities. Additionally, increased diversity in the geosciences would lead to more inclusive decisions. The Villanova Environmental Geochemistry Summer Institute (VEGSI) is a partnership between Villanova Department of Geography and the Environment and the Walter B. Saul High School in Philadelphia, P.A; a school with ~80% of children below the poverty line and about 85% from underrepresented minority groups (URM). In Summer 2024, the VEGSI program hosted 10 high school students from Saul High School to carry out experiments documenting the disparities in pollution exposure along the Cobbs Creek watershed, from the wealthy and predominantly white suburbs to the predominately black communities in West Philadelphia. As undergraduate peer mentors, we assisted three student cohorts (soil, water and air teams) with their investigations, which consisted of soil core collection, air pollution monitoring, and plastic waste collection. We also assisted the three cohorts with mapping and graphing their data using ArcGIS Pro and Excel, respectively, and presentation of their results to the City of Philadelphia Environmental Justice Commission. As part of this presentation, we share our reflections on serving as peer mentors and the effectiveness of the program.

Sara MacMurdo

PA - Westminster College

Discipline: Biology

Authors:

#1 Joshua Corrette-Bennett

Abstract Name: The effect of β -hydroxy β -methylbutyrate (HMB) on rates of axolotl limb regeneration and digit formation

Ambystoma mexicanum (Mexican axolotl) is one of few organisms able to complete scar-free wound healing and produce a functional limb, making them a very useful model organism for studying these two processes so we can apply what we learn to both human and mammal wound healing and tissue regeneration. The

specific aim of this study is to determine if HMB affects axolotl limb regeneration and digit formation. HMB is naturally secreted in humans by the liver but is also used as a supplement for muscle growth and repair. We predict that HMB will increase the rates of wound healing and limb regeneration, and as the concentrations of HMB increase, the rates of healing and regeneration will increase. Post amputation, axolotls were injected with a high or low concentration of HMB or a saline control on days 0 and 27. Pictures were taken of the limbs every three days for two months and measured using ImageJ software. The measurements for each treatment group were averaged and compared to the other groups using graphical and statistical analyses. While we did observe a difference between the control and treatment groups, the results were unexpected because both treatment groups showed significantly slower rates of healing and repair than the control. The significance of the data was assessed using a one-way ANOVA.

Megan MacWade

DE - University of Delaware

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Angela Hattery

Abstract Name: Identifying and Documenting the Long Term Impact of Brain Injury on the Health and Well-Being of Black and Latina Women Survivors of Intimate Partner Violence: A Systematic Review

Intimate partner violence (IPV) affects an estimated 1.5 million U.S. women annually. Survivors of intimate partner violence may experience traumatic brain injury (TBI) as a result of a current or former partner's abuse. Traumatic brain injury can have long-lasting impacts on everyday life. This systematic literature review looks at the linkage between IPV and TBI, as well as identifies four long-term impacts: (1) Central Nervous System (CNS) impacts, (2) cognitive impacts, (3) poor health impacts and (4) mental health impacts from 77 articles. To be included the articles needed include the following criteria: (a) be published after the year 1990, (b) they needed to include information about traumatic brain injury (TBI), (c) only articles that focused on intimate partner violence or domestic violence as a source of TBI were included, (d) articles were included only if they focused on the population of interest for this research: Black women or Latina women and (e) in order to be included in the analysis, articles had to fall in the category of an empirical study, a systematic review or a scoping review to be included. In addition, the analysis reveals that a significant obstacle to research at the intersection of TBI and IPV is the lack of consistent, agreed-upon measures of concussions and TBI. The literature on the TBI impacts among Black and Latina women who have experienced IPV is incomplete and the analysis in this paper is a contribution towards understanding this phenomenon and fills an important research gap.

Helen MacWilliams

IN - Valparaiso University

Discipline: English and Literature

Authors:

Abstract Name: "The Body of His Friendship": Harmful and Healthy Masculinity in the Friendships of William Banks in *To the Lighthouse*

Much of Virginia Woolf scholarship focuses on the damage of gender roles on women and their relationships, with little emphasis or acknowledgement on her thoughts on men and male roles. She does, however, write

regarding both. This paper examines how gender roles shaped the success or failure of the friendships between William Banks and the characters of Mr. Ramsay and Lily Briscoe in *To the Lighthouse*. The generational aspect of the novel lends itself to a comparison of Victorian and Modern gender roles and expectations. By examining Ramsay, Banks, and Briscoe within the context of these roles and expectations, it becomes clear that for Woolf Victorian gender standards impede the creation of deep friendships. In both the Modern and Victorian era, marriage was a priority for both men and women. Mr. Ramsay embodies a male gender norm, serving as the provider and “superior” in his marriage. He prioritizes this over developing an emotionally deep friendship with Banks. At the same time, Ramsay is stuck in the past, choosing to repeat his past successes in this role instead of pursuing a satisfying reciprocal friendship. Briscoe, conversely, has no interest in a marriage deemed necessary by societal norms. She is radically self-sufficient. As a result she is able to have a rich friendship with Banks. Banks himself is a widower, also unimpeded by gender norms, allowing him to pursue deeper friendships that exceed those norms. Banks and Briscoe embody Woolf’s idea of an “androgynous mind” from *A Room of One’s Own*. Ramsay lacks this androgynous mind. However, he is able to approach this state by the end of the novel after the death of his wife, showing a newfound potential to create true reciprocal friendships.

Paul Madany

CA - University of California - San Diego

Discipline: Psychology

Authors:

#1 Paul Madany

Abstract Name: Understanding Belonging Through the Provision of Mutual Value

The concept of belonging has emerged as a topic of increasing importance as studies have identified academic and wellbeing-related effects associated with its presence or absence, among others. Despite this, reviews of the literature find that the concept remains ambiguously defined. This research aims to determine the specific mechanism by which one experiences a sense of belonging. Based on “the lost European explorer experiment,” in which an explorer with ample resources struggles to survive in an unfamiliar habitat without the help of natives, this paper proposes that “belonging” is an evolutionary cue that one can make valuable contributions to a group, gaining survival benefits as a result. Thus, this paper hypothesizes that one’s sense of belonging is the subjective feeling of being valued by a group that they themselves value. To test this hypothesis, participants from a UC San Diego SONA pool will be given a validated questionnaire, such as Glenn Malone’s General Belongingness Scale, with two added items: first to consider a group to which they feel they belong, then (1) to indicate the degree to which they believe they provide value to the group and (2) the degree to which they feel the group provides them with value. We expect that participants will report higher feelings of belonging when they report highly on both items. If we find these results in a questionnaire study, we will further explore this hypothesis in an experimental setting, in which a group of confederates and a participant work on a task they both value. By design, they will be able or unable to help one another such that the requirements for the hypothesis are met or not in the four different possibilities. A questionnaire could then be used to measure belongingness. If successful, this research could serve to clarify this ambiguous topic.

Elisabeth Madany

CA - University of California - Riverside

Discipline: Biology

Authors:

Abstract Name: DNA Barcoding Using the 16S Gene to Identify Fish Fraud

ABSTRACT According to a report published by Oceana, “Deceptive Dishes: Seafood Swaps Found Worldwide,” about 1/5 of sold seafood is mislabeled as a different species. The goal of my project was to investigate possible species mislabeling by using molecular biology techniques. DNA was extracted from a small piece of fish sold as mahi-mahi. Following the extraction, the 16S mitochondrial ribosomal RNA gene was amplified by PCR before undergoing gel electrophoresis. It was then sent out for nucleotide sequencing. After running the Sanger sequence through the NCBI Basic Local Alignment Search Tool (BLAST), the genus and species of the fish was determined as *Coryphaena hippurus*. This scientific name was run by FishBase, which confirmed its common name as mahi-mahi, proving it was accurately labeled. In summary, this DNA barcoding technique is a valid scientific method to fight fish fraud and ensure correct labeling of the species.

Gillian Madden

NY - Long Island University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: “Everybody Is a Teacher, Every Place Is a School”: Empowerment through Women-Centered Space at the PKP Community Centre in Bali, Indonesia

Women across the world remain at a disadvantage economically, socially, and politically as a result of oppressive patriarchal structures that allow men to dominate in both private and public spheres of life. In order to investigate ways in which women-centered community spaces provide alternatives to these structures, this transdisciplinary-informed qualitative research project was conducted at the Pusat Komunitas Perempuan (PKP) Community Centre in the Selasih Banjar north of Ubud, Bali, Indonesia. This case-study sought to answer the question: How does the PKP Community Centre's intentional women-centered community space empower local women? The data were collected over a three-month period from September to November 2024 through participant observation and semi-structured interviews in Indonesian with the women (Ibu-Ibu) who work at PKP. Interactions and data-gathering with participants were informed by decolonial prerogatives of respect, relationships, and reciprocity through trust-building, as well as feminist social constructionism theory. The data showed that, across the board, the Ibu-Ibu have a strong desire for more education, something that they feel PKP offers in part through experiential learning of practical job skills, English practice, confidence building, and emotional resilience. The participants also expressed feelings of isolation, lack of self-confidence and financial struggles before finding PKP where they now feel more empowered in those areas. Additionally, it was made clear that having a community of peers who share similar life experiences improves overall happiness and wellbeing for the Ibu-Ibu. This empowerment allows for them to take better care of themselves and their children, make better contributions to their Banjar (neighborhood), and break generational cycles of hardship. Overall, this research demonstrates that creating space that prioritizes women is beneficial not only to them as individuals but also to their families and communities. Empowering women through women-centered spaces opens new opportunities to establish social, political, and economic gender equality.

Chandler Maddox

KY - University of Kentucky

Discipline: Health and Human Development

Authors:

#1 Alyssa Franklin

#2 Pavel Yanev

#3 Anthony DeSana

#4 Ann Stowe

#5 Kathryn Saatman

Abstract Name: B Cell Counting using HALO Software after Traumatic Brain Injury in Mice

After a traumatic brain injury (TBI), blood cells that are usually blocked by the blood-brain barrier are able to enter the brain. It is understood how several of these cell types interact with neural tissue, but the B cell response is not well documented. B cells are one type of lymphocyte known to produce antibodies and secrete cytokines. These B cell functions have the potential to modulate the inflammatory response after a TBI and affect healing outcomes. While B cells have been localized to the brain after a TBI, the temporal and regional characteristics of their infiltration into the brain are not well understood. We hypothesized that B cells would infiltrate in a delayed manner. To quantify the B cells an automatic counting algorithm was developed. Mouse brain tissue (n=6-8 TBI, n=4 sham/timepoint) collected at 1, 3, 7, 14, and 28 days post-TBI was used to perform immunohistochemistry for the B cell marker B220. Hemotoxin and Eosin staining was applied to visualize regions of hemorrhage to be excluded from the counting algorithm. HALO imaging software was used to demarcate areas within the cortices. Then, an automated counting algorithm was developed to mark each B cell. Though many iterations of the automated counting program were generated, they routinely reported excess counts that did not align with B220 staining. Therefore, manual B cell counts were completed, compared to the automated counts, and were found to be more accurate. The manual counts revealed B cells to be most prevalent at 7 days post-injury. Future studies will phenotype the B cells to better understand their role in the inflammatory response.

Suraj Madhav

CA - Branham High School

Discipline: Engineering

Authors:

Yagnik Chilamakuri

Venkat prasanna Kumar

Abstract Name: Temperature Predictions using Ansys for a Water Cooled Photovoltaic Solar Panel

Cooling solar panels improves their efficiency and lifespan, as high temperatures negatively impact their performance. Thermal cycling is the primary cause of degradation in solar panels. The hypothesis is that by incorporating a closed-loop water cooling system with a solar panel will reduce its surface temperature which may enhance its efficiency. In order to predict the solar panel's surface temperature, Ansys modeling was conducted on a solar panel from SunPower (E 19/320 PV: 200W) with the option of passive cooling using water channels under its surface. The modeling of the system was conducted by SolidWorks and simulated with Ansys Fluent Fluid Analysis to compare with our previous experimental data and test performance at various conditions. The focus was on optimizing flow rates, material selection, and design geometry for maximum thermal efficiency. A steady-state heat transfer model was combined with a laminar fluid flow analysis, considering the relationship between coolant flow rate and panel temperature reduction. The solar panel was subjected to a simulated heat flux of 800 W/m², while water served as the coolant with varying flow rates (0.5–2.0 L/min). In addition, the experimental work also tested a cooling system for a solar panel. A 42% reduction in surface temperature (52°C to 30°C) and an 8% increase in panel efficiency was found. The water's outlet temperature peaked at 50°C, making it suitable for domestic applications. The heated water was

passed through a heat exchanger to reduce its temperature for the closed loop operation in the system. The next phase is to compare these results with the experimental data at identical operating conditions. The computational work is still in progress for various operating conditions and full results along with a detailed discussion will be included in the final presentation.

Rajesh kumar Madhavan

MI - Wayne State University

Discipline: Biology

Authors:

#1 Ahmad Faryami

#2 Pranav Gopalakrishnan

#3 Shaheer Ajaz

#4 Nathan Tappen

#5 Carolyn Harris

Abstract Name: The effects of architectural modifications on resistance to fluid flow in ventricular catheters

Introduction: Although various ventricular catheter designs have been implemented into routine practice, there exist few standardized studies to evaluate relative outflow resistance and the impact these design modifications have to overall shunt performance. This study aims to fill this gap by systematically investigating the impact of various architectural modifications on catheter performance, with a particular focus on bulk flow dynamics and biological outcomes. Methods: Catheters manufactured utilized a novel catheter production setup with 16 variations from standard catheters including but not limited to changes in hole number, hole dimensions, hole displacement, and catheter lumen dimensions. These catheters were tested in a validated in-house ventricular catheter testing device to analyze the resistance to flow (indirectly measured as time elapsed for a set volume of fluid to pass through the catheter). A separate group of catheters, varying in lumen diameter, was tested in a fluid flow model that simulated early blood exposure following signs of blood in the ventricles. Results: With increasing hole and lumen diameter, we found a significant decrease in catheter resistance using DIH20 ($P < 0.05$). Blood-assays for varying lumen diameters showed a significant decrease in blood-particulate obstruction as the diameter increased ($P < 0.05$). Lumen obstructions showed considerable evidence of increasing resistance as obstruction diameter increased ($P < 0.05$). However, row and segmental occlusion of lateral holes showed minimal difference in time elapsed ($P > 0.05$). Conclusions: This study implemented a novel method of catheter manufacturing to systematically produce ventricular catheters with varying architecture. By testing variables independently, we found that catheters have an overall bulk relative resistance, with the most significant shift being caused by shifts in lumen dimensions. In addition, blood has a higher propensity to obstruct catheters of a smaller diameter. From these experiments, we can begin to understand the fundamental effects of catheter geometry on resistance in-vitro.

Joshua Madison

NC - Western Carolina University

Discipline: Engineering

Authors:

#1 Matthew Clontz

Abstract Name: Analysis of Natural Frequencies and Mode Shapes of a Mountain Bike Test Stand Using

One of the biggest hurdles in dynamics and vibrations testing is the development of an appropriate test fixture. In particular, test fixtures need to provide specific mounting capabilities while not interfering with natural frequencies of interest of the test specimen. Previous research suggests that frequencies of a mountain bike system can reach up to 60 Hz. An existing test stand which was used in house for previous experiments meets mounting requirements for a mountain bike. However, upon visual inspection during preliminary tests runs, it appears that the fixture may have natural frequencies which conflict with the current range of interest. To verify and further support these visual inspections, the entire test stand was modeled in Creo Parametric. One challenge which arose in the development of the model was the behavior of the vibration isolation feet which were mounted to the structure. By making some simplifying assumptions, an equivalent model was created. Using Creo Simulate, modal analysis was performed which appears to match the actual behavior of the test structure. Experimental modal analysis was then performed on the actual test fixture in order to validate the results of the simulation. These experimental results confirmed the mode shapes observed in Creo and the approximate natural frequencies associated with those shapes. These results showed that the current test fixture does indeed have natural frequencies which would interfere with the testing and measurements of the mountain bike dynamics. The interference confirmed by the experimental results highlights the need for future work to develop a new test stand which meets both mounting and natural frequency requirements.

Paolo Madrigal

CA - California State University - Fullerton

Discipline: Engineering

Authors:

#1 Pratanu Ghosh

#2 Sushant Chaudhary

#3 Ha Le

Abstract Name: Influence of Temperature and Other In-Situ Parameters on Concrete Resistivity on Various Service Life Models of HPC Bridge Decks

Past research indicates a correlation between concrete electrical resistivity and its vulnerability to corrosion, a destructive chemical process that deteriorates reinforcements, resulting in compromised concrete bridge decks. Strong relationships between resistivity and corrosion make it possible to more accurately predict and calculate concrete bridge deck service lives through resistivity measurement. Based on this concept, this project continues past experiments that predicted service life by measuring the variation of concrete resistivity across several concrete cylinder samples made using different cementitious material combinations according to ASTM specifications. The considered combinations include materials such as metakaolin, zeolite, and silica fume. This project replicates previous experiment test setups but goes into more detail by considering how temperature, humidity, and other in-situ parameters affect previously calculated bridge deck service lives. Multiple concrete cylinders for several mixture designs will be prepared and tested for surface resistivity using a Resipod Concrete Resistivity Meter; additionally, bulk resistivities will be determined using Merlin Meter with a constant 325 Hz frequency and an RCON testing system at 1 kHz frequency. In addition, analyses will be carried out using a Concrete Maturity Meter. Service life will be computed based on Fick's 2nd Law of Diffusion; in addition, aging factors for the diffusion coefficient based on past research will be applied for enhanced service life accuracy. While past research compared these results with existing service life modeling software, namely Korozeeneck and Life365, this project expands the comparison by considering results computed by ATENA 2D modeling software. Based on previous results, it is expected that zeolite-based mixes will exhibit the best performance. Ultimately, the project's goal is to analyze measurements to derive and propose a modification factor that will be incorporated in the determination of concrete bridge deck service lives for more accurate service life prediction.

Aeelyn Magallanes Tristan

IA - Iowa State University

Discipline: Psychology

Authors:

#1 David Vogel

Abstract Name: The Effects of Stigma (Independent and Interdependent) and Familism on Mental Health Help-Seeking in Latino/s Communities.

Current research communicates that Latinos are less likely to seek formal mental health services. Compared to white populations, Latinos have been found to avoid treatment of mental health due to the stigma surrounding it. Although research has talked about an independent view of stigma of seeking mental health treatment (e.g., “I will be perceived as lazy if I seek help”), there is not sufficient evidence of how this affects Latino populations. There is also a gap in how interdependent stigma (e.g., “My family will be viewed negatively if I seek help”) relates to help-seeking attitudes and intentions in Latino populations given the collectivism cultural values of preserving family connections. Having a traditional cultural value of familism, Latinos may tend to rely on family for support making them less likely to seek formal mental health services. We hypothesize independent stigma, interdependent stigma, and familism to be negatively correlated to attitudes towards help-seeking. In addition, we expect links between interdependent stigma and attitudes to be stronger for Latino/a individuals than for white individuals. Data will be collected from an online research platform (Prolific) where participants (N=1250) will complete measures of independent stigma, interdependent stigma, familism, and mental health seeking attitudes. Data will then be analyzed by multiple regression analysis to examine the links between measured variables and the potential moderating effects of race/ethnicity and familism on the links between interdependent stigma specifically on attitudes. Results should provide information to allow mental health providers to provide more culturally-informed access to mental health services within the Latino/a community.

Jonathan Magdy

TN - Middle Tennessee State University

Discipline: Chemistry

Authors:

#1 Kevin Bicker

Abstract Name: Lead Optimization of MTL1-44 for Antibacterial Efficacy and Cytotoxicity in HepG2 cells

Staphylococcus aureus infections, specifically methicillin-resistant S. aureus (MRSA), are becoming increasingly drug resistant. This increase in drug resistance highlights the need for alternative antibacterial treatments. While peptides serve as our body's defense mechanism, they have short half-lives due to recognition by proteolytic enzymes. In contrast, antibacterial peptoids, peptide mimics with side chains attached to the amide nitrogen (N-substituted glycines) rather than the α -carbon, are resistant enzymatic degradation, giving them significant promise as novel therapeutic agents. MTL1-44, a peptoid discovered in the Bicker Lab, has shown promising levels of antibacterial activity against S. aureus while retaining low cytotoxicity. The focus of this project is on performing lead optimization of MTL1-44 via structural modifications to improve its antibacterial efficacy. Utilizing solid-phase synthesis, a sarcosine scan is being done to better understand the structure-activity relationship (SAR) within this lead peptoid. Antibacterial activity will be evaluated through minimum inhibitory concentration (MIC), and cytotoxicity testing will be done on HepG2 liver cells. Subsequent derivatives will be created based on results of antibacterial and cytotoxicity testing of sarcosine derivatives.

Mansura Mahabub Lawal

GHA - Ashesi University

Discipline: Engineering

Authors:

Nathalie Bubune Akorfa De-Lima

Abstract Name: Design and Implementation of a Solar-Powered Automated Crop Drying Machine for Small-Scale Farmers

The central aim of this project is to design and implement a solar-powered automated crop-drying machine for small-scale farmers. Post-harvest losses in developing regions, particularly among small-scale farmers, significantly affect food security and the economic stability of these communities. Traditional drying methods are inefficient and vulnerable to weather conditions, leading to high crop spoilage rates. Current solar drying solutions often lack automation, versatility, and affordability, particularly for small-scale, rural applications. This project attempts to fill these gaps by developing an energy-efficient and automated drying system that utilizes solar power to dry a variety of crops under controlled conditions. This research is situated within the context of sustainable agricultural technology and renewable energy, addressing the urgent need for affordable, scalable solutions for rural farmers. Previous work in solar drying technologies has focused on enhancing drying efficiency and incorporating automation, but few solutions have successfully combined these with cost-effective, locally accessible designs tailored to small-scale operations. The research methodology includes the design and construction of a prototype solar dryer with key features such as adjustable temperature and humidity control, automated moisture sensing, and energy storage for operation during low sunlight. The dryer's performance will be evaluated based on its drying efficiency, energy consumption, and ability to maintain optimal conditions for a range of crops. The expected results are a reduction in post-harvest losses through more efficient drying, enhanced crop quality, and improved

economic viability for small-scale farmers. These outcomes will be discussed in the context of their potential to be scaled and adapted in rural agricultural contexts, contributing to the broader goals of sustainable farming and energy-efficient technologies.

Shalynn Mahady

MN - Minnesota State University - Mankato

Discipline: Psychology

Authors:

#1 Emily Stark

Abstract Name: Understanding Beliefs in Pseudoscience: The Misleading Science Behind Complementary Medicine

Pseudoscience is a collection of beliefs and practices that claim to be factual, but are contradictory with the scientific method. García-Arch et al., (2022), states the use of complementary and alternative medicine, rather than evidence-based therapies, can lead to consequences in patients with severe medical conditions and vaccine refusal which can lead to the spread of possibly avoidable diseases. Hyland et al., (2003), stated that between 30 and 90% of the adult population in modern nations use some form of complementary medicine to prevent or treat a variety of health concerns. Tiller et al., (2023), reports the global health and wellness industry has an estimated value of \$4 trillion. As a result, many methods of practices and products are marketed on deceptive scientific legitimacy and controversial evidence of safety and efficacy. Individuals who choose this method of medicine may be unaware of the false science they are subjecting to. It is crucial to inform the general public on this data, to provide individuals with the knowledge to make objective decisions based on science. In the current study, we measure participants' beliefs about medical pseudoscience as well as other potentially related beliefs, such as conspiracy theories, the paranormal, and other types of pseudoscience, as well as their critical thinking abilities and dispositions. We hope to understand what types of beliefs or characteristics relate to increased belief in medical pseudoscience, in order to potentially create and validate the first scale to measure belief in medical pseudoscience. We are currently collecting data from college student participants, adding to a data file begun last year, with a goal of reaching 200 total participants by this spring semester. That will be enough participants to understand how the medical pseudoscience scale we are testing here relates to other types of beliefs.

Parth Mahajan

PA - Lafayette College

Discipline: Film/Photography Studies

Authors:

Abstract Name: The Devils Within Us: An Examination of Straw Dogs and Deliverance through Thomas Hobbes' Leviathan

The films of the 1970s were some of the most unique, provocative, and personal studies on the inner workings of violent men. Two of these films, Sam Peckinpah's *Straw Dogs* (1971) and John Boorman's *Deliverance* (1972), are some of the most controversial of their time, so much so that the former was banned in the UK until 2002. The films themselves examine "civilized" men of the early 70s who are out of place, in their environments, and their dispositions, so much so that it causes their inner violence to be realized as a result of their circumstances. Both films contain depictions of rural peoples, whether it be villagers in a

Cornish town, or “hillbillies” of Appalachia, that characterize them as violent, uncultured, lazy, and hyper-sexual, further exemplifying the notion that all people have violence in their hearts. The belief that men inherently carry violence in their souls and bodies was pioneered by philosopher Thomas Hobbes in his book, *Leviathan*. Within *Leviathan*, Hobbes defines the theory of the “state of nature”, a hypothetical environment where humans live without law, governance, or morality. Hobbes’ state of nature describes a condition in which all men have equal abilities and desires to kill one another in order to achieve what they desire, leading to a “war of all against all,” (Hobbes, 110). Utilizing Hobbes’ *Leviathan* as a lens to view the films, it is my contention that both *Straw Dogs* and *Deliverance* are examples of films that embody Hobbesian state of nature theory. Through the film’s violent depictions of rural peoples, one could easily read these characters through a Hobbesian lens. Additionally, the films highlight that even the most civilized individuals cannot run away from the violence that lies deep within themselves, showing how no one is immune to their own state of nature.

Namita Mahajan

PA - University of Pittsburgh

Discipline: Psychology

Authors:

#1 Namita Mahajan

#2 Alex Silver

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Abstract Name: Examining How Children’s Mathematical Information-Seeking Promotes Math Discussion

Math is a fundamental skill applicable to everyday life, and early math abilities are strong predictors of later academic success. Research highlights the importance of both parental and child engagement in math talk, or discussions involving numerical or spatial concepts, in fostering math development during everyday interactions. While prior studies have focused on how parents initiate math talk, there is minimal work examining how parents respond to children’s own math elicitations (questions or prompts about math). In this study, we tested whether and to what extent parents’ responses to their children’s math talk vary. A parent can promote or stifle such conversation either by responding relevantly (and encouraging continued discussion and thinking about that math concept) or irrelevantly to the math concept (and stopping the child’s talking and thinking about math by changing the topic of discussion). Using data from the Studying Parental Influences on Number (SPIN) Training Study in the Kids’ Thinking Lab at the University of Pittsburgh, we analyzed 10-minute free play sessions occurring in the lab or at home from 134 parent-child dyads (mean child age = 3.91 years). All interactions were transcribed and coded for math-specific content. Children’s math elicitations were tallied, and parental responses were categorized as either broadly relevant (aligned with the general topic or activity) or specifically relevant to the math concept. Results showed that parents’ responses to 94% of children’s math elicitations were relevant broadly, yet parents’ responses to only 56% of children’s math elicitations were relevant to the math concept specifically. While parents are generally responsive, a lack of math-specific engagement may limit opportunities for deeper exploration and understanding of these concepts. Future work can examine whether this discrepancy between broadly relevant and math-specific parental responses relates to children’s math performance concurrently and over time.

Anjana Mahesh

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

#1 Rutvi Chahal
#2 Becky Clarkson
#3 Shachi Tyagi

Abstract Name: Efficacy of Implementing a Standardized Educational Intervention for Geriatric Patients Discharged with Urinary Incontinence

Background: Urinary incontinence (UI) affects over 25 million American adults, yet effective UI home-care strategies are often not addressed with patients during discharge planning. This study examines whether a 5-minute educational intervention explaining the normalcy, prevalence, and clinical legitimacy of UI—along with four practical home care strategies—can improve UI management and benefit the psychological and social well-being of geriatric patients discharged with UI. **Methods:** This ongoing quality-improvement project enrolled 30 patients aged 65+ from UPMC Shadyside, with 18 completing the study. Participants completed two questionnaires at discharge: the Incontinence Effects Form (IEF) and the International Consultation on Incontinence Questionnaire (ICIQ) Short Form, assessing perceptions of UI and its impact on daily life. Afterward, they received the 5-minute educational intervention. 30 days post-discharge, participants completed the same questionnaires and an additional Quality Improvement Participant Feedback (QIPF) survey, assessing the intervention's effectiveness and implementation of strategies. Data were analyzed with Excel, using paired t-tests and descriptive statistics. ICIQ responses were quantified with a "sum score", where higher scores reflected greater impact of UI. **Results:** Among the 18 completers, all IEQ questions showed improvement. 83.3% reported reduction in their perception of UI precautions as a "nuisance"; 66.7% reported having gained more control over their UI (mainly via implementation of discussed strategies); 44.4% reported reduced feelings of uncleanness. Mean ICIQ sum scores significantly decreased from 15.5 (± 2.9) at discharge to 12.39 (± 3.0) at follow-up ($p < 0.001$). Patients reported reduced UI interference in daily life, with 12/18 participants rating $\leq 5/10$. In QIPF, 72% felt more confident managing bladder health; 83% implemented at least one strategy, including better UI care tools at home. **Conclusions:** Brief intervention implementation at discharge reflects increased confidence, reduced impact of UI on daily life, improved UI self-management, and enhanced quality of life in geriatric patients.

Steven Mai

AL - Auburn University

Discipline: Environmental Science and Sustainability

Authors:

#1 Yaniv Olshansky
#2 Soleil Sklencar
#3 Gabriel Robinson

Abstract Name: A Toxic Love Story: Investigating PFAS Interactions with Microplastics in Sediment

Per- and polyfluorinated alkyl substances (PFAS) are synthetic chemicals that are persistent in the environment due to their resilient carbon-fluorine bonds. PFAS are commonly used in manufacturing many products and goods because of their water-, oil-, and grease-resistant properties. Through common weathering and degradation, PFAS molecules will leach from these goods and accumulate in the soil and water. Recent studies have shown that PFAS can cause adverse effects in humans through ingestion or using products made with PFAS. Soil particles and PFAS interact with each other through electrostatic and hydrostatic properties in which they will bind together. Microplastics, another synthetic pollutant, are widely used in manufacturing goods due to their lightweight, durable, moisture-resistant, and cost-effective characteristics. However, plastics will degrade into smaller 0.5 mm particles and wash into nearby waterbodies and soil. Microplastics have also been shown to have adverse effects on humans through contaminated water, food ingestion, and plastic use. PFAS and microplastics, both toxic pollutants, will interact with each other in sediment and could pose serious risks to the environment and people. This research aims to investigate the adsorption interaction

between PFAS, microplastics, and sediment, learn how microplastic aging processes in the environment affect PFAS adsorption and provide foundational insights for future projects focused on PFAS and microplastics remediation, biological and physiological processes, and other adsorption factors.

Meagan Maiers

WI - University of Wisconsin-Eau Claire

Discipline: Education

Authors:

Makinna Laumb

Abstract Name: Developing an Approach to Mentorship: Analyzing Successful Elementary Mentor Teachers

Strong mentor-mentee relationships are crucial for the development of teacher candidates (TCs) during field experiences, particularly in the formative elementary school environment where foundational teaching skills are cultivated. Mentor teachers (MTs) in elementary schools play a critical role in guiding TCs, modeling classroom management strategies, and fostering instructional and reflective practices. Despite this, little is known about how elementary MTs prioritize, perceive, and develop relationships with TCs. This study focuses on elementary MTs within the Eau Area School District (EASD) to explore (a) the degree to which they prioritize their relationships with TCs, (b) their expectations and assumptions about these relationships, and (c) the approaches they use to foster meaningful connections. Using a comparative case study design within a constructivist framework, this research employs semi-structured interviews to uncover patterns in elementary MTs' mentoring practices. Data will be analyzed through thematic coding to identify effective strategies and align findings with existing research on mentorship and the needs of TCs. Analysis from data from this study will be merged with Elementary MTs face unique challenges in balancing their instructional responsibilities with the need to mentor TCs, making this study particularly relevant for understanding how to optimize these relationships in early education contexts. By providing insights into the relational dynamics specific to elementary MTs, this study aims to inform policy and professional development initiatives that support teacher preparation. Findings will be shared to guide the creation of resources and strategies that enhance mentoring practices in elementary field experiences, ultimately contributing to stronger TCs and improved outcomes for teacher preparation programs.

Sarah Maisto

NC - East Carolina University

Discipline: Business

Authors:

Abstract Name: Emerging Trends and Approaches to Student Leadership within Higher Education

This study investigates the trends and challenges surrounding student leadership in higher education. While leadership development is a priority for many institutions, existing research suggests that current efforts may not be sufficient, highlighting a need for new strategies and programs. This research aims to uncover key issues in student leadership while addressing gaps in existing literature. The study will conclude with actionable recommendations to enhance leadership participation and engagement at institutions nationwide. Previous research emphasizes the transformative power of extracurricular activities and leadership positions for students' future careers. However, studies show that many students are reluctant to engage in these activities, with barriers being particularly pronounced for marginalized populations. This

study seeks to bridge these research gaps by exploring these challenges through the perspectives of both students and faculty, incorporating insights into post-pandemic shifts and evolving leadership dynamics. The research will involve surveying students and faculty in higher education. Participants will respond to a mix of open-ended, scale-rating, and multiple-choice questions to explore their perceptions of leadership accessibility, barriers, and potential improvements. The survey will be administered through East Carolina University's survey platform, Qualtrics. Upon conclusion, the findings are expected to reveal common concerns and trends in student leadership, as well as insights into the effectiveness of leadership academies and training programs, including those targeting high school students. The study will examine how early interventions, such as high school leadership academies, impact future participation in higher education leadership roles. An example of a high school leadership academy will also be provided to share its relevant findings and experiences. By analyzing these findings, this research will offer practical strategies for institutions to foster more inclusive and effective leadership development programs.

Aisha Makama

NY - SUNY University at Buffalo

Discipline: Interdisciplinary

Authors:

Abstract Name: Analyzing the Impact of Instagram, Snapchat, and TikTok on Teen Mental Health: Policy Solution for Content Moderation and Algorithm Transparency

Social media platforms have become integrated into teenagers' daily lives, with Instagram, Snapchat, and TikTok ranking among the most popular. Although these social media platforms provide a space for self-expression and social collection, they present significant risks to teenagers' mental health. Based on previous findings, algorithm-driven content perpetuates harmful comparisons, exposure to idealized body standards, and cyberbullying. Specific features such as "likes," "stories," and "reels" drive addictive behaviors, contributing to reduced sleep quality and increased social anxiety. This study will examine the psychological impacts of these platforms on teenagers between the ages of 13 and 19, with a focus on anxiety disorder, depression, self-esteem, and body image dysmorphia. It will analyze quantitative data from peer-reviewed research, surveys, and psychological assessments with qualitative insights from case studies, interviews, and mental health professionals. Policy proposal is a key component of this research, focusing on accountability measures for social media companies. I propose a solution requiring social media companies to implement mandatory content moderation standards and time-limiting tools for teen users and require platforms to disclose algorithmic processes.

Keara Malazarte

NY - Adelphi University

Discipline: Biology

Authors:

#1 Matteo Rossi

Abstract Name: The Modulation of Evacuation Behavior Based on Ant Colony Group Size and Age

Superorganisms are groups of individual organisms that collaborate through social interactions to reach collective decisions. One such example are collective sensory response thresholds in ants, where ant colonies make collective decisions in response to a stimulus sensed by a group. Previous studies have shown examples

of collective sensory response thresholds in the clonal raider ant in response to changes in temperature. Here, the sensory response threshold is lower in small ant colonies, meaning that evacuation in smaller colonies is more likely to occur at low temperatures. Likewise, larger colonies were found to have higher sensory thresholds and required higher temperatures to elicit an evacuation response. In our study, we tested different variables that could modulate this collective sensory response threshold including age, larval presence, and group size. To do so, we utilized heat perturbations on settled ant colonies inside a temperature and humidity-controlled arena. Larval presence and group size did not affect evacuation behavior in our assays, however, age did show an impact on collective behavior. Colonies composed of only adult ants had lower collective sensory response thresholds, while colonies of younger ants were more likely to have higher thresholds. The results of this study can serve as a baseline for future research regarding ants' ability to socially integrate information as a group.

Sami Maldonado

TN - Milligan University

Discipline: Political Science

Authors:

#1 Amy Edmonds

Abstract Name: Food Insecurity Among Students at Milligan University

The United States Department of Agriculture Economic Research Service reports that twelve point eight percent of U.S. households faced food insecurity in 2022. Meanwhile, the National Center for Education Statistics (NCES) at the U.S. Department of Education reports that as of March 2020, over four million college students were food insecure, twenty-three percent undergraduate and twelve percent graduate. This project is an assessment of the food security levels of Milligan University students during the academic year and an analysis of possible resources currently available and solutions to address this situation in the future. During academic breaks, such as Thanksgiving and Easter, many students remain on campus because they do not have a place where to go. Since Milligan's dining center closes during these dates, students who stay on campus find it difficult to finance and prepare meals during these periods. Some students live under a tight budget and are not able to afford complete meals daily. Meanwhile, even when they can afford the ingredients, most undergraduate students cannot access a kitchen unless they live in upper-class apartments. This project employs an anonymous survey to assess students' food security levels at Milligan. The survey questions are a modified version of those found in the United States Department of Agriculture U.S. Adult Food Security Module. In the survey, there are ten statements about food insecurity along with demographic questions. The demographic questions include questions such as status (undergraduate vs. graduate), marital status, children, age, gender, ethnicity, broad income category levels, housing status (commuter vs. dorms), employment, financial aid recipient, international student status, and presence of food allergies, meal plan status. This survey also inquiries about possible causes of food insecurity based on responses to questions, (e.g., do food allergies limit availability or do school closures limit access to food).

Sruthi Malineni

PA - University of Pittsburgh

Discipline: Computer Science

Authors:

#1 Brock Gjesdal

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#7 Edward Andrews

Abstract Name: Graph Transformer Based Modeling for Real-Time Intraoperative Seizure Prediction

The surgical resection of cranial gliomas in eloquent brain regions is challenging due to their indistinguishable appearance from healthy tissue and high intraoperative seizure (IOS) risk. Cortical mapping (CM), the gold standard for distinguishing functional tissue during resection, increases IOS risk, potentially leading to dangerous neurological complications. To address this, we propose a machine learning approach—a graph transformer model—leveraging intraoperative electrocorticography (ECoG) and electroencephalography (EEG) data to model and predict IOS risk in real-time, with the goal of improving CM utilization while minimizing postoperative deficits. We utilize a graph transformer architecture to simultaneously model the spatial connectivity and temporal dynamics of intraoperative neuromonitoring (IONM) data. Unlike vision transformers (ViTs), which lose the spatial arrangement information of electrodes, the graph transformer uses an adjacency matrix and feature matrix to encode electrode connectivity and voltage-pair relationships. Tokens representing voltage values recorded every 10 seconds are input into the graph transformer to predict seizure onset probability for the subsequent 10 seconds. Comparative analyses are conducted against established architectures, such as ViTs and CNN models, focusing on sensitivity, time-to-prediction, and certainty of seizure prediction metrics. Previous studies have demonstrated the graph transformer's superior performance compared to standard graph neural networks and transformer-based models, with promising applications for domain-specific pairwise interactions, enabling enhanced learning performance. Given the effective performance of ViTs for extra operative EEG data and its potential for intraoperative applications, we anticipate the graph transformer's performance, capitalizing on electrode voltage-pair data, will surpass that of ViTs and CNNs in IOS prediction. This study hopes to demonstrate the potential of graph transformers in neurosurgical applications, offering a scalable method for real-time IOS risk assessment. By encoding spatial electrode connectivity, our model seeks to advance seizure risk prediction and support safer, more effective CM use, potentially reducing postoperative neurological deficits and improving patient outcomes.

Ty Mallin

PA - Saint Francis University

Discipline: Biology

Authors:

#1 Irene Wolf
#2 Hannah Primm

Abstract Name: Examining the Impact of Metformin in HeLa Cells, a Cervical Cancer Cell Lineage, by Utilizing an Annexin V FITC Assay

According to the World Health Organization (WHO), cervical cancer has taken the lives of approximately 350,000 people in 2022 alone. This number continues to slowly rise as the years progress. To combat this crisis, our research project aims to study the impact of metformin on HeLa cells, a cervical cancer cell line. Metformin is a known treatment for type 2 diabetes. However, studies have shown that metformin alone has had a positive impact on apoptosis levels in pancreatic cancer cell lines PANC-1 and BxPC-3. Apoptosis is easy to assess in these studies as a binding protein, annexin V, can tag apoptotic cells, which can then be assessed using fluorescent light microscopy. When a cell undergoes apoptosis, an inner membrane phospholipid called phosphatidylserine flips to the outer membrane to which annexin V can bind to. Cells that are not undergoing apoptosis will not have this key phospholipid on the outer surface of their cell membrane; therefore, annexin V cannot bind to the cells and they will not fluoresce when exposed to UV light. To

conduct this experiment, HeLa cells were cultured in 96-well strip plates with culture media and treated with 100mM of metformin. After a full 24 hours of treatment, cultured HeLa cells then underwent an Annexin V FITC assay from Cayman Chemical Company. The cells were then analyzed using an Olympus CKX41 fluorescent microscope and Lumenera Infinity Analyze 7 software. Our results show that in HeLa cells, metformin caused an increase in apoptosis levels, showing that this drug can also be applied to other cancer cell lines. Future studies aim to determine if metformin works at a lower dosage or synergistically with other drugs like aspirin or dexamethasone.

Kelyse Mallory

NY - Siena College

Discipline: Interdisciplinary

Authors:

Abstract Name: Schenectady County Food Council Survey Development Project

The Schenectady County Food Council (SCFC) Survey Development Project aims to identify gaps in the current Schenectady County Health & Equitable Food Action Plan that has not been updated since 2017. Major events, like the COVID-19 pandemic and high inflation, have shaped the landscape of food security since then. The Schenectady Foundation, who produced the food action plan and directs the SCFC, partnered with Siena College undergraduate students in the Nonprofit Excellence and Transformation program to create a new survey. Over the course of the academic year, the student team has worked to create a survey that will inform the new food action plan and provide the SCFC with practical steps toward their goals. We reviewed surveys from partner organizations to the SCFC, including the Regional Food Bank of Northeastern New York, the Electric City Food Co-Op, and two surveys from Food Pantries for the Capital District to determine themes and gaps in their survey questions. Given our extensive collaboration with nonprofit partners, our presentation will review community engagement best practices for developing a survey with several stakeholders. We will also present our survey, clarifying how each question will help the SCFC to materially implement new ways to address the root causes of food and nutrition insecurity in Schenectady County. This collaborative effort aims to equip the SCFC with more insight and updated strategies, ensuring a more equitable and resilient food plan that addresses the evolving challenges of food and nutrition insecurity within the community.

Akhmadillo Mamirov

OH - The College of Wooster

Discipline: Computer Science

Authors:

#1 Laura Pak

#2 Akhmadillo Mamirov

Laura Park

Abstract Name: Can Gen AI Tools and Basic Prompting Training Enable Non-STEM Students to Complete Field-Specific Coding Tasks?

This study explores the feasibility of non-STEM students leveraging coding tools and Generative AI for research tasks with minimal training. By equipping non-STEM students with basic coding skills and exposure to Gen AI tools, we aim to assess their ability to independently perform domain-specific coding tasks

typically reserved for STEM professionals. Our methodology involved a two-stage exploratory study: guided training followed by independent application. Initial training covered fundamental IDE usage and Python syntax, facilitated by a Computer Science(CS) major student. Subsequently, participants worked independently on real-world data analysis tasks, focusing on historical records of the French East India Company. Results indicated that non-STEM students could overcome coding challenges and contribute effectively to interdisciplinary research, suggesting that basic coding skills combined with AI tools can democratize technical tasks across fields.

Nancy Manasreh

GA - Kennesaw State University

Discipline: Psychology

Authors:

#1 Yian Xu

Abstract Name: Using Cognitive Psychology to Probe AI Social Bias in GPT-4

Human rationality and decision making is heavily susceptible to social and cognitive biases. This irrationality in human nature poses an intriguing question: Does artificial intelligence display the same heuristics as humans? The current study seeks to examine social essentialism, the belief social groups possess natural or biological underpinnings, in GPT-4. This research builds upon recent studies that have tested prominent cognitive biases (e.g., anchoring and representative heuristics) using word vignettes by expanding on social essentialist bias. Our goal is to understand the differences between social essentialist thinking in large language models compared to humans. Specifically, we will examine two dimensions within social essentialism - Naturalness, or the belief in immutable and naturally occurring boundaries within social groups, and cohesiveness, or the belief in uniform characteristics within social groups. We utilized the social essentialism scale, a 9-point likert system, to observe whether GPT-4 would exhibit similar heuristic patterns in race, gender, nationality, religion, and social class domains. Our previous research that we are expanding upon interestingly showcased GPT-4 scoring lower than humans in terms of economic, race, and nationality social groups but higher in terms of the religious domain. We want to see if this pattern stays consistent and we will utilize new methodology such as the switch-at-birth task. The switch-at-birth methodology analyzes participants' essentialist thinking regarding individuals being born into social groups versus becoming a part of differing groups. We will also expand our human participant data collection methods by gathering a sample of U.S adult participants to test our methodologies on and later compare with GPT-4. Overall, we hope to gain a deeper command of artificial intelligences' susceptibility to essentialist bias comparatively to humans and its understanding of social groupings.

Punarvi Mandadapu

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Cailin Kellum

#2 Gillian Kelly

#3 Jackson Colson

#4 Jennifer Pollock

Abstract Name: Early life stress-induced aortic NOX4 and VCAM1 expression is mediated by endothelial

Early life stress (ELS) refers to trauma exposure before the age of eighteen and is associated with increased risk for cardiovascular disease (CVD) in adulthood. We previously found that mice exposed to ELS have significantly higher oxidative stress and inflammation. Additionally, aortic endothelial cells in adult mice exposed to ELS show increased HDAC9 expression, a class II HDAC associated with vascular dysfunction. We hypothesized that ELS induces increased endothelial-cell HDAC9 expression and that endothelial-cell HDAC9 mediates increased pro-oxidant gene, NOX4, and pro-inflammatory gene VCAM-1 in the aorta of mice after ELS. We utilized a mouse model of ELS, Maternal Weaning and Early Separation (MSEW), with normal-reared (NR) mice as controls, with tamoxifen-inducible endothelial cell-specific HDAC9 wild-type (iEC-HDAC9 WT) and knockout (iEC-HDAC9 KO) mice. Aorta from adult iEC-HDAC9 WT MSEW mice have significantly greater NOX4 expression compared to iEC-HDAC9 KO MSEW (75.9 ± 18.4 copies/ μL , 34.1 ± 9.0 copies/ μL , $n=9$, $p=0.0197$). Additionally, aorta from iEC-HDAC9 KO MSEW mice had significantly lower VCAM-1 expression than iEC-HDAC9 WT MSEW mice, critical for inflammatory cell migration (78.2 ± 19.2 copies/ μL , 218.2 ± 69.8 copies/ μL , $n=9$, $p=0.030$). Therefore, endothelial cell-specific HDAC9 mediates NOX4-driven oxidative stress and VCAM-1, contributing to endothelial dysfunction and inflammation after ELS. To build on these findings, we further hypothesized that ELS would promote macrophage priming with increased HDAC9 expression, thereby contributing to ELS-induced inflammation. Bone marrow-derived macrophages (BMDM) were cultured for seven days, followed by acute lipopolysaccharide stimulation. BMDM from MSEW mice showed significantly increased HDAC9 to the NR group (228.9 ± 143.3 copies/ μL , 1.8 ± 0.8 copies/ μL , $p=0.014$). Thus, BMDM from MSEW mice are primed for inflammation compared to NR. We conclude that targeting HDAC9, an epigenetic regulator associated with ELS, may alleviate oxidative stress and decrease inflammation for individuals with ELS exposure.

Jai Manghnani

CA - Archbishop Mitty High School

Discipline: Computer Science

Authors:

Pranav Bellannagari

Abstract Name: Predicting Banking Companies' Customer Churn using Supervised and Unsupervised AI/ML Approaches

This research focuses on our hypothesis that AI/Machine Learning algorithms can develop models for Banking companies to predict whether a customer will churn or not. For this purpose, IBM Watson's AutoAI feature is selected to develop models using multiple algorithms. The dataset obtained from Kaggle provides information relating to both the background of the customer and their previous purchase from the company. The data consists of 10,000 customers, along with 11 features including age, credit score, and balance. Within the IBM Watson platform four machine learning algorithms (XGB Classifier, SNAP Decision Tree Classifier, SNAP Logistic Regression, SNAP Random Forest Classifier) with enhancements (HPO-1, FE, HPO-2) were employed. The XGB Classifier with all the enhancements, achieved an accuracy rate of 86.4%, along with a holdout F1 score of 0.539 and a cross-validation F1 score of 0.594. Thus, it is apparent that while this model is able to perform the task of identifying customers who leave the company with accuracy, the data has a slight imbalance between those who are leaving and those who aren't. In addition, we are also investigating various techniques to balance the data and its impact on the overall models' performance. It is important to note that the above models' results are based on supervised learning. New results by using unsupervised learning will also be added in the final results. A brief comparison of supervised and unsupervised learning methodologies will be added in the final presentation.

Akhil Manikandan

CA - American High School

Discipline: Engineering

Authors:

#1 Venkat Prasanna Kumar

Omkar Anand

Ayati Vyas

Abstract Name: Ansys Simulations for Thermal Analysis of a Bifacial Solar Panel

Most solar panels only convert less than 25% of the sunlight into usable energy. Bifacial solar panels aim to improve their efficiency by absorbing sunlight that reflects off the nearby ground. Experiments show that the temperature of the solar panel surface deteriorates the performance by reducing its efficiency. This research aims to model each layer's internal and external temperatures to properly analyze how the panel heats up as sunlight shines on the panel. We hypothesize that understanding will assist us in cooling the panel efficiently without sacrificing efficiency. The thermal modeling was performed using Ansys-Thermal, requiring the input of the solar panel's geometry and the layers within the PV Bifacial Solar Panel (JJN-Bifacial-200W), such as AR Coating, emitter layer, N-type wafer, and the aluminum back surface. Data related to these layers served as input values for the modeling, including the dimensions of various layers and corresponding thermal properties like thermal conductivities, density, and specific heat. The boundary conditions employed in stagnant air include heat flux at the top of the aluminum frame and glass surface, convection on the top and the frame ($h=5\text{W/m}^2\text{K}$), convection on the back ($h=1.5\text{W/m}^2\text{K}$), and the emissivity of the glass ($\varepsilon = 0.85$). For bifacial solar panels, the heat flux at the back sheet was determined using albedo values of the reflective surface. Computational results show the panel reaching temperatures from 40-50°C after being exposed to indoor conditions with 400W lights shining on the panel for an hour, which implies a drop of about 15% in efficiency using a Pmpp value of 0.5%/°C. These values are being used to validate experimental data where multiple K-type thermocouples were used to register temperature data on both surfaces of the Solar panel. Retested and verified results will be presented at the conference.

Bhavesch Manne

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Michael Kann

#2 Akshay Sankar

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#9 Joseph Hudson

#10 Nitin Agarwal

#11 Nitin Agarwal

#12 Andrew Legarreta

#13 David McCarthy

#14 Jacob Biehl

#15 Edward Andrews

Abstract Name: The Applications of Machine Learning Based Automated Segmentation to Spinal CT Scan

Background: Deep-learning computed tomography segmentation models can segment several structures from CT scans, including the paraspinal muscles, spinal vertebrae, and the spinal cord. Individually segmented vertebral volumes can be integrated with CT scan hounsfield Unit (HU) data to provide objective vertebral measurements. **Methods:** Our cohort encompassed 243 patients with a lumbar CT scan. An open-source automated CT segmentation program was repurposed to segment the L1-L5 vertebrae. Segmented volumes were combined with CT radiographic data to compute volume (cm³) and HU density of lumbar vertebral bodies, trabecular bone (middle 80% of vertebra), cortical bone (outer 10% of vertebra), and endplates (10% of vertebra). **Results:** Patients (85.12% female) had a mean age of 71.03±13.60 years and BMI of 27.88±7.21 kg/m². Mean lumbar vertebra HUs were: L1=213.55±49.61, L2=222.06±53.36, L3=220.38±54.69, L4=222.42±53.20, and L5=238.09±57.35. Cortical bone mean HUs were: L1=258.89±69.28, L2=269.23±81.10, L3=272.62±75.14, L4=272.64±53.23, and L5=278.14±75.84. Trabecular bone mean HUs were: L1=209.88±48.46, L2=218.10±52.20, L3=212.88±62.55, L4=204.66±62.94, and L5=195.16±76.26. Endplate bone mean HUs were: L1=347.92±76.74, L2=351.84±78.15, L3=347.99±78.85, L4=345.01±78.52, and L5=343.38±78.93. Mean lumbar vertebra volumes were: L1=27.44±7.08, L2=30.21±7.24, L3=33.42±8.23, L4=34.18±6.63 and L5=32.42±7.30. Age was negatively correlated with the L1-L4 mean HU-based, but was not correlated with vertebral volumes. **Conclusion:** Deep-learning-driven automated CT segmentation can efficiently assess the volume and HU density of critical vertebral structures. This methodology offers greater accuracy and consistency than manual segmentation techniques.

Bhavesh Manne

PA - University of Pittsburgh

Discipline: Biochemistry

Authors:

#1 Tulika Das

#2 Ying Li

#3 Brian Pfister

Abstract Name: Multi-Analysis of Microglial Temporal Activation following Blast Induced Traumatic Brain Injury

Background: Traumatic brain injuries (TBIs) are sudden external injuries from a blast or blunt impact causing brain damage, neurocognitive disorders, and death. Many service and law enforcement personnel experience repeated blast exposures due to their usage of heavy weaponry, causing traumatic brain injuries. Microglia are neuroglia (glial cells) responsible for clearing cellular debris post-TBI through phagocytosis and stimulating neuroprotective factors to promote neurorecovery. Therefore, this research focuses on determining the relation between microglial activation and induction of cognitive deficits temporally following blast TBI at both varying pressure levels and time frames post-blast. **Methods:** The in-vivo model used was mice with double-transgenic CX3CR1GFP/+ and CCR2RFP/+ (resident microglia are labeled with GFP and peripheral monocytes with RFP). The mice were split into two cohorts before being subjected to a simulated traumatic brain injury through blast chambers at 70 and 180 kilopascals. Brain tissue was extracted after injury in one day, seven days, and 30 days. The region of interest was the dentate gyrus of the hippocampus due to its role in learning and memory - major cognitive functions. **Results & Conclusions:** Preliminary findings show that microglial cells in sham animals, regardless of blast pressure, have small cell bodies and long processes consistently indicative of resting-state microglia. Microglial cells in blast animals, however, have swelled cell bodies and short processes, indicative of activated microglia in response to injury. It was found that initial injury within mice impacted by repeated, mild-level blasts causes microglial activation within 24 hours. However, there was a significant increase in microglial activation at the 7-day peak for both the 180 kPa and the 70 kPa affected mice. Interestingly, there was slightly greater activation and impact within repeated, 70 kPa blasted mice. This further indicates that despite having a low-pressure level, repetition makes the damages comparable to moderate-level blast TBI.

Tyris Manney

IL - Northeastern Illinois University

Discipline: Communications

Authors:

#1 Tyris Manney

Abstract Name: Black Mass Incarceration

The United States holds the highest number of incarcerated individuals globally, a trend that has persisted for centuries. Over the past 50 years, the incarceration rate has skyrocketed from 93 per 100,000 citizens in 1972 to 750 per 100,000 in 2022. Currently, more than 2 million Americans are incarcerated, with an additional 4.6 million on parole or probation. Of those incarcerated, approximately 880,000 are Black Americans, marking a historic high in imprisonment rates. Despite comprising only 13% of the U.S. population, Black Americans account for 44% of the prison population, while White Americans, constituting 64% of the population, make up 39% of prisoners. This stark disparity is exacerbated by policies such as the war on drugs, the growth of the Prison Industrial Complex (PIC), the presence of privately owned prisons, instances of police brutality, and the enforcement of harsher laws disproportionately affecting Black Americans. Given the numerous inequities faced by minority groups in everyday life (employment, housing, education, finances), the prison systems are often overlooked as places exhibiting social injustice/inequity. Furthermore, incarcerated individuals are often viewed as a faceless population deserving of their punishment, not as individuals with unique life experiences. As a student of films studies, I have chosen to bring attention to this issue through documentary filmmaking. The research conducted provides a timeline that underscores how these factors have contributed to the pervasive issue of Black mass incarceration from the era of slavery to the present-day realities within the U.S. prison system.

Olivia Manning

NE - Creighton University

Discipline: Nursing and Public Health

Authors:

#1 Tamara Oliver

Abstract Name: Hospital Acquired Pressure Injuries (HAPI): Quality Improvement Process

Background: Health Acquired Pressure Injuries (HAPIs) significantly burden healthcare systems by increasing patient morbidity, length of hospital stays, and costs. The Center for Disease Control and Prevention reported that pressure injuries affect more than 2.5 million Americans annually resulting in 60,000 deaths and a financial impact of 11 million dollars. Despite growing awareness and preventive measures, HAPIs remain prevalent across the United States. Purpose: The purpose of this quality improvement (QI) project is to reduce the incidence of HAPIs at Level 1 Trauma Center (Bergan Mercy) in Omaha, Nebraska. The secondary aims of the project include improving early identification of HAPIs, enhancing staff education and ensuring adherence to HAPI prevention protocol. Establishing quarterly point-prevalence audits will drive accountability, transparency and continuous improvement. Furthermore, the framework emphasizes the importance of interdisciplinary collaboration and stakeholder engagement in driving process improvement initiatives. Methods: A literature review guided the development of evidence-based interventions for HAPI prevention. The findings from the quarterly audits were used following the A3 methodology to perform a root

cause analysis to establish an effective intervention to reduce HAPI prevalence and improve adherence to HAPI protocol. Outcomes: The results of the quarterly point prevalence audits showed an increased rate of undocumented HAPIs. Additional feedback from surveys of participants in the audit showed that there is a knowledge deficit regarding the appropriate intervention nurses should be implementing to prevent HAPIs. In addition, there was also a lack of documentation about these interventions. The systematic approach combining risk assessment, evidence-based interventions, staff education, and continuous monitoring is expected to significantly reduce the incidence of HAPIs, improve patient outcomes, and enhance overall quality of care. Ongoing commitment and collaboration among healthcare professionals are essential for the sustainability and success of pressure injury prevention efforts.

Kobie Manning

GA - Fort Valley State University

Discipline: Engineering

Authors:

#1 Awad Eldurrsi

Darrell Baker

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Abstract Name: Oscillators Using IC 555 Timer and RLC circuits

The presented research uses the IC 555 timer in combination with RC circuits to investigate the design, operation, and uses of oscillators. The research delves into the basic ideas that enable the creation of periodic signals as well as how RLC networks affect oscillation frequency duty cycle and amplitude of different generating signals. The study illustrates how resistors, inductors, and capacitors regulate the timing properties of the output waveforms using a 555 timer in astable mode. The research will show how to calculate, testing the validation of the circuit using Multisim software, and constructing the circuit. Experimental sets are used to derive and validate key equations governing frequency and amplitude. Practical uses for the 555 timer, such as pulse-width modulation (PWM) circuits, tone generators, and LED flashers, showcase its versatility. The research also looks at ways to improve performance, like utilizing diodes to change duty cycles and optimizing component values for certain use situations. The results highlight the 555 timer's dependability, ease of use, and versatility as an affordable solution for a range of oscillatory tasks, making it essential in electronics and instructional demonstrations.

Claire Mapes

NC - Elon University

Discipline: Business

Authors:

#1 Elena Dowin Kennedy

Abstract Name: Navigating the Literature: Defining the Competencies Central to Entrepreneurship Education

Undergraduate entrepreneurship education programs have been growing at a fast pace in response to demands from both students and policy makers. Due to this rapid growth, there is no consensus on the core competencies entrepreneurship education should be teaching. This can lead to inconsistencies across programs, which makes it hard to understand the efficacy of entrepreneurship education both leading to venture creation and communicating the value of entrepreneurship degrees to external stakeholders. This lack

of consensus makes it challenging to share best practices, develop signature pedagogies, and collaborate across institutions because institutions are building bespoke programs. This study addresses this gap by synthesizing the existing literature that defines specific entrepreneurial competencies. This research examined over 20 different scholarly articles, with the goal to identify the central competencies consistent across multiple articles. The analysis identified 41 distinct competencies and provides a table defining these competencies and categorizing them into four core areas—business skills, interpersonal skills, intrapersonal skills, and opportunity navigation skills. UCINET, a social network mapping software was utilized to visualize these concepts and to identify the competencies and papers that were most central to the literature. The most central competencies are: creativity, opportunity recognition, risk mitigation, self-efficacy, value creation, learning through experience, and perseverance. This research contributes to the literature by providing a clear categorization of entrepreneurial competencies and identifying those that are most central to the field. This framework would allow educators to more effectively collaborate and prioritize competencies to incorporate into their programs. It also could provide students with a tool to evaluate their own competency development and empower them to seek new opportunities to build skill, communicate the value of their degree to potential employers and partners, and transfer their learning to their professional work, whether in their own company or in a traditional work setting.

Phoebe Anne Marbid

NY - Brooklyn College

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

#1 Phoebe Anne Marbid

Abstract Name: Rx for Romance: A Critical Examination of the Savulescu-Earp Love Drugs Framework

Love drugs—substances taken to illicit attraction, affection, and attachment between romantic partners—are a popular subject of fictional works. Recently, bioethicists Julian Savulescu and Brian Earp have proposed that if they were available, it would be permissible to use them to address rising divorce rates. Love drugs, they argue, might encourage marital fidelity and more support with child-rearing. This consequentialist view of love, where the ends justify the means, is controversial. Some dismiss the problem as idle speculation. Love drugs don't exist, and thus they pose no actual danger. Yet, recent experiments with love-associated neurotransmitters in humans suggest that love drugs may be on the immediate horizon, and hence the Savulescu-Earp love drugs framework (SELDF) ought to be seriously considered. In a future in which love drugs are effective, would it be reasonable to consider their effects on partners post-treatment to be love? Or is love something beyond neurochemicals that cannot be “improved” with medicine? Even if it were true love, since these drugs have the possibility of circumventing the wills of the individuals involved, would it be ethical to administer love drugs? I explore these questions through the lenses of three different philosophical understandings of love: (1) neuroreductionism (love is reducible to chemical interactions), (2) love as a fundamental phenomenological experience, and (3) love as a virtue. I will apply these understandings of love in order to critically examine the SELDF and the assumptions it makes about love and divorce, as well as scrutinize from an ethical perspective the emerging science of love drugs as it edges closer to reality. More generally, I argue that, when philosophers dispute the permissibility of inducing emotions in autonomous agents, they often do so while ignoring the true nature of the emotion in question, including its place in social practices.

Sophia Marcelli

PA - Seton Hill University

Discipline: Biology

Authors:
#1 Brett Aiello

Abstract Name: Aorta and Hepatopancreatic Ampulla Anatomy Is Less Variable in Cats (*Felis catus*) Than Humans (*Homo sapiens*)

Anatomical variations are benign differences in organ or vessel structure across individuals. Recognizing these variations is essential within the medical field, as ignorance of these structures can lead to misdiagnosis, surgical complications, or death. For decades, undergraduate anatomy classrooms have demonstrated human anatomy through cats (*Felis catus*). However, anatomical variations, and their frequency, are underexplored in cats, creating a gap in anatomy education. To address this gap, we dissected 33 cats to characterize variations in the hepatopancreatic ampulla and aortic arterial branching patterns. The hepatopancreatic ampulla forms when the common bile duct and pancreatic duct merge to deliver digestive secretions to the small intestine. The abdominal aorta typically distributes blood through five major branches: (from rostral to caudal) the celiac trunk, superior mesenteric, (paired) renal, inferior mesenteric, (paired) gonadal, and terminal bifurcation into (paired) common iliac arteries. Across specimens, we identified two variations of the hepatopancreatic ampulla and seven distinct aortic branching patterns. In the hepatopancreatic ampulla, the common bile and pancreatic ducts typically merged to form a single ampulla fused to the proximal duodenum (29 of 31), though ampulla length varied (0.6 to 1.3 cm). In two specimens, an accessory pancreatic duct also supplied the duodenum. Frequently, cats followed the typical aortic branching pattern (9 of 32). Other variations demonstrated a common origin of the celiac trunk and superior mesenteric (8 of 32) and the inferior mesenteric branching from the superior mesenteric (2 of 32). Further, the paired renal arteries demonstrated both symmetric and asymmetric branching. In conclusion, the identified feline anatomical variations are consistent with those reported in humans for these structures, however, the total number of variations and frequency of shared variations is reduced in the cat in comparison to humans. The identification of these feline variants will help generate new pedagogy for undergraduate anatomy.

Austin Marin

TX - Tarrant County College

Discipline: Biology

Authors:
Michael Leyva
Tatiana Lopera

Abstract Name: Biotechnician Assistant and Credentialing Exam: A Student-Developed Video Curriculum for Success

The Biotechnician Assistant Credentialing Exam (BACE) is a nationally recognized program created by Biotility at the University of Florida that shows a student's knowledge of skills needed to work in a laboratory. While materials such as the Journal of Visualized Experiments (JoVE) and books such as "Biotechnology: A Laboratory Skills Course" by J. Kirk Brown exist there is a distinct lack of educational materials marketed specifically towards the BACE program. The researchers sought to fill this niche by filming a series of videos as an educational curriculum for future BACE participants to use as a study aid. Using Camtasia video editing software, videos were made in accordance with the list of learning objectives provided by Biotility on their official website. The researchers hypothesized that with the assistance of video-learning tools and traditional study methods, undergraduate students will be able to pass the BACE. The researchers intend to take the BACE and provide quantitative data in the form of test scores to determine the effectiveness of the BACE curriculum. Based on two different studies, one conducted by Plymouth University and the other by Johns Hopkins University, research from both universities suggests that having access to digital learning materials enhances student success and improves confidence surrounding reenacting

lab procedures. However, further sample sizes will need to be collected in order to determine the statistical significance of how the researcher's videos affected the student's test scores. The goal of the researcher's project is to provide an accessible study aid for people looking to enter the field of biotechnology.

Christina Mark

FL - Flagler College

Discipline: Mathematics

Authors:

Abstract Name: Visible and Nonvisible Lattice Points and Polygons

A visible lattice point is an integer point in the real plane where a line from the origin to the point does not intersect any other integer points. Herzog and Stewart gave a construction for finding any patch of visible and nonvisible lattice points in the real plane although this construction is not optimal. Goodrich, Mbirika, and Nielsen improved this result for finding square nonvisible patches while still not optimal. We adapt these constructions to find visible lattice polygons. We also include related results to this construction. We will provide Python implementations for the constructive methods of patches and our visible lattice polygons.

Tessa Markham

PA - Duquesne University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Ariel Shensa

#2 Theresa Crytzer

Alex McElravy

Emily Talierco

Abstract Name: The Use And Reliability of Artificial Intelligence Sentiment Sorting In Usability Feedback Analysis of an Internet-Based Healthy Lifestyle Behavior Intervention For People With Spinal Cord Injury

WHEEL-LEARN is an Internet-based healthy lifestyle behavior intervention aiming to increase physical activity (PA) to recommended levels for people with spinal cord injury or disease (SCI/D). Perceived usefulness and ease of use are the primary factors that impact a user's intention for engagement with technology. This study evaluated the usability of the WHEEL-LEARN interface and multimedia content in people with SCI/D and healthcare professionals using a mixed-methods approach. This study also assessed the reliability of artificial intelligence (AI) methods for coding qualitative data. Participants used a "think aloud" approach while completing a series of tasks during usability testing, followed by completion of the System Usability Scale (SUS) and Post-Study System Usability Questionnaire (PSSUQ). Descriptive statistics were calculated for SUS and PSSUQ. Miro, a digital whiteboarding tool, was used for affinity diagramming to complete thematic analysis of participant feedback. Utilizing Miro Assist, a collection of AI-powered tools within Miro, sentiment analysis was performed on thematic groups. Interrater reliability between Miro Assist and the research team was assessed using Cohen's kappa. Average scaled SUS and PSSUQ scores (mean=85, SD=16.3; mean=1.7, SD=0.8) indicated excellent perceived usability and high user satisfaction. The interrater agreement between Miro Assist and the research team showed substantial agreement for positive and negative sentiment and moderate agreement for neutral sentiment (Kappa=0.71, 0.67, and 0.54, respectively). People with SCI/D and healthcare professionals perceived WHEEL-LEARN as

highly usable. Through generated sentiment sorting, AI tooling showed potential for designers to obtain insights from qualitative data. Miro Assist struggled to categorize neutral sentiment, possibly due to highly contextual human usability feedback. WHEEL-LEARN has potential to engage people with SCI/D to meet PA guidelines. In this study, designers maintained full autonomy through human-centered analysis with AI tooling assistance that could support future small design team analysis.

Alexis Marley

AR - Lyon College

Discipline: Political Science

Authors:

#1 Alexis Marley

Abstract Name: Decline of European Democracy: A Comparison of Executive Aggrandizement Hungary and Slovakia

Why are certain European Union (EU) countries experiencing democratic backsliding while others are not? This paper explores executive aggrandizement in the EU in the context of Hungary and Slovakia. Democratic backsliding, the gradual erosion of democratic principles, is a political trend that has increased globally throughout the 21st century. Hungary has been experiencing democratic backsliding since the election of right-wing leader Viktor Orbán. Slovakia, while empowered by some right-wing leaders, has not experienced the same. This is puzzling because both states share borders, and history and have similar economies. Current studies suggest that widespread public support for the executive can increase voters' willingness to approve of actions that increase the power of the executive or erode democratic institutions. The more citizens feel their preferred policies are being supported by their executive, the more they are willing to allow them to bypass certain checks and balances. While this theory has been tested in Latin American countries and found support, it has not been replicated in Europe. This paper adds to the growing literature on democratic backsliding in Europe by comparing partisan support for the incumbent and the state of democracy in Hungary and Slovakia, finding that citizens in Hungary have more support for their incumbent than citizens in Slovakia.

Nathalia Marmol

NY - Guttman Community College

Discipline: Chemistry

Authors:

#1 Nathalia Marmol

Abstract Name: The Correlation between Total Amount of Antioxidant Capacity and the Available Polyphenols in Various Vegetables

Antioxidants play a vital role in protecting cells from oxidative stress and are associated with numerous health benefits such as reducing the risk of heart disease, cancer, and neurodegenerative disorder. These compounds act as a reducing agent, neutralizing free radicals and preventing cellular damage. Given their health-promoting properties, extensive research has focused on evaluating the total antioxidant capacity (TAC) and total polyphenol content (TPC) in various vegetables. This study examines the statistical relationship between TAC and TPC in selected vegetables. The Trolox Equivalent Antioxidant Capacity (TEAC) method, using ABTS, and the Folin-Ciocalteu method were employed to quantify water-extractable antioxidants and polyphenols, respectively. Statistical analyses, including two-tailed and correlation tests,

revealed a significant negative relationship between TAC and TPC at an alpha () level of 0.01. These findings contribute to a deeper understanding of the interplay between antioxidant capacity and polyphenol content in vegetables.

George Maroney

MN - Hamline University

Discipline: Economics

Authors:

#1 Joe Penders

Reece Thomas

Abstract Name: Information Asymmetry in MLM Business Opportunities: Can Disclaimers and Disclosures Help?

Data show that most multi-level marketing (MLM) participants make little to no money or lose money. MLM companies often advertise the earning potential of their business opportunities using vague terminology such as “supplemental income” or “financial freedom.” This can leave consumers with inaccurate impressions of typical earnings, causing them to invest resources into the opportunity which they otherwise would not. The Federal Trade Commission is considering promulgating regulations which could require recruits to be presented with disclaimers and disclosures that communicate past participants’ profit and loss information. The impact of this information in the MLM domain has not been investigated. We fill this gap by testing both the independent and interactive effects of disclaimers and disclosures in a randomized controlled trial experiment with 305 Minnesota State Fairgoers. We showed participants a MLM promotional video and website content. Participants were randomly assigned to a control group (with no information treatment) or one of three treatments: disclaimer only; disclosure only; or disclaimer and disclosure. The disclaimer provided a short message of central tendency while the disclosure included a pictograph with a distribution of profit and loss outcomes. Participants then reported their personal earnings expectations and interest/attraction as well as earnings expectations for others. We also captured potential correlates such as financial literacy, prior MLM exposure, and numeracy. We find that the information treatments reduce interest and bring participants earnings expectations closer to objective reality. For example, the participants who received an information treatment were almost twice as likely to say the typical participant in the MLM loses money (a finding that aligns with the information in the treatments), compared with control participants. While all treatments were statistically significant, the disclosure had the largest effect. Our results suggest that profit-and-loss disclaimers and disclosures could be used by regulators to inform consumers.

Kennedy Marsh

PA - Lycoming College

Discipline: Business

Authors:

#1 Mark Zajack

Abstract Name: Relationship Between Post College Aspirations and Student Outcomes

The purpose of this project is to explore the potential relationship between post-college aspirations and college student outcomes. The study investigates the relationship between students’ post-college aspirations (intrinsic vs. extrinsic) and the outcomes of academic performance and subjective well-being. Guided by Self

Determination Theory (SDT), individuals' motivation can be assessed relative to intrinsic and extrinsic sources. A sub-theory of SDT, Goal Contents Theory (GCT) argues that long-term aspirations categorized as intrinsic directly support wellness and performance whereas extrinsic aspirations, when prioritized, contribute to ill-being. Intrinsic motives are theorized to be associated with autonomous vs. controlled, indicating that intrinsic aspirations and autonomous motivation is likely to yield greater psychological health and performance. Prior research in this area is often focused on working adults and career aspirations. By targeting college student aspirations, this project could provide practical implications for post-secondary institutional settings. Over 100 students at a small mid-Atlantic U.S. liberal arts institution completed self-report surveys on several measures commonly utilized in SDT studies. Students indicated their level of agreement on Likert-scale items measuring future goals (Aspirations Index), autonomous motivation (Academic Motivation Scale), and psychological well-being (RAND Mental Health Scale; Satisfaction With Life Scale [SWLS]). Additionally, students reported demographic information, college major/minor, and cumulative college GPA as a measure of academic performance. Data collection is being completed currently. Data analysis will be completed via an ordinary-least squares (OLS) multiple regression analysis. Based on the SDT framework, the researchers' expected results are student autonomous motivation will be positively related to well-being and academic performance. Furthermore, intrinsic aspiration dimensions are predicted to be positively related to dimensions of well-being whereas extrinsic aspiration dimensions will be negatively related to dimensions of well-being. Results of the hypothesized relationships, future research considerations, and practical implications of the research on student motivation and higher education will be provided.

Kate Marsh

CO - Regis University

Discipline: Biology

Authors:

#1 Kate Marsh

#2 Sarah Bramlett

#3 Hayden Pearson

#4 Gabriel Rodriguez

#5 Michael Ghedotti

#6 Kristofer Voss

Sarah Bramlett

Abstract Name: Evidence of Seasonally Shifting, Deep-Sea Niche Partitioning Between the Deep-Water Glowbellies *Acropoma hanedai* and *A. japonicum* off Southwestern Taiwan.

Ecological interactions are especially challenging to study in the deep-sea where direct observation is limited and specimens in museum collections are the most accessible source of information. The glowbellies in the genus *Acropoma* are bioluminescent, mesopelagic fish that inhabit deep waters between 50 m and 500 m off Korea, Japan, Indonesia, and Thailand. Two species of *Acropoma*, *A. hanedai* and *A. japonicum*, co-occur and are caught together during fisheries operations in the waters off southwestern Taiwan. This provided a rare opportunity to explore if closely related species in the same deep-sea habitat exhibited dietary niche partitioning. We examined stomach contents using specimens collected incidentally in fisheries operations off of Donggang, Taiwan in February and May and in the ichthyological collection of the Bell Museum of Natural History. *Acropoma hanedai* more commonly had crustacean stomach contents in February and fish in May, with the opposite pattern in *A. japonicum*. Larger fish statistically were more likely to have fish prey in the stomach in both species. However, the seasonally different dietary preference between species remained statistically significant even when accounting for the stomach-contents effects of size of fish. This work is one of relatively few studies of niche partitioning in the deep sea.

Emma Marsland

MN - Hamline University

Discipline: Criminology/Criminal Justice

Authors:

#1 Emma Marsland

#2 Shelly Schaefer

Abstract Name: Combatting the 'Good Ole Boys Club': Women Experiences in Policing in Minnesota

Policing continues to be a male-dominated field. Female numbers remain minimal in recruitment, promotion, and retention. Previous literature has mainly focused on the benefits of having women in the police profession. Such as the increase of reports from female victims, less use of excessive force, and higher implementation of community-oriented strategies. However, there is little research on women's experiences in policing. From their decision-making processes of entering and staying in this profession to their perceptions and experiences throughout their careers. This study focuses on women's experiences in policing, primarily on their perceptions of police subculture. This generationally developed police subculture has been noted to be a 'good ole boys club' in previous literature due to its shared values and attitudes. To understand women's experience with this we constructed an anonymous survey in Qualtrics and have partnered with the Minnesota Association of Women Police to distribute the survey out to female officers across the state. We received responses from 61 female Minnesota officers, consisting of a wide range of tenure and size of agency. Our findings show that the perception of the 'good ole boys club' is still prevalent today. More than half of respondents agreed or strongly agreed that the police profession still is a 'good ole boys club' in their own agency, the state of Minnesota, and the profession as a whole. It is important to understand and appreciate women's experiences in the police profession to gain insight into why their numbers remain minuscule to further our understanding of experiences across departments and to find ways to improve for current and future females in the field. Knowing the benefits of women in policing, it is important to increase their numbers and their experience in the hope of bettering the police profession as a whole.

Benjamin Marthaller

SD - Black Hills State University

Discipline: Visual Arts

Authors:

#1 Benjamin Marthaller

Abstract Name: Vacancy

Vacancy is a series of fifteen graphite pencil drawings I created for my senior show containing a continuous narrative; each piece depicts a snapshot of key parts in the overarching story. The viewer acts as the main character as they wander an old gas station that leads them to an abandoned building containing a scientific impossibility. The main story came to me while driving on the lonely highways between North and South Dakota. I could see different abandoned houses and buildings appear and disappear between the rolling hills, and it piqued my interest in what would happen if anyone ever stopped to investigate them. Some of the visual inspiration for this series comes from point-and-click horror video games, where the story is revealed by clicking on clues hidden in static images. However, I wanted to avoid the stereotype of disrepair we often associate with abandoned places by having my scenes completely sterile. The brief description accompanying each piece also came from video games when an object would be selected, and text would appear telling the player whether or not that object would be helpful. Drawing on more horror inspiration, I decided these pieces would be completed in black and white, referencing old black-and-white horror from the 60s that has influenced most of my work. By incorporating the viewer as the main character, I can make the scenes feel

more intimate and draw viewers into the story; how the story ends is entirely up to viewers, whether they read the descriptions or not.

Morgan Martin

TN - Lipscomb University

Discipline: Biology

Authors:

#1 Helena Khalif

#2 Emerald Cole

#3 Whitley Whitehead

#4 Dr. Josh Owens

Jackson Head

Abstract Name: A Novel Discovery Platform to Elucidate Novel Microbe-derived Metabolites and their Effects on Fatty-acid Metabolism

The obesity epidemic has risen to astronomical numbers with over 650 million adults being classified as obese ($BMI \geq 30$). Obesity is of critical concern as excess body fat storage is a comorbidity to various diseases including type-2 diabetes, cardiovascular disease, and cancer. Although obesity has classically been attributed to genetics and unhealthy lifestyle choices, there is a growing interest in other factors affecting obesity, including the gut microbiome. For example, mice lacking a microbiome are resistant to weight gain even when placed on a high-calorie diet. Therefore, bacteria and the metabolites they produce can dramatically affect metabolism and overall weight gain. For this research, we aim to focus on *Faecalibacterium prausnitzii* which has been previously shown to be reduced in obese individuals; however, the mechanism and causation has yet to be fully established. We hypothesized that amplified concentration of *F. prausnitzii* will increase fat metabolism and reduce obesity and its associated effects. To test this, we first used *Drosophila melanogaster* as a model system and administered *F. prausnitzii* to elucidate if it was pro-obesogenic or anti-obesogenic. Our data suggests that Wild Type female *Drosophila melanogaster* survive longer on a high fat diet when *F. prausnitzii* is administered compared to controls. Since identifying this association, our research focus is now elucidating the molecular pathway induced by *F. prausnitzii*. Current experiments suggest the E78 pathway as a putative target for the beneficial effects of *F. prausnitzii*. After confirming the effect of *F. prausnitzii* on fatty acid metabolism, we will attempt to further identify specific metabolites produced by this bacteria. By pinpointing these metabolites, we aim to contribute novel insights into obesity management through targeted modulation of gut microbiota, potentially paving the way for innovative therapeutic strategies to combat obesity and its related diseases.

Avril Martin

OK - University of Central Oklahoma

Discipline: Visual Arts

Authors:

Abstract Name: The Negative Effects of Social Trends on the Crowns of Black Women

The Negative Effects of Social Trends on the Crowns of Black Women is an IRB approved research piece surrounding Black Women and their views on their hair also known as the “crown”. The framework around this research will be around major historical Black events, hairstyle types, and books depicting the Black

experience like “You Are Your Best Thing” by Tana Burke and Brene Brown and “Hood Feminism” by Mikki Kendall. Historically, Black folk (more specifically Black Women) have been at a social disadvantage when trying to get jobs and other opportunities due to misogynoir. Within this framework, I will be referring to pivotal movements and legislation that affected the Black community from the 1960s to present day to understand the intersectional context of our struggle. My process will then move to group interviews asking participants to reflect on how society may influence the way that they choose to wear their hair. These questions will give me insight on the way that Black women do their hair, view their hair, and socialize around their hair. The answers to these questions will connect to the final quilt that will be displayed representing the experiences I will hear about during the interviews. Through my knowledge of art and the Black experience my piece will bring psychological insight on the experiences Black Women of various ages have surrounding their hair. The quilted product that will be presented will cover the sizing of a full sized bed. Each section will represent a person or multiple people that have shared similar experiences and how they have overcome them. It will explore different types of hair and personality through the use of felt, wire, embroidery, and crochet techniques to add 3D elements.

Ivan Martin

WI - University of Wisconsin-Milwaukee

Discipline: Nursing and Public Health

Authors:

#1 Ivan Martin

#2 Ryan Babich

#3 Seok Hyun (Joshua) Gwon

Ryan Babich

Abstract Name: Maximizing Participant Retention in Clinical Studies: Key Lessons Learned From an E-Cigarette Cessation Study

Retention is a critical issue in clinical studies, as participant dropout not only compromises data validity but also increases costs and extends study timelines. This challenge is especially pronounced in studies targeting agrarian areas of the Midwest where cessation resources are less commonly available. Retention strategies must address logistical, cultural, and motivational barriers to ensure participant engagement and adherence. We examine the retention strategies employed in our e-cigarette cessation intervention study targeting rural young adults, conducted since 2023. The study aimed to reduce e-cigarette use through a structured intervention, and retention efforts were vital to achieving meaningful outcomes. The first and second presenters of this abstract served as the project coordinator and case manager, respectively, overseeing participant enrollment, data collection, and adherence to study protocols from initiation to completion. Through a narrative analysis of our experiences, we identify effective strategies to enhance retention and participant engagement. These strategies include personalized communication tailored to individual participants, consistent and proactive follow-ups, and incentives designed to motivate continued involvement in the study. The findings highlight practical, adaptable approaches to improving retention in clinical studies, particularly those focusing on behavioral interventions in rural settings. The conclusions drawn from this analysis propose actionable recommendations for optimizing participant retention in similar contexts. By ensuring study adherence and minimizing dropout, these strategies contribute to data quality and the overall success of clinical research. We aim to provide researchers with a framework for implementing effective retention practices in diverse settings, ultimately enhancing the efficiency and impact of clinical studies targeting underserved populations.

Shae Martin

KY - University of Kentucky

Discipline: Sociology

Authors:

Abstract Name: Conformity in the Game of Life - The Evolution and Expansion of Board Games

The Game of Life is simple; Players get married, have children, and obtain as much money and assets as possible before their time on the board ends. Such actions earn the player money, and the richest player wins. This game represents a successful life as defined by one's marital status, number of offspring, and wealth. Restrictive, right? The Game of Life, whether it is realistically applicable to everyone or not, is a representation of the modern, ideal American life. Board games have represented societal expectations of various cultures for centuries. The Game of the Goose, a potential influence of the Game of Life, illustrates what this would have looked like 200+ years ago. The Game of the Goose woodblock and print collection at the University of Kentucky Libraries Special Collections Research Center contains two 18th century French editions of the board game that was created in the 15th century. The game board depicts major landmarks in life through its illustrated spaces, which simulate such events and either moves them back or ahead. It has influenced many other board games to form expressions of what winning the game looks like from the 18th century to today. This research will explore these board games and the interaction between them and their societies. By comparing and contrasting board games within this time span, found patterns in its progression can be taken into account; the current social ideals reflected through board games can then be better understood. This information will be used to create a more universal, modern "Game of Life" that equates individual happiness and contentment to what constitutes winning. It will reflect how "winning" has evolved since the creation of the Game of the Goose. After all, the ideal life is what makes someone happy, not meeting an outdated set of expectations.

Arthur Martin

PA - Villanova University

Discipline: Psychology

Authors:

#1 Arthur Martin

#2 Delia Tisdale-Floyd

#3 Janette Herbers

Delia Tisdale-Floyd

Abstract Name: Parenting Stress & Social/Emotional Development of Young Children Experiencing Homelessness

Parents of young children experiencing homelessness tend to experience stress due to several factors surrounding fears regarding their child-wellbeing, lack of social and/or shelter support, difficulty obtaining sufficient educational opportunities, or feelings of isolation and loneliness. Parent stress and child development are often correlated, where external stressors tend to have a significant impact on Parent attunement and nurturance. Many existing studies have identified the impact of Parent stress on Parent nurturance and child well-being as it relates to an increased frequency of physiological aggression toward children, increased child behavior management issues, and the onset of developmental disabilities and psychopathology. Existing research also suggests that affective development in parents and children experiencing homelessness is often transactional, where the mental state and mechanisms by which parents express and manage their emotions frequently have a direct impact on the emotional regulation of children. However, very few studies have pinpointed the mechanisms by which parental stress impacts the psychosocial development of children before adolescence, as children begin to acquire positive (or negative) social-emotional competence. This study explores the relationship between Parent stress and children's

social/emotional development in the context of homelessness. Participants took part in an ongoing study of risk and resilience in young children (ages 4 months to 5 years) experiencing homelessness. Thus, we present preliminary results from 28 families with 40 children ages 5 and under, recruited from family homeless shelters across Philadelphia. Structured participant interviews were conducted in private spaces within the shelters they resided. Parents responded to questionnaires assessing aspects of risk, resilience, and functioning including parenting stress, depression/anxiety symptoms, and children's social/emotional development. We predict strong correlations between parenting stress and the social/emotional development of children experiencing homelessness, whereby an increase in parent stress will simultaneously lead to negative child social/emotional development.

Avril Martin

OK - University of Central Oklahoma

Discipline: Art History

Authors:

Abstract Name: Cultural Robbery: The Practice of Spaces in Oklahoma in Higher Education Taking Artifacts

For this piece I will be researching the provenance of non-western art pieces in higher institutions in Oklahoma (Oklahoma State University, University of Central Oklahoma, University of Oklahoma, and Langston University). I will research the pieces that these universities have and whether or not they were obtained ethically through examining the code of ethics through museums. I argue that these institutions do not have the full right to be displaying these art pieces within their space if they did not get them ethically. This is due to historical practices that happened during colonialism. I will be executing this process by utilizing school libraries, archives, and asking about the provenance of art pieces that each institution has on display. Some of the spaces included may not have African artifacts but I believe it is important to list how they format the provenance of the pieces within their collections. I will be critiquing these spaces from an ethical standpoint regarding repatriation and what the standpoint from major museums sources like the American Alliance of Museums.

Abigail Martin

OK - University of Central Oklahoma

Discipline: Education

Authors:

Abstract Name: Trauma in Children of Occupation and Genocide: United States and Israel Relations and the Palestinian Genocide

This paper discusses artwork on the physiological effects of living in war zones on children, with a focus on Palestinians occupied by the Israeli State. For context, the definition of Trauma and the body's 'fight or flight' response is explained along with the mental disorders that follow war trauma. This trauma research has shown that all Palestinian children will suffer from at least three traumas in their lifetime, resulting in Post Traumatic Stress Disorder, which is better diagnosed as Continuous Traumatic Stress Disorder because due to the ongoing wars in Palestine, there is not a 'post' traumatic moment. The origin of the Israel-Palestine Conflict is explained to inform the reader on why these wars have taken place for the last 76 years. The ten stages of genocide are explained to aid any confusion on the recent declaration of genocide in Palestine by the United Nations. Following, for understanding the United States' involvement in the Palestinian genocide, the

relations between Israel and the United States is discussed. The impact of wars on Palestinian children is portrayed in the work of Palestinian artist, Malak Matter, who depicts an idealistic version of Gaza, as a way to cope with her war trauma. In addition, Banksy's artwork on atrocities of war in Palestine, specifically his most recent work on the subject, The Walled-off Hotel in Bethlehem is discussed. In a comparative conclusion, the study demonstrates that both artists' work emphasizes hope for possible Palestine liberation.

Emily Martinez

OK - University of Central Oklahoma

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Intersectionality and the Trad Wife Phenomenon: Understanding the Role of Race, Class, and Gender

This project explores intersectionality in the context of the trad wife phenomenon on the Internet analyzing the influences of race, class, and gender through examining the societal norms and individual experiences of the women who are taking on this traditional role at home. The goal of the study is to determine how interviewees (whether they identify as trad wives or not) view the trad wife phenomenon and how an intersectional approach can reveal the racial, political, religious, socioeconomic, and other factors that influence the articulation of trad wife identities. I chose this topic because of the resurgence of traditional values. While individuals (whether on social media or in real life) are entitled to adopt whatever values suit them, I can see the negative consequences of such a stance for members of the feminist and LGBTQ+ communities who are blamed for not upholding these values. My evaluation of research findings will combine qualitative assessment of interview transcriptions with a qualitative and quantitative assessment of scholarly and journalistic approaches to the Trad Wife phenomenon. My goal is to determine the role of race, class, gender, religion, socioeconomic status, and political affiliation in the Trad Wife movement and to determine how or whether Trad Wives perceive themselves (or are perceived by others) as contributing to and/or amplifying white supremacist movements or viewpoints. This topic is very new and has not been sufficiently addressed within the academic world. I want to bring the digital world into the University of Central Oklahoma's academic field and talk about this movement that is prevalent on the online community and affecting future women.

Emily Martinez

OK - University of Central Oklahoma

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Intersectionality and Femicides: Understanding the Overlapping Factors in Mexico

This project addresses the critical issue of femicide in Mexico, focusing on the intersectional factors that exacerbate this form of gender-based violence. Femicide, the killing of women and girls due to their gender, is a severe and pervasive issue in Mexico, obscured by systemic deception and social indifference. Utilizing the UCO library databases, social media, academic journals, and news articles, this research aims to uncover the complex layers contributing to femicide and highlight the impact on Mexican women. Central to this study is the concept of intersectionality, a framework developed by Kimberlé Crenshaw, which examines how overlapping social categories—such as gender, race, and class—create interconnected systems of

discrimination. By applying an intersectional lens, the research will reveal why femicide remains a severe threat to Mexican women and explore systemic and societal factors at play.

Carmela Martinez

FL - The University of Tampa

Discipline: Anthropology and Archaeology

Authors:

#1 Marco Boscolo

#2 Anna Ragni

Abstract Name: Morphometric analysis of the human jaw in relation to dental carries

Changes in diet and the reduction of the human jaw through time has led to increased crowding, malocclusion, and cavities in modern humans. Modern mandibles are smaller and less robust, shaped by softer processed diets and reduced mechanical demands. Though we know narrow mandibles are associated with higher instances of malocclusion, and malocclusion can increase rates of cavities, there is a gap in the literature assessing the direction relationship between mandible shape and rate of cavities. We hypothesize that specific mandibular shapes are associated with a higher prevalence of cavities. To test this hypothesis, dental caries (cavities) will be documented for 40 contemporary Floridian mandibles. Cavities will be manually counted and combined with dental record information to categorize mandibles by the number of cavities they have. Mandibles will be 3D scanned to document their shape. Using geometric morphometrics techniques, we will visualize shape differences between mandibles with different numbers of caries and quantitatively carry out a MANOVA on PC scores to assess statistical significance of shape differences. We expect our hypothesis to be supported and that we'll find individuals with narrower mandibular arches to have higher rates of dental cavities. This study explore show dietary shifts directly influence jaw structure and dental health, shining light on modern oral health challenges while paving the way for potential strategies in prevention and treatment. These findings could impact the future of dental healthcare.

Natalie Martinez

TX - The University of Texas at San Antonio

Discipline: Environmental Science and Sustainability

Authors:

#1 Jeffrey Hutchinson

#2 Natalie Martinez

Abstract Name: Structure and composition of forests in the Leon and Salado Creek Greenways

Greenways are protected natural areas within urban centers that preserve biodiversity of local flora and fauna and provide passive recreation opportunities. Leon and Salado Creeks are ephemeral streams surrounded by forest habitat located in northern San Antonio. Both greenways have unpaved and paved hiking and biking trails that receive moderate to high recreational activity and a diversity of shrubs and trees. Within two greenways, we hypothesized there will be vegetation difference among the upper and middle slopes, and ephemeral stream within and between the greenways. We further hypothesized that a greater number of facultative and obligate wetland shrubs and trees will be documented in the ephemeral creeks. We sampled the upper slope, middle slope, and dry creek (ephemeral stream) on the east and west sides using the point-quarter method during May 2024 to August 2024, eighteen point-quarter plots were placed in each of the 8

locations surveyed in both greenways. Based the point counts, tree and shrub mean richness, diversity, density, d.b.h., basal area, and biomass will be estimated by species. cursory observations indicate difference between the structure and composition of forests in Leon and Salado Creek Greenways. Results are currently being analyzed and will be presented at the meeting.

Sidharth Masarur

CT - University of Connecticut

Discipline: Engineering

Authors:

#1 Jinhyung Lee

#2 Yupeng Chen

Abstract Name: Optimizing Size and Surface Charge of DNA-Inspired Nanoparticles for Enhanced Therapeutic Delivery

Messenger RNA (mRNA) therapies hold promise for treating genetic and infectious diseases through therapeutic protein expression. However, efficient mRNA delivery remains challenging, especially in tissues with dense extracellular matrices (ECMs), such as those in solid tumors and cartilage. Lipid nanoparticles (LNPs) are commonly used for mRNA encapsulation and cellular uptake but are hindered by their spherical shape and size (50–500 nm), limiting penetration through dense ECMs. To address these limitations, we developed DNA-inspired Janus-Base Nanopieces (JBNps), rod-shaped nanoparticles that improve tissue penetration for RNA delivery. JBNps entangle RNA around nanotubes, assembling into nanorods. This design enhances mRNA delivery, especially for ECM-rich tissues. In our study, we engineered JBNps to optimize their size and surface charge, crucial for targeting osteoarthritic tissues. The JBNps, synthesized and loaded with mRNA via sonication, displayed various size distributions and charges, characterized by a Zetasizer. UV-Vis spectroscopy confirmed nanoparticle uniformity, while different nitrogen-to-phosphate (N/P) ratios were tested for their influence on particle size and surface charge. JBNps with an optimal range of surface charge and size showed the highest cellular uptake, with both smaller and larger particles demonstrating reduced internalization. The dense, negatively charged ECM in osteoarthritic tissue posed a challenge, yet smaller, highly charged JBNps achieved better penetration, enhancing mRNA delivery. Aging JBNps for one week further improved shape and charge uniformity, boosting delivery capabilities. In conclusion, rod-shaped JBNps with an optimized 100–300 nm size and +10 to +20 mV charge significantly improve delivery to ECM-dense tissues, such as those in osteoarthritis. Future research will refine JBNp design using response surface methodology (RSM) to advance gene therapy applications, with potential for treating cancer, genetic disorders, and cardiovascular diseases.

Akilah Masters

OK - Langston University

Discipline: Biology

Authors:

#1 Laura Mejia

#2 Abigael Williams

#3 Jocelyn Labombarde

#4 Susan Kovats

Abstract Name: Sex differences in lung resident and inflammatory dendritic cells during influenza virus infection

Differential gene expression between male and female immune cell subsets significantly contributes to the observed sex disparity in immune cell function. Bridging innate and adaptive immunity, dendritic cells (DC) are sentinels in peripheral tissues that respond to pathogens and initiate immune responses. Sex hormones and their receptors, specifically estrogen receptor alpha (ERα, ESR1), play important roles in DC differentiation and function. Prior research has established that ERα regulates the development of DCs in vitro, specifically a subset of DCs that expands in response to inflammatory signals. We hypothesized that wild-type (WT) mice would show sex differences in pulmonary DC subsets during homeostasis or following an in vivo influenza A virus (IAV) infection, and mice with DCs deficient in ESR1 would fail to expand specific DC subsets. To test this, we infected female and male WT mice with a sublethal dose of influenza A virus (IAV) and used flow cytometry to determine conventional DC type 1 and 2 (cDC1 and cDC2), inflammatory cDC2 (inf cDC2), and monocyte-derived DC (Mo-DC) numbers in the lung in homeostasis or early post-infection. Our analyses revealed no significant difference in numbers of male and female cDC1s, cDC2s, and Mo-DCs in homeostasis. However, on day 5 after IAV infection, WT females harbored greater numbers of inf cDC2s. Future experiments will identify the impact of ESR1 in DCs, using mice in which ESR1 was selectively knocked out in CD11c⁺ DCs. In sum, our data show that females have more inf cDC2s early after IAV infection, suggesting that female-specific factors promote the expansion of the inflammatory cDC2 subset in vivo during respiratory infection.

Elena Maria Mastrantoni

WV - West Virginia University

Discipline: Health and Human Development

Authors:

#1 Zachary Weil

Abstract Name: Frequency of Capillary Stalling in Male and Female Mice Following Traumatic Brain Injury

The CDC estimates 2.5 million people sustain a traumatic brain injury (TBI) each year. TBI has many adverse effects, including capillary stalling, which is a temporary interruption of blood flow. Although the cause varies, but may be due to hemodynamic flux. We hypothesized that injured mice experience stalls which don't recover, leaving them riddled with vasculature damage. To test this, we performed closed head TBI or sham injury on adult male and female Swiss Webster mice. At either 4 or 25 days after injury, we injected 4µm red fluorescent microspheres and allowed them to circulate for 72 hours. After, we repeated injections with green microspheres, which circulated for one hour before euthanasia. Tissue was collected and both timepoint's spheres were quantified to determine the number of stalls. We found differences in number of stalled capillaries, (presence of red microspheres), across timepoints between sexes. In the hippocampus,

cortex, and thalamus, male mice tended to show an increase in the number of stalled capillaries at 7 days post injury (dpi) that continues to increase at 28 dpi. In the striatum, females showed stall capillaries at sham levels at 7dpi that decreased at 28 dpi. Male mice exhibited sham-level frequency of stalling at both timepoints. Future directions include finding mechanisms contributing to stalling after TBI and why capillary stalls exacerbate blood brain barrier (BBB) breakdown and further microvascular dysfunction, leading to larger ischemic and hemorrhagic strokes.

Jasmine Mata

MN - Minnesota State University - Mankato

Discipline: Psychology

Authors:

#1 Jasmine Mata

Abstract Name: The Impact of Repeated Reading on Reading Fluency

Repeated reading is an essential skill that students demonstrate and has even been identified as a defining characteristic of strong readers. Students struggling with reading fluently may be negatively impacted and struggle with reading their homework, reading aloud in class, and even academic performance. It is important to identify why students may be struggling with reading fluency and which strategies and interventions could help them improve their reading fluency. Repeated reading is one intervention that has received increasing attention in literature. In our research, we are looking at how variations on repeated reading impact reading fluency of 3rd grade students. This study will use an alternating treatments design in which several conditions are rapidly and repeatedly alternated to evaluate their effectiveness, specifically repeated reading with no preteaching activities, repeated reading with word-level preteaching, and repeated reading with content-level preteaching. Students who partake in this study are identified as being at-risk for reading difficulties, their parents have provided informed consent, and they have provided assent. Researchers will use grade-level text to implement repeated reading, in which participants are asked to read from the passage for one minute, three times, and after each reading, the researcher will provide error correction for any words read incorrectly. To evaluate the effectiveness of each condition, the researcher will compare the words read correctly on the fourth reading across the three conditions. The condition which results in the highest words read correctly in one minute, most consistently, will be considered the most effective. We anticipate that the use of preteaching strategies will lead to an increase in reading fluency over repeated reading without preteaching.

David Matayo

TX - The University of Texas at Dallas

Discipline: Engineering

Authors:

#1 David Matayo

#2 Mari Domingo

#3 Maria Florian-Rodriguez

#4 Kristen Miller

Abstract Name: Deletion of cGAS Preserves Vaginal Tissue in a Mouse Model of Prolapse

Pelvic organ prolapse (POP) affects 50% of women, is characterized by the descent of pelvic organs into the vagina, and is associated with age and childbirth. Birth injuries can damage DNA in vaginal cells, activating

cGAS, a DNA sensor that triggers immune responses. Prolonged cGAS activation promotes inflammation, weakening pelvic tissues, particularly fibulin-5, which forms elastic fibers critical for pelvic stability. This study investigated if knocking out both the cGAS and fibulin-5 genes in mice (DKO) restores vaginal function. Vaginal modulus was quantified using biaxial inflation testing in POP mice with fibulin-5 knocked out (F5KO) and DKO, compared to wildtype controls (WT). 15 nulliparous female mice (4-6 months old) were divided by genotype: WT, F5KO, and DKO (UTSW IACUC approved). Vaginas were mounted onto a biaxial inflation device to quantify tissue modulus at physiologic loading conditions. The F5KO was less distensible than the WT and DKO as shown by a stress-stretch curve. Circumferential modulus significantly increased in the F5KO compared to WT ($p=0.002$, $p=0.04$) and DKO ($p=0.003$, $p=0.05$), but DKO was not significantly different from WT controls. This study showed that deleting cGAS restored the biomechanical functions of the murine vagina. F5KO mice exhibited significant mechanical differences compared to WT and DKO mice, regardless of prolapse grade. The DKO did not show any significant differences in vaginal biomechanical properties from the WT. Clark+ showed that vaginal distensibility in F5KO mice decreased with grade 1 POP but increased with grades 2-3 compared to WT mice. Zheng+ also identified cGAS as a key mediator in age-related diseases, regulating cellular dysfunction and inflammation. Taken together, these findings suggest that targeting the cGAS pathway may mitigate the negative effects of Fibulin-5 deficiency and offer a promising therapeutic approach to preserve tissue strength and improve pelvic health.

Toni Mateos

CA - California Lutheran University

Discipline: Psychology

Authors:

#1 Toni Mateos

#2 Jamie Bedics

Abstract Name: Investigating the Distinctions in Treatment Adherence and Response towards CBT-I among the Psychiatric Population, based on Baseline Symptom Severity

“Insomnia is a frequent concern for those diagnosed with a psychiatric disorder. Evidence-based psychotherapies can be enhanced through a greater understanding of how treatments work from the perspective of the patients receiving the treatment. Cognitive Behavioral Therapy for Insomnia (CBT-I) has been demonstrated as an efficacious treatment for sleep disturbance. Despite its prevalence and impact, CBT-I's dissemination does not match its public health significance, despite a robust evidence base and recommendation as a primary intervention. Our current study will examine how patients adhere to the treatment during a course of CBT-I and patients' qualitative experience of the treatment. We hypothesized that there will be patterns of change in patient treatment adherence, measured via a weekly sleep log. To investigate this hypothesis, a small cohort of recruited participants will meet inclusionary criteria for insomnia and at least one DSM diagnosis for a psychiatric condition. Participants will complete a 6-week sleep log, which will measure various trajectories of patient adherence. Additionally, a general measure of symptom severity will be administered at baseline to assess symptoms severity. Finally, a qualitative survey to assess patients' experience of CBT-I following treatment will be developed.”

Bailey Matherne

GA - Kennesaw State University

Discipline: Music

Authors:

Abstract Name: Josef Suk's Deviation from Traditional Ternary Form in his "Fantastické Scherzo"

Ternary form typically exhibits three stable thematic sections: a beginning A section, a central B section, and a concluding (sometimes altered) return of the A section. A notable deviation from this form is Josef Suk's "Fantastické Scherzo," a longer ternary work for orchestra. Although this piece follows an overall ternary design, it features a mix of stable and unstable subsections instead of the standard use of a singular stable theme per section. To understand the relationship of these stable and unstable subsections, I will first identify the three main sections of the work (ABA). From there, I will recognize the different themes featured within these sections (two A themes and one B theme) and subsequently divide the sections into subsections based on how these themes are presented. They will be identified as either stable or unstable based on whether the full theme is stated in the section's main key or in fragmentation in other keys, respectively. Once I recognize each subsection's relative stability, I suggest that the fragmented sections are bookended by specific opening and closing motifs derived from each section's opening theme. Finally, I identify that the main sections are unified by common thematic material that alternates between stable and unstable presentations. As a result, I find that although this piece deviates from traditional ternary form, it is possible to unify the main sections by subdividing them into stable and unstable subsections that feature common thematic material.

Alex Matsayko

OK - University of Central Oklahoma

Discipline: Biochemistry

Authors:

#1 Alex Matsayko

#2 Mohammad Hossan Ph.D.

Abstract Name: Fabrication and Analysis of Polycaprolactone Continuous Microfibers

Polycaprolactone (PCL) continuous microfibers have great potential for various engineering and biomedical applications including surgical suture and bio-micro-sensors. This research presents a novel method of fabricating continuous, straight, and spoolable polycaprolactone microfibers and parametric analysis of the produced microfibers. PCL continuous microfibers were produced using an in-house hybrid fused deposition – spinning unit. Biomedical grade PCL filament was extruded through an electro-melt hot end and spun at various rotational velocities and spooled on a spooler. Speed of the extrusion was carefully controlled using Arduino microcontrollers and stepper motors running at a set speed to control the spinning rates. PCL microfibers were produced and spooled for four different spinning rates: 18, 29, 53, and 118 RPM respectively and surface quality and diameters were evaluated using a scanning electron microscope (SEM). The results show that produced microfibers are concentric in their cross-sections and diameters were directly correlated with the spinning rates. Higher spinning rates yield thinner microfibers. The results also show that the developed in-house hybrid system can produce as small as 4 micrometers diameter and as large as 114 micrometers diameters of continuous PCL microfiber. The SEM images also revealed that the surface quality of the produced microfibers was very smooth. This research will help to develop bioresorbable surgical suture and other microfiber based biomedical devices and sensors.

Jonathan Mattes

CA - Medanos College

Discipline: Chemistry

Authors:

#1 Jason Hernadez
#2 Wais Siddiqi
#3 Gabriel Mendoza
#4 Christopher Nichols
#5 Peyton Perez

Abstract Name: Preparation of Banana Peel Effect on Adsorption of Anionic and Cationic Dyes

This study aims to investigate the adsorption of semi-ripe banana peel (BP) as a biosorbent for removing cationic and anionic dyes. Previous research has demonstrated the ability of fruit peels to adsorb pollutants, with a notable efficacy against cationic contaminants. Inspired by these findings BP prepared using different treatments was studied as an affordable and eco-friendly alternative for dye adsorption. Four peel preparation methods—sodium hydroxide (NaOH), hydrochloric acid (HCl), oven dried after water (H₂O), and not dried after water (H₂O) were used to prepare BP for batch adsorption of an anionic and cationic dye, allura red (AR) and methylene blue (MB), respectively. With the goal of maximizing pollutant removal efficiency by optimizing BP preparation while still maintaining environmental sustainability, the experimental design controlled peel size to reduce variability in our comparisons between findings and established literature on similar biosorbents. We found that BP prepared using NaOH had the highest percent removal. Following the pseudo second order kinetics model the peels achieved an adsorption capacity of 2.9 mg/g at equilibrium with a max percent removal of 85% after 7 hours. This suggests potential for broader application with other dyes with this preparation technique. This study contributes to the growing body of research on low-cost, renewable bioadsorbents by presenting a comparative analysis of BP treatments, with potential applications for improved wastewater treatment methods. The findings from this research could further support the utilization of waste biomass for sustainable environmental cleanup, broadening the scope of biosorbent materials used in the decontamination process.

Mason Matthews

VA - Virginia Commonwealth University

Discipline: Chemistry

Authors:

#1 Srishty Sethi
#2 Soma Dhakal

Abstract Name: Single Molecule FRET-Based Detection of Nucleic Acid Biomarkers of Cancer

Over 40% of people are likely to be diagnosed with cancer in their lifetimes. Early detection of cancer is instrumental for higher survivability, quality of life, and remission. Certain circulating nucleic acids have been identified as biomarkers for cancer. While amplification techniques like RT-PCR are available, false positives are common limitations. Developing sensors to confidently detect nucleic acid biomarkers in blood at low concentrations is key in advancing early detection capabilities and treatment options. Fluorescence resonance energy transfer, or FRET, is a distance dependent, non-radiative, energy transfer process that occurs at the nanometer length scale, well suited for studying the dynamics of DNA molecules. In this project, to detect such biomarkers in solution, fluorophore-labeled DNA constructs based on the Holliday Junction were designed and tested. The utility of Holliday Junction-based DNA sensors arises when combined with the distance dependent nature of FRET. When the four-way junction is complete (i.e. when the target is bound), the changing conformation of the sensor alters the inter-fluorophore distance, leading to a dynamic EFRET pattern that can be observed in the TIRF microscopy. Following immobilization of these sensors on the microscope slide and addition of the biomarker target, the sensors were visualized via TIRF

microscopy, and their behavior were analyzed using MATLAB. DNA constructs with bound targets were found to display dynamic behavior, identifiable by characteristic fluorescence and FRET traces. Through this method, a clear and precise detection of circulating tumor nucleic acids is possible, opening up a new frontier to cancer screening.

Darby Matusz

KY - University of Kentucky

Discipline: Psychology

Authors:

#1 Jennifer Osterhage

#2 Matthew Kim

Abstract Name: Perceptions and Beliefs: Investigating Mindset and Advising Styles in Higher Education

Research on implicit theories of intelligence in academic settings has become increasingly popular among researchers and educators. Implicit theories of intelligence represent how people respond to challenges and convey either a growth mindset (intelligence is malleable) or a fixed mindset (intelligence is unchanging). While students' mindset beliefs are incredibly important, how they perceive the mindsets of others can be a stronger predictor of student success outcomes. However, much of this research has focused on instructors and has yet to be expanded to the academic advising realm. Advisors play a key role in students' academic decision-making, and advisor-student relationships can be influential in positive student development. Research on academic advising has primarily focused on advising style, classified as either developmental (holistic) or prescriptive (rigid), with less emphasis on advisor mindset beliefs. However, advisors who believe their students can improve (growth mindset) may be more likely to prioritize advising that promotes student development (developmental advising). In contrast, an advisor that does not believe students can improve (fixed mindset) might suggest a curriculum that underestimates students' true potential (prescriptive advising). This study aims to examine these variables from both the advisor and student perspectives. First, what is the relation between self-reported advisor mindset beliefs and advising style? Secondly, what is the relation between student perceptions of advisor mindset beliefs and advising style? We will run correlational and descriptive analyses using survey data collected from advisors and students at a large public university in the United States. A positive association may indicate an opportunity to utilize developmental advising interventions to promote growth mindset, or growth mindset interventions to promote developmental advising. The results of this study will generate directions for future research to better understand how these motivational processes directly impact student satisfaction and success.

Chloe Matz

VA - James Madison University

Discipline: Biology

Authors:

#1 Chloe Matz

#2 Nikki Cubbage

#3 Katherine Perez-Nesmith

#4 Jaira Ferreira de Vasconcellos

Abstract Name: Characterizing the expression of angiogenic genes in an in vitro injury model

Angiogenesis is a multistep, tightly regulated biological process characterized by the growth of new capillaries that is mediated by angiogenic factors, extracellular matrix components and endothelial cells. Following injury, angiogenesis is essential during tissue repair, which is highly dependent on adequate blood supply and, as a result, on functional and temporally regulated angiogenesis. However, a better understanding of the angiogenic process during tissue repair is still needed. Here we investigated the expression of angiogenic genes in an in vitro injury model consisting of human bone-marrow mesenchymal stem cells (BM-MSCs) treated with transforming growth factor beta 1 (TGFβ1; 10 ng/mL) for 24 hours. Gene expression analysis for the angiogenic genes ANGPTL2, FGF2, VEGFA and COX2 was performed by q-RT-PCR. GAPDH was used as a housekeeping gene. Remarkably, BM-MSCs treated with TGFβ demonstrated a trend towards the up-regulation of ANGPTL2 (control: 1.0 ± 0.0 ; TGFβ: 1.5 ± 0.3 ; $p=0.17$), FGF2 (control: 1.0 ± 0.0 ; TGFβ: 1.8 ± 1.2 ; $p=0.41$), VEGFA (control: 1.0 ± 0.0 ; TGFβ: 2.5 ± 1.2 ; $p=0.15$) and COX2 (control: 1.1 ± 0.1 ; TGFβ: 3.1 ± 2.3 ; $p=0.26$). Additional experiments need to be performed to validate these findings. Altogether, our results support the notion that our in vitro injury model may be used for the investigation of human post-traumatic angiogenesis and may be a useful in vitro system for future translational studies.

Madelyn Maurer

MI - Grand Valley State University

Discipline: Biology

Authors:

#1 Osman Patel

Abstract Name: Effect of Cholesterol on Viability and Proliferation of Breast and Endometrial Cancer Cells

According to the American Cancer Society, ~36% of cancers diagnosed in US women consist of breast cancer (BC) or endometrial cancer (EC). The high incidence of cancer in the US is linked to the obesity epidemic, with obesity affecting over 40% of the adult population. Hypercholesterolemia is a dominant factor in the pathophysiology of obesity and is described as a risk factor for cancer. For instance, a positive correlation between cell membrane cholesterol and ErbB2 (HER2) distribution is reported for BC. Additionally, a direct link is published between hypercholesterolemia and EC risk along with poor prognosis. A correlation between obesity and cancer, however, remains to be elucidated. The goal of this study was to determine how cholesterol supplementation would affect the growth dynamics of both HER2+ BC and hormone-responsive EC cells. HER2+ (SKBR3) and EC (Ishikawa) cells were supplemented with cholesterol (0 mM; 2.5 mM; 5 mM; 7.5 mM) for 28 days. Our results for BC show that cholesterol augmented proliferation rate by ~35% in the 5 mM group, while it increased the number of non-viable cells by ~40% in the 7.5 mM group compared to the control. Cell proliferation rates in the EC group decreased progressively with higher doses of cholesterol (~75% in 7.5 mM) relative to the control. Furthermore, a dose-dependent increase in the number of non-viable cells was observed in the EC group. qPCR data of both BC and EC cells revealed increasing cholesterol concentrations suppressed steady-state expression of genes associated with cell proliferation (cMYC) and the mevalonate pathway (SREBP1, HMGCR, and STARD1). Our findings suggest that cholesterol had contrasting effects on BC and EC cells, but these results merit further studies.

Mihir Maveli

CA - Amador Valley High School

Discipline: Computer Science

Authors:

Abstract Name: Comparing Heart Attack, Heart Failure, and Heart Disease Diagnostic Features Using AI/Machine Learning Techniques

Making comparisons of the features (age, chest pain, cardiac arrest, thalassemia, and blood pressure) present when looking at heart attacks, heart failure, and heart disease will help understand the correlation and any distinguishing features to help differentiate between the three. Our hypothesis is that the diagnoses of heart attacks, failures, and diseases, all share some important variables, which may show presence of more than one of these in one patient, due to their linkage. In current work, we have compared different algorithms using IBM Watson to predict outcomes of heart attack datasets. When our heart attack data, collected from Kaggle, was run through IBM, accuracies as high as 86% from two datasets were achieved. First Dataset included 303 patients and the other held 1025 patients. In this study, multiple algorithms were simultaneously applied that included Logistic Regression, Snap Logistic Regression, and Gradient Boosting Classifiers. Continuing further on this investigation, another goal is to compare the similar features in heart attacks and diseases, which both can lead to heart failure. Using data from Kaggle, IBM Watson will be applied to compare previous results with the significant features and model accuracies with the results of the new data. Comparing the different variables show extremely similar features that may be used to diagnose each condition. The datasets also are compiled with data from different parts of the world, which will yield some variance in data points as cultural factors, such as food. These factors may vary in different parts of the globe to impact the model accuracies. A deeper medical point of view will be presented along with the AI/Machine Learning perspective.

Maanyasri Mavuloori

VA - Virginia Commonwealth University

Discipline: Psychology

Authors:

#1 Maanyasri Mavuloori

Abstract Name: How does Accutane influence patients' mental health, particularly in terms of triggering or worsening depression and anxiety?

Accutane, also known as isotretinoin, has transformed the way severe, stubborn acne is treated by offering long-term relief from the psychological and physical effects of the condition. Its growing use, however, caused worries about possible neuropsychiatric adverse effects, especially given its link to anxiety and depression. With a focus on the therapeutic effects, underlying biochemical mechanisms, and clinical treatment options, this study examines the impact of isotretinoin on mental health. Acne symptoms decrease significantly with isotretinoin, which also controls skin inflammation and sebaceous gland activity. Its capacity to pass across the blood-brain barrier as all-trans retinoic acid, however, raises concerns regarding how it may impact neurological functions such as mood, memory, and synaptic plasticity. Mood swings could be caused by retinoic acid's interaction with the brain's retinoic acid receptors and serotonin signaling. Furthermore, research on animals indicates that isotretinoin may affect stress response pathways and neurogenesis, which might worsen feelings of anxiety and depression. The evidence is still contradictory, despite a large number of case studies that connect isotretinoin to neuropsychiatric symptoms like depression and suicidality. Some research show that when acne goes away, mental health improves, while others show an increase in depressed symptoms. Individual characteristics like the severity of acne, social support, and prior history of mental illness seem to have a significant impact on the results. The advantages and disadvantages of isotretinoin must be balanced, which calls for holistic approaches, frequent mood monitoring, and thorough mental health evaluations prior to therapy. Promoting open communication with patients and their families requires educating them about possible adverse effects. Including mental health specialists in treatment

groups ensures that psychological requirements are met in addition to dermatological improvements. Research advances isotretinoin's safety, reducing psychological and dermatological concerns for acne patients.

Marayna Maxwell

NC - University of North Carolina at Charlotte

Discipline: Environmental Science and Sustainability

Authors:

Abstract Name: Environmental Impacts of the Great Eastern Japan Tsunami of 2011 on Water Quality and Resulting Dangers to Post-Disaster Community Wellbeing and Ecosystem Revitalization Efforts

Tsunamis are some of the most destructive of Earth's natural forces. These disasters are extremely dangerous and can have devastating effects on not only human communities but also on ecosystem health and water quality. This project explores the multifaceted impacts of tsunamis with a specific focus on the Great Eastern Japan Earthquake and Tsunami disaster of 2011, one of the most devastating natural disasters in recent history. This tsunami caused significant damage to marine and freshwater ecosystems alike, resulting in detrimental effects to both aquatic life and human health. The very slightest fluctuations in nutrient levels or suspended sediment in water systems can destroy the delicately balanced ecosystems along the coast and can have damaging impacts on the organisms that make these aquatic ecosystems their homes. Contamination of freshwater sources following the tsunami also raised public health concerns, particularly in relation to drinking water access and the prevention of the spread of waterborne disease. The research in this project establishes that while Japan has made incredible improvements to shoreline infrastructure, including the building of new seawalls and breakwaters along the coast, the effectiveness of these measures often exacerbates destruction and risk in the communities they are intended to protect. Natural techniques are often less damaging to existing ecosystems and help to protect delicate environmental balances that might otherwise be disrupted by man-made infrastructure. This study emphasizes the need for continued research on more effective solutions for water quality remediation and management as well as general disaster preparedness strategies for tsunami-prone areas. It also calls for increased international collaboration for the advancement of technologies for water purification and to develop new natural disaster mitigation strategies that prioritize and protect both human and environmental health.

Cierra May

WI - Alverno College

Discipline: Biology

Authors:

#1 Ethan Weiner

Abstract Name: The Importance of LIP5 Condensate Formation in Plant Growth

Plants respond to their environment to adapt to changing conditions and combat issues like pathogens. Among these responses, plants change the composition of their plasma membrane by, for example, engaging the Endosomal Sorting Complex Required for Transport (ESCRT) proteins that sort and package plasma membrane proteins for degradation. One example of an important ESCRT protein is LIP5, which has the unique ability to form condensates only in plant cells but not in other organisms. To determine the function and importance of LIP5 condensation in plants, we designed an experiment to analyze the ability of LIP5 mutant proteins unable to form condensates to rescue the phenotypic defects of mutants lacking LIP5 and the

ESCRT protein ISTL1. Whereas the single *istl1* and *lip5* mutants in *Arabidopsis thaliana* are viable, the *istl1 lip5* double mutant plants are dwarf and infertile, and therefore ideal for rescue assays. By genetic engineering, we expressed wild-type LIP5 and a mutated version of LIP5 unable to form condensates in the double mutant *istl1 lip5* and measured the rosette diameter of the transgenic lines. The results showed that only the wild-type LIP5 protein can fully rescue the *istl1 lip5* double mutant phenotype whereas the expression of the mutated LIP5 does not completely restore normal growth and fertility, supporting a functional role for LIP5 condensation.

Jade May

NC - Elon University

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

#1 Ann Cahill

Abstract Name: Rethinking Climate Action Policy through a Kantian Model of Obligations

The Westphalian model or state-centered model of international environmental and climate change policy has failed, an argument that has been widely noted in philosophical climate change literature. Philosophers have developed alternative models focused on correcting the structural issues of the international environmental policy regime by delineating the roles and obligations of the four climate actors: states, individuals, collective groups of people, and corporations. However, these approaches have insufficiently addressed the interactions among the responsibilities of climate actors, where the obligations of each climate actor intersect with the others and change the necessary roles and duties of a particular climate actor. As a result, the research question of my paper is: what are the obligations for climate actors such as governments, corporations, and individuals within a Kantian deontological framework? In order to determine the ethical obligations of each climate actor, I use a Kantian deontological framework to ground my philosophical discourse in environmental ethics related to explicating the obligations of each climate actor. Furthermore, in my philosophical project, I will outline the roles and obligations of the four main actors considering the necessity of the interactions among the responsibilities of each climate actor. A clear delineation of the roles and obligations of each climate actor is of crucial importance to the enactment of effective climate change policy. Because human societies cannot effectively act against anthropogenic induced climate change, without first knowing what the appropriate duties for each actor are. Once these duties have been delineated, climate actors will no longer be able to hide from their duties to the environment, a crucial step in the process of climate change mitigation.

Seth Mayberry

IL - Eastern Illinois University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Aswathy Anakkathil Pradeep

Abstract Name: The Effect of Transcutaneous Auricular Vagal Nerve Stimulation on Second Language Learning: A Scoping Review

Adults often face challenges in learning a second language, possibly due to the sensitive period of language acquisition. Post-puberty, the mature brain experiences reduced neuroplasticity, pruning, and synaptogenesis

which impacts language learning. Transcutaneous auricular vagus nerve stimulation (taVNS), a new neuromodulation technique that modulates the release of neurotransmitters like acetylcholine, norepinephrine, and brain-derived neurotrophic factor is proposed to help reverse this decline. This scoping review compiles peer-reviewed publications investigating the effect of taVNS on healthy adults learning a second language. Using PRISMA guidelines, this scoping review examined peer-reviewed publications from 2010-2024 across different databases (e.g., PubMed). The review included eight studies that looked at a total of 387 adults aged 18-35, assessing the effect of taVNS on second language acquisition, such as noun learning, perception and production of speech sounds, tone identification, lexical tone contrast, letter-sound correspondences, and vocabulary. Results showed that taVNS delivered at 25 Hz and low amplitude, had a positive effect on most skill areas studied. Although one study did not find a benefit of taVNS in language learning, it found evidence for an increase in motivation for participants to learn vowel sounds. The studies revealed that the stimulation of the auricular branch of the vagus nerve facilitates neuroplasticity through the production of norepinephrine and acetylcholine, which in turn modulate attention, memory formation, and learning. Overall, taVNS had a positive impact on noun acquisition, tonal language categorization, lexical tone contrast recognition, lexico-semantic representation, automaticity and decoding tasks, and vocabulary. Even the one study that found no efficacy of taVNS beyond tone perception discovered a positive impact in motivating participants to learn easier sounds. Findings suggest that taVNS holds promise in facilitating second language acquisition in adults and paves the way for further research into its role in post-stroke aphasia language rehabilitation.

Shelby Mayhut

TN - Middle Tennessee State University

Discipline: Physics and Astronomy

Authors:

#1 Daniel Erenso

Abstract Name: AI-Assisted Spectral Profiling of Biomass-Derived Red Blood Cells for Stellar Research and Bioenergy

Previous studies, including our own, have shown that red blood cells derived from biomass waste can store and emit electromagnetic energy when exposed to infrared lasers and sunlight. To fully harness this ability, we are developing an AI-assisted program to construct a complete emission spectrum profile of ionized red blood cell samples, similar to the spectral profiles of stars. This program will analyze the illumination of radiation emissions from the ionized samples, identifying key spectral features such as wavelength, color, temperature, and intensity. The AI-assisted code breaks down the plasma's illumination into these spectral components by analyzing the light emitted at different wavelengths, which correspond to different colors and temperatures, and measuring the intensity of the emitted light. These features reveal how blood cells store and release energy from infrared laser light. By identifying and measuring these features, we aim to understand how red blood cell plasma stores and emits energy, potentially advancing stellar research simulations and utilizing biomass waste for renewable energy. This research employs AI-assisted code and modern physics laws to analyze video footage of red blood cells during laser ionization. By applying Stefan-Boltzmann's and Wien's displacement laws, we model the thermal radiation characteristics of ionized blood cells, breaking down the plasma's illumination into spectral components. Our current focus is on the computational analysis of the ionized blood sample's emission spectrum to enhance our understanding of electromagnetic properties in biomass-derived red blood cells. The implications of this research are significant: it allows us to simulate hands-on research of a "small star," which could otherwise only be studied through observation. This contributes to advancements in renewable energy, medical diagnostics, interdisciplinary scientific discoveries, and environmental sustainability by better understanding how biomass waste stores and emits energy through spectral profiling.

Luvada Mayle

PA - Westminster College

Discipline: Psychology

Authors:

#1 Eric C. Fields

Abstract Name: Effects of Rape Myth Acceptance, Sexual Assault Experience, and Gender on Risk Perception and Constructive Memory

Memory recall is a constructive process: What we remember is determined not only by what we encoded during an experience, but also by other knowledge, beliefs, and expectations. This can generate memory errors. Memories for information about sexual assault cases may be especially vulnerable due to the stigma surrounding sexual assault, the prevalence of rape myths, and the varying degrees of personal experience with sexual assault. This study seeks to look at the effects of sexual assault experience, gender, and rape myth acceptance (RMA) on perception of and memory for a narrative of an ambiguous of a sexual assault scenario. Participants were asked to recall the narrative immediately and after a one-week delay. Analyses will examine how individual differences in rape myth acceptance, sexual assault experience, and gender will predict perception of risk in the scenario and which details are remembered correctly and incorrectly from the narrative. High levels of RMA are expected to predict increased memory errors for details that are rape myth inconsistent and decreased risk perception, whereas low levels of RMA are expected to result in increased memory errors for rape myth consistent details and increased risk perception. Women are expected to have increased risk perception and decreased memory errors overall, and sexual assault experience is expected to be negatively correlated with risk perception.

Gina Mazariegos

PA - Commonwealth University - Mansfield

Discipline: Biochemistry

Authors:

Abstract Name: Decoding Uncertainty: Assessing the Pathogenicity of Desmoplakin Variants in Arrhythmogenic Cardiomyopathy

To date, heart disease remains to be the leading cause of death worldwide. Arrhythmogenic cardiomyopathy (ACM) is an inherited heart disease characterized by fibro-fatty infiltration and an increased risk for sudden cardiac arrest that is primarily associated with variants within desmosomal genes. A desmosomal gene of interest is desmoplakin (DSP), a type of protein that acts to tether the intermediate filaments of one cell to the plasma membrane of a neighboring cell. Our lab has previously reported that select variants in a 'hotspot' region of ACM-associated variants have hypersensitivity to calpain degradation. The mutations unfold a previously occluded calpain target site for calpain-mediated degradation by decreasing intermolecular interactions of amino acid side chains. The newly exposed calpain target site is susceptible to calpain proteolysis resulting in a reduction of full-length DSP protein levels. Despite past studies in the field, the majority of ACM linked-DSP variants have yet to be classified as pathogenic or benign. With over 75% of DSP variants classified under unknown pathogenicity (UP), improved molecular knowledge on these variants is necessary for appropriate diagnosis and viable treatment. Our research team examined 7 UP DSP variants within the mutational 'hotspot' to evaluate molecular modifications within the calpain sensitive region of each variant that may trigger calpain hypersensitivity. Molecular dynamic simulations identified 1 UP variant with increased surface exposure of the calpain target site. Surprisingly, 4 variants had increased sensitivity to calpain in vitro, suggesting other factors may contribute to calpain-mediated degradation. Regardless, this

reinforces understanding of the calpain hypersensitivity of DSP and may aid in future personalized treatment for ACM patients with calpain sensitive variants.

Jacob Mazurkiewicz

PA - Duquesne University

Discipline: Mathematics

Authors:

#1 Lauren Sugden

Abstract Name: Uncovering Imputation Bias Using Explainable Machine Learning Methods

Missing data is a common obstacle in building robust machine-learning models, and many classical algorithms require imputation of missing data. The optimal imputation method in each context depends on the correlation structure of a dataset, the amount of missingness, the types of features, and the mechanisms of missingness. Yet, this step routinely receives little attention, and selecting a suboptimal imputation method for a dataset can introduce bias into the model, diminishing the model's generalization capabilities. Shapley Additive exPlanations (SHAP) values are a game-theoretic method of assessing the "importance" of features in a model in producing an output. The values are local estimates of each feature's influence on the dependent variable and are derived through sampling methods that perform inference on records with and without a given feature. Here, we analyze SHAP values to provide insight into the behavior of imputation methods and machine learning models in the presence of missing data. We simulate artificial datasets with missing feature values with varying levels of correlation, mechanisms, and levels of missingness. We apply SHAP techniques to models trained on these datasets, both complete and with imputed data, to demonstrate how the properties of SHAP can lend insight into how imputation techniques affect model performance. SHAP can also provide warnings when imputation may introduce unwanted bias. Practitioners can use these flags of bias to appropriately handle missing data by choosing optimal imputation procedures. This approach can enhance the generalization capabilities of their models while effectively reducing the risk of performance degradation caused by missing data.

Alexis Mazzenga

IL - North Central College

Discipline: Biology

Authors:

#1 Seth Robia

Seth Robia

Abstract Name: Using FRET microscopy to compare the binding affinity of various PLM mutants to the NKA pump.

In cases of Dilated Cardiomyopathy, there is a known decrease in contractile output due to the thinned walls of the left ventricle. Research is currently looking for ways to increase this contractile force and improve the efficiency of the heart. The ultimate question is, how can one increase contractility. Calcium, an ion known to be involved in muscle contraction, is found in cardiomyocytes. One way to increase force output is to utilize calcium by preventing its movement out of the cell. This project looks at the Sodium Potassium (NKA) pump, a protein that moves sodium and potassium across the cell membrane, and its effect on calcium movement out of the cell. As these ions are moving, there is a change in electrical charges which influences

other ions, such as calcium, to move out of the cell. The theory, then, is to find a way to inhibit the NKA pump, preventing its movement of calcium out of the cell and allowing calcium to aid in the contraction of the heart. To inhibit the NKA pump, this project utilizes Phospholemmon (PLM), which has been shown to inhibit NKA function and prevent the ions from moving against a concentration gradient. The goal is then to assess how closely these two proteins (NKA and PLM) bind to one another, as tighter binding can lead to greater inhibition of the NKA pump. The binding affinity is assessed by fluorescently tagging these two proteins and quantifying their difference in binding using Fluorescence Resonance Energy Transfer (FRET) Microscopy. To further this project, known disease-causing mutations of PLM were identified and investigated to determine the mutation that shows the greatest inhibition of the NKA pump, leading to the greatest increase in contractility of dilated cardiomyopathy hearts.

Leona Mbila

AL - University of Alabama at Birmingham

Discipline: Chemistry

Authors:

#1 Ellen Humphreys

#2 Aaron Alford

Danielle Brockmeyer

Obshree Saravana

Abstract Name: Tapping Into Trouble: Investigating Microplastics and Heavy Metals in Birmingham's Water

Microplastics are defined as fragments smaller than 5 mm. If these fragments are small enough, they may cross the human blood-brain barrier. Literature indicates that microplastics can adsorb heavy metals such as lead, copper, and zinc. The adsorption phenomenon means that microplastics can both be harmful on their own and act as a vehicle for introducing other toxins to the body. This study investigates a possible association between microplastic count and heavy metal concentration in drinking water samples and suggests a novel technique to achieve these results. Traditionally, microplastics are quantified through a sediment filtration and microscopy. The proposed method requires only one field sample to determine the presence of both pollutants, further refining the identification of microplastics in the field of community water quality. In the proposed method, water was treated with prepared microplastics and shaken with lead, copper, and zinc to simulate the conditions of a pipe system. The microplastic particles were isolated and treated with a chelating agent. After filtration, the filtrate was further extracted and analyzed using ICP-OES to determine heavy metal concentration. Microplastic count was obtained through microscopy. It is theorized that an increased microplastic count will be correlated with an increased concentration of heavy metals, putting communities with aging infrastructure at risk for heavily polluted drinking water. The methods are cost-effective enough to show promise of being replicated by other institutions, hopefully introducing a more standardized and accessible method for assessing water contamination.

Bella Mbonifor

MD - Bowie State University

Discipline: Biology

Authors:

#1 Princess Dahn

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#12 Onyinye Iheorah
Eli Leach-Comas

Abstract Name: Identification of DNA Barcodes and Genetic Indices from *rbcl* Chloroplast DNA Marker within Pepper Varieties (*Capsicum annum* L.) from Different Grocery Stores in Maryland

Pepper (*Capsicum* spp.) belonging to family Solanaceae is cultivated globally for its essential uses as vegetables, spices, medicines, ornaments, lachrymatories, vitamins A and C. Over 38 species of it has been reported worldwide and there is lack of information on DNA barcoding and genetic diversity of peppers sold at different grocery stores in Maryland. DNA barcoding is a molecular technique used to identify and classify species based on short, standardized regions of DNA, offering a powerful tool for assessing genetic diversity and identification to species level. In this study, ribulose 1,5-bisphosphate carboxylase/oxygenase large subunit (*rbcl*) marker was utilized for DNA barcoding and evaluation of genetic diversity of pepper varieties. Sixteen pepper samples were collected, and DNA was extracted from both seeds and fleshy parts. The extracted DNA samples were quantified using NanoDrop spectrophotometry, followed by dilution makings and polymerase chain reaction (PCR) amplification. The PCR amplicons were verified on agarose gel electrophoresis and later sent to GENEWIZ for Sanger sequencing. The raw sequences were analyzed with DNA Subway's Blue Line platform. Within some consensus positions of the aligned sequences, single nucleotide polymorphisms (SNPs) in forms of insertions-deletions (Indels: .../C), transitions (C/T) and transversions (A/G) were detected. A phylogenetic tree reconstruction revealed the differences and clustered them on different clades and subclades. All the species were confirmed via BLAST analysis with known ones in the NCBI database. This study, despite the minimal number of samples used, demonstrates the effectiveness of the *rbcl* marker for DNA barcoding and identification of intraspecies diversity and provides valuable insights for future studies of more varieties of peppers from more grocery stores within Maryland.

Juliann Mc-Addy

GHA - Ashesi University

Discipline: Computer Science

Authors:

#1 Eric Acheampong

Abstract Name: The Impact of the use of Internet of Things (IoT) Technology and Artificial Intelligence (AI) for remote fetal monitoring on maternal and fetal health outcomes in Ghana

This research investigates how IoT and AI technologies can transform maternal and fetal healthcare by addressing the central research question: “How can IoT technology and Artificial Intelligence enhance remote fetal monitoring to improve maternal and fetal health outcomes in Ghana?”. Maternal and fetal health complications require timely detection and intervention. However, traditional monitoring methods relying on periodic hospital visits leave gaps in continuous care, delaying responses to critical health events. Through AI-driven analysis, the study seeks to demonstrate the potential for early detection of complications, improved healthcare decision-making, and enhanced health outcomes for mothers and fetuses. The study employs a quantitative methodology, beginning with the use of existing fetal health datasets containing key metrics such as fetal heart rate and maternal vitals, to train the AI system. The system will be developed to analyze these patterns, enabling it to detect abnormalities associated with complications. The AI system will

be integrated with a wearable IoT device, which collects real-time data on fetal and maternal health metrics such as fetal heart rate and uterine activity, and transmits it to a web application for healthcare professionals for analysis. The system will process the real-time data to detect potential risks, generating alerts for timely interventions. The AI's performance will be evaluated using accuracy scores to determine its effectiveness. The research is expected to show that IoT and AI technologies improve maternal and fetal health outcomes by enabling earlier detection of complications and timely medical interventions. These findings will provide a solid foundation for integrating innovative technologies into prenatal healthcare in Ghana.

Meghan McAuliffe

CT - Eastern Connecticut State University

Discipline: Education

Authors:

#1 Sudha Swaminathan

Abstract Name: Study of Relationship Between Complexity of Play and Social Participation in Preschoolers' Play

This study examined the relationships between preschoolers' gender, cultural background, bilingualism and their Play Roles, Complexity of Play, and levels of Social Participation level during pretend play. While past studies on pretend play have examined the effects of gender, culture and bilingualism, their relationship with Complexity of Play and levels of Social Participation have not been researched. Sixteen preschoolers enrolled in a lab school participated in the study. Twenty minutes of video footage was captured from each of the children while they were engaging in pretend play at the dramatic play and blocks centers. Every minute of every child's twenty minutes was assigned codes for the four categories of Complexity of Play, Social Participation Levels, and Play Roles. Chi-square analysis was run for these dependent variables against the independent variables of their gender, diversity of cultural background, and bilingualism. Results found several significant relationships. Girls participated in significantly higher Complexity levels, and higher Social Participation than boys. Children from diverse cultural backgrounds participated in higher levels of Complexity of Play and Social Participation than non-diverse children. Bilingual children took on follower Play Roles more often than monolingual children. Classroom teachers can use these findings to purposefully encourage complex play and Social Participation amongst all children. They can employ strategic grouping between the genders to encourage complex play for boys as well. They can also incorporate the knowledge that children of diverse backgrounds often lead play themes and encourage them to share themes of their representative culture. Families of all backgrounds can use this knowledge to encourage complex play at home with their children. By encouraging elaborate object use and play themes aligned with their background, they can support complex pretend play and higher levels of Social Participation with others.

Ethan McBride

DC - American University

Discipline: Political Science

Authors:

Abstract Name: The Compounding Effect: Disability Status, State Policy, & Voter Participation

This study observes the relationship between disability status and voter participation in the United States,

examining how state-level voting restrictions affect civic engagement among persons with disabilities (PWD). Using data from the 2022 Cooperative Election Study (n=60,000) and the Cost of Voting Index (COVI), we investigate how institutional barriers and state-based voting policies intersect with disability status to influence voter turnout. Through regression analyses with interaction terms and chi-squared tests, we find that PWD are approximately 9.34% less likely to vote than their non-disabled counterparts, independent of state-level factors. When accounting for state voting accessibility as measured by the Cost of Voting Index, we see "the compounding effect"; for each point increase in a state's COVI score (indicating greater voting difficulty), PWD experience an added 1.4% decrease in voting likelihood beyond the 1.5% decrease saw within the general population. Analysis of reasons for not voting between PWD and non-disabled potential voters show how transportation and healthcare barriers disproportionately affect PWD across all states, no matter how they may rank in voting accessibility, accounting for approximately 28% of non-voting reasons among PWD compared to 8.5% among non-disabled individuals. These findings coalesce to suggest that despite existing protective legislation such as the Americans with Disabilities Act (ADA) and the Help America Vote Act (HAVA), significant barriers persist for PWD in the realm of political engagement, highlighted especially in states with more restrictive voting regulations. This research provides empirical evidence for policymakers, pinpointing the exigence of establishing more inclusive voting policies that address both individual circumstances and institutional barriers that affect the likelihood of political participation especially for persons with disabilities.

Ethan McBride

DC - American University

Discipline: Political Science

Authors:

Abstract Name: A Broken System: The Impact of Persons with Disabilities' Inequitable Access to Reproductive Healthcare in the United States

In the United States, around eleven percent of persons between the ages of twenty-one and sixty-four have a permanent disability. While permanent disabilities vary in their degrees of severity, all persons with disabilities (PWD) are subject to marginalization in many aspects, whether that comes to obtaining well-paying jobs, furthering their education, or being scrutinized by society for their inabilities. Accessing essential healthcare is another critical challenge experienced by PWD, considering the number of inaccessible healthcare provider offices, the rising cost of services in America, and the already-studied significant wage gap for PWD compared to their able-bodied counterparts. One facet of the healthcare field carrying significant weight in the twenty-first century is reproductive healthcare, and as of current, there is limited research and background as to how access to this specialty is experienced for PWD. The history of reproductive healthcare for PWD centers around the forced sterilization movement of the twentieth century and many of the inequalities still seen today prevail around the ideas founded in this era. This project looks to connect the foundation of ableism and observe how PWD experience the American healthcare system as a whole, then using that background as a base to highlight the current lackluster procedure of reproductive health as it relates to sex education, provider implicit biases, socioeconomic divisions, and insurance. By using scholarly opinion and others' statistical analyses, I argue that PWDs are subject to further marginalization when looking to obtain reproductive healthcare. This project leaves room for further inquiries, especially of more quantitative evidence based on PWD obtaining reproductive healthcare.

Corey McCall

NC - Elon University

Discipline: Biology

Authors:

Abstract Name: Assessing the Effects of Covid and the Covid Vaccine on the Cardiac Health of the General Population: A Heart Rate Variability Study

Covid-19 emerged in 2019 and nearly 5 years later has been responsible for over 7.1 million deaths and 776 million infections globally. As a relatively new virus, its long-term effects, including those related to the vaccinations, are still being studied. Some individuals have experienced heart issues, such as myocarditis and pericarditis, following infection or vaccination. Heart rate variability (HRV) is a noninvasive, relatively inexpensive method to assess cardiac health by measuring the time variation between heartbeats. The greater the variability, the better the cardiac health. Previous research has used HRV to evaluate cardiac damage in severely affected Covid-19 patients, but its predictability in those with subacute cardiac conditions is unclear. This study utilized surveys and HRV data from electrocardiograms to investigate differences in HRV based on Covid-19 infection and vaccination history. T-tests indicated several significant findings: females exhibited a higher HRV (SD Rate) than males ($p=0.031$); individuals never infected with Covid-19 had a higher HRV (SDRR) compared to those infected two or more times ($p=0.030$); those receiving one or two Covid-19 vaccines had a higher HRV (Average RR) than those vaccinated three times or more ($p=0.002$); individuals receiving Pfizer for all doses showed a higher HRV (Average RR; Median RR) compared to others ($p=0.044$; $p=0.039$); and individuals exercising two or fewer days a week had a higher HRV (SD Rate) than those exercising more frequently ($p=0.002$). The hypothesis that increased exposure to Covid-19 antigens—through infection or vaccination—correlates with decreased HRV is supported by these results. This finding suggests that increased exposure may worsen heart rate variability. With future research, HRV has the potential to be used as a screening tool for identifying cardiac issues related to Covid-19 in the general population.

Thomson McCarthy

MT - Montana State University

Discipline: Engineering

Authors:

Abstract Name: Automated Enzyme-MOF Comparisons: Leveraging Computational Tools for Biomimetic Design

Enzymes are biological catalysts with high activity under low severity conditions. However, enzymes pose challenges in industry since they are difficult to produce, maintain, and recover. Metal-organic frameworks (MOFs) are materials that have been synthesized to address the industrial limitations of enzymes. They are porous crystalline structures composed of metal ions connected by organic linkers. MOFs are great candidates for biomimetic catalysts due to their enzyme-like structure, thermal stability, recoverability, and high performance. Through manual comparison, researchers are beginning to find successful MOF-enzyme mimics. With over 16,000 synthetic MOFs already reported, the manual comparison process is slow, serendipitous, and extremely difficult. And if a MOF is chosen for a desirable biomimetic quality, there are often many additional options that were simultaneously overlooked. For this reason, we are interested in optimizing and automating the selection process for biomimetic MOFs. We have initiated a screening strategy comparing the metal sites and the surrounding ligands in enzymes and MOFs. The most important feature of a successful biomimetic MOF is the metal node identity and accessibility for chemical reactions. This is the first filter in our rational screening program which significantly narrows the list of candidate MOFs. The second filter checks if the atoms coordinated with the metal in the MOF match the parent enzyme. Using existing Python libraries, we have created a database with the bonded atoms in the metal sites of thousands of known MOFs. In its current form, this approach has identified MOF-enzyme mimics concurrent with existing literature, such as the MOF MFU-4l-OH which is a known mimic of the enzyme carbonic anhydrase. In my presentation, I will discuss these matches and how additional chemical and structural screening criteria will

enhance the quality of matches and enable a ranking system that provides a user-friendly comparison of enzymes and MOFs.

Annalissa McCaw

WI - University of Wisconsin-Whitewater

Discipline: Biology

Authors:

#1 Annalissa McCaw

Abstract Name: Creating a luciferase reporter to monitor MyoD protein expression during embryonic development in *Xenopus Laevis*.

Circadian rhythm involves changes in gene expression, physiology, or behavior that occur over a 24-hour period. A molecular clock present in each cell keeps time and also regulates the expression of clock controlled genes (ccgs). MyoD is a ccg and is important for muscle development. My goal is to create a tool to monitor MyoD protein expression in *Xenopus laevis* embryos using a nanoluciferase reporter system. We have successfully inserted a small piece of nanoluciferase (HiBiT) into the 3' end of the Myod(S) gene using CRISPR-Cas9 genome editing. HiBiT protein when combined with LgBiT protein reconstitutes nanoluciferase which can make light in the presence of its substrate (furimazine). Currently, I am working to transcribe LgBiT RNA and co-inject it with our Myod(S) guide RNA, Donor DNA, and Cas-9 protein into one cell *Xenopus* embryos. LgBiT RNA will be translated into protein by the embryo. If HiBiT insertion works, the embryos will translate MyoD containing a HiBiT tag. We will confirm HiBiT insertion using PCR as well as assessing light production. Future creation and maintenance of a Myod(S)::HiBit transgenic line will support experiments that test whether circadian genes can influence Myod protein expression during embryogenesis.

MeSha McClanahan

TX - University of North Texas at Dallas

Discipline: Biology

Authors:

#1 MeSha McClanahan

#2 Dr. Nicholas Lorusso

Abstract Name: Forensically Relevant Decomposition Influences Forest Arthropod Communities and Ecosystem Services

Various taxa participate during decomposition, the crucial recycling of nutrients into the ecosystem, ranging from microbes (e.g. fungi, bacteria) to animals (e.g. arthropods, megafauna). In the context of broader community composition, however, the impact of high relative abundance of decompositional taxa can serve as a disturbance for preexisting communities. Decomposers can disrupt natural communities by competing with the existing populations causing changes to overall community composition and promoting an excess of saprobic taxa local to the decomposition site. In the context of forensically relevant decomposition, these changes have the potential to not only to change the broader ecological community but to have compounding effects on the decomposer community, as well. On the one hand, these shifts have the potential to disturb important ecosystem processes by reducing the relative abundance of species providing these services and result in short term changes to ecosystem functioning. Pollination for example is an important ecosystem

service that relies on select species to fulfil this process. These processes could be influenced by nearby decomposer activity, where invasive opportunistic predators might shift access to flowering plants in the vicinity of active decomposition. We used seven fetal pigs as a human model to observe the five stages of decomposition—fresh, bloat, decay, active decay, and skeletonization—to quantify changes to arthropods less directly associated with decomposition with unaltered control plots. We measured the abundance of invasive carnivorous fire ants (*Solenopsis invicta*), pollinators, and soil arthropods to determine if those groups would change in the presence of active decomposition. We observed a significant change in overall arthropod community composition with both pollinators and invasive fire ants changing in response to decomposition. This work highlights that broader insect communities are sensitive to active decomposition and frequent disturbance could lead to changes in community structure and functioning.

Trinity McCleary

TX - San Jacinto College

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

Abstract Name: Personal Environmental Initiative

We currently are living under a quickly warming Earth and the threat of a 6th mass extinction. While both of these issues are known to be caused by humans, data shows that only 1 in 4 Americans report having done anything to actively care for the environment in the past year. Although concerns are rising, action among citizens remains low. Free will guided purely by incentives rather than reason has fueled years of irrational harm to nature. Environmental adaptations are taking place, but often hindered by this lack of urgency and understanding of what climate change action should look like. Through understanding why it is important to act in ways that help the environment and a change in our culture we can stop this hindrance. Environmental justice should allow all living things the foundational resources to live an optimal life, but this opportunity is stripped from many organisms due to climate change. So what is causing this lack of action and how can we argue that personal initiative is important? Utilitarianism doesn't account for plants' health and allows minimal dedication to plant life to persist. In a search to find a philosophy that achieves my idea of justice for all living things in nature I use the teachings of Kant to show that virtue and personal action are vital to environmental protection. Respecting non-human nature as more than a means, practicing frugality, and duty to other humans can initiate a change not only for oneself but the world around them. Kant gives us the key to what must be done for harmony between humans and nature. Through promoting moderation and genuine respect for all aspects of nature Kant shows us contrasting morals compared to our current culture and how we should teach the importance of personal initiative.

Zach McClellan

HI - Chaminade University of Honolulu

Discipline: Psychology

Authors:

#1 Zach McClellan

#2 Darren Iwamoto

Abstract Name: Occupational Stressors Effect on the Quality of Life for Firefighters

Firefighters experience consistent exposure to trauma, high-stress situations, and disrupted sleep, which are

well-known risk factors affecting firefighters' mental health. (Wolffe et al., 2023). This study aims to investigate how occupational stressors affect firefighters' quality of life and raise awareness about mental health concerns within the fire service. Little attention has been given to factors contributing to firefighters' psychosomatic well-being (Carey et al., 2011). 78% of firefighters experienced at least one critical incident at work, and 40% reported experiencing significant emotional distress at work (Torres et al., 2016). Despite the growing body of research on firefighters' mental health and quality of life, there are still gaps in our understanding of how specific occupational stressors impact these outcomes. Many studies have focused on a single stressor or outcome, and there is a need for more comprehensive investigations that examine the interplay between multiple stressors and their effects on various aspects of firefighters' well-being. An online survey was administered to firefighters (N=49) at a department in Southern California. This survey assessed the stress levels of firefighters using the Firefighter Assessment of Stress Test (FAST) and assessed the quality of life the firefighters were experiencing using the Quality of Life Enjoyment and Satisfaction Questionnaire—Short Form (Q-LES-Q-SF). It was hypothesized that Firefighters who experience higher levels of occupational stress, as measured by the Firefighter Assessment of Stress Test (FAST), will report lower quality of life scores on the Quality of Life Enjoyment and Satisfaction Questionnaire - Short Form (Q-LES-Q-SF) compared to those with lower levels of occupational stress.

Emma McConkey

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

#1 Emma McConkey

Abstract Name: The Kilpatrick Estate - Housing Designed for Visual Impairments – Primary Infantile Glaucoma

The Kilpatrick Estate was designed to meet the needs of a family with a son who has Primary Infantile Glaucoma. This rare eye disorder occurs in the first years of life and prevents the eye from draining aqueous humor fluid, which puts pressure on the optic nerve. Left untreated, it can lead to minor or severe damage, resulting in peripheral vision loss, central vision loss, or even complete blindness. Given these circumstances, the family required a home supporting their son's development and learning. The research for this study was conducted through case studies and an interview with an expert in home design for the visually impaired. This research indicated that the home design needed several specific features. Key elements include high contrast to help differentiate between different surfaces, wayfinding components such as tactile paths and audible cues, textured materials with Braille labels, advanced technology like voice-activated features, and ADA-compliant spaces. The home's layout was designed with distinct rooms rather than an open floor plan, enhancing wayfinding. The color scheme was carefully chosen to create contrast within the rooms. Some areas feature wall paneling to add texture. The furniture was selected for its ADA compliance and soft edges, ensuring safety. The bathrooms are equipped with grab bars and accessible showers, along with the appropriate lever-style faucets and handles. Lighting was another critical consideration, emphasizing maximizing natural daylight and providing ample illumination in each room to eliminate dark spots. Additionally, Braille labeling and voice-activated technology were installed throughout the home. This study's significance is crucial for future designers, as it offers valuable insights into effectively accommodating families with similar needs.

Emma McConnell

PA - Duquesne University

Discipline: Environmental Science and Sustainability

Authors:

#1 Emma McConnell

#2 Joseph Reeder

#3 Philip Reeder

Abstract Name: Using Soil Analysis, Air Photograph, Satellite Image and Map Comparison, and Holocaust Survivor Testimony to Uncover the History of the Jungfernhof Concentration Camp Site in Riga, Latvia

Jungfernhof was an improvised Concentration Camp near Riga, Latvia, that used existing buildings from the former Mazjumprava Manor. The camp was in operation from December 1941 through March 1942 and served as overflow housing for 4,000 Jews from Germany and Austria, intended initially for transport to other camps. During the harsh winter of 1941-1942, 800 prisoners died from exposure, disease, and execution. In early spring 1942, dynamite blasted a mass grave in the frozen ground. The research objectives for this project were to define the physical properties of the soils at the site and to determine the location of former camp buildings and a possible mass grave(s). Methodologies focused on locating former buildings compared German military air photos, Google Earth satellite images, maps from 1942 and 1947, and survivor testimony obtained from the Latvian State Historical Archive, the Locker of Memory Project, and the Museum of the Jews in Latvia. Based on field analysis, soil texture was mostly silt, with some sand, and a distinct clay layer, indicating that soils formed in over-bank deposits from the Daugava River. The consistency or inconsistency of the soil layers can reveal areas that have been disturbed, most likely by human activities, which may have included the creation of a mass grave(s) behind a former camp building that, in survivor testimony, is called "the shed," so determining the location of former camp buildings is essential in the process of locating the mass grave(s). Future research will include expanding a part of the project that utilizes ground penetrating radar (GPR) to study subsurface features and further soil analysis to confirm the presence or absence of anthropogenic features that point toward the exact nature of these inconsistencies.

James McCormack

WI - University of Wisconsin-Eau Claire

Discipline: Computer Science

Authors:

#1 James McCormack

#2 Naeem Seliya

Abstract Name: A Deeper Look into Attributes for Diabetes Prediction

Diabetes Mellitus is a significant global health challenge and according to World Health Organization, there are an estimated greater than 800 million people worldwide who are affected by this disease. The increasing prevalence of diabetes warrants a better conscientious effort of investigating alternate methods for developing effective and efficient predictive models of the disease. A key focus of this research is investigating the importance of various attributes associated with diabetes. This entails conducting empirical analysis of the consistency of different factors that are correlated with the disease. Our research work will also explore the relative performances of different attributes for their effectiveness in predicting the disease. We aim to answer the following: "What are the impacts of key socioeconomic factors that strongly correlate with the diagnoses of diabetes." The approach we have taken to address the above-mentioned research goals is utilizing various Artificial Intelligence based predictive algorithms and approaches for analysis of the different attributes to determine their degree of correlation with diabetes. The current case study dataset consists of various attributes for determining whether a person has or does not have diabetes. Our preliminary empirical study has focused on machine learning algorithms to gauge initial insights into analyzing the various characteristics of different predictive attributes associated with diabetes. The primary results of those studies indicated the potential of some attributes (provided in the dataset) as having good predictive capabilities. The planned

directions of this research project will focus on Artificial Intelligence based algorithms to develop experiments to gain a more comprehensive understanding of the different attributes and their characteristics in the context of predicting diabetes. A key focus of our project is also the study on the effect of various socioeconomic factors that indirectly influence the biases and disparities associated with the prevalence of Diabetes Mellitus.

Emma McCormack

CT - Eastern Connecticut State University

Discipline: History

Authors:

Abstract Name: McPotempkin Village: The Globalization of Post-Soviet Russia

Since 2022, a resurgence of Cold War tensions have come to define modern Russian-American relations. Leaders of both nations have once again returned to a state of fundamental opposition, reflecting deep-seated mistrust and uncertainty between Russia and the United States. Yet, for a brief period, Mikhail Gorbachev's 1986 reforms, (glasnost and perestroika) had allowed for economic engagement beyond the Eastern Bloc. Multinational corporations, McDonald's among them, seized this opening to negotiate franchise deals in the Soviet Union. The Golden Arches made their Moscow debut in 1990, drawing unprecedented crowds amidst a period of severe economic hardship. It seemed that the Russian people had embraced Western culture and businesses as their own. However, following the 2022 invasion of Ukraine, McDonald's severed its business ties with Russia at the onset of Western sanctions. During the thirty-six years between Gorbachev's reforms and the Russian invasion of Ukraine, the people's initial sweetness towards globalization had permanently soured. I argue that McDonald's operations in Russia served as a microcosm of Russian American relations, reflecting political and cultural transformations since the Soviet Union's collapse. My interest in this topic emerged from a blend of two distinct discourses: one grounded in Russian perspectives, and the other shaped by Western ideals. In my research, I utilized media accounts and government statements from both nations. I also conducted interviews with everyday Russians who witnessed either the opening or withdrawal of McDonald's in their former home. The interviews, alongside an examination of Western and Russian sources, demonstrate how McDonald's had come to embody the complex dynamics of globalization within Russia.

Inaara McCray

WI - University of Wisconsin-Milwaukee

Discipline: Political Science

Authors:

#1 Sara Benesh

Joshua Matthews

Abstract Name: Beyond the Bench: How the Appearances of Justices Kagan, Gorsuch, and Kavanaugh impact the Public.

The appearances of the Supreme Court justices influence public perception. While it may seem that all appearances would enhance public support, at times, ideological speeches or political rhetoric can decrease public support. Thus finding what appearances elicit a certain reaction in the public is significant. To achieve this goal, we cataloged the appearances of the Supreme Court justices by focusing on Google searches by year and by justice. Google was the chosen search engine because other databases are not likely to be used by

the public. Data collection included reading through the first 50 links of a Google search, and deciding if it was relevant. Relevant appearances happened after the justice was confirmed and off the bench. Furthermore, we did not follow embedded links to additional events found in a report. This mirrored the kind of Google search and result, a member of the general public would encounter. Moreover, this emphasis enabled the measurement of media saturation. Four search terms, interview, speech, comments, and appearance, were used for each Google search. From the Google search, qualifying appearances would be recorded in a Google form. Justices Elena Kagan, Neil Gorsuch, and Brett Kavanaugh were the primary focus of our research because they provide a comprehensive look into the Supreme Court. The findings of these justices allow for a comparison of the number of appearances over time, the average appearance per year, and the dynamic with the public. The data displays that not all appearances have the same impact. We found Justice Kagan, who has the most appearances annually, has a more dynamic relationship with the public. This presentation will share findings from the data collection of the three justices and speculate about the larger implications for justice appearances.

Isla McCubbin-Green

MI - University of Michigan - Ann Arbor

Discipline: Education

Authors:

#1 Xingjian (Lance) Gu

#2 Barbara Ericson

Abstract Name: Influences on High School Students' Interest in Advanced Placement Computer Science

By analyzing reports of student's experiences in Advanced Placement Computer Science courses this study seeks to identify what motivates students to take computer science (CS) coursework while also taking into account the influence of when student's first hear about programming and the effect of the environment of their CS classroom on persistence in the field. This is critical as student entry to CS education becomes earlier and inequalities in high school can become magnified. Identifying why students take CS courses is fundamental in understanding how to increase participation in CS education, especially among traditionally underrepresented groups. This study included 25 hour-long semi-structured interviews of current high school or college freshmen students who completed or were currently in Advanced Placement (AP) Computer Science A (CSA) and/or Computer Science Principles (CSP) course(s). AP CSA is intended to be the equivalent of an introductory college-level CS course, developed by The College Board, while CSP was later created to introduce students to CS and retain them for future courses. Thematic analysis will be conducted on the collected interviews to identify how students enter CS education while also using Bronfenbrenner's Ecological Systems Theory and the CAPE framework as analytical lenses. Bronfenbrenner's theory categorizes environmental impacts into levels—microsystem, mesosystem, exosystem, macrosystem, and chronosystem—that influence students' decisions to enroll in AP CS courses. The CAPE framework—capacity, access, participation, and experience—aids in understanding the complexities of equity in CS education within school and classroom environments. Preliminary results suggest emerging themes such as how students observing their parents in CS or technology related careers encourages them towards CS courses. Additionally, an early introduction to technology before high school often provides students a greater understanding of what CS is, increasing interest in the field and positively influencing students' decision to pursue CS education.

Trevor McDaniel

PA - Community College of Allegheny County

Discipline: Sociology

Authors:

Abstract Name: Food Insecurity in Appalachia: Highlighting Causes & Solutions

In the United States, nearly 28 million (12.5%) people, that is one out of eight experience some form of food insecurity according to USA Facts Team, 2024. In Appalachia, 14% of the population or 3.5 million people live with food insecurity. Appalachia is a region spanning across 13 states with a large rural population and high poverty rates. This can be seen in the lack of access to affordable and healthy food. My project explores the dynamics of food insecurity in Appalachia, especially Pennsylvania and West Virginia, including the causes and possible solutions. I assume that income inequalities and geographical conditions largely influence access to food and the ability to lead a healthy life. I hypothesize that food insecurity can be reduced through individual and community-based gardening practices supplemented by awareness, education and governmental support. Access to home gardening educational resources, food preservation education, nutritional education, farmers markets, and garden grants can encourage people to grow their own fresh food. Apart from describing the geographical, economic, social and cultural features of Appalachia, the concepts of food security, food deserts, food sovereignty, food justice, food loss, food waste, and community gardens are explored. The disproportionate amount of college students currently experiencing food insecurity is also pointed out. This poster highlights the causes and produces specific strategies that people can use to overcome food insecurity in Appalachia using secondary research sources like books, journal articles and reliable websites

Lauren McDonald

IA - Iowa State University

Discipline: Environmental Science and Sustainability

Authors:

#1 Anna Tucker

Abstract Name: Evaluating Spatial Error in Radio-Tracking of Blanding Turtles in Terrestrial Habitats in Iowa

Triangulation via radio-tracking is a standard method in wildlife studies to monitor species' movements and habitat preferences, particularly in challenging areas. My research examines the spatial error associated with triangulation techniques used to track Blanding's turtles (*Emydoidea blandingii*), a semi-aquatic species of conservation concern, within wetlands near Ames, Iowa. An accurate understanding of these errors is critical for interpreting movement data and supporting habitat conservation efforts. VHF radio tags were strategically placed in known locations, and their locations were then estimated using triangulation from four distinct observer points. We recorded S coordinates for reference, enabling a comparison between the estimated and actual positions of the transmitters. Error distances ranged from 6.5 to 25.8 meters, with an average error of 15.4 meters. Notably, approximately 15% of the location estimates deviated beyond the expected accuracy range of GPS units, highlighting the potential for substantial error in location data. While the findings provide insightful information into triangulation performance in terrestrial environments, the lack of data from aquatic habitats leaves a significant gap in understanding the full range of Blanding's turtles' spatial ecology. Future research will address this limitation by extending triangulation efforts to aquatic environments where the species spends significant time. By quantifying spatial errors and emphasizing the need for precision in radio-tracking methodologies, this study contributes to improving conservation practices for Blanding's turtles. Accurate movement data will allow researchers to assess habitat use better, inform protection strategies, and mitigate threats to this vulnerable species in diverse environments.

Cailin McDonald

KY - University of Kentucky

Discipline: Biochemistry

Authors:

#1 Louis Hersh

#2 Martin Chow

#3 Eun-Suk Song

Abstract Name: Designing a Nanobody-Based Treatment Targeting the HER2 Protein

Receptor tyrosine-protein kinase erbB-2 (HER2) is a receptor protein that is associated with the development of several cancer types, most notably breast cancer. HER2 positive breast cancers are responsive to treatments that specifically target the HER-2 protein. Existing treatments use monoclonal antibodies to bind to the HER2 protein. The aim of this project is to re-engineer an existing monoclonal antibody into a nanobody® for treatment. Nanobodies are also called single domain antibodies, while the name NANOBODY® and NANOBOODIES® are registered trademarks of Ablynx N.V. Nanobodies® consist of solely the VHH region of antibodies. The use of nanobodies® comes with unique advantages due to their small size, stability, and ease of production, but a nanobody does not sacrifice the functionality that comes with the use of a whole antibody. A nanobody® gene was designed based on the binding domain from the existing monoclonal antibodies used for treatments, Trastuzumab and Pertuzumab. The VHH sequence from the monoclonal antibodies was ligated into an expression vector, and then inserted into E. coli cells. Expression of the gene was induced to produce the nanobody®. The nanobody® was purified using immobilized-metal affinity chromatography. A direct ELISA test was then used to confirm that the nanobody® is properly binding to the HER2 protein. Two nanobodies® that can effectively target and bind to the HER2 protein were produced. The project can now be extended for further testing and optimization of the nanobody®.

Jordan McDonald

SC - University of South Carolina Upstate

Discipline: Psychology

Authors:

#1 Scott Meek

#2 Michelle Phillips-Meek

Kayla Pinkerman

Abstract Name: Is Physiological Feedback Impacted by the Perceived Gender of the Presenter?

Electroencephalogram (EEG) research has previously demonstrated that the type of feedback individuals receive can impact their neurological responses by creating either a positive or negative waveform/amplitude. These responses to certain cognitive tasks are referred to as Event-Related Potentials (ERPs) and when people receive negative feedback it produces Feedback-Related Negativity (FRN). FRNs are typically observed around 200-400ms after feedback is presented. This study specifically investigates FRN responses as they relate to a feedback presenter's gender. There is limited research on FRN responses and even less that investigate FRNs as they relate to gender. The current study seeks to explore how neurological response is influenced by the perceived gender of the presenter of feedback utilizing an EEG and a pattern recognition task. Participants are presented with a pattern of nine randomized letters. Participants are then shown a slide with two letters where the participant is asked to recall which of the two was presented in the previous pattern using a response input device. To guarantee events lead to a FRN response, 64 of the 200 questions lack a correct option, resulting in an incorrect feedback slide for either response. The feedback screens vary across

blocks, with two blocks consisting of female photos and two with male photos. If the participant correctly identifies the letter from the presented pattern, the photo will be of the male or female smiling. If the participant incorrectly identifies the letter, the photo will be of the male or female frowning. Participants are equipped with a 64-channel hydrocel EEG while completing the task to measure scalp-related potentials associated with feedback. Preliminary results indicate an anticipated increase in negative amplitude for feedback screens showing a male compared to a female. The valance of the feedback does not have a significant effect on the FRN response.

Kaisha McFall

UT - Utah Valley University

Discipline: Sociology

Authors:

Jamie McFall

Abstract Name: Utah Gun Safety: Addressing Utah's Gaps in Resources, Education, and Legislation

This study investigates four primary factors to gun safety disparities in Utah: misinformation, inadequate funding, misleading legislation, and feedback loops. Utah consistently ranks among the highest in the nation for accidental child shootings and gun-related suicides, underscoring a need for effective and accessible safety resources statewide. Furthermore, Utah's relatively lax firearm regulations make it one of the easiest states in the U.S. to obtain a gun, presenting both an opportunity and challenge in terms of implementing preventive safety measures. Using a mixed-methods approach, it incorporates insights from existing research, legislative reviews, and interviews to formulate ideas. By examining regional and demographic data, the research explores existing interventions, historical patterns, stakeholders, and power dynamics. This research aims to equip policymakers, educators, and community leaders with evidence-based strategies to address gun safety disparities and build a stronger, statewide safety culture. Key levers of change include encouraging firearm manufacturers to innovate toward safer gun designs—such as developing locking safety triggers and "smart" locks that restrict access to authorized users. Policies like "extreme risk laws" could empower law enforcement to temporarily restrict firearm access in cases where individuals pose a clear risk to themselves or others. The study aims to illuminate evidence-based strategies that can reduce accidental firearm injuries, enhance responsible ownership practices, and decrease gun-related suicides across Utah.

Owen McGrath

NE - Creighton University

Discipline: Computer Science

Authors:

#1 Owen McGrath

#2 Luke Zacher

#3 Samer Al-Khateeb

Luke Zacher

Abstract Name: Mobs Simulator: A Multi-theoretical Stochastic Agent-based Modeling Tool to Study Mobs Outcome & Mobbers Behaviors

A mob is an event organized via digital communication technologies where people assemble (online, offline, or both) to exert a collective force, ranging from benign gatherings such as dance performances at a shopping

mall to deviant/malicious actions like coordinated cyber-attacks, organized crimes, and street takeovers. While previous research has established theoretical frameworks and data-driven approaches to understand mob dynamics and mobbers' behavior, these models often remain inaccessible to practitioners and researchers. Building upon the collective action theory-based model developed by Al-khateeb et al. (2024) and the multi-theoretical framework by Murray et al. (2024), we implement a stochastic agent-based modeling (ABM) simulation tool mainly using the Python programming language to understand mob phenomenon better. Our model incorporates key behavioral scenarios driven by 5 social science theories where agents can: act (participate), withdraw, perform power exchange (to gain utility), or act against the mob. The simulation takes three primary inputs: the number of invited participants, the number of known powerful participants/agents (e.g., mob organizers), and a threshold for mob success. We randomly assign each participating agent/mobber 18 traits/social science factors, then we determine the agent's decision/action based on multi-theoretical constraints. Then the model uses various theoretical scenarios (relating to each agent decision) and calculates a participation rate to determine mob success or failure. All of this is then wrapped into a web application to create an accessible and interactive tool for studying collective behavior, which is particularly valuable for understanding cyber-social group formation and its potential societal impacts. Our work bridges the gap between complex theoretical models and practical applications, offering insights into related phenomena such as social movements, organized protests, the diffusion of innovation, and the spread of online rumors.

Naysha McGriff

GA - Kennesaw State University

Discipline: Mathematics

Authors:

#1 Lauren Matheny

Abstract Name: Sabrina vs Steph: The Battle Between the WNBA and NBA

Background The average salary of a Women's National Basketball Association (WNBA) player is 110 times less than a National Basketball Association (NBA) player's. Despite increasing WNBA viewership, gender inequality in sports remains high, with female athletes often perceived as less skilled. The lack of investment in women's sports limits fair comparisons with men's leagues. This study examines whether the perceived skill gap between WNBA and NBA players is real or influenced by external factors by developing an unbiased measure of player efficiency to compare athletic performance. **Methods** This dataset was sourced from Basketball-reference.com and cleaned to remove duplicates and missing values, resulting in 555 players (166 WNBA, 389 NBA). Extreme outliers were assessed. An unbiased measure for comparing player efficiency (dependent variable) was developed: $\text{Efficiency} = (\text{Points} + \text{Rebounds} + \text{Assists} + \text{Steals} + \text{Blocks}) - (\text{Missed Shots} + \text{Turnovers}) / 100 \text{ Team Possessions}$. A multiple linear regression model was conducted. Independent variables included games played, games started, personal fouls, organization and the interaction between games started and organization. **Results** Average efficiency of WNBA players was 24.2 (SD=8.1) points and 26.5 (SD=8.2) for NBA players. Multiple linear regression revealed that 23.6% of the variation in efficiency was explained by games started, games played, personal fouls, organization, and games started*organization, ($R^2=0.236$, $F(5)=33.54$, $p<0.001$). Number of games started had a stronger effect on NBA players' efficiency than WNBA players. Specifically for every additional game started by an NBA player, efficiency decreased by .200 units on average, compared WNBA players ($t=-4.63$, $p<0.001$). **Conclusions** Findings indicate that WNBA players are not less skilled than NBA players; however games started significantly impacts NBA players differently than WNBA players. These results emphasize the need for greater investment in female sports' data collection and research to create a more equitable comparison of performance between genders.

Miles McIntosh

Discipline: Geography/Geology

Authors:

#1 Jason Janke

#2 Juk Bhattacharyya

Abstract Name: Surface And Subsurface Temperature Monitoring of a rock glacier in the semi-Arid Andes

The retreat of glaciers serves as a clear indicator of a changing climate. However, the impact of climate change on rock glaciers, which are covered by insulating debris, is often overlooked. Known as "water towers," rock glaciers store hidden reserves of water within their ice. This water resource is crucial in regions like Chile, which has been experiencing prolonged droughts. By monitoring temperature, we can better understand and manage these water reserves, ensuring sustainable water supply during times of scarcity. The Aconcagua River basin in central Chile presents a valuable opportunity for study. This basin, showcasing a continuum from rock glaciers to ice-exposed glaciers, serves as an ideal environment for monitoring environmental changes in this sensitive area. For this project, we examine the Tres Gemelos rock glacier complex near Los Andes, Chile. Temperature measurements were collected at the surface and 30 cm below the surface at a 2-hour sampling interval. Data loggers were placed at two locations. One was near the toe of a rock glacier, while the other was closer to the rock glacier head at higher elevation. The monitors were active from March 2013 through November 2022. Taking a reading every 2 hours for a total of 12 readings a day, totaling in over 42,000 points of data for each monitor. The average temperature has increased about 1-2° C over the last decade. Similar trends were observed at the surface and at depth with average temperatures peaking during 2019 and 2020. We also found the length of winter has been reduced since 2017. Our analysis holds the potential to enhance our understanding of climate change and its impact on glaciers.

Erin McKenna

PA - Mercyhurst University

Discipline: Political Science

Authors:

#1 Seyma Akyol

Abstract Name: An Analysis of the Sincere and Strategic Ratifiers of Immigration and Family Laws in the International Community

The subject of analysis is the way international laws and norms are interpreted and implemented in vastly different ways, depending on whether the state is considered to be a strategic or sincere ratifier. To compare and contrast among the international community, this analysis will focus on the case of the international norms around the treatment of immigrants and arranged/child marriages. In the case of immigration laws and the treatment of immigrants entering a foreign domain, the subject of analysis will be the United States border with Mexico, and the jurisdiction in which BORTAC operates under, and how they violate international law. In the case of child marriage and arranged marriage, the subject of analysis will be Trinidad and Tobago, and their violations with the implementation of CEDAW. Through analyzing the discrepancies in the implementation of international law surrounding immigration and Family law, the case structure of strategic and sincere ratifiers will be more apparent in the international system. To analyze sincere and strategic ratifiers, one must look into the country's motivations in signing or ratifying an international law. Differentiating the motivations, and whether these motivations are out of a country's self-interest in appearing societally advanced compared to their counterpart in the international community or whether they are ratifying a treaty to create genuine societal progress for citizens. In order to properly differentiate a state's

motives, you must look at their governmental structure, and their past record of adhering to international laws and norms, this will allow a clear detection whether a state is a strategic or sincere ratifier. Once this is deduced, the question at hand will be what are the possible policy recommendations that can correct this disparity and abuses of international law ratification.

Britta McKinnon

WI - University of Wisconsin-Milwaukee

Discipline: Environmental Science and Sustainability

Authors:

#1 Emma McKeel

#2 Rebecca Klaper

Abstract Name: Impact of Cerium Oxide and Silica Nanoparticles on the Freshwater Microalgae, *Raphidocelis subcapitata*

The use of nanoparticles is rapidly expanding across numerous fields, including agriculture, health, and cosmetics. Subsequently, these nanoparticles inevitably end up within our environment, leaving a lasting impression on ecosystems. Strengthening the knowledge of the effects of CeO₂ and SiO₂, two commonly used nanoparticles, on *R. subcapitata* will enable researchers to gauge how these nanoparticles impact a central freshwater organism. This foundational knowledge will serve as a baseline for future research towards improving safety in industries utilizing nanoparticles. According to previous research, Cerium Oxide nanoparticles were shown to stimulate positive attributes to plant growth and survival while similarly, Silica nanoparticles are shown to assist in biotic and abiotic stress resistance within plant organisms. Studies regarding the safety of both CeO₂ and SiO₂ nanoparticles in microalgae, with a range of concentrations and long-term exposure, remain lacking. To clarify the underlying mechanisms and concentrations relating to the nanoparticles, control treatments will be compared to three experimental concentrations of each nanoparticle. High-content image analysis, reactive oxygen species measurements, and gene expression will be used to determine sublethal impacts of exposure. I hypothesize that both Silica and Cerium Oxide nanoparticles will result in ROS alterations while impacting the morphology and growth inhibition of the *R. subcapitata* algal cells.

Cleo McLaughlin

MD - Salisbury University

Discipline: Chemistry

Authors:

#1 Cleo McLaughlin

#2 David Keifer

Abstract Name: Determining Charge Limits on Particles using Electrostatic Energy Analysis in Electrospray Ionization Mass Spectrometry

The purpose of this study is to understand how the shape of analytes influences their charge states during electrospray ionization mass spectrometry (ESI-MS), which is crucial for interpreting charge state distributions of large biomolecules and nanoparticles. By investigating the maximum number of like charges that can be accommodated on various particles before the electrostatic repulsion energy exceeds twice the surface energy—a threshold relevant in ESI-MS—we aim to enhance our understanding of ionization processes, contribute to the analysis of complex analytes, and have implications in analytical chemistry and nanotechnology, particularly in the design of nanoparticles and biomolecules with specific charge properties. To achieve this, we developed a computational model to analyze three-dimensional shapes such as cubes, spheres, and cones. The model incorporates a modified optimization algorithm to avoid local minima, enhancing the accuracy of charge limit determination. Charges were randomly placed on the particles, and the total electrostatic energy was iteratively minimized and compared to the surface energy to determine charge

limits. The results indicated that the maximum number of charges a shape can accommodate depends significantly on its geometry and size, with more extended shapes accommodating more charges due to higher surface area. Visualizations using MeshLab provided insights into how charges distribute on complex surfaces to minimize repulsion.

Duncan McLendon

GA - Kennesaw State University

Discipline: History

Authors:

#1 Masako Racel

#2 Albert Way

#3 Jonathan Gentry

Abstract Name: Assimilation Policy or Military Development: Conflicting Methods in the Japanese Occupation of Guam

On December 10, 1941, at 3:30 A.M., the Imperial Japanese Army landed on the shores of Guam, an American territory in the middle of Japan's South Seas Mandate. The invasion was a simple matter for the soldiers who gained control after only suffering one casualty. The subsequent occupation was not as simple. The Imperial Japanese Navy sought to create an agricultural industry on Guam so that it was self-sustainable and able to support the Navy's military actions. In order to do this, the Navy established the civilian administrative unit Minseibu, headed by Japanese civilians experienced in island administration, whose job was to govern Guam and advance the development of agriculture. These civilian officials believed the best method to achieve self-sufficiency was to assimilate the native people of Guam, the CHamoru, so that they would develop a sense of loyalty to Japan. They pursued this through the establishment of educational institutions and cultural celebrations. However, their desire for assimilation was not shared by the Navy, which had intended the Minseibu to support the Navy's broader efforts in the Pacific War through its administration. This created an environment where Japanese Navy personnel and Minseibu civilian employees were fighting amongst themselves to promote what they considered the best method for colonization. This infighting caused the Navy to fail in the establishment of a self-sustainable Guam colony and had disastrous consequences for the native CHamoru who were forced by the Navy and Minseibu to provide labor, attend schools, and support competing visions for how the Guam colony would function under Japanese occupation. This project makes use of Japanese oral histories, letters, and testimonies from those who lived through the occupation to reveal why the Japanese occupation of Guam failed in its goals.

Jill McLendon

GA - University of Georgia

Discipline: Linguistics and World Languages

Authors:

#1 Jill McLendon

#2 Vera Lee-Schoenfeld

#3 Steven Foley

Abstract Name: Sorting It All Out: Degree Phrase Modification in Particle Verb Phrases

Particle verbs are combinations of a verb and particle, like eat up. They present a long-standing puzzle in

syntactic theory due to the word order alternation traditionally analyzed as particle movement. Verb and particle stay together in the unmoved (continuous) word order, as in he ate up the spinach, but separate in the moved (discontinuous) order: he ate the spinach up. Crucially, the particle can be modified in the discontinuous word order (ate the spinach right up), even by a whole phrase (ate the spinach pretty much right up), however, modification in the continuous order (*I ate right up the spinach) is ungrammatical. We also have to explain the ungrammaticality of particle modification in the continuous order (*I ate right up the spinach). While these features of particle verbs have been noted in the literature (Larsen 2014), previous analyses (Larsen 2014, Harley 1997, Ramchand 2008) either fail to predict that particle modifiers can be phrasal (totally all out of spinach) or rely on under-motivated syntactic machinery: an object movement specific to particle verbs and extra structure existing only to accommodate it. We propose a simpler solution based on the widely adopted vP-VP shell analysis of (di)transitive verbs (Larson 1988), eliminating the need for ad-hoc functional projections. While retaining Larsen's (2014) phrasal analysis (PrtP) to allow modification, we originate the object as an argument of the verb, not within the PrtP like Larson. Further, we integrate DegP into our PrtP for the discontinuous order only, explaining the ungrammaticality of continuous order modification. The alternation of orders is motivated by idiomaticity, where less idiomatic, decomposable constructions allow modification. This analysis accounts for the previously unnoticed interaction between phrasal modification of particles and the idiomaticity of particle-verb constructions, suggesting a condition on the syntax-semantics interface to explore in other constructions and languages.

Destiny McManus

IN - Indiana University East

Discipline: Biology

Authors:

#1 Danyelle Bland

Abstract Name: YHR039C in *Saccharomyces Cerevisiae* and Potential Role in ER

Saccharomyces cerevisiae has multiple genes throughout the genome for which the function is still unknown. YHR039C is one of these genes of unknown function. Using bioinformatics, research of different proteins and genes that have any form of interaction with YHR039C were inspected along with images of the GFP-protein fusion that help determine localization. We found that Yhr039cp is predicted to be localized in the endoplasmic reticulum and may increase the cell wall strength and membrane integrity via ergosterol production. To identify the function of YHR039C, it was replaced in the yeast genome with URA3 to create a knockout yeast strain. A PCR-based strategy was used to replace YHR039C with URA3, and a confirmation PCR reaction validated the disruption of YHR039C. The growth of the knockout strain was tested against different drugs using multiple rounds of spot assay to observe cell growth compared to the wildtype strain of yeast. Spot assays of wild type and yhr039c were tested using fluconazole, ethanol, and dithiothreitol. Preliminary results from wet lab investigations showed that ethanol and DTT stress factors impacted yhr039c cell growth significantly when comparing the knockout and wildtype strains. A morphological analysis of both yhr039c and the wildtype log-phase cells showed a decrease of large, budded cells in yhr039c compared to wildtype, indicating that there may be a delay in the G2 phase of the cell cycle. Without YHR039C, it is possible that ER function cannot be maintained properly, and this may ultimately disrupt lipids being made by the ER that are necessary for maintaining cell membrane integrity.

Valerie McMullen

PA - Duquesne University

Discipline: Philosophy, Ethics, and Religious Studies

Authors:
#1 Valerie McMullen

Abstract Name: AI-Assisted Technologies in Speech-Language Pathology

Over the last few years, we have seen significant advancements in Artificial Intelligence (AI) and a growing use of AI in education, health care, and preventative care. This poster explores the impact of AI in Speech-Language Pathology and, in particular, the benefits and ethical challenges of using AI in the day-to-day responsibilities of speech-language pathologists. Speech-Language Pathology is a specialized field within healthcare and education that works with individuals on their speech, language, communication, feeding, and/or swallowing to improve their communication and increase their independence and overall quality of life. The three main areas of responsibility of a speech-language pathologist are (1) evaluation and assessment, (2) treatment, and (3) documentation. In this poster, we look at the impact of AI-assisted technology in each of these three areas. AI-assisted technologies offer increased efficacy of diagnosis, treatment, and therapy for speech, language, and swallowing disorders, as well as improve individuals' quality of life. In all three areas, AI was found to save therapists time on mundane tasks, allowing them more time to spend providing direct services to their clients. Only a limited number of studies reviewed for this poster presented information regarding the limitations of AI in the field of Speech-Language Pathology in terms of the clients and therapists alike. Further research is necessary to determine the privacy risks of using AI in a clinical setting, whether the benefits of using AI outweigh the loss of a human connection, the effect that reliance on AI may have on therapists' creativity and cognition, and how patients of all ages may respond differently to AI. These ethical concerns must be addressed before the Speech-Language Pathology community can fully embrace the benefits of this new technology.

Maggie McNeilly

GA - University of West Georgia

Discipline: Psychology

Authors:
#1 Dr. Christine Simmonds-Moore

Abstract Name: Exploring Ecological Consciousness and Extrasensory Perception

There has been ample research conducted about ecopsychology in relation to transpersonal psychology and extra sensory perception through the lens of Parapsychology, but to date, there is no research on how being connected to nature might influence access to non-local information. That is why my mentor and I have been in the process of conducting an academic Psychology research study that seeks to investigate how intrapersonal (interoception and transliminality), interpersonal (empathy) and other forms of connectivity (connection to nature, ecopsychological self and extrasensory perception) relate to one another. It will also explore the idea that those who display higher levels of connection and who are more psychologically healthy (as measured by a measure of satisfaction with life) will perform better at an Extra Sensory Perception task. In addition, we will explore whether it is possible to boost scores on intra and extrapersonal measures of connection as a result of listening to "Plant music" via the Plantwave system. This system claims to generate music by measuring biological changes within plants, graphing them as a wave and translating the wave into pitch and presenting these signals as music. Before participants come into our research lab on campus we have them complete a Qualtrics survey that goes along with our study aim. After the survey is completed, participants come into our lab and complete a series of ESP tests, followed by listening to 15 minutes of Plantwave music. We then have them complete the same ESP tests and survey as before so we have a comparative analysis. In person experiments are still being conducted, but after we have collected data from 40 participants we can begin to analyze our findings through SPSS software. Our final research data will be ready to be presented through a powerpoint oral presentation by April for NCUR.

Abbey McNely

KY - University of Kentucky

Discipline: Environmental Science and Sustainability

Authors:

#1 Abbey McNely

Abstract Name: The Ethical Responsibility of Sustainable Tourism in Indonesia

Bali, Indonesia has seen a tremendous increase in tourism has jumped more than 70% since 1980 (Milko & Jatmiko, 2022), which led, in turn, to a massive increase in plastic pollution. Marine and local life has suffered without a clear plastic management solution. This project examines the impacts of tourism on Bali's economy, aquaculture, and indigenous peoples, exploring the question of whether tourism can prove sustainable for Indonesia's economy and environment. Drawing from interviews with tourists, domestic Indonesian visitors, and indigenous Balinese communities, and considering greenwashing regulations in hotels and resorts, this project will explore the environmental strain tourism has placed on Bali and its surrounding islands.

Paul McPartland

PA - University of Pittsburgh

Discipline: Engineering

Authors:

Abstract Name: Thermophoretic Effects on The Removal of Neutron Poisons in Nuclear Thermal Rocket Fuel Rods

This study modeled the production and spread of neutron poisons, such as Xenon-135, throughout the fuel of a High Assay Low Enriched Uranium (HALEU) Nuclear Thermal Rocket (NTR). Neutron poisons are a danger to the effective use of NTRs for long term space flight, as they can reduce the reactivity of the reactor to a point where it is unable to start, until the poison decays or is removed. The study investigated the potential use of a thermophoretic force to remove the neutron poisons from the fuel. The computational approach determined that the thermophoretic force was not strong enough to make a worthwhile effect on the concentrations of the neutron poisons in the fuel, but was able to make an effective model for the buildup of poison throughout the fuel cell.

Alexandra McPike

PA - University of Pittsburgh School of Nursing

Discipline: Nursing and Public Health

Authors:

#1 Alexandra McPike

#2 Julia M. dos Santos

Abstract Name: Socioeconomic disparities in BPA and BPS exposure and their impact on metabolic health in T2D individuals

Background and Purpose: Bisphenol A (BPA) and Bisphenol S (BPS) are endocrine disruptors used in manufacturing products like food packaging. Ultra-processed foods, often containing BPA and BPS, are more accessible to people with lower economic means. High exposure to these chemicals is linked to increased risk of metabolic diseases. This study aims to identify whether individuals in areas with high deprivation indices are at greater risk for BPA and BPS exposure and its impact on type 2 diabetes (T2D) management. **Methods:** Plasma samples from 106 males and 152 females were obtained from a randomized control clinical trial investigating medication adherence in T2D patients. BPA and BPS levels were measured using ELISA assays and correlated with data on glycated hemoglobin (A1C), blood glucose, insulin, high-density lipoprotein (HDL), low-density lipoprotein (LDL), and triglycerides. The Area Deprivation Index (ADI) was determined using participants' zip codes from public data by the Center for Health Disparity Research, University of Wisconsin. Comparisons between male and female groups were performed using independent t-tests, and variable associations were analyzed with Kendall Tau b test using SPSS software. **Results:** Males showed higher levels of BPS and triglycerides and lower levels of ADI, insulin, and HDL compared to females ($p < 0.05$). No significant differences were observed in BPA, A1C, LDL, and blood glucose levels. BPS levels positively correlated with A1C in males ($r = 0.165$), while ADI negatively correlated with BPS and HDL in females ($r = -0.133$, -0.108 , respectively). **Conclusion:** Males are more exposed to BPS than females, potentially explaining higher triglycerides and lower HDL levels. BPS exposure may increase A1C in males, while affecting HDL in females. ADI appears to influence BPS levels in females but not metabolic outcomes in males. Reducing BPS exposure might improve metabolic outcomes in T2D patients.

Mikel McQueen

TX - The University of Texas - Permian Basin

Discipline: Engineering

Authors:

Ilan Yzaguirre

Tyler Catherwood

Abstract Name: Coating System Bearing

Current ball bearing assemblies used in specialized powder coating machines for internal pipe coatings often seize and fail within six months of operation. This failure stems from residual ceramic powder infiltrating the bearing housing, clogging the assembly, and rendering it immobile. To address this, at the University of Texas of the Permian Basin we developed an advanced bearing system that minimizes powder ingress and extends operational lifespan. Leveraging SolidWorks for CAD modeling, the group analyzed the original design, identified key issues, and introduced new design parameters to mitigate the root causes of failure. Simulations, including stress-strain and flow analysis, confirmed the robustness and efficiency of the redesigned bearing assembly. Previous attempts to prolong bearing lifespan, such as using pressurized air to clear residual powder, only marginally improved performance without addressing the core design flaw. These inefficiencies result in costly downtime and frequent replacements, impacting both productivity and revenue. The redesigned bearing incorporates a modular structure for ease of maintenance, allowing periodic cleaning in the case of minimal powder accumulation. The improved bearing system is specifically tailored for machines that apply ceramic coatings to drill string pipe, used in oil and gas operations. Force studies proved the engineered bearing could withstand higher torques and moments than the bearing would ever undergo from the powder coating machine. Flow simulations expressed satisfactory results of minimal airflow between the assembly that would affect the bearing system. The results of which are manifested in a fully functional, true-scale product of engineering design. By integrating this advanced bearing into powder

coating systems, companies can achieve extended machine uptime, reduced maintenance costs, and greater operational efficiency.

Sophia McRae

CA - University of the Pacific

Discipline: Visual Arts

Authors:

#1 Jill Vasileff

Abstract Name: How Tragedy Rewrites Our Minds

Faith undergoes a profound transformation in the wake of personal tragedy. While death often feels distant when it's a stranger, it becomes strikingly personal when grief enters your life. My close friend's untimely drowning and my mother's battle with liver cancer forced me to confront the delicate balance between the acceptance and rejection of faith. This phenomenon where tragedy either deepens or dismantles one's belief system is at the heart of my art series. Religion is ingrained in over eighty percent of the global population, yet history reveals its dual response to catastrophe. Events such as the Black Plague, the Covid Pandemic, the Hiroshima bombing, and the Holocaust highlight two diverging paths: the reinforcement or renunciation of faith. Cognitive dissonance, the psychological tension caused by trauma that challenges one's beliefs, plays a pivotal role in this shift. When higher power appears to "allow" excessive suffering, faith can waver. Yet paradoxically, tragedy often births hope, as seen in how the Black Plague strengthened Christianity's influence. My series blends Renaissance-inspired techniques with acrylic and oil on canvas, depicting statues of universal religious themes: gods, angelic figures, and divinely chosen mortals. Drawing inspiration from Gothic religious art, Greek sculpture, and the Renaissance Movement, each painting explores existentialism and the psychological reshaping of belief systems in response to grief. Future works will expand to include visual interpretations of humanity's collective tragedies. Through this project, I process personal losses while examining how faith evolves under the weight of trauma, with the end goal of finding an answer to this phenomenon. This work serves as an artistic and emotional inquiry into the human condition, capturing the double-edged sword of hope and despair. My ongoing exploration reflects both personal healing and a broader dialogue on the role of religion and culture in navigating life's most profound losses.

Ryan McWilliams

WV - West Virginia University

Discipline: Music

Authors:

Abstract Name: Modernizing Music: Exploring Unconventional Uses of Timbre, Dynamics, and Duration and their Effects on Compositional Style and Musical Awareness

As music has continued to develop, so have the approaches to the question of "what is music?" There are many debates pertaining to the answer to this question, but it truly cannot be answered when isolated from the compositional and performance aspects of a work. Music can be anything that is desired of the players, composers, and listeners, as long as its intent is music. Such is the case with this piece, Journey West. There are no standard conventions of music, like melody, harmony, key, or time, but instead it is entirely reliant on the performers to utilize their instruments and the timbres they create to perform an intricate work. Deriving counterpoint and musical ideas from aspects like volume, timbre, and duration are not new concepts, but they

are driven to the forefront of this work to display them and show that a “melody” does not have to consist of rhythmic pitches, but may instead simply be the intentional organization of sounds. The creation of this composition challenges not only the listener, but the composer as well to think more critically about applications of musical ideas and how being aware of more nuances of music can help develop skills that can be applied to future compositions or listenings.

Gustavo Medina

UT - Weber State University

Discipline: Biology

Authors:

#1 Kirstie Kandarlis

#2 John Mull

Abstract Name: An Assessment of Native Wood-Associated Beetles on New and Old Slash Piles in the Western Rocky Mountains

Coniferous forests in the Rocky Mountain West are at an increasing risk of significant wildfires. The U.S. Forest Service has implemented an array of fire suppression treatments to reduce fuel loads, an effort to reduce the intensity of major wildfires. One of these treatments involves mechanical tree thinning that is followed by the burning of slash piles when weather conditions allow for them to be safely burned. The objective of this study was to determine if old (> 1 yr) or newly cut (< 1 yr) slash piles were more effective at supporting native wood-associated beetles, especially borers. Twenty screened enclosures (ten per treatment group) were placed over old and new slash piles during the summer of 2024. Beetles emerging from the wood were collected using blue vane traps placed inside these enclosures. Specimens were later pinned, identified to family and tentatively assorted in to species. Beetles were 2.5 times more abundant and diverse at the family and species level in the new slash piles. Thus, younger slash piles contribute more to the maintenance of the diversity of wood-associated beetles in these forests than older slash piles. To balance the need to maintain biological diversity while reducing the risk of fire, management agencies should consider leaving slash piles on the landscape for at least a year after cutting.

Andrea Medina

WI - Carthage College

Discipline: Communications

Authors:

Abstract Name: The Illusion and Reality of Parasocial Relationships with Celebrities

Abstract This paper explores the impact parasocial relationships with celebrities have on media followers and figures. While parasocial relationships have been around for years, they are only growing, leading, in many cases, to both negative and positive interactions. The narrative review examines and dissects the history and psychology of parasocial relationships, their impact, and how parasocial relationships are used in the media. Using attachment theory as a lens, this paper also delves into the phenomenon of Taylor Swift, her use of parasocial relationships to build engagement and branding, and her clever use of social media tools to foster a sense of connection and belonging.

ELVIS MEDINA

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: Walking an independent life with no constraints

Being born with optic nerve hypoplasia (ONH) presents unique challenges not only for individuals with the condition but also for their families. This congenital defect, caused by underdevelopment of the optic nerve during fetal growth, significantly impacts visual function. Prenatal factors such as maternal infections, substance use, or other disruptions during pregnancy can contribute to this condition, resulting in varying degrees of visual impairment. Individuals with ONH may face difficulties navigating their environment, both at home and in public spaces or community centers, requiring thoughtful accommodations to enhance their quality of life. Designing spaces for those with visual impairments involves implementing features that prioritize safety, accessibility, and sensory enrichment. Essential design elements include high-contrast color schemes to help differentiate between walls, floors, and furniture, as well as tactile features like textured flooring or wayfinding for orientation. Lighting plays a crucial role, with ample natural and artificial light carefully managed to reduce glare while maximizing visibility. Open layouts minimize physical obstacles, allowing for easier navigation within the home. Advanced technologies can further enhance independence. Voice-activated systems, smart home devices, and multisensory aids, such as auditory signals or aromatic markers, provide additional support for daily activities. These features, rooted in research and practical application, create environments tailored for independent living. For individuals with ONH, homes designed with these elements foster a sense of autonomy and confidence, making everyday life more manageable and fulfilling. By addressing the specific needs of visually impaired individuals, both in residential and public settings, thoughtful design not only improves functionality but also empowers them to lead more independent lives. This holistic approach ensures that spaces are not only accessible but also enriching, supporting the dignity and well-being of those living with ONH.

Rachel Mehle

WV - West Virginia University

Discipline: Dance

Authors:

Abstract Name: Shut Out

In this current day and age, I wanted to explore the theme of bullying as a constant social issue domestically as well as globally. Bullying may be present in various environments such as school, extracurricular activities, and now online. I created this piece based on my own bullying story. I have a cast of four dancers to represent the theme, which includes a door prop to create a physical mental element within the piece. The main themes that my work focused on were forms of bullying that are physical and social. The build-up of this can be seen throughout the piece. The psychological impact of bullying can also be shown through low self-esteem, depression, and anxiety. The reasoning behind bullying is the need to feel empowered. This may create peer pressure and the need to fit in socially. In my work, this is established by one dancer who is in charge with two others following. Establishing these relationships within my work also depicts the role of bystanders, who can either perpetuate or mitigate bullying through their reactions. Society can play a crucial role in bullying, as cultural norms and media representations can normalize aggressive behavior, while institutions frequently fail to address bullying effectively. Overcoming this issue involves fostering resilience in victims, educating potential bullies on empathy and communication, and implementing anti-bullying

campaigns and legislation. The narrative of bullying does not end in defeat. Moving on from the experience is difficult but not impossible. For many, the journey begins with finding strength in small acts of kindness from friends, family, or even strangers. This piece shows it as the victim moves to a new place that makes one feel accepted.

Diya Mehta

DC - The George Washington University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Diya Mehta

Abstract Name: The Impact of Social Norms on Intervention Strategies for Honor Crimes in India

Honor crimes in India which deeply rooted in patriarchal norms and caste-based hierarchies, continue to pose significant challenges to justice and social reform. This study examines the prevalence of honor crimes, analyzing why intervention strategies by governmental and non-governmental organizations have largely failed. Through qualitative interviews with NGO activists across seven states in India, the research highlights the intersections of gender, caste, and religion as critical factors that perpetuate these crimes and undermine policy efficacy. Key findings revealed chronic underreporting, systemic law enforcement failures, and societal resistance as major barriers to effective interventions. The study also critiques existing legal frameworks, such as the Special Marriage Act and the Prevention of Atrocities Act, for their limited implementation and inability to address the cultural dynamics driving honor crimes. Recommendations include awareness campaigns, educational reforms, accessible counseling services, and the enactment of a specific honor crimes law to ensure accountability and victim protection. This research emphasizes the urgent need for holistic, culturally nuanced approaches to dismantle the societal structures that enable honor crimes, contributing to the broader discourse on gender-based violence and social justice in India.

Aditi Mehta

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Diego Hernández Espinosa

#2 Amantha Thathiah

Abstract Name: The Differential Activation Phenotype of Human Microglial Cells in Response to Diverse Stimuli

Microglial activation plays a central role in the progression of Alzheimer's disease (AD), where the response to amyloid beta (A β) can determine neuronal survival. Appropriate regulation of microglial activation is critical, as it protects neurons from the neurotoxic effects of A β accumulation. Dysregulation of this process contributes to cognitive deficits and disease progression. Emerging evidence suggests the G protein-coupled receptors (GPCRs) may significantly influence microglial function and neuroinflammatory pathways. Among them, GPR3 is a promising target for modulating microglial responses, although its role in amyloidosis requires further exploration. This study aims to characterize the activation of phenotypes of human microglia under conditions designed to mimic pro-inflammatory (LPS/IFN- γ), anti-inflammatory (IL-4), and cellular damage-associated (etoposide) conditions. Using the Human Microglial Clone 3 (HMC3) cell line, we

assessed cellular responses to the various stimuli over 24 hours. Morphological changes were monitored using phase contrast microscopy. Flow cytometry was employed to evaluate the expression of microglial activation markers CD11c and CD45 . Metabolic activity was indirectly measured through medium pH fluctuations. Western blot analysis was used to quantify the expression of ARG-1 and iNOS, markers indicative of distinct microglial activation states. Preliminary observations suggest that microglial responses are stimulus-dependent, exhibiting distinct changes in morphology, marker expression, and metabolic activity. These findings highlight the heterogeneity of microglial activation under different environmental conditions, underscoring the importance of characterizing these responses as a step toward understanding their role in AD. We hope this sets the stage for future studies into how GPCRs, including GPR3, might influence microglial activation and response to amyloid pathology, potentially contributing to therapeutic approaches for AD and other neurodegenerative diseases.

Aani Mehta

NY - Adelphi University

Discipline: Psychology

Authors:

#1 Lawrence Josephs

Abstract Name: Is Love Addiction Associated with Personality Disorders and Trauma?

Love addiction (LA), a behavioral addiction, is a controversial concept that is not yet an official diagnosis. It can be defined as an insatiable need to be in love and be considered vital to a romantic partner, according to Maglia et al. (2023). A recently developed measure of LA incorporates the three features of addiction: craving, tolerance, and withdrawal (Costa et al., 2021) Love addicts cannot live without feeling love and they constantly crave it. They build tolerance to feeling loved and will insatiably need to feel more desired by their partner. If love addicts feel unloved or if they are not in a relationship, they may experience withdrawal symptoms like severe mood swings, depression, and irritability. The purpose of the present correlational study is to examine whether LA is associated with other psychopathologies with which it might overlap. LA may overlap with obsessive compulsive personality disorder (OCPD) since both involve obsessive thought processes and compulsive behaviors. LA might intersect with narcissistic personality disorder (NPD) because both involve excessive idealization. Both LA and post-traumatic stress disorder (PTSD) involve emotional dysregulation. The study administered an anonymous survey with self-report measures of LA, OCPD, NPD, and PTSD on Qualtrics. Participants are being recruited through Amazon Mechanical Turk. The current study is still in the data collection stage. Due to the overlapping features of LA with these other disorders, it is being predicted that results may show a positive correlation between love addiction and at least one of the other disorders. Exploration into this topic is vital to contributing to current understanding of negative mental and emotional states, which harm an individual as well as their relationships. Relationships that love addicts have are filled with their dysfunctional behaviors, such as crippling and constant emotional dependence on their partner.

Jai Mehta

TN - University of Tennessee at Knoxville

Discipline: Computer Science

Authors:

#1 Yogesh Dhungana

#2 Jiyang Yu

Abstract Name: Defining Effector and Memory-like Cell State In in-vivo CAR T Cells from Multi-center Clinical Trials

Chimeric Antigen Receptor (CAR) T-cell immunotherapy is an emerging treatment that has demonstrated high remission rates in pediatric patients with non-solid tumors. This process involves extracting T cells from the patient, inserting the CAR gene, and allowing the cells to proliferate in a laboratory setting before reinfusion into the patient to target and destroy tumor cells. The inaugural recipient of CAR T-cell therapy has remained cancer-free for twelve years. Despite this success, the specific in vitro concentrations of effector and memory T cells, which are crucial subtypes for sustained immunologic response, remain poorly characterized. This lack of definition can lead to relapse if the in vivo balance of these cells is inadequate. This study utilized a Gaussian Mixture Model (GMM) to classify clinical T cell data into what are hypothesized to be effector and memory groups. Validation was conducted using data from the first patient (PT1), with UMAP Joint-Embedding confirming a significant correlation between clinical group classification and PT1's durable CAR T-cell gene expression. These findings suggest that the GMM effectively delineates in vivo CAR T cell phenotypes corresponding to effector and memory functions, enhancing our understanding of post-treatment T cell dynamics.

Oscar Mejia Rodriguez

NJ - Kean University

Discipline: Computer Science

Authors:

#1 Oscar Mejia Rodriguez

#2 Eric Landaverde

#3 Daehan Kwak

Abstract Name: COVID-19 Tweet Classification Using Large Language Models

The COVID-19 pandemic sparked widespread discussions on social media platforms such as Twitter, where people shared their real-time perceptions regarding various controversial topics such as vaccinations, public health policies, and societal effects of the pandemic. This research tells the story of the pandemic by classifying millions of web-scraped COVID-19 related tweets into various categories through the use of Large Language Models (LLMs). This process involved creating a pipeline that benchmarked the efficiency and accuracy of locally deployed LLMs (Mistral, LLaMa3.1, Gemma, Qwen, etc.) on tasks such as topic classification. After scraping Twitter and storing tweets in a database, they were retrieved and pre-processed to ensure high-quality tweets were used. Using these models, we categorized tweets into a predefined set of topics such as masks, vaccines, and quarantining. These categories were then appended back into the table and stored in the database for further analysis. To evaluate the performance of different LLMs, model accuracy and classification consistency will be considered. Zero-shot and few-shot prompting, with and without contextual examples, were explored to optimize the classifications generated by the LLMs. Throughout the research, various prompt engineering techniques, such as self-consistency prompting and chain-of-thought prompting, are utilized. When comparing and analyzing the models, some were better suited for the task at hand, thus identifying the best model for the job. The work accomplished during this research project underlines the potential of LLMs in labeling datasets, a task that would otherwise require significant manual work and time. This research project highlights an efficient pipeline to extract insights from large-scale datasets. The findings of this project can aid in policy-making and demonstrate the utility of LLMs for real-time data classifications during future emergencies.

Alondra Melendez

PA - Westminster College

Discipline: Biology

Authors:

#1 Alondra Melendez

#2 Joshua Corrette-Bennett

Abstract Name: The impact of HMB on fgf8 expression levels during *Ambystoma mexicanum* limb regeneration.

Axolotls are organisms with the ability to regenerate different types of tissues through a complex process involving wound healing, dedifferentiation, and re-development. During the dedifferentiation phase, the expression of the fgf8 gene plays a key role in promoting the differentiation of mesenchymal cells into muscle tissue. Within this developing muscle tissue, the metabolite Beta-hydroxy-Beta-methylbutyrate (HMB), is synthesized to promote the expression of essential muscle proteins necessary for tissue growth. While HMB is known for its role in muscle growth, its effects on muscle tissue regeneration are unknown. And have not been tested for tissue regeneration capabilities. The aim of this study is to determine the impact of HMB on fgf8 expression during muscle tissue regeneration. We expect that injecting increasing concentrations of HMB will lead to increasing expression levels of fgf8 in regenerating tissues. For this study, RNA was extracted from untreated non-regenerative tissue and treated regenerative tissue, converted to cDNA, and PCR amplified with fgf8 gene-specific primers. Our results have shown that high concentrations of HMB correlate with decreased fgf8 expression levels during the early stages of the axolotl wound healing and regeneration process. These results provide a foundation for future studies on various dietary supplements during tissue regeneration.

Emma Melendez

CO - University of Northern Colorado

Discipline: Anthropology and Archaeology

Authors:

#1 Emma Melendez

Abstract Name: Metabolic Disease and Bones: Trace Element Abundance in Skeletons with Evidence of Metabolic Disease

According to the Centers for Disease Control (CDC), metabolic diseases such as diabetes metabolic syndrome, hypercalcemia, hypertension, and others affect approximately one-third of Americans. Alterations to the skeleton can indicate the presence of metabolic disease, like diffused idiopathic skeletal hyperostosis (DISH). Diet is a factor that significantly contributes to the prevalence of metabolic disease. Trace elements in diet are incorporated into bone as it forms, providing evidence of metabolic disease after death. However, traditional analysis of these trace elements destroys the bone sample, and new non-destructive techniques are necessary. X-ray fluorescence (XRF) analysis is one possibility. This study examines how trace elements vary in skeletons of individuals with and without evidence of metabolic disease, with the goal of providing a new way of observing evidence of metabolic disease. It was hypothesized that skeletons with evidence of metabolic disease will have levels significantly different from the skeletons with no evidence. Using observational techniques, a collection of skeletons was categorized into a control and experimental group, at which point trace element measurements were taken to quantify the abundance. Four different regions of the skeleton on both groups were measured. Results revealed no significant difference in trace elements between the skeletons with evidence of metabolic disease to those without, implying that trace elements may not be a fruitful approach for identifying metabolic disease. Levels of silicon and calcium in certain areas, as well as

the presence of titanium in some of our samples, raise new questions for research in the future. XRF spectrography was successful in detecting trace elements in human skeletons.

Natalie Melert

OH - Capital University

Discipline: Biology

Authors:

#1 Katherine Freeland

#2 Jia Campbell

#3 Jennifer Larson

#4 John Mersfelder

Abstract Name: Academic Stress of Undergraduate Students Affecting Dental Caries

The acid produced from the fermentation by *Lactobacillus* is believed to make teeth more susceptible to dental caries, while stress is thought to increase the amount of *Lactobacillus* bacteria present. This study aimed to directly investigate the impact of stress on the oral microbiome, with a specific focus on the presence of *Lactobacillus* bacteria and their potential role in oral health. It was hypothesized that there would be a positive correlation between elevated stress levels and increased *Lactobacillus* presence, which highlighted the potential disadvantages contributed to overall oral health and dental susceptibility. 100 undergraduate students completed the Perceived Stress Scale in order to quantify their stress levels. These students provided saliva samples in test tubes containing Snyder Test agar, so that correlations between stress levels and *Lactobacillus* could be seen. The results supported the research hypothesis by demonstrating higher stress levels produced more *Lactobacillus*, meaning teeth were more susceptible to dental caries when under stress. Overall, this research contributed to the broader understanding of the oral microbiome dynamics and emphasized the importance in decreasing levels of stress to maintain oral health.

Gabrielle Mellor

LA - Louisiana State University

Discipline: Psychology

Authors:

#1 Gabrielle Mellor

#2 Vanessa Burke

Abstract Name: To Conform or Not to Conform: An Evaluation of the Situational and Dispositional Factors that Influence Group Conformity and Employee Voice Behavior

This study delves into the complex dynamics influencing voice behaviors within organizational settings, focusing on the interplay between situational and dispositional factors. Voice behaviors, crucial for organizational success, facilitate innovation, adaptability, and overall growth. However, when individuals feel silenced or hesitant to express dissent, detrimental outcomes such as ethical lapses and missed opportunities may arise. This research aims to bridge gaps in the existing literature by examining how both situational contexts and dispositional traits impact voice behaviors and conformity both individually and interactively. Through empirical investigation, it seeks to provide insights into the mechanisms underlying voice behavior, enriching theoretical frameworks in organizational psychology. Additionally, the study explores practical

implications for organizations, offering guidance on fostering cultures of open communication and constructive dissent to enhance long-term resilience and success.

Ruby Mendez

NY - City University of New York - City College of New York

Discipline: Psychology

Authors:

#1 Ruby Mendez

#2 Sarah O'neill

Abstract Name: ADHD risk for COVID-19 infection among Young Children

Adults with ADHD were shown to be at increased risk for more severe outcomes following COVID infection than individuals without ADHD. It is unknown if greater risk for COVID infection risk was also apparent in children. The current study aimed to examine this association in young children. Pregnant women were recruited from the Obstetrics and Gynecology clinics at Mount Sinai Hospital and New York Presbyterian-Queens in New York. Their babies were later born at these same hospitals between June 2011 and July 2015. Inclusion criteria required the absence of obstetric risks. N=62 mother-child dyads were reassessed annually between ages 2-6 years and then again during the first year of the COVID-19 pandemic. A subsample of 154 preschoolers with clinical interviews for preschool-aged children and assessments of parenting dimensions were included in the current study. Prenatal stress exposure status (Superstorm Sandy Stress) was defined according to whether mothers were pregnant and residing in the NY metropolitan area when SS made landfall in New York on October 29, 2012 (in-utero exposure). ADHD diagnosis was assessed using The Preschool Age Psychiatric Assessment (PAPA). Children who met DSM-IV criteria for ADHD at any point between 2 and 6 years were considered to be ADHD positive. Approximately half (n=29, 48%) of children were exposed to Superstorm Sandy in utero and 8% (n=5) met criteria for ADHD during childhood. Superstorm Sandy exposure was associated with increased risk for ADHD, $\chi^2(1) = 6.01$, $p = .01$, $ES = .31$. Compared to children without ADHD, those with ADHD in early childhood were more likely to have a suspected COVID-19 infection, $\chi^2(1) = 5.72$, $p = .017$, $ES = .30$, and more likely to have a confirmed infection, $\chi^2(1) = 3.55$, $p = .059$, $ES = .24$. Future research should investigate the mechanism of this association, including inflammatory pathways or ADHD behaviors that increase risk for exposure.

Karla Mendez

LA - Louisiana State University, Baton Rouge

Discipline: Biology

Authors:

#1 John Larkin

Abstract Name: Genomic and Phenotypic Comparison of Leaf Morphology in *Schrenkiella parvula* Standard and Turkan Ecotypes

Leaves occupy most of a plant's biomass and are essential photosynthetic organs, and thus are crucial to agriculture. Larger leaves tend to gather more light for photosynthesis, but in return they lose more water in dry or saline environments. Saline soils result in \$27.3 billion annually in agricultural losses. *Schrenkiella parvula* is an extremophyte species from the Brassicaceae (mustard) crop family. In contrast to most plants, it can complete its lifecycle at salt and ion concentrations six times greater than sea water, and it has become a

model for studying multi-ion stress. The purpose of this study is to understand the genetics of leaf variation in *S. parvula* and create a new genome resource that allows genetic mapping of phenotypic traits. Until now, only one genotype of *S. parvula* has been studied. Understanding phenotypic variation within the species, including variation in leaf traits, will contribute to understanding how it tolerates saline soils. The two varieties present in *S. parvula*, the Lake Tuz ecotype and the Turkan ecotype, have different leaf size and shape. These two ecotypes and their crosses were grown for 10 weeks under 12 h day/ 12 h night cycle in 512 ppm CO₂ using Percival Intellus control system. They were given a diluted Hoaglands solution and watered twice per week. Leaf surface area, width, and length measurements were captured using FIJI software. Plants from crosses between these two varieties are being studied with the goal of identifying regions of the genome contributing to the difference in leaf shape between these two ecotypes

Imandi Mendis

MO - Saint Louis University

Discipline: Biology

Authors:

#1 Imandi Mendis

#2 Julia Gaugel

#3 Nathan Krugman

#4 Jack Lee

Abstract Name: ESKAPE Antibiotic Resistance: Unknown Environment Microorganisms Producing Antibiotic Activity Against ESKAPE Pathogens

Antibiotic resistance has rendered many of our typically prescribed antibiotics useless against bacterial infections. Six of the most drug resistant pathogens are highlighted under the acronym ESKAPE, which stands for *Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, and the *Enterobacter* species. Our lab was gifted two libraries of unknown environmental isolates, which had previously exhibited antibiotic activity against at least one ESKAPE pathogen. For the current study, the libraries, named “2023 isolates” and “2024 isolates”, were screened for antibiotic activity against all six ESKAPE pathogens by placing a small amount of the unknown isolate on a lawn of an ESKAPE pathogen. After incubation, we measured the zone of inhibition, the indicator of antibiotic activity, for each unknown isolate in a series of three trials. From our results, we chose the most promising unknown isolates based on the number of ESKAPE pathogens inhibited. For each promising unknown isolate, we began the process to isolate the antibiotic activity by extracting the organic compounds within the unknown isolate. With the help of our collaborators, our promising unknown isolates were fractionated and tested in order to determine the active antibiotic compound. Currently, both batches of the unknown isolates are in the process of being isolated for the active antibiotic compound. From the 2023 and 2024 batches, we have a total of 43 promising isolates that are currently undergoing further purification and testing.

Rebecca Mendoza

CA - California State University - San Marcos

Discipline: Biology

Authors:

#1 Johnny Tran

#2 Jacob Hizon

#3 Ruth Ayanful-Torgby

#4 Joshua Tran
#5 Mariana Salas Garcia
#6 Sarah Allard
#7 Jack A. Gilbert

Abstract Name: Evaluating *Bacillus subtilis* Strains for Pathogen Reduction in Built Environments

Traditional cleaning products pose various harmful risks to one's health, such as dermal and respiratory issues due to the chemicals cleaning products may contain, as well as musculoskeletal-associated symptoms due to prolonged repetitive movement. *Bacillus subtilis* does not threaten human health but has great potential for biological control of pathogens. *Bacillus subtilis* has been shown to reduce the spread of pathogens and infectious diseases by either producing antimicrobial compounds that inhibit the growth of pathogenic microorganisms or by supporting the survival and colonization of commensal microorganisms, limiting pathogenic species to establish dominance. Specifically, *Bacillus subtilis* can inhibit growth of Methicillin-resistant *Staphylococcus aureus* (MRSA). Therefore, in this project the hypothesis tested was that incorporating *Bacillus subtilis* in 3D-printed structures in built environments could reduce antibiotic-resistant pathogens, providing a biological alternative to chemical disinfectants. We evaluated four different strains of *Bacillus subtilis* (TH002, TH035, K02, K04) at various concentration levels and conducted an exclusion assay against MRSA. It was found that the knockout strains (K02, K04) developed for enhanced antibiotic production demonstrated the most resistance to MRSA in comparison to the wild-type strains (TH002, TH035). These results suggest that the knockout strains (K02, K04) do in fact produce a greater amount of antipathogenic compounds that work against MRSA. Overall, all the *Bacillus subtilis* strains demonstrated potential in reducing pathogenic bacteria but the knockout strains showed to be the most effective out of all the four strains tested. For future directions we hope to conduct more testing on a bigger variety of *Bacillus subtilis* strains rather than just four strains, testing the different concentration levels in a variety of environments and conducting field studies to measure the long-term efficacy and reliability of *Bacillus subtilis* in public settings, such as hospitals and schools.

Jennifer Mendoza

TX - The University of Texas at San Antonio

Discipline: Nursing and Public Health

Authors:

#1 Leeann Fawkes
#2 David Gimeno Ruiz de Porras
#3 Eric Rodriguez

Abstract Name: Environmental Risk Perceptions of Forever Chemicals (PFAS) near U.S. Air Force Bases in San Antonio, Texas

Per- and poly-fluoroalkyl substances (PFAS) are synthetic substances primarily used for their oil and water-repellent properties. One of the applications was in aqueous film-forming foams (AFFF) used for extinguishing fuel-based fires on military installations. Using fluorine in AFFF enhances its effectiveness in both containing and extinguishing fuel-based fires. However, there is limited understanding of PFAS and its effects on the environment and the health of surrounding communities, including the contamination of groundwater, drinking water, and soil in these areas, which raises a public health concern. Using a citizen science approach, this study aims to investigate the community's perception of PFAS contamination in air, water, and soil in the La Quintana neighborhood, a known cancer cluster identified by the Texas Department of State Health Services, in San Antonio, TX. We hypothesize that 1) the majority of the respondents will have little concern about chemical contaminants in their neighborhood, 2) some respondents will be concerned about health risks to themselves or their families from potential exposures of living within close proximity to the Air Force Base, and 3) some respondents have heard about the chemical compounds PFAS.

Future studies will include an environmental risk assessment of the exposed community. This approach will be used to identify and evaluate the risk by collecting environmental samples in the Quintana neighborhood.

Aleah Mendoza

TX - Texas Woman's University

Discipline: Biology

Authors:

#1 Bitali Islam

#2 Dayna L. Averitt

Abstract Name: Effect of Gonadal Hormones on P2X Purinergic Receptor 3 (P2RX3) Expression in the Rat Trigeminal Ganglia

Orofacial pain disorders, like migraine and temporomandibular joint disorder, are 2-4x more prevalent in women. Studies report that gonadal hormones (estrogen, progesterone, testosterone) contribute to sex differences in pain. Estrogen can regulate pain-generating ion channels, including transient receptor potential vanilloid 1 (TRPV1) and P2X purinoceptor 3 (P2RX3), on sensory neurons. Preclinical studies on pain are largely conducted in rodents where estrogen levels are highest during the proestrus phase of the estrous cycle (homologous to the early luteal phase of the human menstrual cycle) and lowest during the estrus phase (homologous to the late luteal phase). We recently reported that P2rx3 gene expression is significantly higher in female compared to male rats, which could be one mechanism contributing to higher orofacial pain behaviors observed in female rats (modeling humans). The P2rx3 gene encodes P2RX3 protein as a ligand-gated ion channel activated by ATP that leads to an influx of cations to trigger pain signaling. Previous studies reported that estrogen downregulates P2RX3. We hypothesize that P2RX3 expression is sexually dimorphic and fluctuates with the estrous cycle in the trigeminal sensory neurons that relay orofacial pain signals to the brain. To test this hypothesis, we extracted trigeminal ganglia from rats during each stage of the estrous cycle (diestrus, proestrus, estrus; as determined by vaginal smear), ovariectomized females (surgical removal of ovaries as source of gonadal hormones), and males. Tissues were fixed in paraformaldehyde, sectioned onto glass slides, and processed by fluorescence immunohistochemistry to visualize and quantify P2RX3 and TRPV1 expression. Our data indicate that P2RX3 is highly expressed in the TRPV1 population of sensory neurons in female rats. If modulation of P2RX3 by gonadal hormones contributes to sex differences in orofacial pain, then higher levels of P2RX3 within the TRPV1 population of sensory neurons will be observed in females, and particularly during estrus.

Nicole M. Mendoza Hung

FL - Florida International University

Discipline: Biology

Authors:

#1 Katherine Kaiser

Abstract Name: Quantifying Properties of Calcific Extracellular Vesicles from Osteoblasts and Vascular Smooth Muscle Cells

Vascular calcification is the abnormal deposition of mineral in blood vessels. It is an active, cell-regulated process that has been recognized as a key cardiovascular risk factor and is the most significant predictor of an individual's risk of a heart attack. Interestingly, this abnormal mineralization in arteries is often accompanied

by reduced bone density. This contradictory relationship, known as the “calcification paradox” is commonly observed in conditions such as osteoporosis and chronic kidney disease. The specific mechanisms underlying the divergent mineralization by the primary calcifying cells in each tissue, vascular smooth muscle cells (VSMC), and osteoblasts (HOB), remain unknown. Both types of mineralization utilize the release of small membrane-bound compartments known as extracellular vesicles (EVs), which transport procalcific materials into the extracellular space to initiate mineral formation. We hypothesize that EVs released from VSMCs, and HOBs have distinct characteristics, due to unique mechanisms of formation. Osteoblast-derived EVs have been previously characterized as ectosomes, with a reported size range of 10-400 nm. VSMCs have been shown to have exosomal origins, and therefore, we hypothesize that they produce smaller EVs within the 40-160nm range. This project will compare calcifying EVs isolated from cultured HOBs and VSMCs using Tunable Resistive Pulse Sensing (TRPS) to measure EV size, concentration, and charge. We aim to use these different characteristics to identify unique features between the two EV populations, thus providing better insight into their mechanistic origins. The findings could have significant implications for developing therapeutic strategies against vascular calcification and bone-related diseases.

Johavy Mendoza Meza

VA - University of Richmond

Discipline: Linguistics and World Languages

Authors:

#1 David Giancaspro

Abstract Name: Subject Pronoun Variation in Honduran Spanish: Insights from Northern Virginia

This study investigates the Spanish spoken by first-generation Honduran immigrants in Northern Virginia (NoVA). Despite the significant growth of the Honduran population in the U.S., they remain largely overlooked in linguistic research. Within Central American Spanish varieties, subject pronoun variation, a well-established area of study in Spanish-language variation, has yet to be thoroughly explored in Honduran Spanish. Unlike English, where subject pronouns are mandatory (e.g., they danced), Spanish allows optionality, meaning speakers can include or omit the subject pronoun without changing the meaning of the sentence (e.g., (ellos) bailaron: “(they) danced”). This feature provides a unique lens for examining dialectal variation. Prior studies reveal significant cross-dialectal differences in subject pronoun usage, with Dominicans using pronouns most frequently and Mexicans the least. These differences are often shaped by internal linguistic factors such as verb tense, person, and clarity of the subject, as well as external factors like speaker identity and sociocultural context. However, no research has yet addressed how these patterns manifest in Honduran Spanish. To address this gap, we conducted sociolinguistic interviews with ten first-generation Honduran immigrants in NoVA. Each interview lasted approximately 30 minutes, allowing for spontaneous, naturalistic speech. For analysis, we transcribed fifteen-minute segments from minute 10 to minute 25 of each interview. Verbs within these segments that fit the envelope of variation, meaning contexts where a subject pronoun could either be present or omitted, were coded following guidelines established by Otheguy and Zentella (2012). Preliminary findings suggest that Honduran Spanish speakers may exhibit subject pronoun usage patterns similar to high-pronoun-usage groups like Dominican Spanish speakers. By filling a significant gap in sociolinguistic scholarship, this research highlights the unique linguistic characteristics of Honduran Spanish and its contribution to the broader understanding of Spanish variation in the U.S.

Johavy Mendoza Meza

VA - University of Richmond

Discipline: Education

Authors:

Abstract Name: Reflections on Community Translation and Interpretation in Educational Settings

Language access is critical for equity in education, yet many families with limited English proficiency (LEP) encounter significant barriers to effective communication. As a bilingual fluent in English and Spanish, with personal experience as a language broker, community translator, and interpreter, combined with formal training in translation and interpretation, I bring a unique perspective to the challenges and opportunities of facilitating communication in educational settings. This presentation reflects on my lived experiences alongside an analysis of systemic issues and actionable solutions. Despite the protections of Title VI of the Civil Rights Act of 1964 and Executive Order 13166, many schools lack adequate resources to meet the needs of Spanish-speaking families, one of the largest LEP demographics in the United States. Students like me often take on the role of language brokers, navigating emotionally complex and high-stakes conversations between parents and school officials without formal training. These experiences highlight the personal and cultural pressures of bridging two worlds often interpreting not just words, but cultural nuances that can make or break understanding. Through personal narratives and research, I explore potential solutions/recommendations such as increasing funding for interpretation services, developing educational interpreter training programs, and creating community partnerships with universities to provide free resources to Spanish-speaking families. By sharing my journey and reflections, I aim to highlight the lack of effective language access programs in education and how this hinders Spanish-speaking families from fully participating in their children's academic success.

Julianna Meneses

CA - University of the Pacific

Discipline: Music

Authors:

Abstract Name: Indigenous Sounds of Gathering: Music and Dance Memory in the Cordillera Highlands of the Philippines

This documentary film demonstrates how indigenous music and dance are deeply ingrained into the Tinggian people's collective memory. The Tinggian people are from the province of Abra and are one of several ethnolinguistic groups in the Cordillera mountains of the Philippines. Most of this documentary film's contents were filmed in the barangay (village) Taripan in Malibcong, Abra, Philippines. This documentary film depicts two traditional Tinggian dances accompanied by Cordillera flat gong music, pallook and tajok. Pallook is a joyful group dance performed at celebrations, where women and men dance in alternating formations with (usually) men playing the gongs. Tajok is a social partner dance between men and women of all ages and the accompanying musicians play the gongs on their laps. The film also shows a traditional chant called Ugayyam, which is included at all social gatherings and performed by a chosen elder of the community, signifying its importance to Tinggian cultural identity. Ugayyam is usually performed at the beginning of an event before other dances or chants to signify the start of festivities at a celebration. These performances in the documentary were a part of a birthday celebration where the community gathered together. The documentary also depicts scenes of road travel, environment and daily life, which are interwoven with the scenes of music and dance. By juxtaposing the scenes of music and dance with scenes of road travel, environment and daily life, the documentary explores ideas of tradition, heritage, indigeneity, and homecoming. This documentary film was created from various video and audio clips recorded during fieldwork research in July 2024. Length of film: 12 minutes.

Trevor Menge

OK - University of Central Oklahoma

Discipline: History

Authors:

#1 Trevor Menge

Abstract Name: The Race to Messina: George Patton's Strategic Failures and the Evacuation of Axis Troops from Sicily, 1943

This presentation explores US General George Patton's "race to Messina" with British General Bernard Montgomery during the Allied invasion of Sicily in 1943. Using Patton's diaries, the memoirs of his colleagues, and official military reports, this research proves that his decision to deviate from the plan in competition with Montgomery allowed the evacuation of approximately 100,000 Axis soldiers. These soldiers continued fighting on the Italian mainland, which slowed the Allied advancements. Military historians consistently understate the consequences of his actions, but this research proves that Patton was the main cause for the strategic failure of preventing an Axis evacuation. This presentation demonstrates the consequences of jealousy-driven military decisions, which in this case prolonged a war.

Trevor Menge

OK - University of Central Oklahoma

Discipline: History

Authors:

#1 Trevor Menge

Abstract Name: Class and Antisemitism: An Intersectional Study of Theodor Herzl's Zionism

This research demonstrates that Theodor Herzl, the founder of political Zionism, infused his classist rhetoric with antisemitic stereotypes in an effort to garner support for Jewish nationalism. Drawing upon tropes about undesirable Eastern European Jews, he appealed to the racist elites of Europe to gain support for Jewish emigration. He also delegitimized his critics, accusing them of betraying their Jewish identity as "mauschel." Using his diaries, published articles, and Zionist writings, this research shows that Herzl previously unequivocally condemned antisemitism, but changed after becoming a journalist in Paris. While there, he believed that Eastern European Jews exemplified the racist stereotypes, altering his method of approaching the subject. Previous research treated Herzl's use of antisemitic stereotypes separately from his classist statements. However, this presentation shows that his use of antisemitic tropes was a mode of communicating his classist beliefs, inherently connecting the two. While Herzl saw Zionism as the cure for antisemitism, he used hateful rhetoric about Eastern European Jews to advance his political goals.

Michael Menichetti

NC - University of North Carolina at Wilmington

Discipline: Nursing and Public Health

Authors:

#1 Yea-Jyh Chen
#2 Valerie Tarte
#3 Lenis Chen-Edinboro

Abstract Name: Using Complementary Health Therapies for Stress Management: A Survey Study of Nurses' Perceptions and Experiences

Background: Stress, a natural response to disruptions in human homeostasis, can negatively impact individual well-being, contributing to global health concerns. While traditional stress management often relies on pharmacological interventions for resultant medical conditions, complementary health therapies (CHTs) have emerged as promising non-pharmacological alternatives. Despite their potential benefits, the integration of CHTs into mainstream healthcare practices remains inconsistent. This study aims to understand nurses' perceptions, attitudes, and use of CHTs across urban and rural healthcare settings. Methods: An online survey study was conducted with nurses working in Southeastern and Eastern North Carolina using Qualtrics questionnaires. The survey assessed their perceptions and use of CHTs for stress management and their awareness of newer modalities, e.g., somatic therapies. These measures were descriptively analyzed. Results: The study nurses (n=36) were mostly middle-aged female Caucasians with an average of 18 years in nursing. Nearly all (>95%) reported positive views on self-healing and supported the idea that CHTs could enhance conventional medicine. While nurses expressed their familiarity with traditional CHTs, including exercise, yoga, meditation, and massage, their knowledge of less common practices, such as rolfing, tapping, and somatic therapy, was more limited. Clinical nurses frequently used CHTs for personal stress management (94.4%), supported offering them to patients (86%), and believed in the importance of integrating them into workplace practice (72%); yet referrals (44%) and patient discussions (38.8%) using CHTs were notably less common in their usual practice. Conclusions: Our study reveals a discrepancy in that nurses have positive attitudes toward CHTs for personal stress management but tend to underutilize them in patient care. This may result from insufficient resources and knowledge about CHT use in a healthcare setting. Further research with diverse samples is needed to identify practical barriers and validate the effectiveness of CHTs in standard care.

Liam Mercader

PA - Pennsylvania State University

Discipline: Anthropology and Archaeology

Authors:

#1 Liam Mercader
#2 Timothy Ryan
#3 America Campillo

Abstract Name: Comparative Analysis of Femoral Cortical Bone Properties Across Temporal and Cultural Populations: Insights into Bone Functional Adaptation and the Role of Physical Activity

Bone remodels to alterations in biomechanical loading and physical activity through a process called bone functional adaptation. Bone remodeling alters bone strength, shape, and resistance to mechanical load. The exact relationship between physical activity and bone remodeling is unclear, but this process of adaptation can help researchers understand activity patterns in past human populations. To further understand the process of bone functional adaptation, comparing the bones of individuals for which lifestyle, activity, and behavioral patterns are known may shed light on how those factors impact bone remodeling. As such, we examined femoral cortical bone cross-sectional properties from three human groups across time: 1.) the African Bronze-Age Kerma population, 2.) a European medieval population from St. Johns, Cambridge, UK, and 3.) a modern American population. Cortical bone structure was analyzed in the femur using microCT images. Cortical bone cross-sectional geometric properties were analyzed in ImageJ at 10% intervals along the shaft (from 30% to 70% bone length) to determine cortical area, maximum second moment of area, minimum

second moment of area, torsional rigidity, and cross-sectional shape. Measurements were compared between groups using the One-Way ANOVA method, employing Tukey post-hoc testing in SPSS. Statistical significance using a 95% confidence interval was identified in both the minimum second moment of area and cross-sectional shape at the 70% slices. The Kerma population exhibited a lower minimum second moment of inertia, indicating slightly less resistance to bending. The modern American population was predicted to have lower strength metrics due to increased sedentism in a modern, industrial society. However, the current results place the American population in line with the older populations. These findings suggest an additional influence on skeletal phenotype aside from solely physical activity.

Ana Mercado

PA - Pennsylvania State University

Discipline:

Authors:

#1 Subhadra Ganguli

#2 Ana Mercado

Subhadra Ganguli

Abstract Name: AI Collaboration for Forecasting in Business Using Prompts– A Case Study Analysis

Can application of Generative AI help in the analysis of economics and business forecasting? Literature (2023) concludes that the productivity frontier of knowledge workers collaborating with AI has been “jagged” with high productivity and high quality of work for some workers and poor productivity and low quality of work produced in others. Students, as researchers, in an upper-level economics forecasting course explored the consequences of their collaboration with AI using a case study. Their analysis varied regarding AI’s role and performance in the exercise. However, researchers universally concluded that AI as a collaborator, with the appropriate use of iterative prompts, have enabled them to perform their tasks more productively resulting in a higher quality of work. This research is a qualitative analysis by the researchers, where they reflected on their individual performance of business forecasting analysis against collaborative AI’s performance of the same using the case study as a reference. Researchers provide step by step detailed analysis of the business problem from the two perspectives. The results of the study provided students better clarity, than before, towards AI application and collaboration in their future work in business forecasting and analysis. Reference: Dell'Acqua, Fabrizio, Edward McFowland III, Ethan Mollick, Hila Lifshitz-Assaf, Katherine C. Kellogg, Saran Rajendran, Lisa Kraye, François Cadelon, and Karim R. Lakhani. "Navigating the Jagged Technological Frontier: Field Experimental Evidence of the Effects of AI on Knowledge Worker Productivity and Quality." Harvard Business School Working Paper, No. 24-013, September 2023.

Chloe Merino

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Jing Yang

#2 Lance Davidson

Abstract Name: Examining the role of anisotropic tissue strain on neural cell rearrangement in *Xenopus laevis*

Mechanics are integral to organismal development, not only by shaping early stage embryos, but by providing cues to guide cellular and subcellular activities (Chu et al., 2020). In developing *Xenopus* embryos, the central nervous system is established during neurulation via mechanical processes of elongation of the neural plate and folding of the neural tube (Vijayraghavan and Davidson, 2017). During elongation, cells in the neural ectoderm rearrange collectively and are thought to actively drive convergent extension (Keller and Sutherland, 2020). While several factors, such as planar cell polarity, are known to drive cell rearrangement in a specific direction, it is difficult to decouple the role of mechanical cues from biological cues in cell rearrangement in neural ectoderm in vivo. To test this, we generate a non-polarized neural ectoderm within *Xenopus* animal cap ectoderm using Wnt3a and Noggin over-expression. Next, we apply uniaxial strain to the induced neural ectoderm to investigate if anisotropic strain alone can induce directional cell rearrangement observed in vivo. We hypothesize that mechanical cues alone can drive rearrangement of unpolarized neural ectoderm tissue. Preliminary data also suggest that patterns of cell rearrangement in the native neural plate can be altered by external strain from stretching. This work suggests that external forces driving uniaxial strain play a key role in guiding directional cell rearrangement in the neural ectoderm.

Brittany Merino Galdamez

CA - California State University - Fullerton

Discipline: Health and Human Development

Authors:

#1 Priya Patel

Faith Santonil

Jocelyn Ramos

Abstract Name: Socioeconomic Status and its Effect on Language Development: A Systematic Review

We are conducting a systematic review of peer-reviewed journal articles published between 2000 and 2023, focusing on studies that assess the relationship between SES and language development in early childhood. The review includes studies that examine syntactic and semantic development using assessments such as the Clinical Evaluation of Language Fundamentals (CELF) and the Test of Semantic Skills Primary (TOSS-P). Studies are being analyzed based on participant characteristics, SES indicators (e.g., parental education, income, occupation), language outcomes, and the methodologies employed, including longitudinal and cross-sectional designs. We were able to gather information from 15 randomly chosen articles. Our preliminary findings found that the area of language most studied was semantics. In addition, 12 out of 15 articles reported a significant relationship between SES and the language domains studied. After further analysis, we expect to find a strong association between lower SES and delays in syntactic and semantic development, with implications for long-term academic outcomes. This review anticipates providing a clearer understanding of the impact of SES on early language development and identifying areas for targeted early interventions.

Lauren Merrill

TN - Belmont University

Discipline: Environmental Science and Sustainability

Authors:

#1 Matthew Heard

Lauren York

Abstract Name: Are Local Garden Centers Potential Sources of Invasive Species in Davidson County, TN?

Recent research has suggested that local garden centers may help promote the spread of invasive species. However, there has been little research done in many geographic areas to determine how these local garden centers may contribute to their spread to local areas over time. In this study, we documented the number of exotic and invasive plant species that were for sale at the two largest garden centers in Davidson County, TN – Home Depot and Lowes. We then cross-referenced these taxa with iNaturalist and the Tennessee Invasive Plant Council species list to determine if any of the exotic or invasive species sold at Home Depot and Lowes had previously spread across Davidson County metro parks. Using this approach, we found that more than 80% of all the species sold at Home Depot and Lowes are exotic. In addition, we found that 19 of these exotic species sold at Home Depot and Lowes have been found spreading in Davidson County, TN. Ultimately, our findings support recent research which suggests that local garden centers have the potential to contribute to the spread of exotic species in local communities. In addition, they suggest that work is needed to help local businesses recognize that they are selling species that are invading local communities.

Crescentia "Sensi" Messner-Baker

DC - American University

Discipline: Interdisciplinary

Authors:

Abstract Name: Barriers and Bridges: The Intersection of Race and Socioeconomic Status in Accessing Disability Accommodations in Education

This research investigates how race and socioeconomic status (SES) intersect to impact elementary school children's access to disability accommodations legally mandated by the Americans with Disabilities Act (ADA). While existing literature explores disparities in access to accommodations, there is limited understanding of how systemic biases rooted in both race and SES compound these inequities. This study seeks to address this gap by examining the ways overlapping identities shape children's experiences within the educational system, emphasizing the broader implications for equity and inclusion. Utilizing a mixed-methods approach, this project integrates quantitative analysis of school district and state education data with qualitative insights from semi-structured interviews with parents, teachers, administrators, and advocates. Quantitative data will illuminate patterns of accommodation distribution by race and SES, while thematic analysis of interviews will capture nuanced perspectives on the barriers marginalized families face in navigating the accommodation process. Preliminary findings suggest that systemic inequities, such as underdiagnosis of disabilities among racial minorities and resource constraints in low-SES schools, significantly limit equitable access to accommodations. This research contributes to disability studies by applying intersectionality and critical disability theory to reveal structural barriers within the ADA framework. The findings aim to inspire policy reforms that move beyond compliance, fostering educational systems that prioritize inclusion and dismantle inequities at their root. This discussion will center on how these insights can reshape advocacy and policy to better serve all students.

Madison Metrick

WV - West Virginia University

Discipline: Biology

Authors:

#1 Rachel Gandee

#2 Alejandro Sánchez Alvarado

Abstract Name: Knockdown of the Hox Gene Post2b Maintains Allometry in the Flatworm Species Schmidtea Mediterranea

Proper body allometry is a critical aspect of animal development and underlies differences in body plans across metazoan evolution. In the regenerative flatworm species *Schmidtea mediterranea* (Smed), the size and proportions of their body dynamically change based on nutrient intake. Smed naturally grow and degrow within a typical size range of 0.5 to 15mm. Knockdown of the Hox gene post2b, removes body size restriction in Smed, allowing for the body to grow upwards of six times beyond its natural limit. My research objective is to determine whether post2b knockdown alters the allometric scaling of the body plan. We hypothesize that these animals either maintain the normal allometry or display changes in growth rates and organ rescaling, deviating from the expected allometry. To test this, I performed brightfield imaging and morphometric analysis, observing body regions to determine total body allometry in actual and relative lengths. Our findings suggest that post2b maintains proper allometry by establishing a ratio at which the various body segments find an equilibrium.

Samantha Meyo

IN - University of Notre Dame

Discipline: Biology

Authors:

#1 Trenton Agrelius

Abstract Name: Further characterization of the scarlet *Daphnia magna* mutant for genes related to oxidative stress and neuronal function

Scarlet is an ATP-binding cassette (ABC) transporter essential for transporting an eye pigment precursor, 3-hydroxykynurenine (3HOK), into specialized organelles in invertebrate species. Knockout of the scarlet gene in *Drosophila* has been characterized by accumulation of 3HOK, oxidative stress, and locomotive aberrations. *Daphnia magna* scarlet mutants (Sc) also show age-progressive locomotive dysregulation and some neurotransmission abnormalities, but more studies are needed to fully characterize the effects of the mutation. Initial RNASeq data from adult wild-type and mutant animals showed significant differences in gene expression; however, data from other age classes were contaminated, rendering analyses unreliable. This study aims to add both statistical power to the initial differential gene expression (DGE) screen and correct the areas of potential contamination. Using Gene Ontology (GO) terms, we selected five candidate genes related to oxidative stress or damage and neuronal function that were found to be differentially expressed. Gene expression differences of candidate genes were validated using quantitative PCR (qPCR) in both genotypes using multiple age classes. We propose that the knockout of the scarlet gene induces an age-progressive form of neuronal degeneration via the accumulation of 3HOK. This accumulation likely results in oxidative stress and neuronal damage, leading to the altered locomotive behavior observed in adult mutant animals. Determining gene expression levels of these five genes at various age classes will reaffirm that these genes are involved in the pathway and contribute to 3HOK accumulation and subsequent oxidative damage.

Jose Meza-Pantoja

CA - University of California - Merced

Discipline: Interdisciplinary

Authors:

Abstract Name: Writing/Righting Authoritarian Regimes in Real Time: Political and Personal Struggles In Venezuelan Daily Life Under Chavismo

Since 1998, Venezuela has experienced the slow decay of democracy and the strengthening of its current authoritarian regime. This has resulted in one of the largest humanitarian crises in the present day, with 7.7 million Venezuelans having fled the country. In order to maintain its status quo, the Chavista regime has exposed countless Venezuelans to daily acts of violence, torture, and other traumatic events which have disrupted daily life. This research project focuses on analyzing the experiences of Venezuelans to understand how they experience these political and personal struggles and how they situate themselves in their present historical context. To do so, I analyze recent texts, both fictional — including the novels *La hija de la española* and *The Voice of the Llanos* — and nonfictional—including the text *Testimonios de la represión*, that relate to Venezuela's current political situation, as well as interviews conducted with Venezuelans who have lived through this authoritarian regime. These findings help us to understand the role that everyday citizens play in shaping the social and political structures that surround them and in turn to promote democratic processes, not just in Venezuela but across the American continent.

Ashley Mezquite-Moctezuma

NC - Wingate University

Discipline: Biology

Authors:

#1 Alexandra Jerby

Abstract Name: The Hunt For a Bacteriophage to Defeat *Stenotrophomonas maltophilia*

Antibiotic resistance is a significant problem in the medical field, leading to bacterial infections that are increasingly difficult to treat effectively. This challenge arises from the non-specific nature of antibiotics and the development of resistance, often caused when patients fail to complete the full course of treatment. In response, bacteriophages have emerged as a promising solution due to their host specificity and ability to replicate within bacteria, ultimately causing bacterial lysis. Bacteriophages typically follow one of two life cycles: the lytic or lysogenic cycle. The lysogenic cycle is where the bacteriophage will integrate its DNA into the bacterium's DNA and so the bacterium would replicate both leading to eventual cell lysis. The lytic cycle is where the bacteriophage infects the bacteria, replicates rapidly in it, and causes the bacterium to lyse. After identifying an antibiotic-resistant strain of *Stenotrophomonas maltophilia*, isolating a bacteriophage became the next focus. A lytic phage was successfully isolated from a soil sample collected at Campus Lake. It was then purified and amplified. DNA was then extracted and a restriction enzyme digest was performed to characterize its genome. It was determined that *HaeIII* cut the phage, it was named phage Chithonia, about 90.2 ng/μL of DNA was extracted and a final titer of 4.46 x 10¹¹ pfu/mL was achieved. This approach offers a targeted strategy in the fight against antibiotic-resistant infections, providing a more specific and potentially more effective alternative to conventional antibiotics. Further research will need to be performed to determine phage Chithonia's viability as a candidate for phage therapy.

Morgan Micharski

NC - Elon University

Discipline: Physics and Astronomy

Authors:

Abstract Name: Exploring Molecular Hydrogen as a Gas Reservoir and Excitation Diagnostic for Dwarf Active Galactic Nuclei

Intermediate-mass black holes (IMBHs) are objects 100-1,000,000 times the mass of the Sun with a gravitational pull so strong that not even light can escape. Astronomers have determined that giant black holes co-evolve with their host galaxies, and finding IMBHs is critical in understanding this relationship. However, IMBHs are relatively elusive due to the rarity of IMBHs accreting matter (i.e., siphoning), which would be heated up enough to give off light to observe it. This type of an IMBH is called a dwarf active galactic nucleus (AGN). Guided by recent observations with JWST NIRspec and cosmological simulations of IMBHs, we have determined a relationship between the cloud's radius and its column density by solving a system of equations related to the gas cloud's geometry. Evidence of molecular hydrogen (H₂) has been found in the inner regions of larger AGN, and this H₂ region could exist within dwarf AGN, and could possibly serve as a gas reservoir for the IMBH to accrete. However, the typical reaction for forming H₂ is inhibited in dwarfs due to the lack of micron-sized, solid dust particles within them. Using the astrophysical code Cloudy to run simulations, we have found that the preferred method for forming H₂ in this dust-poor environment is associative detachment, which could possibly produce enough H₂ for the IMBH to accrete. Our current photoionization simulations within Cloudy predict that H₂ emission is still too faint to be observed, and this will be the subject of future work and analysis.

Mia Michel

PA - Carnegie Mellon University

Discipline: Biology

Authors:

#1 Mia Michel

#2 Charles Ettensohn

Abstract Name: Regulating Cell Migration: Skeleton Growth in Purple Sea Urchins

Coordinated cell migration is a hallmark of animal development. VEGF/VEGFR is a signaling pathway that has been shown to be critically important for this migration during sea urchin development (Duloquin, 2007). In order for proper skeletal development, Primary Mesenchyme Cells (PMCs) must migrate through the developing embryo to precise locations as they are the source of skeleton formation. The expression of VEGF in the ectoderm, and the specific expression of its receptor, VEGFR, in the PMCS directs this movement. Since VEGF/VEGFR plays a vital role in sea urchin skeletogenesis, this project is designed to investigate the regulation of the gene *vegfr-10-Ig* by identifying enhancers that drive its transcription. To do this, putative enhancer regions are identified through ChIP-seq data of ALX1, which is a transcription factor known to be a master regulator of the sea urchin genome. These candidate regions are then cloned into reporter constructs, microinjected into fertilized sea urchin embryos, and the embryos observed with fluorescent microscopy. Specific PMC fluorescence will indicate a candidate region is able to drive expression, confirming it as an enhancer. In future experiments, various truncations of a confirmed enhancer site can then be cloned into reporter constructs to determine the shortest sequence needed to drive expression of VEGFR-10. Bioinformatics tools will then be used to look for conserved sequences among other sea urchin species and identify candidate transcription factors that interact with the enhancer.

Dennis Miczek

PA - Pennsylvania State University

Discipline: Computer Science

Authors:

#1 Divyesh Gabbireddy

#2 Suman Saha

Abstract Name: Advanced XSS Detection Through LLM-Driven Dataset Augmentation

According to the Open Web Application Security Project (OWASP), Cross-Site Scripting (XSS) is a critical security vulnerability. Despite decades of research, XSS remains among the top 10 security vulnerabilities. Researchers have proposed various techniques to protect systems from XSS attacks, with machine learning (ML) being one of the most widely used methods. An ML model is trained on a dataset to identify potential XSS threats, making its effectiveness highly dependent on the size and diversity of the training data. A variation of XSS is obfuscated XSS, where attackers apply obfuscation techniques to alter the code's structure, making it challenging for security systems to detect its malicious intent. Our study's random forest model trained on traditional (non- obfuscated) XSS data achieved 99.8% accuracy. However, when tested against obfuscated XSS samples, accuracy dropped to 81.9%, underscoring the importance of training ML models with obfuscated data to improve their effectiveness in detecting XSS attacks. A significant challenge is to generate highly complex obfuscated code despite the availability of several public tools. These tools can only produce obfuscation up to certain levels of complexity. In our proposed system, we take a unique approach by fine-tuning a Large Language Model (LLM) to automatically generate various complex

obfuscated XSS codes. Our toolchain takes original XSS samples and applies multiple obfuscation techniques to produce diverse and challenging training data, which is then used to train and evaluate an ML model. Our approach achieved a 99.5% accuracy rate with the obfuscated dataset. We also found that the obfuscated samples generated by the LLM were 28.1% more complex than those created by other tools, significantly improving the model's ability to handle advanced XSS attacks and making it more effective for real-world application security.

D'Amore Midgett

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

#1 D'Amore Midgett

Abstract Name: Increasing the Independence of the Aging Population: Home Design for People With Diabetic Retinopathy

Housing today is not designed to accommodate people with visual impairments, which would allow them to live independently. With an increasing percentage of the population aging, there is a greater number of people with visual impairments. The purpose of this study focuses on creating a house that enables people with the visual impairment of diabetic retinopathy to live with little to no aid. Reviewing literature and conducting interviews related to diabetic retinopathy shows specific ways that it can affect vision and how best to address the loss of vision. Diabetic retinopathy affects vision by causing dark spots in vision, floaters, and difficulty seeing at night. The design takes this knowledge and implements several design features to accommodate the needs of someone with diabetic retinopathy. One design feature is textural contrast from coarse textures in public spaces to smooth textures in private areas as a wayfinding cue. Another design feature is the use of contrasting colors of light orange and light blue walls and dark bronze colored trim to heighten visibility of objects and increase accessibility. Contrasting colors are also used as a way to distinguish the lighter colored floors and walls from the furniture and fixtures in the space. This allows people with visual impairments to easily navigate through spaces and identify obstacles. Lastly, lighting layers of ambient light, decorative light, and task light have been used to accommodate varying needs of people with visual impairments. This new design for housing will empower residents with visual impairments to live a self-sufficient life and give them a greater quality of life.

Manraj Miglani

GBR - Cambridge Centre for International Research

Discipline: Biology

Authors:

Abstract Name: Optogenetic Manipulation of Pain-related Neural Circuits to Alleviate Pain from Trigeminal Neuralgia

Trigeminal neuralgia (TN) is characterized by its rapid, intense episodes of facial pain resulting in poor quality of life for patients who wish to live a normal life. The pathophysiology and etiology regarding the mechanisms of TN are not fully understood, resulting in seemingly inadequate treatments. Currently, pharmacological treatments include a variety of anticonvulsants, antidepressants, and muscle relaxers, however drug-resistance and intolerance to side effects often require alternative treatments. Surgical

interventions can provide relief despite limitations and reports of pain recurrence. Exploration of orofacial pain pathways is still currently expanding, including the functions of sensory and emotional processing complexes in chronic neuropathic pain. Combining genetic and optical engineering, optogenetics offers new insight into trigeminal neuropathic pathways, as well as likely becoming a target for developing therapeutics in TN remedies. Genetically modified neurons expressing light-sensitive proteins, opsins, can control and modulate neurobiological functions through light stimulation. In preclinical models and studies, optogenetic modulation of neuronal circuits have shown promising results. Selective activation or inhibition of circuits within four structures—the trigeminal ganglion, anterior cingulate cortex, nucleus accumbens, and trigeminal nucleus caudalis—exhibited reduced pain perception and responses. Due to the extreme spatiotemporal precision and efficiency, optogenetics has an optimistic role over other alternative treatments. This review aims to discuss current treatments and their respective limitations, as well as sensory/affective complexes and their relation to neuropathic pain modulation, ultimately concluding with a proposal on new directions for refining optogenetic treatments. This paper comprises a literature search review. Comprehensive research was conducted using multiple academic databases such as Pubmed, Nature, Springer, and other related articles that focused on optogenetics in pain management. This review finds that optogenetics maintains its role as a powerful tool in neuroscience research, and, over time, may emerge as an innovative approach for management of TN pain.

Samantha Migliore

FL - University of Central Florida

Discipline: Health and Human Development

Authors:

#1 Abrianna Lalle

#2 Jeffrey Stevenson

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#4 Viviana Rivera

#5 Peter Smith

#6 Matt Dombrowski

#7 John Sparkman

#8 Albert Manero

Maanya Pradeep

Abstract Name: A Standardized Approach for Evaluating Electromyographic Multi-gesture Prosthesis Control

Upper limb prostheses must meet functional demands of daily life [1]. Electromyographic (EMG) prostheses have gained popularity for having increased capabilities and fewer reported cases of device abandonment [2]. Lack of functionality is cited as a factor of upper limb prosthesis rejection rates [3]; thus, there is a need to assess and expand physical capabilities with EMG prostheses [4, 5]. Despite growing availability of myoelectric devices [6], there is little data providing insight into how many gestures can be feasibly handled by novice users compared to experienced users. With more gestures to perform, there may be a tradeoff of training time and cognitive workload [2, 7] required to differentiate various controls [8, 9]. This study seeks to explore performance and perceptions with a maximum of 5 distinct surface EMG gestures in one session. A training and evaluation instrument was developed based on our pre-existing calibration app technology to evaluate multi-gesture performance [10]. First-time EMG users will participate, and cohorts differ in the number of distinct zones of control. Providing three rounds of fifteen randomized cues assessed performance in accuracy among four cohorts. Results will cultivate a better understanding of how the general population first interacts with this multi-gesture training and progression of distinct muscle contraction intensities. Continued work will consider cognitive workload and performance benchmarks to suggest appropriate progressions of gesture capabilities, including comparisons between new and experienced users. Currently, serious gaming is being utilized in ongoing clinical trials to prepare individuals for using EMG upper limb prostheses. Video games with the primary intention of training have already shown promise in improving usability and performance outcomes [4]. Insights from this study will help researchers standardize initial

capabilities and progression among future device users. Additionally, serious game developers can use these results to improve the patient experience.

Daniel Mikardos

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

#1 Eleni Moschonas, PhD

#2 Hailey Donald, BS

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Abstract Name: Effects of modafinil, a central nervous system stimulant, on sustained attention after controlled cortical impact injury in males and females

Traumatic brain injury (TBI) stands as a significant contributor to global mortality and morbidity. The ensuing disabilities often encompass long-term impairments in memory, attention, and overall cognitive function. Pharmacotherapeutic interventions involving stimulants following experimental TBI have shown promise in enhancing cortical function, thereby mitigating several cognitive deficits commonly observed. We predicted that modafinil (Provigil®), a non-amphetamine central nervous system (CNS) stimulant thought to act in a concerted fashion on multiple catecholamines in the brain (dopamine, norepinephrine), as well as glutamate, GABA, and histamine, to enhance arousal and focus, will improve sustained attention post-TBI. Adult male and female Sprague Dawley rats were trained in the 3-choice serial reaction time task (3-CSRT) before receiving either a controlled cortical impact (CCI) of moderate severity to the right hemisphere or a sham injury. Rats were then randomly assigned to either receive modafinil (10 mg/kg) or vehicle (saline, 1 ml/kg) being administered once daily throughout behavioral tasks beginning 14 days post-injury. 3-CSRT retrials were conducted post-injury days 14-24 to assess sustained attention via percent accuracy and distractibility via percent omissions. Ongoing histological analyses include assessments of cortical lesion volumes and hippocampal cell survival. TBI induction in both male and female rats resulted in significant and lasting deficits in both sustained attention and distractibility on the 3-CSRT task. Chronic modafinil administration concurrent with post-surgery behavioral testing produced promising results by attenuating TBI-related deficits in percent accuracy, as well as percent omissions in males, however, not in females, suggesting prompt intervention post-TBI may be therefore warranted. Our findings support the benefits of modafinil on sustained attention post-TBI and can be further expanded upon in future studies with adjustments in treatment timelines and paradigms that may allow for observation of higher efficacy in reinstating complex cortical function.

Kaia Mikula

PA - Duquesne University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Elena Donoso Brown
#2 Kasey Stepansky
#3 Lee Min Hun
#4 Hannah Clark
#5 Kaia Mikula
#6 Mia Delvecchio
#7 Robert Halyama

Abstract Name: Understanding Rehabilitation Therapists' Perspectives on AI/ML in Post-Stroke Assessment and Intervention.

The use of artificial intelligence (AI) and machine learning (ML) in healthcare is rapidly evolving. Implementation of research findings into practice is an ongoing process that takes time and collaboration with key stakeholders. The purpose of this research project was to gain an understanding of rehabilitation therapists' perspectives on AI/ML in post-stroke assessment and intervention. The study used a mixed method design with surveys and focus groups. To be included, participants within the last year had to have a caseload of at least 30% of persons post-stroke, be an occupational or physical therapy practitioner in the United States (US) or Asia, and speak English. Participants (n=33) in this study were provided consent forms to engage in the 30-minute video webinar followed by a 30-minute focus group to discuss their perceptions and practical applications of AI/ML. Participants completed a survey before and after the one-time virtual meeting. Quantitative data were analyzed using frequencies and percentages. Transcripts from the focus groups were reviewed for accuracy and de-identified before analysis. The qualitative data was coded by the research team, using an inductive approach and MAXQDA. From the analysis of the survey results, therapists reported knowledge of many types of AI/ML technologies, however, the frequency of use in stroke rehabilitation was limited. Four themes were identified from the qualitative data analysis: 1) Current practice and identified gaps, 2) Current therapist perceptions of AI, 3) Perceived future, and 4) What is necessary for implementation. During the focus groups, participants discussed the importance of considering the efficacy of use and carryover outside the clinic when developing AI/ML applications. The analysis from this study will be used to guide the creation of AI/ML technologies within stroke rehabilitation that will assist rehabilitation therapists in optimizing care.

Alexandra Miles

MN - University of Minnesota - Twin Cities

Discipline: Psychology

Authors:

#1 Annie Colomer
#2 Kathleen Thomas

Abstract Name: The Effects of Bilingualism on Measures of Executive Function in Young Adults

Bilingualism is strongly linked with executive function, which refers to brain processes that control goal-oriented activities such as attention, planning, and self-control. It is important to be able to accurately measure executive function as it can play a significant role in success in the classroom, social situations, and overall long-term outcomes. While the reliability and validity of measures of executive function have been carefully verified, little is known about how language impacts performance when testing bilingual individuals. This study examines if the language of executive function test administration impacts bilingual participants' performance. The study sample includes individuals between the ages of 18 and 25-years-old who self-report at least an advanced level of fluency in English and in Spanish. The expected N is 20 with an equal number of White Hispanic and White Non-Hispanic and more females than males. Each participant completes questionnaires regarding their background demographics and language history, as well as a language evaluation for English and Spanish in order to quantify their oral proficiency in each language. They

then do two executive function measures in English, and two in Spanish. Individual differences on tasks in English versus Spanish will be analyzed using a repeated within measures ANOVA with potential covariates of age, sex, fluency, and type of bilingualism. As bilingualism is not a straightforward category, their language histories will also be taken into account to see if certain types of bilingualism, such as simultaneous acquisition or immersion school learning, have a greater impact than others.

James Miller

PA - Duquesne University

Discipline: History

Authors:

Abstract Name: Michael Angelo Musmanno: A Contextualization of Pennsylvanian Anti-Communism Within Labor and Electoral Politics

In a 1951 publication of the Pittsburgh Post Gazette, Democratic leader Hiram Andrews is quoted to have said of Judge Michael Angelo Musmanno, "he is now apparently nursing the ambition to become the Senator McCarthy of the Democratic party. He is a victim of exhibitionism in its advanced state." Despite Musmanno's deeply held anti-Communist beliefs, such a description is hardly accurate. This framing of the judge can be compared to the inaccurate portrayals of anti-Communism during the Cold War in contemporary historiography. My research intends to reverse such a narrative through a case study on Michael Musmanno. By analyzing Musmanno with this intention, a deeper social history can be found, and he can be contextualized in the war against the perceived threat of Communism within labor and electoral politics. Such examples include Musmanno's and liberals' attacks on the Progressive Party and Henry Wallace, as well as Musmanno's activism and support for labor in the war against their left flank. The research involved in this paper includes extensive use of primary sources from the Michael Musmanno Collection in Duquesne's Gumberg Library and his autobiography, as well as secondary sources, such as Cold War At Home by Philip Jenkins and John S. Haller Jr.'s biography Michael Musmanno. The research and sources in this paper are divided between examining Musmanno's actions and examining those of his peers to contextualize him. What is concluded from this research is that Musmanno, a New Deal Democrat and supporter of labor, was on par with his peers' anti-communist beliefs and actions, despite his eccentricities. The context in which this conclusion will be discussed is a conversation about contemporary Cold War historiography along with the use of researching one man as a means to discover a social history.

Anna Miller

IN - Indiana University Purdue University Indianapolis

Discipline: Biology

Authors:

#1 Anna Miller

#2 Fabrizio Pin

#3 Joshua Huot

Abstract Name: Liver metastases accelerate cachexia in models of lung and pancreatic cancer

Background: Advanced cancer patients frequently develop cachexia, characterized by musculoskeletal wasting. Liver metastasis(LM) is a poor prognosis in patients with lung and pancreatic cancer. LMs exacerbate cachexia in colorectal cancer, however, whether LMs heighten musculoskeletal wasting in lung

and pancreatic cancer is unknown. We aimed to characterize the impact of LMs on musculoskeletal health, using mouse models of lung and pancreatic cachexia. **Methods:** C57BL/6J male mice were randomly grouped into the lung or pancreatic cancer study. In study 1, mice underwent intrasplenic (IS) and subcutaneous (SC) injections with saline or LLC cells in one of the following experimental conditions: Sham (IS: saline; SC: saline); low-dose SC (IS: saline; SC: 1.25×10^5 cells); high-dose SC (IS: saline; SC: 1.0×10^6 cells); LM (IS: 1.25×10^5 cells; SC: saline). In study 2, mice underwent IS and orthotopic (OT) injections with saline or T4-KPC cells in one of the following experimental conditions: Sham (IS: saline; OT: saline); OT (IS: saline; OT: 1.0×10^4 cells); LM (IS: 1.0×10^4 ; OT: saline); LM/OT (IS: 0.5×10^4 cells; OT: 0.5×10^4 cells). Body weights and in vivo plantarflexion torque were assessed. Tissues were collected for further analyses. **Results:** Lung LMs had reduced fat ($p < 0.01$), muscle mass (gastrocnemius: $p < 0.01$; quadriceps: $p < 0.01$; tibialis anterior: $p < 0.001$), and muscle torque ($p < 0.05$) compared to all groups. Compared to sham, ultimate force of femur bones was only reduced in mice with LM ($p < 0.001$), suggesting accelerated cachexia. Similar effects were found in animals with pancreatic LMs. The pancreatic LMs displayed reductions in gastrocnemius ($p < 0.01$) and tibialis anterior ($p < 0.01$), and plantarflexion torque ($p < 0.01$). Molecular characterization reinforced the wasting phenotype, evidenced by elevated atrophy signaling in animals bearing lung LMs. **Conclusions:** Like our prior work in colorectal cancer, these findings suggest that LMs also worsen cachexia in models of lung and pancreatic cancer. Investigating how LMs worsen cachexia is crucial to preserving musculoskeletal health.

Zachary Miller

PA - University of Pittsburgh

Discipline: Psychology

Authors:

#1 Zachary Miller

#2 Carla Mazefsky

#3 Caitlin Conner

Abstract Name: Communication Dynamics in Neurotype Matched and Mismatched Interactions Among Autistic Adults

Communication challenges are central to autism spectrum disorder (ASD), affecting both expressive and receptive language abilities and often leading to social isolation. These difficulties stem from differences in communication styles between autistic and neurotypical individuals. While autistic individuals may communicate effectively with others of the same neurotype, they often struggle in neurotype-mismatched interactions. Emotional states further impact communication abilities: negative emotions exacerbate difficulties, and positive emotions may cause overstimulation. This study examines communication dynamics in neurotype-matched and mismatched scenarios, focusing on emotional and stress implications and the role of rapport in autistic individuals' emotional well-being. We hypothesize that autistic individuals face greater communication challenges and stress in neurotype-mismatched interactions, with negative emotions more frequently affecting communication than positive ones. An online survey with 40 questions targeted autistic individuals aged 18–35. Using a five-point Likert scale and qualitative items, the survey evaluated emotional, relational, and communication experiences in cross-neurotype contexts. Statistical analyses, including descriptive statistics and Kolmogorov-Smirnov tests, were conducted using Excel and PRISM software. Over six weeks, 69 participants responded: 72% female, 25% male, and 3% unspecified, with an average age of 26. Ethnic diversity was noted, and 86% had annual incomes below \$70,000. While 69% reported adequate speech comprehension, 52% faced speech generation difficulties even under optimal conditions. Emotions influenced communication for 86%; 50% cited negative emotions as worsening communication, while 14% noted positive emotions as a factor. Statistical analysis showed no significant difference in emotional impact between neurotypes ($p = 0.7426$), though 36% reported feeling more emotionally affected when interacting with neurotypicals. This study highlights critical communication challenges for autistic individuals in neurotype-mismatched contexts. Speech generation struggles, frequent communication adjustments, and emotional influences—particularly negative emotions—exacerbate cognitive load and stress. In the future, we

will conduct qualitative analyses to gain deeper insights into the emotional implications of cross-neurotype communication.

Regan Miller

MN - College of Saint Benedict/ Saint John's University

Discipline: Biology

Authors:

#1 Kristina Timmerman

#2 Ian DeGross

Brooke Paradise

Zachary Stang

Abstract Name: Does Distance Between Safari Jeeps And Elephants (*Loxodonta africana*) Influence Elephant Agonistic Or Aggressive Behavioral Rates?

The African savannah elephant (*Loxodonta africana*) is found in southern and eastern Africa. In previous years, elephant populations have faced a significant level of threats, primarily due to poaching and anthropomorphic habitat loss and habitat conversion. Tanzania is a tourist hotspot for safari expeditions, and jeep traffic contributes to potential human-elephant interactions which could have a negative impact on elephant behavior. We wanted to know if distance between safari jeeps and elephants would result in increased rates of agonistic (aggressive) or avoidance behaviors. We hypothesized that there is a relationship between distance between jeeps and elephants. Based on this hypothesis, we predicted that there would be higher rates of agonistic or avoidance behaviors when elephants are closer to jeeps. We conducted an observational study in Ngorongoro Crater and Serengeti National Park, Tanzania during May-June 2024. We categorized distances as <50m, 50-100m, 101-150m, 151-200m and 200m+ (distances determined by rangefinders). Across the two areas, 147 elephants in 17 herds were observed. We recorded 148 avoidance behaviors and 128 aggressive behaviors. There was not a significant difference in distance relative to behaviors (aggressive; $t=1.801$, $df=8$, $p=0.109$ and avoidance; $t=1.298$, $df=8$, $p=0.230$). However, in cases within 50 meters, 19.51% of elephants displayed aggression and 61.90% elephants displayed avoidance (these behaviors were almost non-existent at further distances). We think that the lack of statistical significance in our results is likely due to the small sample size of encounters that were within 50 meters or less. This data can be used as a starting point for future studies on jeep/elephant interactions during safaris.

Emily Miller

PA - Westmoreland County Community College

Discipline: Social Work and Human Services

Authors:

Abstract Name: Kinesics Training Mandate: The Importance for Child Protective Case Workers

Having kinesics training as a tool to utilize, may provide case workers with valuable knowledge they can use to communicate with children. Kinesics is the study of the way in which certain body movements and gestures serve as a form of nonverbal communication. For example, if someone is scared, their body movements can be tense posture, crossed arms or leaning back slowly. Children tend to express emotions nonverbally more often and earlier than they do verbally when disclosing abuse. When children expressed more nonverbal emotions, they were more responsive during an interview and more informative about the

abuse. Child welfare workers spend the majority of their time visiting the homes of families they serve in order to assess the service needs of children and families and to monitor the well-being and safety of the children in the family. They must do their job for the safety of the children while putting their own lives in danger every day. Case workers having on-the-job or educational kinesics training may help protect themselves and the youth they work with. Reports show that approximately 70 percent of child welfare workers in the United States have been victims of violence or threat of violence in the workplace. This project uses government sites for ninety percent of the research because I wanted the information to be factual. Findings from the research underline the value and importance of training for nonverbal emotional communication.

Max Miller

AL - Auburn University

Discipline: Engineering

Authors:

#1 Yadrianna Acosta-Sojo

Abstract Name: Improving Human-Exoskeleton Coordination through Modification of the Torque's Rise and Fall Time Control Parameters in Powered Ankle Exoskeleton

Exoskeletons have become increasingly popular due to their potential to enhance or assist human capabilities across various industries, such as manufacturing and healthcare. Lower-extremity powered exoskeletons are driven by controllers that store commands to assist the user. However, they still have their own unique set of complexities and unknowns. It needs to be determined how changes in exoskeleton control parameters can affect human-exoskeleton coordination. Changes in exoskeleton parameters, such as ankle timing and quasi-stiffness, can influence gait characteristics and muscle activation, affecting human performance. This research aims to develop a new exoskeleton controller for the Dephy ExoBoot to modify the torque profile's rise and fall time (exoskeleton parameters) and evaluate people's sensitivity to the changes and associated changes in gait characteristics. The Dephy ExoBoot provides torque/assistance at the push-off during the stance phase of the gait cycle. To provide the assistance, the actuator produces a torque about the ankle joint by spooling an inelastic belt that is rigidly attached to the exoskeleton's lever arm. The results from this pilot study will provide a preliminary understanding of human perception towards changes in exoskeleton control parameters, which offers insight into individual preferences and differences in exoskeleton usage and informs exoskeleton precision requirements to maximize human-system interaction, improving human performance.

Mason Miller

PA - Susquehanna University

Discipline: Biology

Authors:

#1 Sophie Charvet

Abstract Name: The Effects of Nutrient Availability on Trophic Modes in Prasinophyte Mixoplankton

Mixoplankton, a type of marine prasinophyte capable of modulating between phototrophy and phagotrophy, exist in abundance across the world. These microbial eukaryotes have the ability to switch between trophic modes based on need, allowing them to contribute to marine oxygen production and the carbon cycle. The exact parameters that cause these changes to occur are still unknown. We investigated different treatments

that may promote these changes in the prasinophycean green algae *Cymbomonas tetramitiformis*, namely f/2 (default high nutrient media), f/20, f/2 with low nitrate, and f/2 with low phosphate. We hypothesized that lowering specific essential nutrient concentrations, nitrate and phosphate, available to *C. tetramitiformis* would cause it to switch to phagotrophy to bypass the stress placed on it by environmental nutrient levels. To combat this, we expect *C. tetramitiformis* will obtain the required nutrients by ingesting prey. So far, we have attempted RNA extraction to test for gene upregulation in genes related to phagotrophy and are now using fluorescently labeled bacteria to test for phagotrophy. We hypothesize that because of our low nutrient treatments, we will see our organisms turn to phagotrophy.

Lydia Miller

TN - University of Tennessee at Knoxville

Discipline: Nursing and Public Health

Authors:

#1 Jennifer Smith

Abstract Name: Caregiver Health: Improving the Health of Informal Caregivers Through an At-Home Exercise App

The number of informal caregivers is rapidly increasing due to the increasing life expectancy of older individuals. This leaves a population of individuals that have little time to care for themselves, and they often experience health issues, including heart disease, obesity, and diabetes. The purpose of this study is to determine how an at-home modular workout app will benefit the health of informal caregivers by allowing them to workout and maintain their health while having the flexibility to stay home and care for their loved ones. The main research question is as follows: how will an at-home modular workout app impact the physical health of informal caregivers? This quantitative study will gather information including changes in blood pressure, heart rate, weight, as well as other information using a pre-test and post-test style for data collection. The population of this study included informal caregivers from rural Kentucky, and these caregivers are chosen using convenience sampling. Analysis of this data is TBD.

Robert Miller

OK - University of Oklahoma Norman Campus

Discipline: Physics and Astronomy

Authors:

#1 Alisa Javadi

Abstract Name: Design and Construction of an Actively Dampened Fabry Perot Optical Cavity with High Stability

Quantum emitters are essential for generating quantum states of light, enabling applications in quantum communication and sensing. When working with quantum emitters, it is necessary to place the emitter inside an optical cavity to enhance the collection of emitted photons. The most effective cavities will exhibit high stability and the capacity for sustained locking. Among many different types of cavities, Fabry-Pérot cavities are particularly well suited for this because their output is well-matched to optical fibers, and they are highly tunable. Unfortunately, such cavities are highly susceptible to mechanical vibrations. These vibrations induce small perturbations in the cavity length, which limits cavity performance and thus photon collection. One way to overcome these mechanical disturbances is to include a piezoelectric actuator within the cavity. The

actuator can then be controlled through an active feedback loop to stabilize the cavity. Another approach is to dampen the system mechanically with an external actuator. The aim of this project is to measure the mechanical vibrations of four approximately one-meter-long rods coupled in a square pattern, compare these measurements with frequency simulations performed in COMSOL, and then dampen the system mechanically to achieve high cavity stability. Measurements will first be taken using a Fabry-Pérot cavity with a piezoelectric actuator, and the results will be used to design an actuator that acts directly on the mechanical system rather than the cavity itself. The ultimate goal is to design and build an actively dampened Fabry-Pérot cavity with high stability.

Tia Miller

LA - University of Louisiana at Lafayette

Discipline: Nursing and Public Health

Authors:

#1 Tia Miller

#2 Omaree Peltier

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Dexter Walker

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Abstract Name: A Review of the Current State of the Evidence on Food, Nutrition, Literacy, Health, and Education: Implications for Nursing

Purpose: To examine the current evidence on the existing relationships between food, nutrition, literacy, health, and education. The primary aim of this review is to identify common themes, describe gaps in literature, and explore nurses' role in providing education to promote health and wellness among diverse populations by improving food and nutrition literacy. Background: Over the past decade, food and nutrition literacy research has grown underscoring the recognition that food and nutrition literacy can empower individuals to make food choices that can promote their health and well-being. The ability to understand, manage, and adopt a healthier eating lifestyle has the potential to improve long-term outcomes related to chronic diseases such as obesity, diabetes, and heart disease. Nursing is uniquely positioned to effectively enhance food and nutrition literacy across individuals with diverse health conditions. An initial search conducted using the Library Search Database (EBSCO Discovery Service) at the University of Louisiana at Lafayette Library combined the keywords of (food literacy OR food competency OR nutrition literacy OR nutrition) AND (health professional OR nurses OR doctors OR dietitians) AND chronic illness yielded 325 manuscripts. The research team's review of titles and abstracts found many irrelevant articles; therefore, four individual searches using the same database were conducted with keywords in various combinations with the Boolean operator "AND". The search yielded between 21-27 results per search. The results from the searches were combined and duplicates were removed with a final yield of 60 manuscripts. At least two team members review each manuscript in the analysis phase. Results: Analysis continues in progress. It is expected that separate and intersecting concepts/themes will be identified that will provide a baseline foundation for understanding the gaps and areas in need of further exploration. Key recommendations for nursing practice, education, and research will be formulated based on findings.

Harper Miller

MN - University of Minnesota - Duluth

Discipline: Psychology

Authors:

Abstract Name: Abortion Ballot Outcomes in Florida and Missouri Predict Changes in Belonging and Inter-State Migration Intentions

Dobbs v. Jackson Women's Health Organization overturned federal abortion protections, shifting regulatory power to state legislatures. This ruling created regional disparities in abortion access, making state residence consequential for healthcare and moral alignment. The ideological migration hypothesis proposes that people are motivated to relocate from communities that conflict with their political values to ones that align with their values in order to satisfy the fundamental need to belong. Although existing research suggests that political sorting in the United States typically occurs locally—between urban and rural areas or neighborhoods within states—state laws may also prompt migration across state lines. The present pre-registered study (N = 1,230) tests whether changes in state abortion laws predict changes in Americans' sense of belonging and desire for inter-state migration. Specifically, pro-life and pro-choice advocates living in Florida and Missouri—two states with restrictive abortion laws voting on ballot measures to expand abortion access—were surveyed before and after the 2024 U.S. presidential election. Whereas Missouri's ballot measure passed, Florida's measure failed. Participants were informed about their state's current abortion law pre-election and outcome of their state's ballot measure post-election (85% response rate). In both survey waves, participants indicated their sense of belonging living in their state and desire to migrate to another state. Our results support the ideological migration hypothesis. Among Missouri residents, pro-life advocates reported decreased belonging and increased migration intentions following the ballot measure passing, and pro-choice advocates reported the opposite. Conversely, pro-choice advocates in Florida reported decreased belonging and increased migration intentions following the ballot measure failing. These findings have implications for understanding how the Dobbs v. Jackson decision may influence domestic migration in the United States over the coming decades and its consequences for amplifying political division and animosity.

GRACE MILONE

PA - Duquesne University

Discipline: Nursing and Public Health

Authors:

#1 ERGIE INOCIAN

RACHAEL GARLAND

NING JIANG

Abstract Name: Palliative Care Needs of Older Patients with Stroke: A Scoping Review

Background: Stroke is a leading cause of mortality and serious long-term impairment. Palliative care focuses on addressing the holistic needs of patients with serious illness to improve their quality of life. Aim: This scoping review aimed to explore the existing body of knowledge on the palliative care needs of older patients with stroke and sought to fill the gap in literature by synthesizing empirical research findings. Design: This scoping review follows the methodological framework of Arksey and O'Malley (2005) comprising of five stages: [1] Formulating the review question; [2] Identifying relevant studies; [3] Screening and selecting the studies; [4] Charting the data; and [5] Collating, summarizing, and reporting the results. Methods: Three online databases (PubMed, Embase, and CINAHL) were searched for studies published between 2014 and 2024. A combination of keywords with Boolean operators and database subject terms were used including: "palliative care needs", "older adults" and "stroke patients". Retrieved articles were imported to Endnote and Covidence review management software for screening and selection based on inclusion/exclusion criteria. Reporting followed the Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines. Results: Empirical evidence drawn from 20 included studies suggest that older patients who have experienced stroke need comprehensive palliative care to improve their quality of life. Specifically, the results of this review identified five overarching themes: physical mobility needs, psychosocial and emotional

support, informed decision-making, symptom management, and comfort-based care. Conclusion: Palliative care is an essential component of integrated and patient-centered stroke service to improve the quality of life of older individuals. The information generated from this review aids in understanding the specific palliative care needs of older adults suffering from the debilitating effects of stroke. Effective palliative care delivery for older patients with stroke requires collaboration between patients, families, and healthcare professionals.

Jamie Miltenberger

MD - Bowie State University

Discipline: Biology

Authors:

#1 Kimberly Smith

#2 Ama-Soley Allrich

#3 Janiya Davis

#4 David Miller

Abstract Name: Birds of the Burbs: Documenting Bird Communities in Suburban Landscapes of the D.C.-Baltimore Corridor

More than one in four birds have disappeared from North American since 1970. As natural wildlife habitat is lost to development, it is increasingly important to understand how urban/suburban environments can support declining bird populations. It is also critical to understand if people have equal access to urban and suburban birds and to the natural areas that support more bird species. Here, we used the Merlin Bird ID app to document bird species richness throughout Prince George's County, MD and the Washington, D.C.-Baltimore corridor, more generally. We generated >1,000 observations of 89 bird species from 62 sites based on bird vocalizations in the morning and evening (near dawn and dusk chorus), and we also characterized the human populations at our study sites using income, race, and ethnicity data from the 2020 census. We found that race and ethnicity were largely unrelated to bird community metrics, such as species richness and the occurrence of non-native species. However, there were more bird species (higher species richness) and a smaller percentage of declining bird species in communities where more people selected the "some other race" census category. The strongest trends in our dataset derived from income: neighborhoods with higher average income supported more bird species overall but fewer species with decreasing population trends. Finally, we compared the bird communities of three focal sites: Bowie State University (BSU) campus, the Governor Bridge Natural Area, and Crofton Park. We documented the most bird species (43) and the highest proportion of declining bird species at BSU, likely because of its proximity to large tracts of protected habitat. Overall, our data highlight inequalities in human exposure to local biodiversity. However, our findings also emphasize the important role that suburban landscapes can play in supporting declining bird species, especially when they include large protected natural areas.

Alexandra Mindnich

NY - City University of New York - City College of New York

Discipline: Psychology

Authors:

#1 Ran Cortright

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Daniel Trobetzkoy

Quame Verneuil

Abstract Name: EEG data on Heavy Tiktok Engagement Influencing Attention Deficit

TikTok is a social media platform consisting of short user-generated videos. The popularity and addictiveness of this app calls for understanding whether and how TikTok usage affects the academic experience of our youth. The present study seeks to confirm that prolonged TikTok use is associated with self-reported inattentive experience. Additionally, the study collected both behavioral and electroencephalogram (EEG) data during a selective attention task, to evaluate if the self-reported attention deficit experience can be confirmed by their behavioral and neurological experience. By looking at these factors, this study explores the underlying relationship between observed academic struggles and active TikTok use. Student participants signed up from the CCNY SONA pool. Four surveys, including the Depression Anxiety and Stress Scale, the adult ADHD self-report scale, a TikTok modified version of the Social Media Use Questionnaire, and demographics survey were used. Participants were divided into either the low TikTok or high TikTok group based on their TikTok usage. Participants then performed a modified Flanker Task while an electroencephalogram (EEG) with 160 electrodes evenly distributed recorded. Our study plans to run a correlation analysis between the amount of TikTok use and self-reported ADHD experience. We also plan to analyze the EEG data collected, and compare event-related potentials (ERPs) among participants who were high and low TikTok users. Specific ERP P1 and N170 in response to the target will be used to evaluate if more brain activities would be seen among the high TikTok user group during the attention task. Both ERPs have been commonly used to indicate neural reactivity in the process of attention processing. By looking at these two ERPs, our study hopes to explore if there's potential evidence that the brain may be working more than usual to achieve a similar attention function due to cognitive impairment from prolonged TikTok use.

Nathnael Minuta

MN - Minnesota State University - Mankato

Discipline: Engineering

Authors:

#1 Nathnael Minuta

#2 Joel Tchouke

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Joel Tchouke

Mustanser Ahmad

Abstract Name: Advanced Smart Glasses Project

This project aims to develop an assistive system using smart glasses to enhance the independence and navigation of visually impaired users. The system integrates object detection, voice generation, and wireless communication modules to provide real-time feedback and interaction with the environment. The object detection module utilizes the Jetson Nano and NVIDIA's Jetson Inference library to identify and classify objects within the user's surroundings, such as furniture and household items. This system processes live video feeds from a connected camera, providing audio guidance or haptic feedback to inform the user of detected objects. To optimize performance, the model was retrained to focus on common household items, enhancing precision while reducing computational load. The voice generation module provides auditory feedback by converting text into speech, essential for users with visual impairments or those seeking a hands-free experience. This system uses the Jetson Nano and a text-to-speech engine to deliver clear auditory responses, while addressing challenges in speech quality and power consumption. Pre-generated audio files for frequent commands help mitigate processing demands. For wireless communication, the system uses an IoT camera for live video streaming and Arduino Pico boards for controlling external devices like lights or thermostats. Wireless protocols such as MQTT and WebSocket ensure efficient transmission of data, with security measures like WPA2 encryption to protect sensitive information. The development process has involved significant optimization for low-power, high-efficiency operation, while maintaining robust functionality. Future work will focus on further enhancing detection accuracy, refining voice quality,

improving power usage, and expanding device compatibility. This integrated system demonstrates the potential to assist visually impaired individuals in navigating complex environments.

Jubelqui Miramontes

OK - University of Central Oklahoma

Discipline: Economics

Authors:

#1 Zhen Zhu

#2 Kuang-Chung Hsu

#3 Nefeli Zafeiri

Abstract Name: Weather Forecast, Forecast Revisions and Natural Gas Price Dynamics

There is no doubt that weather drives natural gas price through consumption demand from mainly the residential, commercial, and power sectors as well as through supply side interruptions. Mu (2007) documented the impact of the weather on the conditional mean and conditional volatility of the natural gas price. Linn and Zhu (2006) also revealed that models with fundamental variables such as weather performed better in terms of forecasting natural gas price. It is customary to see news reports of the impact of weather forecasts on gas prices however, there is no study of how the weather forecasts affect gas price and its volatility. Understanding how natural gas price responds to weather forecast is an important step in understanding the price dynamics. It helps market participants to design a better program for trading and risk management. It also helps to settle the issue of whether and/or to what degree gas prices are affected by market fundamentals or non-market fundamental factors. Our project employs a forecasted weather dataset (daily price forecast for a total of two weeks between April 2021 and August 2024) obtained from Pratt's to gauge the degree of natural gas price response to changes in weather forecast. According to economic theory, the expectation of demand and supply ultimately determines pricing. Our study has several steps. In the first step, we review the accuracy of the weather forecasts. In the second step, we use Pratt's weather forecast as a representative market weather forecast to generate weather forecast shocks and examine how the gas price level has responded to the weather forecast revisions. Third, we study how the weather forecast and forecast revisions have contributed to market price volatility. Our research is expected to clarify a crucial yet missing piece of how weather forecast affects the energy price dynamics.

Laiba Mirza

PA - Duquesne University

Discipline: Nursing and Public Health

Authors:

#1 Laiba Mirza

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Destiny Smith

Abstract Name: Parental Leave Policies : Battling Inequities and Realizing Transformational Health (BIRTH)

Workplace dynamics in the 21st century emphasize the need for equitable parental leave However, the United

States lacks a guaranteed parental leave policy, raising concerns about the adequacy of available leave. This study examines different company sizes and the impact of parental leave policies on employee retention and gender equity in workplaces. In 2023, an initial benchmark survey was conducted by PBGH and Healthy Start. In 2024, a follow-up BIRTH survey was sent to 27 employers, covering 360,000 lives, primarily in the Pittsburgh region but with a broader reach. The survey assessed parental leave policies, childcare support, and health equity initiatives, with data analyzed by company size. Descriptive statistics were used to analyze the data. A recommendation guideline: consisting of workplace policy transformation, strategic action brief, and identification of social determinants of health barriers was achieved. Preliminary results from the second survey indicate that most employers offer parental leave, but often only 2-3 paid weeks. Eligibility for maternity leave is determined by 70% of employers and 78% for paternity leave contingent on employment duration. At employers' discretion, the leave can be partial or unpaid. Over the next two years, 30% of companies do not plan to adjust their leave policies. Parental leave policies are essential for supporting new parents during this transformational life event. Existing federal policies like the Family and Medical Leave Act (FMLA) and the Federal Employee Paid Leave Act (FEPLA) provide a foundation but fail to comprehensively address the needs of marginalized, low-income families. Equitable policies can enhance child development, bonding, and overall well-being. The BIRTH project offers employers insights and benchmarks to improve their benefits. Companies with comprehensive parental leave and childcare support report higher employee retention and satisfaction with smaller companies having more family-friendly policies. Around 70% of companies responded to the initial survey.

Laiba Mirza

PA - Duquesne University

Discipline: Nursing and Public Health

Authors:

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#2 Hannah Hardy

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#5 Lisa Ripper

#6 Arthur Harper

Abstract Name: Mobilizing Prevention and Early Detection of Alzheimer's Disease and Related Dementias (ADRD) in Allegheny County through the Area Agency on Aging (AAA)

In collaboration with the Department of Human Services (DHS): the Area Agency on Aging (AAA) using the Healthy Brain Initiative (HBI), this project will involve the development of a comprehensive literature review examining the impacts of Alzheimer's disease and related dementias (ADRD) on patients and their caregivers. The project aims to help the AAA focus on strategies to delay the onset of ADRD in Allegheny County by enhancing early detection and prevention programs through the Building Our Largest Dementia Infrastructure (Bold) Grant. Additionally, the project will explore how public health initiatives can increase access to care, educate the public, and train healthcare providers to better support patients and caregivers. Secondary research will serve as a basis for the analysis of the Behavioral Surveillance Survey System (BRFSS) data collected by the Centers for Disease Control and Prevention (CDC) and ACHD. Literature reviews will identify public health strategies and interventions for ADRD that AAA can implement using BRFSS data. An interview of several departments in the AAA was conducted regarding the preventable and diagnostic care that the AAA provides for patients dealing with dementia and memory problems. The data achieved will be qualitatively analyzed to provide feedback and possible program implementations about ADRD services offered in correspondence with the secondary research. This project aims to provide evidence-based strategies to improve early detection and diagnosis, enhance caregiving support, and raise awareness within the county. These efforts will promote earlier interventions and integrate them into community health practices. In the future, AAA will aid the HBI and use the American Heart Association's cardiovascular disease guidelines as a model to establish ADRD-specific public health interventions. This project will utilize

levels of prevention to develop a baseline need for the ADRD community, aiming to improve overall health outcomes and support for patients and caregivers.

Rishikant Mishra

VA - Virginia Commonwealth University

Discipline: Biology

Authors:

#1 Janina Lewis

#2 Ross Belvin

Abstract Name: Identifying Vitamin B-12 Transport Genes from Suspected TonB-dependent Receptors

Periodontal disease, particularly chronic periodontitis, is a major global health challenge, leading to severe bone loss and possibly causing other systemic diseases. *Porphyromonas gingivalis*, a pathogen found to be highly associated with chronic periodontitis due to its ability to cause dysbiosis of the oral microbiome, relies on cobalamin, also referred to as Vitamin B12, as an important cofactor for its growth. However, due to an incomplete biosynthetic pathway for cobalamin, the bacteria primarily rely on TonB-dependent transport. This study explores the role of suspected TonB-dependent receptors in mediating cobalamin transport in *P. gingivalis*. Being able to identify nutrient acquisition mechanisms in *P. gingivalis* could provide possible methods to interfere with the uptake of these nutrients and lead to the reduction of periodontal disease. After growing the bacteria in Casein Minimal Media deficient in cobalamin and anaerobic conditions, quantitative RT-PCR was done on the genes encoding TonB-dependent transporters to evaluate differential expression of these genes in the presence and absence of cobalamin. Genes PG0185, PG1414, and PG1715 were identified as potential candidates based on their significant upregulation in the presence of cobalamin. Genes PG1414 and PG1715 were subsequently deleted in the *P. gingivalis* strain W83. While the mutants were successfully created, further investigation into their role is required to confirm their involvement in cobalamin uptake.

Davis Misner

MD - Howard Community College

Discipline: Mathematics

Authors:

Abstract Name: Singular Matrices with Random Natural Number Entries

Singular matrices are a cornerstone of Linear Algebra with significant theoretical and practical implications. Motivated by a classroom discussion, I investigated the probability of a randomly generated 2×2 matrix being singular when its entries are restricted to natural numbers less than or equal to a given value n . By approaching the problem geometrically, I derived a combinatorial formula to determine this probability. To validate the formula, I wrote a program that confirmed my formula for the first 20 natural numbers. Restricting the possible entries of the matrix to natural numbers produced a finite number of matrices from which the proportion of the number of singular matrices could be determined.

Carley Mitchell

TX - Midwestern State University

Discipline: Social Work and Human Services

Authors:

#1 Packiaraj Arumugham

Joanna Estrada

Louisa Barrick

Abstract Name: Mental Health of Commuter and On-Campus Students

Commuters and resident students may be seen as receiving the same education, but these two populations experience unique and significant differences. One study by Jamil, et al. (2022) noted that increased commute time was associated with decreased academic performance in college students. Additionally, commuting tended to reduce students' feeling of belonging to their college community, leading to overall inferior well-being (Stalmirska et al., 2022; Barnhart 2023). It is clear that symptoms related to mental health can be exacerbated by commuting; thus, we hypothesize that commuter mental health will be lower than their resident counterparts. While studies have compared the relationship between college students' living status and academic performance, well-being, weight, and drinking habits, there is a paucity of research examining whether resident or commuter status affects mental health. The purpose of this study will be to examine the difference between the mental health of students living on campus and that of commuter students. The study participants (n=200) will be drawn using simple random sampling for the residents and convenience sampling procedures for the commuters. The survey will be conducted using the Patient Health Questionnaire-9 (PHQ-9) and General Anxiety Disorder Questionnaire-7 (GAD-7) relating to mental health and socio-demographic questions. The data will be collected via Google Forms. The collected data will be entered into SPSS 29.0. Preliminary data analysis reveals that there is no significant difference between commuter and resident study participants regarding their mental health issues.

Kush Modi

DC - Georgetown University

Discipline: Biology

Authors:

#1 Kush Modi

Tony Joseph

Abstract Name: Analysis of the Relationship between PARP1 and BRCA1 Suggests PARP1 Gene Has a Role in Breast Cancer

Poly [ADP-ribose] polymerase 1 (PARP1), one of the genes in the PARP family, is mainly involved in the detection and repair of DNA damage in cells, and its upregulation has been associated with tumorigenesis. PARP1 is essential to all cells in the body as it ensures that DNA is replicated correctly. The PARP1 protein addresses repair of single-stranded breaks (SSBs) in DNA by initially binding near the point of break in the DNA. While it is bound to the region of the SSB, PARP1 transfers ADP ribosyl moiety from NAD⁺ to acceptor proteins. This leads to the recruitment of DNA repair proteins to the region of DNA breaks. The PARP1 protein also aids the double-stranded break (DSB) repair of DNA by recruiting the homologous recombination (HR) pathway proteins. Due to this role of PARP1 in DNA repair, it has been associated with cancer growth. Using databases, including UniProt, Xena Browser, and CBioPortal, this article explores the relationship between PARP1 mutations and BRCA1-mutated breast cancer. BRCA1 is a tumor suppressor gene, which is involved in DNA repair through the HR pathway. Therefore, in BRCA1-mutated cells, the lack of tumor suppressor factors leads to cancer growth. However, in a cell that has both BRCA1 mutations and PARP1 inhibition, DNA damage cannot be repaired, leading to apoptosis. Hence, PARP1 inhibitors have

become essential in BRCA1-mutated breastcancers. There are several PARP1 inhibitors that are currently being used to treat breast cancer, which work using several mechanisms of action, including PARP1 trapping, which prevents the repair, transcription, and replication of DNA. This article also focuses on the clinical trials of three specific drugs, Olaparib, Iniparib, and Veliparib, which are used to treat breast cancer. However, due to the lack of understanding surrounding PARP1 inhibition mechanisms and potential drug combinations, more research needs to be done to understand potential biomarker targets and PARP1 inhibitor resistance.

Zeel Mody

IL - Elmhurst University

Discipline: Criminology/Criminal Justice

Authors:

Abstract Name: The Impact of Intimate Partner Violence with Firearm Presence on Low Socioeconomic, Minority Women

There is an increase of low socioeconomic, minority women as victims of intimate partner violence when a firearm is a contributing factor. Gun violence in the United States has risen within the past decade from access to firearms through legal or illegal means, and it has been used as a weapon to harm women in a heterosexual relationship where intimate partner violence (IPV) is prevalent. Individuals within an intimate partner violence relationship suffer from emotional, mental, sexual, and physical abuse leading to chronic illnesses or even death. IPV can lead to chronic diseases such as traumatic brain injury, depression, or PTSD. The harm of IPV prompted the question, "How does the availability of firearms in households correlate with the severity of domestic violence incidents, and what factors contribute to variations in this relationship across different sociocultural contexts?". Through a meta-analysis-based research process of scholarly sources, minority women with a low socioeconomic status (SES) have been the demographic that has been greatly impacted. Between 2015 and 2019, over 11,000 women were killed with a firearm. The homicide of women, femicide, or the attempt to commit femicide reached 4.5 million women within the U.S. For every 100,000 women, 6,400 Black women and 1,900 Hispanic women have been the demographic that has been impacted by firearm domestic violence, with contributing factors of racism, residential segregation, and unemployment under the social disorganization theory. Factors about culture, religion, and hegemonic masculinity contribute to why low SES women are impacted more than other demographics of women. Accessibility of firearms is higher where the perpetrator has a criminal history or a mental illness that has maladaptive behavior. Closing the "boyfriend loophole," tightening firearm accessibility, adopting new legislation, and tackling the social stigma of reaching out for resources are progress toward creating lasting resolutions for IPV victims.

Ayechan Moe

GA - Agnes Scott College

Discipline: Mathematics

Authors:

#1 Alan Koch

#2 Edie Irwine

Abstract Name: Complete residue systems in second-order linear recursive sequences mod a prime

This work is a study of the behavior of sequences which follow a second-order linear recurrence relation.

Such sequences $\{a_n\}$ are given by initial conditions $a_0 = 0$, $a_1 = 1$, and the recurrence relation $a_n = c_1 a_{n-1} + c_2 a_{n-2}$. Given a prime p , we investigate whether $\{a_n\}$ contains a complete residue system mod p , that is, whether there exists a_{n_i} such that $a_{n_i} \equiv i \pmod{p}$ for all $0 \leq i \leq p-1$. Such sequences are necessarily periodic modulo p , and using number theory and finite field theory we show that the existence of a complete residue system depends only on the period length. Explicit examples will be given. Finally, we will investigate the proportion of sequences which are periodic for a fixed prime p .

Yesser Mohamed

EGY - The American University in Cairo

Discipline: Engineering

Authors:

#1 Yasser Mohamed

#2 Zeyad Mahmood

Zeyad Mahmood

Abstract Name: Potential Use of Sustainable Phase Change Materials (PCM) to regulate Asphalt binder Temperature and harvest Solar Energy

This study investigates the possibility of incorporating different sustainable Phase Change Materials (PCMs) into asphalt binders aiming at harvesting practical amount of solar energy along with regulating the asphalt pavement temperatures. This was done by examining different types of PCM-modified asphalt binders in terms of their rheological, chemical, thermal, and microstructural properties and energy storage performance. The base asphalt binder was sourced from an Egyptian refinery named Suez Oil Company and designated directly as Suez asphalt, which was then mixed with PCMs. Two different types of PCMs were used the first type was 5% beeswax and 3%, waste cooking oil (WCO) by weight of asphalt. While, the other PCM type was 5% beeswax, 3%, WCO, and 0.3% Carbon Nanotubes by weight. Scanning Electron Microscopy (SEM) was employed to provide two-dimensional imaging to observe surface microstructure and composition. Fourier Transform Infrared Spectroscopy (FTIR) and Ultraviolet-Visible Spectroscopy (UV-Vis) were used to identify composition, Light-induced aging, and degradation. Rheological analyses involved several tests, including Dynamic Shear Rheometer (DSR), Rotational Viscometer (RV), and Bending Beam Rheometer (BBR), conducted across short-term aging (RTFO) and long-term aging (PAV). Additionally, Multiple Stress Creep Recovery (MSCR) and Linear Amplitude Sweep (LAS) tests were used to assess rutting resistance under high stress and fatigue resistance, respectively. Thermal Gravimetric Analysis (TGA) was employed to study the different PCM-modified binders' thermal stability and energy harvesting possibilities in reference to their control asphalt binders. Results revealed that incorporating PCM into asphalt has increased the energy-storing capacity of the asphalt pavement while regulating its thermal performance. The rheological properties of the PCM-modified binders were different based on the type of PCM used. Although, incorporating only the beeswax and WCO resulted in a lower performance grade (PG) of 52-18 Compared to the base PG of 58-12, potential enhancement in thermal regulation and energy harvesting was recorded.

Faisa Mohamed

MN - St. Catherine University

Discipline: Nursing and Public Health

Authors:

#1 Angela Ekwonye

Abstract Name: Understanding Community Well-Being and Actions of Faith Communities during the COVID-19 Pandemic: Perspectives of Members of Faith Communities

Indicators of community well-being (CWB) can help a community gauge and assess its current well-being status. While previous studies have explored indicators of CWB through community samples, retirees, and policymakers, there is a paucity of research that engages directly with members of faith communities. Faith communities play a vital role in nurturing CWB, particularly during global crises. This study focused on understanding CWB from the lens of faith community members and how faith communities promoted CWB in the Twin Cities area during the COVID-19 pandemic. From March to June 2023, semi-structured interviews were conducted with 16 participants from diverse faith communities to ensure religious representation. The data were thematically analyzed, revealing key indicators of CWB: 1) connectedness and belonging, 2) social trust, 3) community participation, and 4) social equity. Participants emphasized that meaningful relationships and perceptions of support fostered a strong sense of belonging. Participants trusted that people in their communities adhered to and engaged in practices that benefited and protected everyone during the pandemic. Community participation was highlighted as critical for enhancing CWB, with respondents advocating for more opportunities to engage in social and religious activities. Social equity, underpinned by values of justice, was seen as crucial for fair treatment, equal opportunities, and access to meaningful employment. Faith communities actively promoted CWB by providing tangible and emotional support, enhancing community connectedness, and advocating for and promoting social justice. The findings of the study underline the importance of understanding local indicators of well-being to improve community resilience and viability during crises. Knowing the local community indicators of well-being is vital for sustainability and improving the community's quality of life during a pandemic. The findings highlight the need for public health authorities to collaborate with faith communities to promote CWB and recognize the unique role faith communities play in fostering CWB.

Akrama Mohamed

WI - University of Wisconsin-Madison

Discipline: Sociology

Authors:

#1 Katherine Curtis

Abstract Name: Racial Disparities in Internal Migration: Examining Patterns and Inequities in the United States

Recent studies have focused almost exclusively on national immigration, but understanding internal migration within the United States is crucial for the investigation of racial disparities in migration. Researchers have shown that racial differences in migration patterns contribute to the unequal distribution of Black and White Americans across the nation's landscape, reflecting both historical and ongoing social, economic, and political forces with implications for racial inequities in various outcomes. This study examines the racial dynamics of internal migration by comparing the 2000s and 2010s patterns for non-Hispanic Blacks and non-Hispanic Whites in the United States. Using net migration datasets, the analysis focuses first on California, New York, and Texas, then extends to all other states, counties, and decades. The study explores how race, as a social construction, shapes migration motivations and outcomes beyond traditional economic models of mobility. The findings reveal that the pattern of migration for non-Hispanic Black immigrants is much stronger in comparison with that of their non-Hispanic White counterparts. This trend underscores the role of historical racial constructs in shaping migration decisions. Understanding these migration patterns is essential for addressing systemic inequities, as migration not only reflects existing disparities but also reinforces inequalities in access to resources, opportunities, and social networks.

Zuhayra Mohamed

TN - Middle Tennessee State University

Discipline: Biology

Authors:

#1 Cole Easson

#2 Deborah Gochfeld

Abstract Name: Microbiome Shifts in *Aplysina cauliformis* Due to Ocean Acidification and Ocean Warming

The ocean's water is becoming warmer and more acidic due to increased carbon dioxide in the atmosphere. This rapid increase of carbon dioxide is deposited into the ocean through the atmospheric gas exchange, creating carbonic acid and increased hydrogen ion byproducts to lower pH and raise temperature. Together, these variables disrupt the marine ecosystem by throwing homeostasis off balance and damaging coral reefs. Our study was centered on *Aplysina cauliformis*, a common Caribbean sponge situated near the equator, rendering it more vulnerable to ocean acidification and warming. We investigated whether shifts in temperature and pH will disrupt the microbiome of *A. cauliformis*, and whether it will exacerbate the disease *Aplysina* Red Band Syndrome (ARBS), a highly transmissible disease spread through physical contact. We hypothesize that these stressors will have minimal effects on the microbiome of healthy sponges, but ARBS will likely lead to more impactful shifts within the symbiotic microbial community. To achieve this, DNA was extracted from samples exposed to various stressors, including health status (healthy or diseased), temperature (29°C or 31°C), and pH (acidic or nonacidic) in a factorially designed short-term stressor experiment. We conducted Illumina amplicon sequencing on the 16S rRNA region using standard universal primers. We analyzed our data using the statistical program R to determine the relative impact of our three stressors. Our initial results indicate a high impact of ARBS on the microbiome of *A. cauliformis*, while increased temperature and lower acidity led to more subtle shifts in the microbiome. Disruptions in microbiomes can lead to changes in the physiology of the overall sponge, which may broadly affect how *A. cauliformis* survives and interacts with other organisms on coral reefs.

Arun Mohan

PA - Pennsylvania State University

Discipline: Engineering

Authors:

#1 Arun Mohan

#2 Brad Sottile

#3 Frank Barber

Brad Sottile

Abstract Name: Student, Faculty and Industry Collaboration to Co-create Microcredential on Engineering Ethics

Public safety relies on the professionalism and ethics of engineers. It is important for undergraduate engineering students to understand real-world scenarios of ethics failure. In this work, we (student, faculty, and alumnus working in industry) co-authored a micro-credential on engineering ethics. The micro-credential utilizes case studies including the Challenger explosion, Boeing-737 MAX crashes, the Volkswagen emissions scandal, intellectual property misappropriation, and the Ford-Firestone tire tread separation issues. Case studies provided an opportunity for micro-credential learners to discuss and understand the ethical challenges in each of these situations. As a student, I realized that real-world engineering incidents are often much more "gray" in contrast to classroom problems that focus on defined solutions. Further, my understanding of engineering problems was enhanced by differing perspectives from the faculty and alumnus

in the industry. The novelty of this approach rests on the curricular development team involving an atypical three-way partnership between faculty, student, and industry alumnus.

Arun Mohan

PA - Pennsylvania State University

Discipline: Engineering

Authors:

#1 Arun Mohan

#2 Prakash Chakraborty

Prakash Chakraborty

Abstract Name: Improving Operations Research Using Artificial Intelligence and Machine Learning Approaches

How can Machine Learning (ML) and Artificial Intelligence (AI) enhance the robustness and adaptability of solutions to Operations Research (OR) problems? Traditional OR methodologies, which rely on well-defined variables, constraints, and optimization techniques, often suffer in dynamic environments where parameters such as costs, supply, or demand are uncertain or random. This can lead to suboptimal or infeasible outcomes. ML and AI, when used appropriately, offer tools to address uncertainty, provide robust solutions, and enable adaptive, real-time decision-making. These techniques are powerful in situations where data are often complex or incomplete, such as optimizing resource allocation in healthcare, managing supply chain disruptions, pricing financial instruments under stochastic market conditions, and scheduling maintenance for critical infrastructure. This study investigates OR problems where classical OR techniques are compared with solutions generated by AI and ML models with applicability across diverse domains including telecommunications, healthcare, manufacturing and supply chains, financial engineering— under static and random conditions. We present the strengths and weaknesses of both classical and modern techniques and attempt to understand when and how each method can be leveraged.

Gabriela Molina Otaiza

VA - George Mason University

Discipline: Law and Legal Studies

Authors:

Abstract Name: Legal Frameworks Under Pressure: International Venezuelan Diaspora

According to the United Nations Human Rights Office of the High Commissioner (UNHCR, 2018), over 5.9 million Venezuelan migrants have been displaced or are fleeing at an alarming rate due to “widespread human rights violations, crime, and crises” and are considered the “second largest displaced population globally” (Del Real 1). Venezuelan President Nicolás Maduro (2013-present) and his administration have enacted mass human rights violations, and “excessive force against political opponents” (Del Real 1). In addition, their public healthcare system has collapsed and failed to provide medical staff with the necessary supplies to treat patients. Moreover, current economic and sociopolitical impacts have resulted in an economic recession consisting of hyperinflation, rising food costs, and electrical shortages, and unlivable wages and access to the job market. Consequently, millions have fled in search of better living conditions and hopes for economic and political stability (Council on Foreign Relations 1). On July 28th, 2024, presidential elections were held in Venezuela. The country was hopeful that a long-awaited political leadership change would happen. However,

official results indicated that Nicolas Maduro won by a close margin of votes. The people of Venezuela started all sorts of protests, most notably banging pots and pans urging for justice to be brought (Council on Foreign Relations 1). “As of 2021, Colombia has 1.7 million Venezuelan migrants and refugees” and “600,000 Venezuelan migrants” in the United States. The implications of this mass wave of immigration are seen severely among the different implementations of immigration law, procedures, and policies within the United States and Colombia. The extent to which the current regulations in place are equipped to handle this influx directly affects the ability for Venezuelan immigrants to seek Temporary Protection Status (TPS) , other permanent legal protections, as well as the flaws and barriers that exist within each sector.

Adam Monek

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

- #1 Adam Monek
- #2 Michael Kann
- #3 Fritz Steuer
- #4 Stephen Canton
- #5 Jarrett Cain
- #6 Richard Smith
- #7 Omar Yaldo
- #8 Regan Shanahan
- #9 Shovan Bhatia
- #10 Jacob Biehl
- #11 Jacob Biehl
- #12 Edward Andrews

Abstract Name: Augmented Reality Guidance for Fifth Metatarsal Screw Fixation

The utility of Augmented Reality (AR) in surgical medicine is a rapidly expanding area of development, offering orthopedic surgeons a new and innovative way of planning and executing difficult procedures. A proximal 5th metatarsal fracture (Jones fracture) currently poses significant challenges for surgeons due to its narrow, curved intramedullary canal, making it difficult to achieve precise and effective screw placement. Conventional guidance methods for screw placement include x-ray or fluoroscopy, exposing patients and surgeons to potentially harmful doses of radiation. The goal of this study is to assess the accuracy of AR guided screw placement in the fifth metatarsal bone. Computed tomography (CT) images of 12 cadaveric legs were obtained and uploaded to Medivis SurgicalAR for pre-operative metatarsal screw trajectory planning. These images were registered and superimposed onto the cadaveric legs. Orthopedic surgeons utilized the AR-planned trajectory to guide the placement of a guidewire within the 5th metatarsal, subsequently using the guidewire's path to position the screw. The final screw positioning was verified using a postoperative CT scan, which was compared to the original planned trajectory to evaluate placement. AR was effectively used by three different orthopedic surgeons to guide and place 12 intramedullary screws within the 5th metatarsal. Preliminary postoperative data analysis was completed for one leg, showing that the tip of the guidewire deviated by 2 mm from the planned trajectory, with an angular deviation of 9.8°. Initial findings suggest that AR guidance serves as an effective tool in assisting fifth metatarsal screw placement. The observed angular deviation and minimal distance discrepancy between the planned and actual guidewire trajectory highlights the potential of AR technology to enhance precision in this orthopedic procedure. By providing a more intuitive method for trajectory planning and execution, AR guidance may significantly improve surgical outcomes and safety for both patients and surgeons.

Janaye Monroe

MD - Bowie State University

Discipline: Physics and Astronomy

Authors:

Abstract Name: The Role of Significant Figures on Calorie Label Accuracy: A Study of Snacks Transparency

When it applies to nutritional labeling and customer decision-making, calorie data is crucial. However, the use of significant figures in the measurements and calculations involved has a direct impact on the accuracy of these counts. This study looks into how important numbers affect the number of calories in packaged foods, drinks, and candies. The class was divided into groups, and each team examined different packaged goods to investigate the effects of measurement accuracy and rounding procedures on calorie labeling. To promote an awareness of how important numbers affect nutritional transparency, the project intends to draw attention to distinctions between labeled and calculated values through empirical data gathering and critical analysis. The results highlight how crucial accurate labeling is in helping customers make educated food decisions.

Shannon Monson

MN - College of Saint Benedict/ Saint John's University

Discipline: Biology

Authors:

#1 Shannon Monson

#2 Molly Davison

#3 Mary Murnane

#4 Keegan O'rourke

#5 Soren Pederson

#6 Mateo Cisneros

#7 Kristina Timmerman

Molly Davison

Shannon Monson

Abstract Name: Vigilance: Does Human Activity Level Change Squirrel Vigilance Patterns in Central Minnesota?

In recent decades, urbanization has rapidly increased changes in natural habitats for many wildlife species. With urban spread, also comes higher probabilities of wildlife behavioral habituation. The National Institute of Health defines habituation as a decline in behavioral responses due to repeated exposure to a stimulus without a negative impact. We wanted to know if habituation has affected squirrel vigilant behavior on a Central Minnesota university campus. We hypothesized that there was a relationship between squirrel vigilant behavior rates (standing tall and alert, running away) relative to high and low human activity on campus. We predicted that there would be greater evidence of behavioral habituation in high human activity areas. Three species of squirrels were observed in high/low activity areas on campus and vigilant behavior was recorded when researchers approached squirrels either head-on or obliquely (after a 15-minute acclimation period). We found a significant difference in mean alert initiation distance (AID) based on approach types (head on vs. oblique) between the three species ($F = 4.025$, $p = 0.003$, $df = 91$). We also found a significant difference in mean AID between high and low activity levels ($F = 67.20$, $P < 0.001$, $df = 91$) and mean flight initiation distance (FID) between high and low activity levels ($F = 63.94$, $P < 0.001$, $df = 91$). We conclude that squirrels in high activity areas exhibit greater habituation behaviors in relation to human approaches. More

regular contact with humans appears to reduce squirrel vigilant behaviors, which could have a negative impact on avoiding predation by native raptors or canids.

Endi Montalvo-Martinez

IA - Iowa State University

Discipline: Health and Human Development

Authors:

#1 Amie Zarling

Abstract Name: Adapting ProACTIVE for Spanish-speaking Latino Men: A Culturally Responsive Program on Intimate Partner Violence

Intimate Partner Violence (IPV) is a significant public health issue in the United States. It is defined as physical, emotional, psychological, verbal, and/or sexual abuse between two individuals engaged in a current or previous romantic relationship. Individuals arrested for this offense are usually court-mandated to batterer intervention programs (BIPs), which are designed to reduce IPV. Current research has found Acceptance and Commitment Therapy (ACT) to be an effective treatment for IPV among men mandated to complete a BIP. However, a focus on justice-involved men fails to recognize the institutional racism men of color face and fails to address the need for IPV prevention. ProACTIVE is a community-based relationship violence prevention program designed for men in the community seeking support in their relationships. Initial cohorts of ProACTIVE have shown preliminary success, suggesting ProACTIVE can be an effective voluntary relationship violence prevention program and emphasizing the need to intentionally adapt ProACTIVE for specific marginalized men. Currently, ProACTIVE is being adapted specifically for Spanish-speaking Latino men.

Andrea Montano

DC - Trinity Washington University

Discipline: Political Science

Authors:

#1 Andrea Montano

#2 Callenes Mercedez

Abstract Name: Authoritarian Crime Control in El Salvador: Examining the Sustainability of Nayib Bukele's Policies in a Democratic Context

This research examines the impact of authoritarian governance on combating organized crime in Nayib Bukele's El Salvador. Autocratic practices in Latin America have often gained initial support through aggressive anti-crime measures, but their disregard for democratic norms has made them unsustainable. El Salvador has endured high levels of violence tied to organized crime since the 1990s. Transnational crime organizations flourished in the post-war environment, deepening instability. In recent years, Bukele has implemented authoritarian measures, including violations of habeas corpus, extrajudicial killings, enforced disappearances, electoral interference, the removal of constitutional court judges, and aggressive policing that violates human rights. These policies have produced immediate reductions in crime, bolstering Bukele's popularity. However, historical trends in Latin America suggest these measures are unsustainable and may worsen conditions for future generations. Using data from Freedom House, Human Rights Watch, the Organization of American States, Amnesty International, and the United Nations Office on Drugs and Crime,

this study analyzes authoritarian practices similar to Bukele's policies across thirty countries. Findings show that while such measures often yield short-term reductions in crime, they risk creating long-term societal fractures if socio-economic causes are left unaddressed. This mirrors patterns in other nations, such as Colombia's experience with Bandas Criminales (Bacrim). This study highlights the dangers of relying on authoritarian tactics for crime control. Without addressing root socio-economic issues, El Salvador risks following the trajectory of other autocratic regimes in Latin America, characterized by democratic erosion and a resurgence of worsened organized crime. It emphasizes the need for sustainable, rights-based strategies to ensure lasting public safety.

Jazmyn Montes Limon

CA - Medanos College

Discipline: Chemistry

Authors:

#1 Valerie Macha Ramos

#2 Adrian Ochoa

#3 Brenda Maya

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Daniel Murillo

Abstract Name: Adsorption of Methylene Blue using Fish Scales and Fish Chitin

Textile dyes pose a threat to our water systems along with the ecosystems surrounding and within. Current physical and chemical methods to remove textile dyes are very expensive, demanding a more cost-effective means of removal. Biomass adsorption is a possible alternative as it is more cost effective, more sustainable, and better for the environment. This study investigated the effectiveness of salmon and Labeo rohita (rohu) scales as well as chitin produced from both fish, as fish scales are ample waste products in the fish processing industry, making them a sustainable source for chitin. Chitin is a biopolymer found abundantly in fish scales and can be used as a natural and inexpensive adsorbent for textile dyes. Chitin was created by soaking in a 1M HCl solution to remove calcium carbonate and prevent hydrolysis, deprotonating the fish scales with 0.5% NaOH followed by a grinding process that converted the scales into a fine powder. Dye adsorption studies showed that salmon chitin resulted in nearly 80% removal of methylene blue within 25 minutes, surpassing the performance of salmon and rohu fish scales and rohu chitin. Salmon chitin demonstrated superb dye removal compared to fish scales, exemplifying its potential as a sustainable and efficient remediation of contaminated water and a promising solution worth exploring.

Marcela Montufar Soria

TX - The University of Texas at San Antonio

Discipline: History

Authors:

Abstract Name: The Quest to Map the Nanyang: An Analysis of Sino-Jesuit Cooperation in High Qing Maritime Cartography

The first Jesuit missionaries from Europe arrived in China during the Ming Dynasty (1368-1644 CE) and established a presence in the imperial court that endured through to the Qing Dynasty (1644-1911 CE). This thesis project will attempt to answer the research question: How did Western cartography methods introduced

by Jesuit missionaries influence Qing scholarship and cartography of the South China Sea and Southeast Asia in the High Qing era (1683-1799)? Through archival research and critical analysis, this study examines China's indigenous scientific development, the impact of Western technology and methodologies, and the relationships between the Jesuit missionaries and Qing China's literati scholars. China borders the Yellow Sea, the East China Sea, and the South China Sea. This project's research parameters are narrowed down to the Nanyang region, which encompasses Southeast Asia and the South China Sea. The purpose of this project is to expand on established scholarship about imperial China's cartographical endeavours in the High Qing Era, a period of cultural interactions and territorial growth. To delve into the cartographical methods of this period, this project analyses primary sources such as manuscripts, maps, cartographic surveys, and the personal documents of Chinese and European scholars. Previous research on Jesuit cartography in Qing China has primarily focused on land mapping and has asserted that rather than domination of Western intellectual superiority and undermining of Chinese thought, the interactions between Jesuit and Chinese scholars led to a unique evolution of ideas and creative works that represented the transforming landscape of the 17th and 18th centuries. This project investigates how this conclusion about Sino-Jesuit collaboration applies to the Qing Dynasty's cartographical projects in the Nanyang region and contrasts the type of work done in land and sea settings, considering the maritime world provided a very different landscape with its own challenges and possibilities.

Elaine Candice Mooney

TN - University of Memphis

Discipline: Psychology

Authors:

#1 Elaine Candice Mooney

#2 David Aaron Heath

#3 Stephanie Huetten

Abstract Name: Investigating Mental Simulation and Mental Imagery Using Sentence-Picture Verification

How we understand meaning during language processing is a fundamental mystery in the study of the mind. This study hypothesized a potential underlying similarity between how we represent meaning in language and how we deliberately imagine, albeit on different timescales. In this study, participants completed a sentence-picture verification (SPV) task that explored how instructions (none vs. "visualize the sentence") affect reaction times. In an SPV task, participants read a sentence that implies the visual features of an item. Participants then see a picture of the item that agrees or disagrees with the sentence implication and must verify if the item in the sentence appears in the image. Responses are faster and more accurate when the picture matches the sentence. To isolate the difference between automatic modes of understanding and deliberate imagery, this experiment was completed in two blocks, one without and one with explicit instructions to visualize the sentence content. To isolate the difference in timescale, each block included pseudo-randomized trial time structures. In combination, these manipulations allowed us to examine how effort and time may affect automatic understanding and deliberate imagination during reading. Results and implications for language meaning will be discussed.

Liya Mooradian

IA - Iowa State University

Discipline: Biology

Authors:

#1 Nesreen Sedeek
#2 Sajid Uchayash
#3 Donald Sakaguchi
#4 Long Que

Abstract Name: Differentiation and Proliferation of AHPC Neurospheres Plated on Gold Substrates Subjected to E-stim

Electrical stimulation (E-stim) is known to modulate neural activity and circuit function, promote neuroplasticity, and facilitate neural repair through its ability to activate or inhibit specific brain regions. Controlling E-stim's activation and inhibition functions has become increasingly important for advancing therapeutic strategies in neurodegenerative diseases and neural regeneration. To this end, understanding how E-stim influences stem cell behavior, particularly in terms of proliferation and differentiation, is critical for harnessing its potential in regenerative medicine. This study investigates the effects of electrical stimulation on the differentiation and proliferation potential of Adult Hippocampal Progenitor Cells (AHPC) neurospheres, with an additional focus on comparing the biocompatibility and impact of smooth versus nanoelectrode devices. AHPC neurospheres were cultured on each device and subjected to 1 Hz biphasic E-stim at 20 and 40 mV for 10 minutes over 5 days in vitro. The differentiation of AHPCs was assessed using immunocytochemistry with a panel of cell-type-specific antibody markers. Fluorescence microscopy was employed to visualize the immunolabeled and 4',6-diamidino-2-phenylindole dihydrochloride (DAPI)-stained cells, which were then quantified. Thus far, three biological replicates were performed using beta-III tubulin (TuJ1) antibody, which indicates immature neurons. Preliminary results from these quantified biological replicates, analyzed with ImageJ software, reveal that 20 mV E-stim significantly enhanced neuronal differentiation, as indicated by an increase in TuJ1-positive cells, compared to the control and 40 mV conditions. Both smooth and nanoelectrode devices demonstrated biocompatibility, with no significant adverse effects on AHPC neurospheres. Future work will expand on these findings by incorporating additional neuronal markers, such as microtubule-associated protein 2a,b (MAP2ab), and glial markers like glial fibrillary acidic protein (GFAP). Additionally, gene expression analysis via qPCR will be explored to further elucidate the molecular mechanisms underlying AHPC differentiation and proliferation in response to E-stim. This work holds promise for advancing regenerative therapies in neurodegenerative conditions.

Deagan Moore

PA - Duquesne University

Discipline: Political Science

Authors:

Abstract Name: Socialism with Confucian Characteristics: Legitimacy in Contemporary China

Political Legitimacy takes many forms during the tenure of the Chinese Communist Party (CCP). In recent times, Confucianism and traditional Chinese values have emerged as a key element in the legitimization of the Chinese government, and they will likely remain a critical factor in the coming decades. Since the CCP broke away from the hardline Marxist policies of the Mao Era in the late 1970s, it has been reliant on the country's economic performance to legitimize party rule. Now, however, China's economy is already showing signs of slowing down, and the work force is expected to shrink. President Xi Jinping looks to Confucius as a potential remedy for legitimacy, drawing from traditions that had been utilized in imperial China. Xi is fleshing out the definition of "Socialism with Chinese Characteristics" that was popularized by Deng Xiaoping. The new definition includes the perspective that socialism is of Chinese origin because of China's historical practices such as the distribution of land and benevolent rulers governing in favor of the largely agrarian proletarian class. The party is promoting the study of China's past and urging academia to explore the ideas of traditional China, and this has led to voluminous writings on the subject. While President Xi's reliance on Confucianism and traditional Chinese values is not unheard of in the history of the CCP, the

extent and intensity of his effort is unprecedented. This revitalization of Chinese classics serves as a building block for the CCP to rally Chinese nationals around their cultural identity to further legitimize its rule.

Jeffery Moore

OK - University of Central Oklahoma

Discipline: Engineering

Authors:

#1 Jeffery Moore

Abstract Name: Rapid Injection Molding with Resin 3D-printed molds

Formative manufacturing using injection molding technology is a process by which a plastic or composite raw material is melted down and extruded under pressure into a mold. Some of the advantages of injection molding over other manufacturing technologies include the ability to manufacture complex geometries with tight tolerances, the compatibility with a wide range of materials and colors, the high repeatability, fast production cycles and the ability of material reuse. Despite all these benefits, injection molding endures several drawbacks, most importantly, the need for custom metal tooling for the injection molded parts, making it prohibitively expensive and time consuming for small part quantities. Hence, the need for a more time-and-cost effective alternative. The main objective of the current research is to develop a systematic and economical procedure for the design and 3D-printing of stiff and thermally stable resin molds for low volume injection molding of plastics. To achieve this objective, common design practices for injection mold design and additive manufacturing of stiff and high Heat Deflection Temperature (HDT) resin will be used in the SLA (Stereolithography)-3d-printing of high precision molds with improved surface finish. 3d-printed molds of simple and complex part geometries will be used with a Desktop injection molding machine (the APSX-PIM V2) under a wide range of pressures, temperatures, and materials. The injection molded parts will be tested for durability and geometrical accuracy. The successful completion of this research will make formative manufacturing using injection molding technology more time-and-cost-effective.

Alani Moore

KY - University of Kentucky

Discipline: Biochemistry

Authors:

#1 Alani Moore

Abstract Name: The Complex Role of Polyamines in Tau Pathology: Insights from Ornithine Decarboxylase Manipulation

Alzheimer's Disease (AD) is one of several neurodegenerative diseases that specifically affect brain regions involved in memory formation and retention. It is driven by the aggregation of the disordered protein, tau, which in turn drives neuronal dysfunction and death. Polyamines are small aliphatic cations that are essential for internal processes such as cell growth. Higher order polyamines, such as spermidine and spermine, had shown in in vitro studies that its increase reduced tau pathology, offering a therapeutic mechanism to the disease. Therefore, it was hypothesized that increased polyamine levels would diminish the tau phenotype. A study focused on a lower-ordered polyamine, ornithine decarboxylase (ODC1), which is the rate-limiting enzyme in polyamine synthesis, arose and modeled this hypothesis. Tg4510 transgenic mouse models that overexpress mutant tau were used to examine the effects of ODC1 overexpression on tau aggregation. Western blotting techniques were used to quantify tau phosphorylation and total tau levels, using antibodies such as AT8, PHF1, and HT7. The results contrasted the initial hypothesis, showing that Tg4510 mouse models with an ODC1 treatment possessed increased levels of tau. This suggested that ODC1 disrupted polyamine homeostasis and worsened tau pathology. The contrasting findings caused the hypothesis to be revised, stating that while polyamines are beneficial in traumatic stress responses, the chronic upregulation of polyamines induces an inadequate polyamine stress response (PSR). Within the inadequate PSR, aberrant polyamine metabolism amplifies tau pathology, emphasizing the complexity of polyamine metabolism and regulation in neurodegenerative diseases. Future studies will focus on understanding the balance between beneficial and inadequate polyamine responses, potentially disclosing novel strategies to reduce tau pathology in AD.

Kayla Moore

VA - James Madison University

Discipline: Chemistry

Authors:

#1 Brycelyn Boardman

Abstract Name: The Importance of Polyol Structure: A Spectroscopic Investigation of Triols and Linear Polyols Interaction with Glucosamine and Chitosan

The use of bioplastics as alternatives to petroleum-based plastics has gained significant attention in recent years. These biomaterials are typically created by combining biopolymers like chitosan with plasticizers such as glycerol (Glyc). Previous research has shown that the amount and type of alcohol used can significantly affect the polymeric structure. Chitosan's repeat unit, glucosamine (GlcN), and Glyc are key compounds in forming polyol solutions. Glycerol can have primary binding sites (1,2 or 1,3-OH) and secondary binding interactions due to its additional hydroxyl groups. To explore the impact of primary binding on GlcN aggregation, ethylene glycol and (1,3)-propanediol were used to probe the 1,2 and 1,3 binding modes. Various diols, including (1,2)-propanediol, (2,3)-butanediol, and (2,4)-pentanediol, were analyzed to understand secondary binding while keeping primary interactions constant. This summer, additional polyols such as 2-

methyl-(1,3)-propanediol and 2-(hydroxymethyl)-(1,3)-propanediol were tested to evaluate how an increased alcohol content affects GlcN aggregation and disaggregation. Spectroscopic techniques, including dynamic light scattering (DLS), attenuated total-reflectance infrared spectroscopy (ATR-IR), and nuclear magnetic resonance (NMR), were used to analyze the intermolecular interactions between these diols and GlcN. While most of the analysis focused on ATR-IR, solutions of polyols like Xylitol, Sorbitol, and Mannitol were compared to diols and triols to assess their impact on binding and aggregation. Results indicate that a higher alcohol content leads to increased hydrogen bonding at the molecular level, with more significant hydrogen bonding observed in polymeric chitosan solutions than in glucosamine solutions.

Sydney Moore

PA - University of Pittsburgh

Discipline: Chemistry

Authors:

#1 Shubhankar Kundu

#2 Anumita Kumari

#3 Haitao Liu

Abstract Name: Interactions of DNA nanostructures with silane-based Self-Assembled Monolayers (SAMs)

DNA origami, a manipulation of DNA's double-helical structure, is promising in biological and material science research providing nanoscale precision on surface localization of chemical functional groups. Understanding the interactions between the nanostructures and surfaces will allow efficient localization. Study with silane-based surface modification via forming self-assembled monolayers (SAMs) provides insight into nanostructure morphology related to surface composition. In this work, it's shown that interactions of DNA nanostructure with the surface affects their structural integrity and number density. We have prepared both single and multi component SAMs using an amine-terminated silane mixed with alkyl trichlorosilane of different chain lengths (C18, C6, C4) at various molar concentrations in a solvent-based deposition. We discovered that the surface with a higher concentration of the polar amine-terminated silane mixed with the longest alkyl chain (C18) resulted in the highest density of DNA nanostructures with maintained structural integrity.

Kristin Moore

PA - Community College of Allegheny County

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Final Girls: Surviving Until Subversion

The sound of an audio stinger, accented by a high-pitched feminine scream, recalls one thing specifically: a slasher movie. The mental association exists for a good reason. According to a 2017 Geena Davis Institute study, horror is the only movie genre where female characters have more screen time than males, by a narrow margin of 53%. Those female characters pay the blood price via an abundance of harmful stereotypes. As a horror fan, I have screamed at the television, telling the actress on screen not to go up the stairs countless times--but why does she corner herself instead of ducking out the back door? How do I know the woman who just had sex is as good as dead? Why are capable, well fleshed-out final girls so hard to find? Ever since Carol J. Clover coined the term "final girl," she has been established as a tragic but resilient archetype. Her name

and foes vary greatly, but there is no denying her survivorship. But what about the actress who gives her life and the difficulties they endured? To truly understand her origins, we must peel back her skin to reveal what lays beyond and excise her essence from fictional flesh and bone. We cannot afford to turn blind eyes to the bigger picture beyond the character of the final girl herself to see what her existence was meant to tell us. In my poster, I plan to explore just what pop culture's reflection shows us through the most honest mirror we have at our disposal, not only regarding what traits are portrayed, but how they came to be. My poster will display my findings with the flair we expect from horror movie posters, highlighting my research while paying homage to Pittsburgh's rich history in horror.

Ezra Moore

LA - Louisiana State University, Baton Rouge

Discipline: Psychology

Authors:

#1 Ezra Moore

#2 Eileen Haebig

Abstract Name: Exploring Vocabulary Development in Autistic Children: The Role of Imageability and Vocabulary Acquisition

Language skills and early word learning are typically delayed in autistic children. Previous research has indicated that autistic children may display similar learning biases relative to non-autistic children but acquire language at a protracted rate, while others suggest autistic children may have different learning biases and processing abilities. Evidence has shown that children are biased in learning words with certain features, including high imageability, which is the ease with which a word evokes a mental image. Though prior research indicates that imageability is associated with vocabulary development in non-autistic and autistic children, imageability data have not been collected for a significant number of early-acquired words, which has restricted previous studies. Due to the limited research on word learning biases in autistic children, the present study aims to develop an imageability database and to more thoroughly investigate the association between word imageability and vocabulary development in autistic and non-autistic children. Thus, we are developing a task to collect imageability scores for each word that appears on a commonly used parent questionnaire of child vocabulary knowledge (Macarthur-Bates Communicative Development Inventory; MB-CDI). College participants will be shown words from the MB-CDI and asked to rate how imageable each word is on a scale of 1 (Not imageable) to 7 (Very imageable). After collecting these imageability scores, we will assess whether word imageability predicts word-level normative data of vocabulary acquisition. Specifically, we will use a newly created vocabulary acquisition normative variable—vocabulary size of acquisition—that has been derived separately for autistic and non-autistic children.

Colleen Moosman

PA - Carnegie Mellon University

Discipline: Political Science

Authors:

Abstract Name: Investigating the Revitalization of Al Qaeda in the Arabian Peninsula

This paper explores the role of Al Qaeda in the Arabian Peninsula (AQAP) within Yemen's complex landscape of regional conflict, with a focus on the group's recent restructuring and evolving capability and

strategy. The central research question investigates and evaluates AQAP's current threat level, leadership dynamics, and potential alliances with other terror organizations. Although AQAP has historically been one of the strongest Al Qaeda affiliates, existing literature primarily focuses on Yemen's Houthis due to their increased attacks. In contrast, AQAP has done the opposite, drawing the media away from AQAP. In recent years, little academic research has been conducted that evaluates the group's current threat level, including the organization's transnational strike capability and its intent to strike the homeland. This is critical given the group's previous intent and capability. This paper's research uses available open-source intelligence on AQAP and seeks to address the significant gap in understanding AQAP's operations and recent actions. The study includes a comprehensive history of AQAP in Yemen and assesses AQAP's direction, highlighting alliances and new strategies alongside Yemen's historical and geopolitical context. It argues that the group's recent restructuring creates an ideal environment for the group to revitalize. This thesis seeks to rekindle scholarly and policy-focused attention on AQAP by delivering a comprehensive and current analytic assessment of the group's current intent and capabilities, thereby informing the U.S. counterterrorism strategy.

Amitis Moradkhani

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Samantha Golf

#2 Stefanie Robel

Abstract Name: Interrogating the Role of Astrocytic Cilia in Astrocytic Response to Diffuse Mild Traumatic Brain Injury

Heterogeneous astrocytic responses to traumatic brain injury (TBI) have been extensively documented, yet the mechanisms driving these responses and the downstream consequences remain poorly understood. Following a focal injury, astrocytes proliferate to form a glial scar that effectively isolates the damaged region. This astrogliosis response is crucial for protecting surrounding healthy tissue from extravasation from the impaired blood-brain barrier (BBB). Yet after diffuse mild TBI, astrocytes do not proliferate and BBB repair fails. Astrocytic cilia play an essential role in stopping the cell cycle and detecting extracellular inhibitory signals, thereby reducing proliferation. Thus, we hypothesized that preventing astrocytic cilia formation will significantly increase astrocytic proliferation and consequently BBB leakage after diffuse mild TBI. To test this hypothesis, we employed a genetic strategy to induce Cre recombinase expression in astrocytes (Aldh1l1CreERT2) of mice carrying floxed alleles for the required cilia protein intraflagellar transport 88 (IFT88) by tamoxifen administration. Loss of astrocytic cilia was confirmed via immunoblot analysis compared to Cre-negative controls. Subsequently, mice were subjected to mild diffuse TBI or sham injury. Astrocyte proliferation was measured using immunohistochemistry and immunoblot analysis for Ki67, a protein expressed in nuclei of proliferating cells. BBB integrity was assessed using the small fluorescent molecule cadaverine, which cannot cross the BBB under physiological conditions, and with immunohistochemistry for essential BBB proteins.

Michael Morales

FL - Embry - Riddle Aeronautical University

Discipline: Engineering

Authors:

#1 Siddharth Parida

Abstract Name: Co-Designing Resilient Living Seawalls: A Nature-Based Solution for Coastal Protection in Volusia County, Florida

Volusia County, Florida, faces increasing risks from sea-level rise and extreme weather events, as evidenced by the significant erosion and infrastructure damage caused by recent hurricanes Ian, Nicole, and Milton. This collaborative research project, led by Embry-Riddle Aeronautical University, Bethune-Cookman University, the University of Central Florida, and local stakeholders, focuses on developing hybrid "living seawall" designs as scalable, nature-based solutions. By combining durable structural components with ecological elements such as dune vegetation, the project aims to enhance coastal resilience while addressing environmental and community needs. Through extensive community outreach and four planned engagement workshops, stakeholders - including property owners, local governments, and environmental organizations - have collaborated to co-design research-informed concepts for living seawalls. These concepts are set to be implemented during a subsequent grant-funded phase, contingent on funding approval. The proposed designs integrate storm surge protection with ecological benefits, such as promoting sand accumulation, stabilizing vegetation, and enhancing wildlife habitats. The project's expected outcomes include the adoption of a living seawall design that complies with federal, state, and local regulations and the identification of pledged shoreline properties for Stage 2 implementation and monitoring. This initiative not only strengthens coastal resilience but also advances the understanding of adaptive management strategies for high-energy coastlines. By bridging community engagement with scientific innovation, the project seeks to promote the sustainable coexistence of natural and built environments. The current findings and lessons learned are presented here as a foundation for ongoing efforts.

Roger Morales-Quintero

TX - San Jacinto College

Discipline: Interdisciplinary

Authors:

#1 Roger Morales-Quintero

Abstract Name: Improvements in Particle Accelerators Aimed at Optimizing Energy Output: An Extended Analysis on Multivariable Calculus Tools

Particle accelerators are devices for increasing the velocity of particles. Their core functioning lies in electromagnetic interactions, and the phenomena observed in and because of them have diverse applications in biology, chemistry, industry, and particle physics. This study dives into the historical improvements in particle accelerators, going through what has made it possible to go from the basic functioning of the Cockcroft-Walton and Van de Graff accelerators to synchrotrons and storage rings like the Large Hadron Collider (LHC), the most powerful particle accelerator ever built. Furthermore, it explores the limitations of each stage of these machines. To facilitate further research on this current topic, it is also necessary to examine the mathematical tools used in the study of the electromagnetic, relativistic, and quantum phenomena observed in particle accelerators. The essential tools described in this first study are related to multivariable calculus, starting with functions and vectors, followed by their applications in multivariable calculus with multivariable functions and partial derivatives, and concluding with vector fields, gradient vector fields, vector field's potential, line integrals, vector field divergence, and vector field curl. A complete understanding of these mathematical concepts will allow for further research to understand Maxwell's Equations and Lorentz's force law, which require the operation of the studied concepts applied to open and closed surfaces.

Alexis Moreno

TX - Our Lady of the Lake University

Discipline: Criminology/Criminal Justice

Authors:

#1 Kathryn Anderson

Abstract Name: Administrative Segregation: Necessary or Cruel and Unusual?

This presentation describes a qualitative study that explored whether administrative segregation (AS), previously known as solitary confinement (SC), constitutes a violation of the Eight Amendment in Texas. The aim of AS is to lower crime rates within prisons and act as a safety measure. However, researchers have shown that it does the opposite and directly harms prisoners (Tadros et al., 2023; Lobel & Akil., 2018; Aranda-Hughes et al., 2021; Smith., 2006). In 2015, the UN Convention Against Torture created the United Nations Standard Minimum Rules for Treatment of Prisoners, Mandela Rules, stating that SC/AS only be used in exceptional cases and as a last resort for a short time (defined as 115 days) (Fettig, 2020). However, this remains an issue of “soft law” thus UN rules are in juxtaposition with the realities of the harsh practices seen in the U.S. and even more so, Texas. Researchers state that AS violates the 8th Amendment through many clauses such as psychological deterioration, physical harm, and living conditions. Additionally, most of this research, however universally applicable, is primarily found in international studies. Therefore the lack of research specificity to Texas presents an additional gap in the literature. This study will address these gaps by exploring the following questions. Is an incarcerated individual’s mental health affected by AS in Texas and how? Are the living conditions of AS inhumane? Is there physical harm produced by AS? If so, do these conditions reach the criteria for violation of the Eight Amendment? Through structured interviews, the perspectives of previously incarcerated individuals were captured addressing such questions. Analyzing the transcribed data collected from the interviews, a thematic analysis was used to explore such themes.

Zoe Moreno

MI - Northern Michigan University

Discipline: Biology

Authors:

#1 Zoe Moreno

#2 Saralynn Delwiche

#3 Paul Mann

#4 Robert Winn

#5 Matthew Jennings

Abstract Name: Rapid Detection of the FGFR3-TACC3 Gene Fusion in Glioma

The FGFR3-TACC3 (fibroblast growth factor receptor 3 - transforming acidic coiled coil) gene fusion is a genetic alteration seen in approximately 5% of diagnosed glioblastomas. This particular fusion harbors characteristics that drive tumor transformation and thus gives poor prognosis and greater resistance to therapeutic treatments. In IDH (isocitrate dehydrogenase) wild type (WT) tumors, 3-5% possess FGFR3-TACC3 gene fusions in which the resulting protein becomes constitutively active, thereby promoting cellular proliferation. The most common forms of the fusion occur in exon 17 of the FGFR3 gene and exons 11 (20%), 10 (11%), and 8 (14%) of the TACC3 gene. Using synthetic DNA, we demonstrate the proof of principle for the discrimination of FGFR3x17 – TACC3x8 gene fusion DNA from the wild type DNA sequence. We utilized Recombinase Polymerase Amplification (RPA) and Loop Mediated Isothermal Amplification (LAMP) nucleic acid amplification techniques to amplify the gene fusion and discriminate

from WT sequence from the FGFR3x17- TACC3x8 gene fusion within 20 – 45 minutes, respectively. Due to the clinical impact of treatment based on the specific FGFR3-TACC3 gene fusion, we intend to develop a panel of the aforementioned gene fusions to rapidly discriminate between gene fusions. These advancements demonstrate the potential of RPA and LAMP as reliable, rapid diagnostic tools for detecting FGFR3-TACC3 gene fusions, offering a foundation for improved glioblastoma diagnostics and personalized therapeutic strategies.

Talia Morgenstern

PA - Westminster College

Discipline: Biology

Authors:

#1 Joshua Corrette-Bennett

Abstract Name: Effect of Neuropeptide Y on Staphylococcus aureus biofilm formation

Biofilm is a substance produced by many bacteria. Along with providing nutrients for those bacterial cells interior of it, biofilm protects them against antibiotics and reduces recognition by the host immune system. Biofilm poses a unique challenge to the fields of health and medicine as biofilm-producing bacteria are difficult to treat. When biofilms form on medical devices and implants, they can be transferred from patient to patient and contribute to the spread of infections. Antimicrobial peptides (AMPs) are an emerging factor of interest because of their size, accessibility, and ability to prevent microbial growth and biofilm formation. This research studies the effect of a specific AMP called Neuropeptide Y on Staphylococcus aureus, a type of biofilm-forming bacteria. Following growth and treatment of S. aureus with Neuropeptide Y, crystal violet stain and spectrophotometry were used to generate quantitative measurements of biofilm production. Our preliminary results indicate that treatment of S. aureus with Neuropeptide Y can significantly reduce biofilm formation.

Joe Moriwa

MN - Minnesota State University - Mankato

Discipline: Computer Science

Authors:

#1 Rushit Dave

Abstract Name: Behavior as a Password: Machine Learning for Behavioral Biometric Authentication

In today's fast-moving tech landscape advancements are happening at a fast pace. These advancements come with new opportunities to make our lives easier. However, alongside the rise of these new technologies also comes the introduction of new threats. So, it is important that security trends evolve along with the fast-paced development of technology. Most security today is based on traditional physiological biometrics like fingerprint and iris scans. While this is effective to an extent, it is not adequate as there are ways this type of authentication can be breached. This project explores behavioral biometric authentication using machine learning. It aims to answer the question: How can behavioral biometrics combined with machine learning techniques provide a strong defense to counter modern cyber threats? This project will present an analysis of various behavioral traits, such as keystroke dynamics, mouse movements and gait analysis using machine learning techniques. These techniques include feature extraction, model training, and validation. Through the application of these techniques, this project provides an analysis of these behavioral characteristics,

demonstrating their potential in developing more robust and adaptive security frameworks that offer greater protection against emerging threats.

Arys Morman

LA - Louisiana State University

Discipline: Biochemistry

Authors:

#1 Arys Morman

#2 Fatima Rivas

Abstract Name: Studies of the Natural Product Bakuchiol Against Solid Tumor

Breast cancer is the leading cause of cancer deaths, with 55,000 new cases every year; the most lethal type is triple-negative breast cancer (TNBC). The lack of estrogen, progesterone, and human epidermal growth factor type 2 receptor proteins, which define TNBC, makes it difficult to treat using hormone therapies that are effective against other breast cancers. TNBC leads to approximately 150,000 deaths per year, indicating that there is a need for effective therapeutic agents. We aim to develop derivatives of the natural product bakuchiol to fill this gap. Bakuchiol is a phenolic monoterpenoid isolated from *P. corylifolia* that is reported to target bacteria, insects, and pests, as well as enhance flavor in food. In recent studies, bakuchiol showed cytotoxicity to cancer models in the low micromolar range. Synthetic analogues of bakuchiol are observed to have anti-cancer, antioxidant, cytotoxic, antiviral, and antibacterial properties. Therefore, we hypothesize that superior bakuchiol compounds can be generated from this pharmacophore. Our methodology includes the synthesis and biological evaluation of bakuchiol and its derivatives. The effect of their properties on cell viability in TNBC was detected by CTG, PI, and colony assay formations. Our preliminary findings suggest these compounds have promising biological activities against the cancer cell models while no cytotoxicity was observed against the non-cancerous BJ cell line. Further studies of Bakuchiol and its derivatives include target identification and molecular docking studies to improve their efficacy. The bakuchiol derivatives have promising biological properties and could lead to effective therapeutic agents for patients with TNBC.

Joshua Morris

NY - St. John Fisher College

Discipline: Biology

Authors:

#1 Zachary Murphy

Abstract Name: Optimization of sgRNA Synthesis For Use in CRISPR-CAS9 Knockdown Studies Using RNP Complex Delivery

In CRISPR-Cas9 mediated knockdown studies, a ribonucleoprotein (RNP) complex is assembled with a specifically designed sgRNA and the Cas9 enzyme to target a specific gene of interest. The ideal concentration of sgRNA in this complex is between 1-1.5 $\mu\text{g}/\mu\text{l}$ for optimal transfection efficiency. Through experience in our institution's research lab and in course-based research experience, we identified an inconsistency and inefficiency in the method of sgRNA synthesis. This method was a kit obtained from NEB for both sgRNA synthesis and RNA purification (Method 1). We hypothesized that the limiting factor of sgRNA yield was the purification column used in the RNA purification kit and that this loss could be mitigated through phenol-chloroform isolation (method 2). We also hypothesized that the limiting factor was

in the synthesis of sgRNA itself. In order to test this, we used a plasmid template to create and amplify DNA segments of our sgRNA which would then later be reverse-transcribed and purified using phenol-chloroform (Method 3). Two target-specific-oligo sequences were designed by our lab (Targeting MIF and CCL11) and synthesized by IDT. The sgRNA was synthesized in three separate trials for each method from these target-specific-oligos. We determined that Method 3 yields a significantly greater concentration of sgRNA compared to the two alternative methods. However, there still exists an application for the two alternative methods in a course-based research setting where the extended time requirement for Method 3 is not sufficiently available. The identification of an optimal method of sgRNA synthesis has led to the optimization of the transfection of these RNP complexes. Comparing transfection rates of Lipofectamine and electroporation using Sanger sequencing and TIDE analysis. This project is part of the lab's ongoing work to optimize molecular biology techniques for successful CRISPR-Cas9 used in our research.

Miles Morrison

PA - Lafayette College

Discipline: Engineering

Authors:

#1 Christian López

#2 Matthew Deacon

Abstract Name: Leveraging Language Models to Generate Programming Questions of Varying Difficulty

This study explores the potential of Large Language Models (LLMs), particularly ChatGPT-4, to generate Python programming questions across varying levels of difficulty, a capability that could transform adaptive learning in computer science education. As educational systems increasingly seek to personalize learning experiences, the ability to tailor question difficulty based on a learner's proficiency is critical. In this research, ChatGPT-4 was tasked with generating Python programming questions, which were then evaluated by participants to compare the model's difficulty ratings with their perceived challenge level. The results demonstrate alignment between ChatGPT-4's difficulty ratings and participants' perceptions, revealing the model's effectiveness in producing a broad range of questions suitable for learners at different levels. This suggests that LLMs like ChatGPT-4 could play a vital role in designing personalized educational experiences that adapt dynamically to individual learners' needs. The implications of this work are significant for the future of educational technology, particularly in creating adaptive learning platforms for programming education. Future research should explore the model's application to other programming languages and more complex topics, expanding the potential impact of LLMs on personalized, scalable learning environments. This study offers valuable insights into how advanced AI models can support the next generation of adaptive educational systems, driving innovation in personalized learning and teaching.

Colin Morrison

CT - Eastern Connecticut State University

Discipline: English and Literature

Authors:

#1 Colin Morrison

Abstract Name: The Shift

THE SHIFT: a novel By Colin Morrison The Shift is an original work of fiction that explores how corporate

control and environmental deterioration will someday negatively impact our lives and relationships. The project has evolved significantly over time, beginning as an anthology of interconnected short stories, then changing into a more traditional novelistic structure to better fit the themes of the story. The Shift can be an unforgiving place, and nobody knows this better than Lydia Crane. It's where she grew up, where she first fell in love, where she was arrested, and where she spent ten years in a corporate prison. Now a private investigator, Lydia leverages her local knowledge to try and make the Shift a better place, one case at a time. When a missing persons case comes to an unfortunate conclusion, Lydia finds herself thrust into another case, one that will bring her past into the present. Her estranged mother, Audra Dennison, a high-powered executive in the society-controlling megacorporation Ficus, comes to Lydia with a job: her half-brother Aldrick, who Lydia didn't know existed, stole something important to Ficus, and even more important to Audra. Audra wants Lydia to recover the stolen goods, no matter the cost. After initially turning down the job, Lydia reports to Bogs, her handler and the closest thing she has to a friend. Bogs tries to convince her to reconsider, before pulling rank and forcing her to take the case. Left with no choice, Lydia accepts the job. The case takes her on a journey from the homeless camps of the Shift to a shady club called Shift City all the way to Ficus' headquarters, and brings to light numerous secrets—not just about Ficus and the world Lydia lives in, but about her mother and herself as well.

Rojin Mortazavi

PA - University of Pittsburgh

Discipline: Chemistry

Authors:

#1 Geoffrey Hutchison

#2 Maya Hayden

Abstract Name: High Stress and High Energy: Piezoelectric Response of Synthesized and Modeled Foldamers

Piezoelectric materials produce an electrical charge in response to deformation. They have a wide range of uses ranging from medical devices and home technology to energy harvesting. Most conventional piezoelectric materials are lead or barium containing ceramics, which are not only brittle but toxic. This work is concerned with the piezoelectric response of foldamers, conformationally ordered molecules stabilized by their non-covalent bonds, which are carbon based and flexible. Foldamers exhibit high deformation and their ability to take stress results in a higher electromechanical response, or in our case the piezoelectric voltage constant, d_{33} . In this work, we synthesized a number of foldamers to measure their respective piezoelectric properties and compare them to predicted values from density functional calculations. The fundamental relationship of these properties is studied by comparing their response to structural adjustments, such as length and functional group attachments. The response of the synthesized foldamers are measured by forming a self-assembled monolayer (SAM) and applying a custom mechanical piezoelectric device tester. In conjunction with these synthesized foldamers, we are using computational modeling of the same and a variety of other foldamers to predict and explore their responses. Given a high similarity between synthesized and modeled piezoelectric response, we can explore larger and more complex structures in less time using computed response from density functional calculations.

Jennifer Mortensen

UT - Utah Valley University

Discipline: Psychology

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#1 Jennifer Mortensen
#2 John Ortiz

Abstract Name: Understanding Foster Care

This research aims to discover participants' perspectives and understanding of the Utah foster care system and what it strives to accomplish, what stigmas may be present concerning their view of the Utah foster care system, their perspective on the children in care, what would help participants consider being foster parents, and what hesitations they may have about being foster parents. Utah foster care is currently experiencing a shortage of foster parents and would like to know what may help people decide to become foster parents either now or in the future. They also would like to see what people's stigmas and possible misunderstandings may be of the foster care system. Participants were asked to complete a survey of 13 questions concerning their opinions and stigmas surrounding the foster care system specifically in Utah. Including questions on what they thought foster care was and what would help them consider being a foster parent. 11 questions were free-entry responses and 2 questions were multiple choice. Participants were anonymous and assigned a randomized number. The research's conclusions showed that many participants had not been exposed to any advertisement or education regarding Utah foster care or the need for more foster parents. Participants held negative stigmas concerning foster care and showed a misunderstanding of what the foster care system is and what its purpose is. This will help Utah foster care know where the gaps are in their community outreach and what may help them retain and entice prospective foster parents.

Tykari Mosburg-Samuels

OK - Tulsa Community College Northeast Campus

Discipline: Biology

Authors:

#1 Jazmin Ramos
#2 Mona Easterling

Abstract Name: Identifying Geographic Disparities in the Health-Risk Behaviors in Oklahoma

The purpose of this project is to identify demographic disparities between the US and the state of Oklahoma in survey data. Factors for the health-risk behavior of adults currently reporting smoking cigarettes daily and educational attainment will be compared using publicly accessible survey data. Cigarette smoking is the leading cause of preventable death in the United States, causing approximately 480,000 deaths each year. In 2022, the Behavioral Risk Factor Surveillance System (BRFSS) reported 12.5% of US adults currently smoke cigarettes, while the crude prevalence in Oklahoma for the same period was reported at 16.1%. BRFSS is a random-digit-dialed telephone survey collecting information on health conditions, health practices, and risk behaviors. Cigarette smoking increases the risk of several chronic diseases, including heart disease, stroke, multiple types of cancer, and chronic lung disease. Smoking impacts the smoker and those exposed to secondhand smoke. About 2.5 million people have died from medical problems caused by second-hand smoke since 1964. A statistical comparison will be made between the state and the national data for the purpose of comparing educational attainment and adult smoking behavior. This study will explore education as a social determinant of health to lower the health-risk behavior of adult cigarette smoking within the state of Oklahoma and that state data will be compared to national numbers.

Pari Motivaras

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Resha Rajkarnikar

#2 Mythreye Karthikeyan

Abstract Name: Stress Induced Regulation of Mitogen-Activated Protein Kinase 15 (MAPK15) in Ovarian Cancer Models

Amongst all gynecological cancers, ovarian cancer is one of the leading causes of cancer death in women. A major reason for this high fatality rate is the late detection of advanced and metastatic disease. For metastasis, cancer cells must detach from their primary tumor and survive under matrix detachment during which they have to overcome multiple cellular stressors to survive including DNA damage, starvation, oxidative stress, etc. Mitogen-activated protein kinase 15 (MAPK15) is over expressed in ovarian patient samples compared to normal and a higher expression is correlated with lower survival of patients. We found that MAPK15 expression is further induced upon matrix detachment when ovarian cancer cell lines are cultured in suspension. We found an increase in expression in both mRNA and protein levels upon matrix detachment compared to the attached condition. The purpose of this research was to assess how expression of MAPK15 is induced upon matrix detachment. We hypothesize that upon matrix detachment, DNA damage occurs, which induces the expression of MAPK15 as a DNA damage response protein. We induced DNA damage with either cisplatin, which is the standard of care chemotherapeutic drug, or by culturing cells in suspension to test the generalizability of the observed response. DNA damage was assessed by γ H2AX, a biomarker for DNA double-strand breaks, using, immunofluorescence. The expression of MAPK15 was assessed using western blot analysis. Data analysis was conducted using cell counting, fluorescence intensity measurements, and IC50 measurements using an SRB assay Graph Pad Prism. Data using human ovarian cancer cell lines that reflect high-grade serous will be presented.

Esmail Mousavi

UT - Weber State University

Discipline: Computer Science

Authors:

#1 Kyle Feuz

Abstract Name: Acoustic Denial of Service Attacks on Hard Disk Drives: Vulnerabilities, Impact, and Mitigation

The increasing reliance on hard disk drives (HDDs) in critical systems has exposed an overlooked vulnerability: susceptibility to acoustic denial of service (DoS) attacks. This research investigates the deliberate use of acoustic signals to interfere with HDD functionality, posing significant risks to data integrity and system availability. The study aims to identify the specific frequencies and environmental conditions that render HDDs most susceptible to acoustic interference, characterize the nature of such attacks, and catalog HDD models most vulnerable to this emerging threat. Grounded in foundational principles of resonance scattering and leveraging insights from previous studies, this research builds upon experimental findings to validate and extend their applicability to diverse HDD models. Methodologically, the project involves controlled laboratory experimentation using advanced facilities at WSU's School of Computing and Electrical Engineering. It analyzes acoustic waveforms, amplitude variations, and environmental factors to determine the mechanics of successful acoustic DoS attacks. Machine learning techniques will be explored to identify and test potential mitigation strategies, aiming for robust defenses against these attacks. Preliminary findings indicate specific resonant frequencies significantly impact HDD performance, with variations across models. The expected outcomes of this research include a scholarly paper and presentations to inform manufacturers and end-users about mitigating acoustic threats. Results will be shared at the WSU Undergraduate Research

Symposium to contribute to the growing field of cybersecurity and enhance understanding of hardware vulnerabilities. This project not only advances academic knowledge but also equips students and faculty with valuable insights for tackling real-world security challenges.

Dahana Moz Ruiz

NJ - Kean University

Discipline: Computer Science

Authors:

#1 Dahana Moz Ruiz

#2 Daehan Kwak

Abstract Name: Local and Online Large Language Models for Mental Health Summaries

Electronic mental health records (EMHRs) often contain extensive, text-heavy reports, making it challenging for medical professionals to review them efficiently. Traditional methods of analyzing these records are time-consuming and may hinder timely interventions. This study explores the use of local and online large language models (LLMs) to address this issue by summarizing EMHRs into actionable insights. Local LLMs, such as GPT-4-All, LLaMA, and BLOOM, offer advantages in privacy and security, which are crucial for handling sensitive mental health data. However, local models often struggle to produce accurate results for longer records due to limitations in computational resources, model size, and insufficient fine-tuning. In contrast, online models like ChatGPT and Gemini demonstrate greater summarization accuracy and scalability but raise concerns about data security and compliance with privacy regulations. This research focuses on developing a framework for EMHR summarization tailored to specific contexts, such as summarizing by doctor, event, timeline, or mental health issue. The study evaluates local and online LLMs across dimensions like accuracy, efficiency, security, and applicability. Diverse datasets of mental health records will be used to test these models, ensuring robustness and relevance. Preliminary findings highlight the trade-offs between the privacy benefits of local models and the broader capabilities of online models. Future directions include refining local LLMs to overcome token limitations and exploring hybrid approaches that leverage the strengths of both local and online models. By enabling efficient and secure summarization of EMHRs, this research aims to improve the workflow of mental health professionals and enhance patient care outcomes. By providing a structured comparison of local and online LLMs, this study aims to enhance EMHR utility in mental health care. The findings provide insights for creating secure, effective tools to improve workflows and outcomes, highlighting the potential of artificial intelligence in mental health care.

Lidiya Muche

VA - George Mason University

Discipline: Psychology

Authors:

#1 Anne Magro

Abstract Name: Identity, Trust, and Tax Morale

Recent reports from the United States Treasury Department and the Government Accountability Office expose inequities in the tax benefits enjoyed by different racial and ethnic groups resulting from the application of tax law and tax enforcement activities. If tax morale (i.e., the willingness to pay taxes independent of potential enforcement activity) is reduced when tax systems are perceived as unfair, the

overall efficiency and effectiveness of the tax system can be compromised. While overall perceptions of taxing authority equity may decline following such news, members of those groups currently disfavored by the tax system or non-dominant groups that have been historically disfavored by the government may respond differently to the information than others. Building on Kirchler, Hoelzl, and Wahl's (2008) slippery slope framework of tax compliance, we develop a model describing how government actions affect trust in the taxing authority (a key driver of tax morale) through perceived equity. We further consider whether social identity moderates those relationships. Relying on Tajfel and Turner's (1982, 1986) Social Identity Theory, we add identification with the group favored or disfavored by the tax system or with the dominant or non-dominant groups as moderators of those relationships. We will test our hypotheses in an experiment in which U.S. taxpayers assess the equity of the tax system, trust in the taxing authority, and tax morale, and make a tax compliance decision after reading a story about tax system inequities that disfavor either a group with which they identify or one with which they do not identify.

Joseph Mueller

TX - The University of Texas - Permian Basin

Discipline: Engineering

Authors:

#1 Jenna McEnaney

#2 Krissy Hickey

#3 Malcolm Tungo

#4 Anthony Gonzalez

#5 Seyed Ghiaasiaan

Abstract Name: Strength and Weight: The Iterative Design and Development of a Formula SAE Chassis

This project explores the design and development of a Formula Society of Automotive Engineers (FSAE) chassis, focusing on the engineering design process and the challenges associated with meeting FSAE regulations. The project emphasizes a systematic, iterative approach to chassis design, balancing the critical factors of strength, weight, and structural integrity to ensure optimal performance and safety during operation. A key objective was to achieve a high strength-to-weight ratio while maintaining durability under the demanding conditions of competitive motorsport. The design process began with a thorough review of the 2024 FSAE rules and regulations, which set specific requirements for dimensions, material selection, and safety features. These constraints guided the development of initial design concepts, which were progressively refined based on feedback from the capstone director and analytical testing results. The iterative approach allowed for continuous improvement, incorporating lessons learned from previous designs and insights from user feedback to fine-tune the chassis. Material selection played a critical role in the design, with careful consideration given to the strength, weight, and manufacturing feasibility of various materials. Structural integrity was tested through simulation and physical validation to ensure the chassis would withstand the forces experienced during racing conditions. Additionally, different fabrication methods were explored to optimize cost-effectiveness while maintaining quality and performance standards. This document provides a comprehensive overview of the design evolution, detailing the key factors that shaped the final chassis, from regulatory constraints and material choices to design testing and refinement. The result is a highly optimized FSAE chassis that meets the performance, safety, and manufacturing requirements of the competition.

Njoki Mukuria

IL - Trinity Christian College

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

Abstract Name: Rhythmic Reflection: Poetry as a Hermeneutic Channel for Achieving Shared Philosophical Understanding

With his concept of the “hermeneutic circle,” philosopher Martin Heidegger emphasizes the ways in which understanding requires that we enter into the assumptions and the world of what is being understood. While this hermeneutical orientation can be applied to anything that calls for our understanding, I see it as particularly relevant for noticing the specific contribution that poetry offers as an interpretive tool and an illumination of human experience. In my project, I propose an understanding of poetry as a hermeneutic channel – that is, as an interpretive means for bringing initially distant, abstract philosophical ideas closer to the empathetic imagination of the poem’s audience. First, I lay out a framework of poetry as a hermeneutic channel by placing Heidegger in dialogue with the work of James Olthuis, who reaches beyond Heidegger in positing an explicitly interpersonal “hermeneutic spiral” that promises a mutually responsive “hermeneutics of connection,” rather than simply of “interpenetration.” I then use this poetic framework to engage in a close reading of M. NourbeSe Philip’s poem “She Tries Her Tongue: Her Silence Softly Breaks,” in which Philip draws the reader closer to her experience of cultural trauma and rehabilitation. I argue that Philip achieves this contact not by mere description, but by constructing poetic patterns that bring about a shared hermeneutic engagement through deliberately fragmented and looping language. In this way, Philip’s poem exemplifies how poetry itself counts as a form of philosophical expression and exploration, by showing how philosophical complexities are more intimately encountered through poetry’s distinctive affordances.

Helen Mun

VA - Virginia Commonwealth University

Discipline: Biology

Authors:

#1 Helen Mun

Abstract Name: The enigma of idiopathic hypersomnia: Exploring its potential impact on memory consolidation in young adults (ages 18-25)

Idiopathic Hypersomnia (IH) presents a significant challenge to young adults, disrupting their daily lives and impeding cognitive functions, including memory. Despite reports of memory impairment among IH patients, the exact mechanisms underlying these impairments remain unclear. This paper investigates the potential impact of IH on memory consolidation in young adults (ages 18–25) by systematically reviewing existing research and synthesizing findings into five key areas. First, I analyzed foundational research to establish a clinical understanding of IH, emphasizing its defining symptoms (excessive daytime sleepiness (EDS), unrefreshing sleep, and sleep inertia) and the diagnostic challenges posed by overlapping conditions and limitations in testing methods. Second, I investigated the role of sleep inertia in impairing memory encoding and retrieval. Third, I explored how disruptions in non-rapid eye movement (NREM) and rapid eye movement (REM) sleep, both crucial for memory consolidation, result in decreased slow-wave sleep (SWS), increased REM duration, and the prevalence of REM parasomnias. These disruptions, alongside altered cerebral blood flow and incomplete NREM-to-wake transitions, illuminate the mechanisms by which IH may impair memory processing and cognitive function. Fourth, I examined changes in the salience network and default mode network (DMN) associated with IH, highlighting how hypermetabolism in the salience network and disruptions in the DMN interact to potentially impair memory consolidation and cognitive function. Finally, I investigated parallels between IH and major depressive disorder (MDD), focusing on shared mechanisms such as altered regional cerebral blood flow in the medial prefrontal cortex, which impair memory consolidation. Lifestyle factors like substance use, nutrition, and physical activity complicate the relationship between IH and memory. Current research is limited by small sample sizes, lack of diversity, and

insufficient longitudinal studies. Addressing these gaps is crucial to understanding IH-related memory impairments and developing evidence-based strategies to improve cognitive outcomes and quality of life for affected individuals.

Naveen Mundlapudi

TX - San Jacinto College

Discipline: Environmental Science and Sustainability

Authors:

#1 Naveen Mundlapudi

#2 Jonathan Pham

#3 Madhu Gyawali

#4 Abigail Segovia

#5 Nisa Rodriguez

#6 Dylan Ta

Jonathan Pham

Abigail Segovia

Abstract Name: Comparing Variations of Ozone (2005-2024) in Multiple Cities Using Data From Pandora Spectrometer, and EPA Sensors

Ozone (O_3) is a pollutant primarily formed from volatile organic compounds (VOCs) and nitrogen oxides ($NO_x = NO_2 + NO$). While ozone in the stratosphere plays a critical role in shielding the Earth from harmful UV radiation, its presence near the surface poses health risks, especially to respiratory systems. This research examines ozone trends from 2005 to 2024 in Houston, other major U.S. cities, and Singapore. Data for this analysis were collected using the recently installed Pandora spectrometer at San Jacinto College, South Campus in Houston, Texas. The spectrometer is part of the Pandonia Global Network (PGN), a collaboration between NASA and the European Space Agency (ESA). This instrument provides real-time measurements of air pollutants, including NO_2 and O_3 , offering valuable insights into air quality in the Houston-Galveston area. In addition to the Pandora data, we used the Environmental Protection Agency (EPA) ground-based measurements for a broader perspective. By using Python-based data processing techniques, we translated raw measurements into clear ozone trends.

Kevin Munoz

CO - Metropolitan State University of Denver

Discipline: Engineering

Authors:

#1 Bryan Nydegger

#2 Hunter Trujillo

Lucas Tapler

Blake Burbage

Abstract Name: Predictive Modeling of Surface Roughness in Metal Additive Manufacturing using Machine Learning

To achieve high-quality, additively manufactured metal parts, real-time process monitoring and advanced

predictive modeling of the surface roughness are crucial for accelerating quality assurance in metal additive manufacturing. This study proposes a methodology to improve the quality of additive manufacturing (AM) products based on the data analysis. Surface roughness is one of the important quality indicators and can cause short product life and poor structure performance. The study explores the use of artificial intelligence (AI) and machine learning (ML) models to predict surface roughness in metal additive manufacturing (MAM) with the XM200C powder-bed fusion 3D printer at MSU Denver. Surface roughness is crucial for the performance and reliability of metal parts used in aerospace, automotive, and biomedical applications. Traditionally, manufacturers rely on expensive trial-and-error methods to optimize printing parameters, which this project aims to replace with a data-driven framework. The research team will conduct controlled experiments to gather data on crucial printing parameters, such as laser power, scanning speed, layer thickness, and powder properties. Advanced metrology tools will measure surface roughness, informing the development of predictive AI/ML models. Predictions will be validated against experimental results from test prints. Expected experimental results to show that the predictive models trained by the machine learning algorithms are capable of predicting the surface roughness of additively manufacturing metal parts with high accuracy. Deliverables will consist of an AI/ML predictive tool, detailed experimental findings, and a comprehensive report, marking a significant advancement in additive manufacturing. This comprehensive analysis encompasses the impact of process parameter variations on a wide range of surface roughness values, affirming the efficiency of the proposed methodology.

Danny Munoz

NJ - Kean University

Discipline: Computer Science

Authors:

#1 Danny Munoz

#2 Daehan Kwak

#3 Galia Shokry

Abstract Name: Assessing Green Space Accessibility in Urban Communities

Urban environments are continuously evolving, driven by population growth, economic development, and societal changes. As cities expand, the need for sustainable practices that enhance the quality of life for residents has become increasingly apparent. Parks, gardens, and green corridors are just a few of the many components that make up urban sustainability. These areas not only provide essential ecological services but also strengthen the sense of community in urban areas by serving as outlets for recreation, relaxation, and social interaction. The purpose of this study is to assess the accessibility of green spaces within communities, utilizing Geographical Information Systems (GIS) to provide a comprehensive understanding of the importance of green spaces within communities and their role. Using the GIS tool called ArcGIS, this study will evaluate key parameters related to green space accessibility, quality, and distribution across diverse communities. It will also consider other important factors such as health outcomes, social connectivity, and economic benefits. By spatially mapping out green spaces, this research study will explore how disparities in green space access correspondingly correlate with access to green infrastructure and significantly influence community well-being and social cohesion. There will be specific attention to how green spaces promote physical activity, support mental health, and help mitigate environmental issues. The findings from this study will provide insights for urban planners, community stakeholders, and policymakers aiming to enhance urban livability through the introduction of green spaces. By highlighting the multiple benefits of green spaces, the research will advocate for more policies that prioritize access to green infrastructure, contributing to a more sustainable urban environment. Through this initiative, the research seeks to inform the ongoing discourse on urban planning and sustainable development, underscoring the critical role of green spaces in shaping communities.

Lidia Munoz

DC - Trinity Washington University

Discipline: Biology

Authors:

#1 Lidia Munoz

#2 Patrice Moss

Abstract Name: Implementing the Odyssey Fc Machine: Developing a Research Module for Classroom Application

Undergraduate research experiences have been shown to be extremely beneficial and contribute to persistence in the STEM major, especially for women and students from marginalized communities. However, all students do not have equal access to these types of impactful experiences. Therefore, the goal of this project was to design a research module within a course that will engage undergraduate STEM students, women of color, in authentic research by making discoveries and practicing scientific skills. The research module was designed to use the Odyssey Fc System to study gene expression in two different types of bacteria: *Enterobacter aerogenes* and *Bacillus cereus*. After completing the research module, students will be able to: develop a research question and hypothesis, understand and apply Odyssey Fc technology, engage in scientific literature, have an increased confidence in conducting research, analyze data and draw conclusions, and develop written and oral communication skills; thereby, preparing them for advanced research and professional careers. This research module not only provides valuable skills transferable to internships and other student research opportunities, but also aims to equip students with the proficiency to utilize the Odyssey machine.

Nalima Munyofu

PA - University of Pittsburgh

Discipline: Engineering

Authors:

#1 Nalima Munyofu

#2 Ghazaleh Rostaminia

#3 Steven Abramowitch

Abstract Name: Towards the development of synthetic ultrasound data for image classification of Obstructed Defecation Syndrome

Obstructed defecation syndrome (ODS) without dyssynergia is a form of constipation associated with structural defects in rectal support. Diagnosing ODS remains challenging due to inter-patient anatomical variability. The overarching aim is to train deep learning models for automated diagnosis. However, clinical image acquisition and manual annotation are time-consuming and resource-intensive. This study investigates the feasibility of generating synthetic ultrasound images using a dual-stage pipeline. In the first stage, Houdini™ software was used to create geometric models representing the rectum, vagina, cul-de-sac, and levator plate using simple geometries. The 3D model was animated to mimic and simulate dynamics observed during ultrasound imaging. The second stage utilizes Field II, a MATLAB-based ultrasound simulation tool, to simulate collecting radio frequency data of anatomic phantoms based on the Houdini model. The radio frequency data was then processed to create synthetic ultrasound B-mode images. One simulation using 50,000 point scatterers in the phantom required approximately 20 minutes to collect 50 lines of radio frequency data. The results demonstrated the pipeline's ability to produce realistic ultrasound images with clear anatomical boundaries. Compared to collecting real clinical images, the pipeline is more time efficient,

allowing for scalability to create batches of models and images. Future work will improve the anatomic accuracy of the model, integrate patient-specific MRI-derived geometries, and refine parameters to match clinical probe specifications. This study establishes the pipeline as a viable method for synthetic ultrasound image generation.

Andres Manuel Muradas Esquivel

GA - Kennesaw State University

Discipline: Biology

Authors:

#1 Andres Manuel Muradas Esquivel

#2 Martin Hudson

Abstract Name: Identification of Potential Orthologous pmt-2 Genes in Parasitic Nematodes

Nematodes such as *Caenorhabditis elegans* and the parasitic *Haemonchus contortus* share a phosphobase methylation pathway analogous to plants and *Plasmodium* species. This pathway converts phosphoethanolamine (pEA) to phosphocholine (pCho), enabling the Kennedy pathway to produce phosphatidylcholine—essential for phospholipid biosynthesis. This pathway is divided into two functional domains of phosphoethanolamine methyltransferase: N-terminal (PMT-1), which initiates the methylation of pEA to phosphomonomethanolamine (pMME), and C-terminal (PMT-2) that continues to methylate the pMME and the phosphodimethylethanolamine intermediate to yield pCho. In nematodes, the PMTs are encoded by two distinct paralogous genes. There is growing interest in studying the structure and biochemical function of PMT-2 for potential drug targeting, driven by the need to develop novel nematocides that can combat parasitic nematodes that infect animal, human, and plant hosts; fueled by concerns about anthelmintic resistance in nematodes and the rising prevalence of parasitic infections associated with the expanding human population in developing countries. We employed the NIH's Basic Local Alignment Tool (BLAST) to detect probable nucleotide and protein sequences in parasites containing unannotated pmt-2 genes orthologous to those known in *C. elegans* and *H. contortus* across numerous sequence databases. Additionally, the Conserved Domain Search, also provided by the NIH, aided in locating conserved domains characteristic of PMT-2, namely the N-terminal vestigial domain and the S-adenosylmethionine-dependent methyltransferase binding site. The presence of pmt-2 genes was further analyzed using gene prediction software like GENSCAN and GeneID, which are capable of estimating the exons of protein-coding genes that can be used to formulate hypothetical sequences that may be identified in genomes of parasitic nematodes in future studies. To date, we have made predictions for pmt-2 in *Teladorsagia circumcincta*, *Ascaris lumbricoides*, and *Meloidogyne javanica* and plan to expand our predictions to other nematodes listed in the neglected tropical diseases category, as well as those of significant medical and agricultural importance.

Kieran Murnan

MN - College of Saint Benedict/ Saint John's University

Discipline: Health and Human Development

Authors:

#1 Christine Shikutwa

Abstract Name: Using Probability to Illustrate the Confirmation Evidence Trap in Diagnosis

The confirmation Evidence Trap The confirmation evidence trap not only changes how we collect or receive

information in the medical field, but also how they interpret the information which significantly contributes to medical bias, affecting diagnosis, treatment, and patient outcomes. In the medical field, this bias manifest when healthcare professionals focus on evidence that confirms their initial assumptions or diagnoses while disregarding an individual's contradictory critical information. Therefore, devising strategies to mitigate the effect of the confirmation evidence trap will be paramount for proper diagnosis

Abigail Murphy

MA - Bridgewater State University

Discipline: Visual Arts

Authors:

#1 Collin Asmus

Abstract Name: Feminine Rage: A Study of the Feminine Struggle Through the Eyes of Lilith

The project explores what it means to be a woman in a modern world, to be vilified for being angry about being a woman today, and issues that are far older than they should be. My project aimed to create a series of seven circular large-scale figurative oil/mixed media paintings that contributed to casting a more transparent lens onto the struggles of women in society and the misconceptions of feminine rage. In this, I utilized my double major, English/Creative Writing and Studio/Fine Arts/Painting, to create a visual narrative of the biblical figure Lilith embodying/being afflicted by the seven deadly sins. Each painting is also accompanied by several playlists specially curated for each individual piece.

Zachary Murphy

NY - St. Lawrence University

Discipline:

Authors:

#1 Charly Campanella

Josh Morris

Abstract Name: Finding Alternative Ways to Engage in Meaningful Research at Primarily Undergraduate Institutions: Inclusive CUREs and Protocol Alternatives

Research at Primarily Undergraduate Institutions (PUIs) is critical for several reasons. Among them are student growth and development, collaboration in and outside the institution, and contribution to the field. St. John Fisher University is a PUI in Rochester, NY where we have begun to pilot two primary ways to enhance undergraduate research experiences at a PUI. First, the Division of Life Sciences has committed to ensuring a Course Based Undergraduate Experience (CURE) to all majors to all of inclusive access to research. This is paired with an optional elective that further allows for the enhancement of student experiences. Further, use of soft skill building, inclusive teaching, and open pedagogy are used within in the source. Second, within our lab specifically we have continued the tradition of finding affordable means to conduct relevant cell and molecular techniques for advanced research. Jointly, more affordable research further increased inclusive access to research as we provide more opportunities for all to research. Here we propose to share our insights into the importance of inclusivity and ingenuity in the research setting. It is our hope to continue to expand the long standing tradition of meaningful research at PUIs; and to do so by engaging in meaningful conversation and community through discussion at NCUR.

Rachel Murphy

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: Housing Design for Multi-Generational Families and Visual Identification for Age-Related Macular Degeneration.

This project aimed to design a single-family residence for an older adult with age-related macular degeneration (AMD). The target user had recently been diagnosed with late-stage AMD. Research was conducted to target the user's needs. These findings were collected through online resources, two case studies, and interviews with a family member who has also experienced AMD. Additionally, the project involved researching inclusive design features suitable for individuals with visual impairments. The residence incorporated key design features such as North and South window orientation to ensure consistent natural light, even lighting layers to avoid large pools of light, high contrast for better visibility, color-coded rooms for easy identification, pocket doors for minimizing door swing interference, and textured wainscot for wayfinding. The home featured innovative technology, including a voice-controlled shower and refrigerator. Accessibility features applied to this house were oversized cabinet hardware, under-cabinet lighting, wider 36-inch doors, wide enough room size for improved mobility, and non-slip floor materials for safety. The kitchen and laundry room design included integrated eye-level storage, continuous countertops, soft-close drawer glides, a pull-out pantry, textured sink fronts and backsplashes for identification, and a higher toe kick for convenience. These accessible and inclusive design solutions support both safety and independence for the user and contribute to long-term independence and quality of life.

Olivia Murray

PA - Susquehanna University

Discipline: Biology

Authors:

#1 Sophie Charvet

Abstract Name: The Effects Nutrient-Limited Conditions Have on Prasinophyte Mixoplankton

Mixoplankton are marine protists that have the ability to perform both phototrophy and heterotrophy. Their ability to switch between these trophic modes makes them vital components for the health of marine ecosystems on a global scale. However, not much is known on when these mixoplankton switch between feeding methods and what causes them to do so. Prasinophytes are one of the earliest lineages of green algae, and have been classified as strict phytoplankton. Recent studies have shown that under low nutrient conditions, certain strains of prasinophytes were seen to switch from phototrophy to heterotrophy, indicating that some may exhibit mixotrophic traits. With this newfound information, we want to further investigate if a certain strain of prasinophyte, *Cymbomonas tetramitiformis*, presents this mixotrophic switching by placing it in nutrient-limited environments. By growing *Cymbomonas tetramitiformis* in a full nutrient medium, a diluted version of the full nutrient medium, a full medium with low nitrate, and full medium with low phosphate, we expected that the prasinophyte strain would switch from autotrophy to heterotrophy. We observed how *Cymbomonas tetramitiformis* reacts under certain nutrient-limited environments based on growth observed overtime. *Cymbomonas tetramitiformis* showed little growth in the diluted full-nutrient

medium and the low nitrate medium, with no growth shown in the low phosphate medium. The results in the nutrient-limited treatments indicate that there was an attempt to switch to phagotrophy which resulted in slower growth under phototrophy. We plan on performing feeding experiments to confirm that the strain did switch trophic modes. Understanding the feeding mechanisms of prasinophyte mixoplankton can aid in uncovering more about their lineages to see where these traits arose from, and allows for future research on the impact these organisms have on marine environments overtime.

Neharika Murthy

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Ashlee Wood

#2 Erin Kershaw

Abstract Name: The impact of global CREBRF overexpression on energy homeostasis

Causative genes and underlying mechanisms of obesity, a global health threat, remain largely unexplained despite the high prevalence and heritability of the condition. Though obesity is typically associated with metabolic dysregulation, a subset of individuals have been identified to have a missense variant that confers protection from these metabolic disturbances. The CREBRF-R457Q variant is associated with an elevated risk of obesity while paradoxically protecting against type 2 diabetes in humans. Prior in vitro studies have demonstrated the CREBRF variant's role in promoting cellular lipid storage and cellular energy conversion. However, neither the function nor the mechanism of action for the gene has been established in vivo. A murine model was generated with CREBRF overexpression to better understand CREBRF's impact and complications. We hypothesized that global overexpression of CREBRF in mice will replicate the metabolic phenotypes associated with the CREBRF-R457Q variant, illuminating its role in energy homeostasis. To test this hypothesis, global transgenic CREBRF and control mice were given either a sucrose-matched low-fat or high-fat diet until sacrifice at 22 weeks. During this 22-week period, the mice's energy, glucose, and lipid homeostasis were assessed. Results indicated that global CREBRF overexpression increased lean and fat mass, and body weight, and that total body and fat mass are further exacerbated by chronic nutritional overload. Furthermore, the transgenic mice's length increased, consistent with existing data indicating an increase in heights in human individuals with the CREBRF-R457Q missense variant. In addition, the variant, despite contributing to an excessive increase in body weight, positively influences lipid homeostasis regulation through the reduction of non-esterified fatty acid, triglyceride, and cholesterol levels. These findings offer novel insights into CREBRF's role in energy and lipid homeostasis, paving the way for future therapeutic strategies targeting obesity and related metabolic disorders.

Vithravini Murugavel

MI - University of Michigan - Ann Arbor

Discipline: Interdisciplinary

Authors:

#1 Ragan Glover

Abstract Name: Application Development of Digital Safety for Women

The increasing prevalence of unsafe environments for women highlights an urgent need for innovative

solutions to enhance their security. This research focuses on developing a mobile application tailored to address key issues related to women's safety. The app's design is based on findings from the literature on gender and safety, which suggests that women's mobilities are inherently precarious, due to pervasive sexual violence against women and also draws from semi-structured interviews with women focused on safety and digital technology use. The PI and undergraduate researcher analyzed this data, finding that women have concerns about accessing these apps in moments of crisis, maintaining a sense of privacy and autonomy when using location-sharing features, and using these apps when cell services are unavailable. Based on these findings, the PI and undergraduate researcher developed a high-fidelity prototype of a mobile safety application that addresses these concerns. They engaged user testing of the application, refining the design with features that accommodate user needs and promote safety. It incorporates features such as ad hoc location sharing, customizable emergency alerts, and discreet communication options for use during dangerous situations. By analyzing gaps in existing safety tools and leveraging user insights, the project emphasizes the importance of accessibility, adaptability, and reliability in designing digital solutions to the complex social problem of women's safety. Beyond technology, this initiative advocates for systemic change by promoting awareness of responsive safety measures and highlighting the need for policies that prioritize women's well-being. Additionally, this project offers app design recommendations, explores user-driven functionality, and discusses broader implications for fostering safer, more inclusive communities.

Avanti Murukan

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Karina Yoon

#2 Aubrey Miller

#3 Jamie Aye

#4 Elizabeth Beierle Chen

Abstract Name: Evaluation of ICAM-2 expression in patient-derived xenograft models of neuroblastoma

Neuroblastoma is the most common extracranial solid tumor of childhood and accounts for ~15% of all cancer-related deaths in children. Most children with high-risk neuroblastoma survive less than 5 years. Our laboratory investigates mechanisms of neuroblastoma progression and metastasis, with a long-range goal of developing effective therapies that prevent or slow relapse with metastatic disease. We recently made the novel observation that intercellular cell adhesion molecule-2 (ICAM-2) delays the development of disseminated tumors in a mouse model of metastatic neuroblastoma. We identified the cytoskeletal linker protein α -actinin as a binding partner of ICAM-2 and observed that this binding functions to suppress metastasis. Further, this binding is essential to the suppression of metastatic progression. Importantly, and relevant to the proposed project, we observed that primary human neuroblastoma cells expressing ICAM-2 have limited metastatic potential. The goal of the current study was to immunostain for ICAM-2 in our recently developed patient-derived xenograft models of neuroblastoma, to begin to identify correlations between stage and ICAM-2 expression and between stage and subcellular localization of this protein. We developed these models, Stage I-III, to implant directly into immunodeficient mice. Our published data document that SK-N-AS neuroblastoma cells transfected to express ICAM-2 express readily detectable levels of this protein and do not form metastatic tumors when implanted into immune-deficient mice. In contrast, control SK-N-AS transfectants express no detectable ICAM-2 and do form metastatic tumors in vivo. For the current project, we used an ICAM-2 specific antibody to immunostain thin sections of 5 patient-derived xenograft models derived from these tumors. The data will address the level of expression of ICAM-2 in specimens of neuroblastoma tumors.

Caroline Muscat

PA - Susquehanna University

Discipline: Biology

Authors:

#1 Kathleen Christiansen

#2 Pavithra Vivekanand

Abstract Name: The Effect of Raptinal on Apoptosis in Melanoma A375 Cells

Melanoma is the most aggressive form of skin cancer that can become life threatening in only six weeks. Cancer cells can become resistant to current treatment options, which often target the RAF/MEK/ERK signaling pathway to mitigate deregulated cell proliferation. Raptinal has been shown to induce rapid and reliable activation of the intrinsic apoptotic pathway in several other cancer cell lines. However, its effect on A375 human melanoma cells have not been investigated. We were therefore interested in examining whether Raptinal could induce concentration dependent apoptosis of A375 cells. XTT viability assays showed that viability decreased to 60% in cells treated with 2 μ M Raptinal and further decreased to 43% upon treatment with 10 μ M Raptinal. PARP cleavage was evident in cells treated with 2-10 μ M concentration of Raptinal, indicating that apoptosis was induced in treated cells. As the MAPK signaling pathway has been shown to induce apoptosis of cancer cells when treated with certain drugs such as cisplatin, we examined the phosphorylation status of ERK. Activation of ERK, as indicated by phospho-ERK (p-ERK), was observed in cells dosed for 12 and 24 hours with Raptinal. We have shown that Raptinal induced apoptosis of A375 cells in a concentration dependent manner, and future objectives are to investigate whether the inhibition of ERK MAPK signaling is required for the induction of apoptosis by Raptinal.

Ella Muschlitz

SC - College of Charleston

Discipline: Physics and Astronomy

Authors:

#1 Ana Oprisan

Abstract Name: Universality Laws in Pure Fluids and Critical point Experiments Under Density Gradients

Critical fluids have properties that deviate from typical fluids; for example, some quantities present a divergence in power laws when the temperature is very close to the critical temperature. We investigated two critical fluids, critical oxygen under magnetic levitation and sulfur hexafluoride in microgravity conditions. The topics of the first project show that turbidity data, a quantity due to density fluctuations, can be directly obtained from image analysis. We fitted the turbidity to a theoretical expression and estimated the isothermal compressibility and correlation length. The second project focused on the late-stage phase of SF₆ in microgravity after quenching from the critical point. We studied the distribution of the radius of vapor/gas bubbles as a function of time and found that it could be well approximated by lognormal functions and the bubbles shifted to a smaller radius over time. We observed binary coalescence events during the phase separation process and small droplets presumably generated by condensation.

Sawyer Mustopoh

KY - University of Kentucky

Discipline: Social Work and Human Services

Authors:

#1 Sawyer Mustopoh

Abstract Name: Modeling Decisions in Crisis: A Game-Theoretic Analysis of the 988-Suicide Prevention Hotline

This study examines the decision-making processes surrounding the use and referral of the 988-suicide prevention hotline through a game-theoretic model incorporating dynamic utility functions and prospect theory. Analyzing survey data from a national sample of 1,694 teens on Personal Use and 1,569 teens on Referral Behavior, we categorized key positive and negative factors such as HELPFUL, POLICE INVOLVEMENT, RESOURCE, and CARE FRIENDS. The data was analyzed by applying logarithmic and square root utility functions to quantify the net utility for both the Caller and the Referrer, incorporating loss aversion to reflect the disproportionate impact of negative factors. The findings reveal that both players are disincentivized primarily by negative perceptions, leading to a Nash equilibrium of disengagement. Simulated scenarios, adjusting the weights of positive motivators and reducing negative deterrents, demonstrate that improving the hotline's perceived helpfulness and mitigating negative perceptions significantly increase engagement, highlighting the importance of a holistic and critical intervention approach.

Filza Mutaal

KY - Berea College

Discipline: Economics

Authors:

#1 Filza Mutaal

#2 Elisabeth Wasserman

#3 Brynna Wert

#4 Yifan Wang

Abstract Name: Deaths of Despair in Virginia: Analyzing Socioeconomic Factors and Demographics

"Deaths of despair", a term coined by Anne Case and Angus Deaton in 2015, refers to fatalities from suicide, drug overdose, and alcohol-related diseases. Over the past twenty years, the U.S. has seen a significant rise in deaths of despair (DOD). Reflecting this national trend, Virginia, and Appalachia overall, experienced a significant increase in these deaths in 2019, primarily driven by a rise in drug overdoses that disproportionately impacted economically disadvantaged areas. Our study examines the socioeconomic factors and demographics of DOD in Virginia from 2018 to 2022. We utilize county-level socioeconomic data from the 5-year American Community Survey (ACS) and death rates from the Centers for Disease Control and Prevention (CDC). We document gaps in DOD rates across different demographic groups, including sex, race, and age. Using ordinary least squares (OLS) regression, we analyze the relationship between education, income, and employment rates and the incidence of DOD. Our findings indicate that populations with lower educational attainment, higher poverty rates, and higher unemployment rates are most susceptible to DOD. Aligning with previous literature, our study suggests that middle-aged, White males represent highest rates of DOD, but in 2022, African Americans surpassed the White death rate in Virginia, representing a substantial demographic shift. By assessing correlates and demographics associated with DOD, we highlight the need for targeted interventions and suggest potential directions for future research.

Milind Natraj Muthiah

TN - Vanderbilt University

Discipline: Interdisciplinary

Authors:

#1 Jordan Gunn

Shreyas Teegala

Abstract Name: Birds of a feather compete together? Modeling homophily across stakes and backgrounds

This study investigates the conditions under which homophily—individuals’ tendency to form ties with those who share their demographic attributes—affects team formation under different task contexts. Homophily is traditionally understood as an overarching principle of social network formation, but a growing body of observational research suggests that it is inconsistently expressed depending on task demands and participant factors. We designed a controlled experiment in which participants, serving as team leaders, selected teammates from a demographically diverse pool for tasks with varied stakes and objectives. Specifically, we compared a low-stakes, collaborative scenario focused on improving a community space with a high-stakes, adversarial setting, where participants faced greater performance pressures. In our experiment, participants made social tie decisions using a “group ranking” approach and a pairwise selection mechanism. The group ranking condition allowed participants to sort all potential teammates at once, encouraging comparative evaluations that might accentuate or diminish demographic preferences. By contrast, the pairwise task forced direct comparisons between two candidates at a time, potentially highlighting more granular biases. Through these complementary methods, we sought to discern whether participants rely on stable demographic heuristics or adjust their strategies according to contextual demands and selection formats. Preliminary analyses indicate that homophilic sorting, while present in more relaxed, cooperative tasks, attenuates in higher-stakes, adversarial scenarios. Under greater competitive pressure, participants appear more willing to set aside demographic similarity in favor of perceived skill or other advantageous attributes. Our results suggest that homophily is not a universal principle of team formation, but rather a flexible strategy that individuals variably deploy in response to task demands.

Martina Nacach Cowan Ros

MA - Boston University

Discipline: History

Authors:

Abstract Name: The Evolution of Human Rights Throughout the 1940s

What are human rights? The loaded term seems to have always existed. It plagues news headlines, books, and day-to-day rhetoric. However, the specific definition of human rights and how they should be enforced has rarely been clear. My research explores how the concept of human rights evolved throughout the early 1940s, as the Second World War made people yearn for peace through a “One World” that would potentially ensure international protection of human rights. Through the announcement of the Four Freedoms, the Atlantic Charter, and the Declaration of the United Nations the term human rights became more prevalent by the 1940s. Yet, the interpretation of the concept varied. Many scholars circumvented the term, taking advantage of its vagueness. The Catholic church paraded the term around, declaring its all-time commitment to protecting rights and religious freedom. Others tried to connect the term to natural law, searching for differences between the concepts. Only a few attempted to define human rights and generate meaning from the definition. One of these scholars was Quincy Wright, an American lawyer, who ventured to figure out how difficult it would be to set up an intentional institution to protect human rights. He highlights the difference between positive and negative rights, with negative rights being easier to protect through policy than positive ones. Yet, other scholars were against the international protection of human rights, such as

opposing scholar Frank Holman who believed America should keep to itself rather than take the lead in global affairs. The complex conversations, and lack thereof, that occurred surrounding human rights in the 1940s are monumental to understanding why, to this day, granting universal rights seems impossible. It gives clues as to why policy to protect human rights has become so complex, as national sovereignty and cultural differences rise as key issues.

Aurianna Nacua

VA - Virginia Commonwealth University

Discipline: Anthropology and Archaeology

Authors:

#1 Bernard Means

Abstract Name: Dragon Ladies and Lotus Blossoms: Deconstructing the Colonial Fantasies of Southeast Asian Women

Western perceptions of Asian women have always been rooted in the fascination of the exotic Other. Through concepts such as dragon lady and lotus blossom, this view is clear; fierce and hyper-sexual, while also obedient and pure. Despite this being applied to women throughout the continent, Southeast Asian women have a particularly unique experience due to Southeast Asia's strained relationship with the United States - one full of colonization, exploitation, and violence. This study examines the fetishization and objectification of Southeast Asian women in the U.S. by considering the intersections of race, gender, and Orientalism through an analysis of scholarly literature. The U.S. involvement in the region will be highlighted to give background information on the history and origins of such ideas. From there, the connection between contemporary notions of Southeast Asians and Asian women will lend itself to a better understanding of what it means to be a Southeast Asian woman in the U.S., how Orientalism plays a part in day-to-day life, and what steps can be taken to decolonize the Southeast Asian female body.

Shashank varma Nadimpalli

VA - Virginia Commonwealth University

Discipline: Biology

Authors:

Abstract Name: FTY720 as a potential drug treatment for activating pro-survival pathways in NPC Disease Models.

Niemann-Pick disease type C (NPC) is an inherited lysosomal storage disorder characterized by cholesterol and sphingolipid accumulation, leading to complex progressive neurodegeneration and death. The S1P/S1PR axis is a ligand/receptor combination involved in NPC pathology, and the binding of extracellular S1P to S1PR activates a pro-survival intracellular signaling pathway unique to each S1PR isoform, providing potential therapeutic targets. FTY720 is a high-affinity ligand agonist of S1PR1 and has been shown to decrease cholesterol and glycosphingolipid levels in NPC1 mutant fibroblasts as well as activate the synthesis of cytoprotective proteins through distinct pro-survival signaling pathways. However, it is unclear if FTY720 activates these pro-survival pathways in NPC knockout cells. Current therapies for NPC disease have shown the involvement of the S1P/S1PR axis in alleviating symptoms of NPC models. However, current treatment effects are suboptimal, underscoring the need for additional therapeutic options. Preliminary data confirms significantly increased cell death in HeLa NPC KO compared to WT ($p = 0.0028$) and treatment of HeLa KO

NPC cells with 2 uM FTY720 did not significantly reduce cell death. A dose escalation study will be performed with increasing concentrations of FTY720. Additionally, western blot analyses will be conducted to examine the pro-survival proteins AKT and MEK, which are modulated by the S1P/S1PR axis. Understanding FTY720's role in pro-survival signaling pathways of S1PRs could lead to significant developments in new therapeutic approaches to treating NPC disease and other neurodegenerative diseases.

Aishwarya Nagabhushan

DC - The George Washington University

Discipline: Sociology

Authors:

Abstract Name: Women of the Night: A Study on Indian Women Employed in the Business Process Outsourcing Sector (BPOs)

Since 1990, the female labor force participation rate in India has declined. Moreover, in the 2023-24 Women Peace and Security Index, India was ranked 128 out of 177 countries in terms of women's security. Additionally, in recent decades, cities like Bengaluru have begun to globalize and offer more job opportunities to women, especially within the business process outsourcing sector (BPOs). Since many BPOs operate in the United States and Canadian time zones, many women employed in the BPOs work the night shift. As a result, more Indian women now interact with public spaces at night while simultaneously navigating Indian sociocultural norms and stereotypes of respectability, which dictate that Indian women should avoid public spaces, especially at night. Furthermore, while literature exists on physical mobility, respectability, and women's economic opportunities, we know little about how ideas of both physical mobility and respectability affect the future economic opportunities of women employed in BPOs, specifically those working the night shift in Bengaluru. This research seeks to fill this gap by answering the following question: How do physical mobility and ideas about respectability affect the future economic opportunities of women employed in business process outsourcing centers (BPOs) working the night shift in Bengaluru, India? 13 semi-structured interviews with Indian women working the night shift in BPOs revealed themes surrounding safety, health, and fertility concerns, changes in night-shift perceptions post-marriage, and strict company policies. The research concludes that the themes, explored through anecdotes, illustrated how ideas of respectability impacted Indian women's physical mobility, often hindering future economic opportunities. The study strongly advocates for greater inclusion of women's voices in developing company policies on women's safety and calls for broader public education on the role of women in the BPO sector to increase Indian women's economic opportunities and participation in the formal labor force.

Malhaar Nagaraj

PA - University of Pittsburgh

Discipline: Psychology

Authors:

#1 Malhaar Nagaraj

Abstract Name: Emotional Appraisal of the Hindustani Classical Raag System

Do all humans have similar emotional appraisals of music? Experts in North Indian Classical [Hindustani] Music ascribe emotional responses to melodic structures [Raag]. While research into the emotional appraisal of Western scales exists, there is little research into the universality of emotional appraisal of Hindustani Music. To what extent do demographics, training, and culture influence this association of a Raag and its emotional appraisal? If strong emotional associations are identified, these may be utilized in emergent Raag-based music therapy, applicable to diverse demographics. Participants (n=665) were provided with a survey where they were prompted to listen to vocal recordings of compositions in four Raags, each associated with a dominant emotional response. For each clip, participants were asked to choose one among four options of emotions they experienced. Recorded factors included demographics (age, gender, ethnic background), familiarity with Indian and non-Indian Music, and understanding of lyrics. A numerical score for each participant's response was assigned relative to the "correct" response, and a frequency distribution of emotional response accuracy was generated for each Raag and factor. Statistical tests conducted rejected the null hypothesis that the distribution was uniform across emotional responses. To analyze the relative importance of different factors, a Random Forest classification algorithm was implemented. Age is the most important factor in response accuracy: younger participants more correctly/consistently identify the correct emotional response. Interestingly, expertise in Indian and non-Indian music or understanding lyrics does not correlate with higher accuracy. The results strongly suggest the universality of Raag-based music's emotional appraisal, which suggests a promising applicability to music therapy.

Pranav Nagila

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:

#1 Jennifer Pollock

#2 Claudia Edell

#3 Jackson Colson

Abstract Name: Endothelial cell HDAC1 mediates vascular and kidney damage in diet-induced obesity

Histone deacetylase 1 (HDAC1) is an enzyme related to direct post-translational deacetylation of proteins. HDAC1 increases risk of cardiovascular disease (CVD). Endothelial dysfunction is related to nitric oxide (NO) reduction. Endothelial dysfunction is a major mechanism initiating organ damage in CVD. Our lab has shown that overexpression of HDAC1 in endothelial cells (ECs) reduces NO production, suggesting that HDAC1 may mediate endothelial dysfunction. Obesity is a major risk factor for CVD. Mice fed high fat diet have endothelial dysfunction, vascular damage, and kidney damage. We hypothesized that EC HDAC1 mediates vascular and kidney damage in a model of diet-induced obesity (DIO). Our lab generated tamoxifen inducible EC specific HDAC1 (iEC-HDAC1) wild-type (WT) and knockout (KO) mice. We utilized a 20-week DIO (45% high fat) protocol. We gave tamoxifen at week 17 of DIO and assessed vascular and kidney damage at week 20. Vascular function was assessed by pulse wave velocity (PWV) to measure aortic

stiffness. Male iEHDAC1KO DIO had significantly reduced PWV compared to iEHDAC1WT DIO mice ($p=0.0018$). There were no differences in females. Kidney damage was assessed by measuring tubular vacuoles and interstitial fibrosis with histology. We found that iEHDAC1KO DIO males showed reduced tubular vacuoles and interstitial fibrosis compared to iEHDAC1WT DIO males (Vacuoles: $p=0.0118$, Interstitial Fibrosis: $p=0.0228$). No differences were observed in females. Our data indicate that DIO mediates vascular and kidney damage through EC HDAC1-dependent mechanisms in male mice only. Future studies will investigate mechanisms of how EC-HDAC1 drives damage in male DIO mice.

Abigail Naidich

PA - University of Pittsburgh

Discipline: Chemistry

Authors:

#1 Abigail Naidich

#2 Peter Wipf

Abstract Name: Design and Synthesis of Inhibitors Targeting c-MYC in Cancer Treatment

Myc is a family of proto-oncogenes that encode for transcription factors. In healthy cells, these transcription factors, namely c-Myc, regulate a variety of important cellular processes, including cell growth, division, metabolism, differentiation, and apoptosis, among others. When Myc and its associated transcription factors become dysregulated, they drive a series of harmful changes, such as genomic instability, uncontrolled cell proliferation, and cellular immortalization—hallmarks of tumor pathology. The effects of Myc are not exclusive to certain parts of the body, gender, age, or tumor type and are observed in over half of all human cancers. Previous studies have elucidated that small molecules can inhibit the heterodimerization between c-Myc and its zip partner, Max, and effectively silence all Myc activity in the body contributing to significant tumor regression. Complete silencing of Myc in the body has been shown to result in only mild and reversible side effects. Targeting the c-Myc-Max protein-protein interaction is a promising strategy for cancer treatment, particularly given the toxicity and invasiveness of current cancer therapies. This project aims to develop and synthesize small-molecule inhibitors to inactivate c-Myc-Max interaction. We seek to improve upon the metabolic stability, potency, and affinity to the c-Myc binding region of previously tested inhibitors using SAR analyses. Specifically, we aim to develop a series of oligoamide analogues for their ability to mimic characteristics of the alpha-helices involved in the c-Myc-Max interaction. A general synthetic route has been designed to create a series of O-alkylated monomers and construct the oligomer using a facile amide bond formation. Further work will include validating the inhibition of c-Myc dimerization and transcriptional activity in vitro. The development of effective inhibitors could provide a novel and preferred treatment option for cancers influenced by c-Myc activity.

Trisha Naidu

VA - Virginia Tech

Discipline: Engineering

Authors:

Neil George

Sasha Eppler

Abstract Name: Designing a Novel and Effective Childproof Gun Lock for Gun-Owners Families

Our project aims to create a novel and effective gun lock that is child-proof but allows adult owners to access their firearms hassle-free. According to research collected in 2022, more children in the United States were killed by guns compared to any other cause of death. This trend has been consistent for the past four years. Unnecessary deaths, especially accidental ones, can vastly be prevented if guns are more securely stored in homes. Starting with our local community in Southwest Virginia, we have researched the types of guns that families most commonly own. These gun types include shotguns, rifles, and handguns. Our current design is modeled around a handgun and consists of three main parts that we have 3D-printed. There is a box around the trigger which is secured to the gun using child-proof velcro. A top component goes around the barrel of the gun and secures the velcro in place. Lastly, we use multiple long connecting pieces to hold the trigger box and top component together. Our gun lock has multiple parts to ensure that children do not have access to the trigger. Adults can still assemble and remove the gun lock due to our ergonomic design. Compared to currently existing cable locks and gun safes on the market, our design makes sure that the trigger itself is securely encased. Working in conjunction with students at our local medical school, we plan to get feedback on our design from multiple stakeholders, including gun-owning families that have children. We will then apply this feedback to refine our design and work towards making it more adjustable to guns of all sizes. Ultimately, our project will allow adults to more safely own and store firearms in households with children.

Varun Nair

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Yanhua Huang

#2 Tobias Teichert

#3 Chengcheng Huang

Abstract Name: Analyzing Sleep Waves in Monkey Cortical and Subcortical Areas

Sleep disturbances are common in psychiatric disorders, yet there have been limited sleep-based biomarkers. Conventional sleep measures are often of low resolution, low throughput, with poorly understood neural mechanisms and potential applicability to diverse psychiatric conditions. We recently discovered in rats a surface electroencephalogram (EEG) signature – a modified EEG theta-delta-theta peak (EEGTDT) ratio – which provides a high-resolution metric for assessing quality of rapid eye movement sleep (REMS). EEGTDT ratio closely tracks the second-to-second dynamics of population activities of melanin-concentrating-hormone (MCH) neurons in the lateral hypothalamus – a group of neurons that critically regulate sleep, emotion, and reward. Hence, EEGTDT ratio-based evaluation of REMS may provide novel biomarkers for psychiatric conditions. A critical knowledge gap in translating EEGTDT ratio from rodents to human lies at the different sleep wave forms and frequency compositions across species, and our lack of understanding on how different features of EEGTDT ratio may be produced and regulated between subcortical and cortical regions. Here we take advantage of monkey cranial EEG and intracranial mesoscopic local field potential (LFP) recordings during sleep to analyze EEGTDT ratio dynamics in sleep. Mesoscopic recordings are achieved by tessellating the volume of an entire macaque hemisphere with 992+ intracranial electrode contacts. Contacts are distributed across chronically implanted multi-electrode shafts, forming an approximately regular three-dimensional grid with 5 mm or less between adjacent electrode contacts. We asked the following questions: What are the appropriate frequency bands for calculating monkey EEGTDT ratio? What are the spatial and temporal distribution patterns of LFPTDT ratio across brain regions and sleep states? What are the relationships between surface EEG and intracranial LFP regarding the TDT ratio? Answering these questions will provide key insights into the spatial temporal organizations of EEGTDT ratio features and critically bridge rodent-to-human transitions for the development of EEGTDT ratio-based biomarkers.

Ankita Nair

DC - The George Washington University

Discipline: Political Science

Authors:

Abstract Name: Restrictive Contexts, Organizational Attributes, and Operation of Local NGOs in Northeast India

Scholarship has explored the operation of international non-governmental organizations (INGOs) under restrictive contexts and how their organizational attributes influence their experiences of the restrictive contexts and the adaptive strategies they employ. However, there is a gap in the understanding of how local NGOs may differ from INGOs in their responses to these restrictive contexts. This study aims to examine the experiences of local NGOs under restrictive contexts, how they experience and adapt to these restrictive contexts, and how their organizational attributes impact these experiences. This research will focus on local NGOs operating in Northeast India, as this region is underrepresented in existing literature and offers opportunities to analyze a range of restrictive contexts, including funding restrictions and government scrutiny, regional conflict, and limitations in resources and support for NGOs in the region. Interviews with 13 NGO staff members from local NGOs in Delhi and Assam revealed nuances and variations in the correlation between organizations' responses to restrictive contexts and their organizational attributes, such as size, mandates, location, funding portfolios, and principles. It is thus recommended that local NGOs operating in Northeast India consider partnering with organizations in Delhi in a capacity that does not involve funding or subgranting. These partnerships can help local NGOs raise awareness about their programming, while increasing support and access to resources for their initiatives.

Lalitha Nair

MO - Saint Louis University

Discipline: Biology

Authors:

#1 Lalitha Nair

Abstract Name: Evaluation of CRISPR/Cas knockdown of glutathione-dependent genes in Group B Streptococcus

Group B Streptococcus (GBS) can cause meningitis and pneumonia in infants. Glutathione, a small molecular tripeptide, protects GBS against damage caused by oxidative stress and synthesis of glutathione can contribute to GBS virulence in mice. CRISPR/Cas9, a gene-editing tool, can be used to target and disrupt genes involved in glutathione metabolism in GBS. This project's focus is to apply CRISPR interference (CRISPRi) to knockdown specific GBS genes involved in glutathione synthesis (gshAB) and glutathione import (gshT and tcyABC) to examine how glutathione metabolism affects the growth and/or virulence of GBS. We designed oligonucleotides to synthesize double-stranded protospacers to use as guide RNAs to insert into the plasmid p3015b, a shuttle plasmid used for CRISPRi in GBS. We digested both p3015b and the protospacers with BsaI and ligated the protospacers into individual linearized p3015b plasmids. Transformations of ligation reactions were performed in chemically competent *E. coli*, and single colonies were counted to determine transformation efficiency. The resulting plasmids containing the protospacers were confirmed by restriction enzyme digestion and DNA sequencing. Confirmed plasmids will be transformed into electrocompetent GBS and phenotypic expression in silenced versus wild-type genes will be studied. We will also compare the knockdown of gshAB to our gshAB knockout strains of GBS. These results will show how CRISPRi can be used to study glutathione metabolism in GBS.

China Nakamura

JPN - Musashino University

Discipline: Computer Science

Authors:

#1 China Nakamura

#2 Kurumi Endo

#3 Mizuki Enomoto

Abstract Name: Analysis and Forecasting of U.S. and Japanese Economic Indicators

This study investigated the prolonged yen depreciation against the U.S. dollar following the Corona pandemic, a trend that defied expert predictions, and its subsequent rapid appreciation. Additionally, the research explored connections to mathematics and artificial intelligence (AI), culminating in using deep learning for predictive modeling. Generally, exchange rates, interest rates, and inflation rates exhibit interdependence under normal conditions. However, extraordinary events can disrupt these relationships. Hence, the study visualized time-series data of these three economic indicators from 2000, identified anomalies in graph fluctuations, and analyzed their correlations with global events during the same period. The originality of this study lies in focusing on interrelationships among these economic indicators and contextualizing them with broader global developments. Key events associated with rapid inflation rate changes included the 2008 Lehman Shock, quantitative easing policies under Abenomics in 2013, fiscal spending during the COVID-19 pandemic, and the surge in oil prices post-2021. Each event corresponded to distinct economic outcomes: rising prices and yen depreciation in 2008, stable prices but yen appreciation in 2013, and simultaneous price increases and yen appreciation after 2022. Japanese interest rates also exhibited notable patterns: a sharp decline in 2008, a sustained decrease from 2013 to 2017, and a negative one since 2017 (data sourced from BIS Statistics). Graphical trends revealed distinct characteristics during each anomaly. The analysis extended to predictive modeling targeting dollar-yen exchange rates using DataRobot, an AI-driven platform that automates machine learning and data analysis. The model employed was an elastic net regressor (L2 / Poisson Deviance) with forecast distance modeling, combining ridge regression and LASSO regularization to manage missing values and perform rigid transformations. Model validation yielded a mean absolute error of 1.9147 and a prediction accuracy of 54.8%. This study presents findings from both the data analysis and machine learning model.

Syam Sundar Nallamekala

OH - University of Toledo

Discipline: Computer Science

Authors:

#1 Syam Sundar Nallamekala

Abstract Name: Making Brain Tumor Detection More Accurate: Fuzzy Means Clustering and Convolutional Neural Network Integration

Accurate and swift detection of brain tumors from MRI scans is very important for the treatment of patients, yet it remains a challenging task for a doctor to perform manually. Present techniques are heavily dependent on individual doctors examining such scans-a time-consuming process that might result in different opinions from different doctors. This research effort combines two powerful computer techniques to help solve this

problem and make brain tumor detection more reliable. The first, Fuzzy Means Clustering, is particularly good at detecting the unclear or fuzzy tumor boundary in brain scans—a very similar process to the human expert searching for subtle differences in the images. Unlike traditional computer programs, which make strict yes-or-no decisions, this method can handle uncertainty in the images, making it especially suitable for medical diagnosis where boundaries aren't always clear-cut. The second technique, Convolutional Neural Networks, is very good at learning to recognize patterns in images after being trained on many examples, like how humans learn to recognize objects through experience. By combining the two methods, we have created a system capable of recognizing brain tumors with an accuracy of over 95%, and more speedily than in traditional methods. More importantly, it provides clear explanations for decisions to support doctors in understanding and verifying the results rather than just giving them a black-box answer. Early testing shows this combined approach not only to be more accurate but also much faster than current methods. This may help doctors make quicker and more reliable diagnoses, which could lead to earlier treatment for patients. The real impact such research can have on healthcare involves the fact that physicians would, for the first time, have a dependable means of diagnosing brain tumors, which will expedite proper treatment for patients while also lessening the burden for medical professionals.

Puneet Nalluru

CA - San Jose State University

Discipline: Environmental Science and Sustainability

Authors:

Akshat Gupta

Prithvi Kapilavai

Abstract Name: Temperature Predictions for South America using an Auto-ARIMA Time-Series Based Algorithm

This analysis focuses on modeling temperature change in South America, a region particularly vulnerable to the impacts of climate change due to its diverse ecosystems, from 1917 to 2020. We hypothesize that ARIMA-based predictive algorithms can help us understand future global temperatures and find preventive measures for environmental disasters. The proposed ARIMA model was applied to test data obtained from Kaggle, which includes temperature changes in the South American region over the last century. ARIMA is a time series algorithm that employs an autoregressive integrated moving average technique to model data for future predictions. The model performed moderately across all regions, with root mean square error (RMSE) values averaging 0.42 in South America during the months of Summer. Significant temperature changes over select months in South America contribute to extreme environmental events, such as the landslides in Colombia (2017) and the volcanic eruption in Chile (2015). For summer data in South America, temperatures transitioned from a decrease of 0.4°C in 1960 to a projected increase of 2°C by 2030, indicating a sharp rise even without accounting for external factors. Including external influences like carbon emissions and energy consumption may improve the model's accuracy, offering deeper insights. This enhancement would also enable the identification of key factors that cause temperature anomalies, allowing for targeted strategies to fight global warming. Using external factors with natural variability will also help predict region-specific solutions and policies. Similar analyses conducted for other regions revealed similar trends, suggesting that temperature fluctuations will significantly increase compared to current temperature value. This research aims to explore time series-based algorithms, their applications, and their performance limitations. A detailed analysis will be presented at the conference.

CJ Nance

VA - Virginia Tech

Discipline: Psychology

Authors:

#1 CJ Nance

#2 Casey Kozan

#3 Ellie Townsend

#4 Xinle Zhang

#5 E. Scott Geller

Casey Kozan

Abstract Name: Assessing Transgender Physical and Psychological Safety at a University: Suggestions for Administrative Reform.

Psychological safety refers to an organization wherein one feels included and can challenge the status quo without fear of negative consequences, whereas a physically safe environment is free from violence and threats of violence. Therefore, a sense of safety is essential for a person's wellbeing. Transgender college students who participated in previous studies have reported alarming levels of transphobic harassment and discrimination. Environments high in such incidents can be considered both psychologically and physically unsafe for trans people. Transgender students at a land-grant University were asked whether they felt safe. If transgender students feel unsafe, what dimensions of their safety concern them most, and what could the University Administration do to be more supportive? This study designed and applied a 60-question self-report survey to assess the perceived psychological and physical safety of 26 trans individuals currently enrolled at or recently graduated from a large University. A total of 57 cisgender students, serving as a comparison group, took the same questionnaire. Results have provided insight into where, on both a policy and community level, the university could improve at serving its transgender students. Regarding psychological safety, trans students expressed 20% more concern about the behavior of peers, faculty, and staff than did their cis peers. Of the transgender respondents, 88% had been in a situation on campus where they felt threatened because of their gender presentation, compared with only 17.9% of cisgender respondents. Additionally, transgender participants felt less supported by and were less likely to access the University administration, and were more concerned about the behaviors of faculty, staff, and other students toward themselves. The data suggest a need for the University administrators to be more sensitive to the specific and unique challenges of transgender students, and to consider implementing a large-scale intervention to reduce gender identity-based stigma.

Valentina Naranjo Ramírez

COL - EAFIT University

Discipline: Political Science

Authors:

#1 Adriana Marcela Ramírez Baracaldo

#2 Mariana Rúa Tobón

Abstract Name: Equity vs. Efficiency, the sensitive balance in electoral pledges: a methodological proposal

Equity and efficiency are fundamental concepts in both economic theory and everyday language. The tension between these principles, often referred to as a trade-off, has been a subject of extensive debate, with scholars like Okun (1975) arguing for its existence. Conversely, other researchers such as Atkinson (2009) and Kenworthy (2000), have challenged the notion of an inherent conflict between the two. This study seeks to propose a methodology that allows to identify this trade-off in electoral pledges and preferences in the case of the last three mayoral elections in Medellín, Colombia. By focusing on voter behavior, the research aims to analyze individual preferences and perceptions regarding this dilemma, offering insights into the interplay

between these concepts in electoral decision-making. This is a preliminary version of a research that contains the results of the textual analysis of the electoral pledges and the design of a survey instrument for the voters.

Rithika Narayan

PA - Carnegie Mellon University

Discipline: Computer Science

Authors:

#1 Henny Admoni

#2 Suresh Kumaar Jayaraman

Abstract Name: Teaching Robot Policies to Humans Using Erroneous Examples

Human-robot collaboration describes the process of humans and autonomous agents working together to accomplish common goals. This process is facilitated best when robot policies, or behaviors in different situations, are made transparent to humans. Demonstration-based explanations have been a focus of human-robot collaboration research, and the field has frequently drawn upon education literature to improve how humans are taught robot policies. However, no single teaching method has been proven effective across domains, difficulties, learners, and other variables; the question of how humans can most effectively be taught robot policies remains open. We propose augmenting existing policy teaching frameworks with erroneous examples as investigated in traditional classrooms, in which learners are shown incorrect responses to problems and correct them to promote understanding of common pitfalls. We build upon a teaching framework investigated in previous work to teach human learners a robot's policy through demonstrations, testing, and feedback. We will conduct a user study to investigate whether viewing incorrect demonstrations of robot behavior and correcting the actions to align with the actual policy improves a human's ability to predict policy in unseen environments. With this work, we aim to advance the methods by which robots educate humans on their policies and enable fluid collaborations and trust between human and autonomous agents.

Owen Nasal

PA - Pennsylvania State University

Discipline: Mathematics

Authors:

#1 Jessica Conway

Abstract Name: Residual HIV Viremia Impacts Time to Viral Rebound Following Suspension of Suppressive Drug Therapy

Antiretroviral therapy (ART) effectively controls HIV, improving quality and extending the length of life of people living with HIV (PLWH). However, ART is not a cure. When ART is stopped, HIV can resurge to pre-ART severity. The leading hypothesis for resurgence is the presence of cells latently infected with HIV, which can activate and spark resurgence by producing virus. Mathematical models of post-ART viral rebound therefore typically rely on the assumption that rebound is driven by latent cell activation. However, highly sensitive assays reveal that, despite effective implementation of ART, PLWH have some residual virus left in their systems. We hypothesize that the contributions of residual viremia towards post-ART rebound are not negligible. We investigate this hypothesis using stochastic simulations and differential equations in order to model post-ART HIV viral rebound. We construct models of increasing complexity and seek to investigate

the relative contributions of residual viremia. Specifically, we model delays associated with intracellular processes, ART pharmacokinetics and pharmacodynamics, and, time permitting, immune responses. Our initial model exhibits statistically significant contributions of residual viremia, indicating that earlier rebounds are more likely to be attributable to residual viremia. We seek to revisit these ideas throughout our later, more complex models. HIV cure strategies are ultimately tested through suspension of ART therapy. Developing stronger and more complete insights into the role of residual viremia towards viral rebound is therefore essential to evaluating cure strategies and could help to guide future research in mathematical modeling of HIV and the development of HIV treatments.

Hanna Nash

VA - Randolph-Macon College

Discipline: Computer Science

Authors:

#1 Maha Elouni

Abstract Name: The Future of Retail: Robotics in Retail. Hanna Nash and Dr. Maha Elouni, Department of Computer Science.

This paper demonstrates how to solve the issues with self-checkout. For the past few years, self-checkout has experienced issues with theft and wait times. It's gotten to the point where major retailers like Walmart and Target are uninstalling their self-checkout units. Previous solutions, such as adding more cameras at self-checkout units, have not completely solved the issue of theft. The solution to this problem is simply robotic. A robotic arm would control all the objects being scanned, rather than leaving them to the human, thereby reducing the gap for potential theft through improper scanning. By comparing the efficiency of a robotic arm to that of a human operator, this paper demonstrates how a robotic arm can effectively address the growing problem. The robotic arm not only enhances security by minimizing theft opportunities but also has the potential to improve efficiency by reducing checkout time. Although the robotic arm built in this study was constructed from LEGOs and the number of scanned items was small, resulting in the human operator being slightly faster, the proposed solution remains promising. With further development and refinement, robotic arms could significantly solve the challenges faced by self-checkout systems.

Riku Nasu

JPN - Musashino University

Discipline: Mathematics

Authors:

#1 Riku Nasu

Abstract Name: Investment Strategies for Achieving SDG 11 in Japan: A Portfolio Optimization Approach in Key Infrastructure Industries

Japan is recognized as one of the most earthquake-prone countries globally, which underscores the urgency of advancing infrastructure development and enhancing resilience in its urban areas. To achieve Goal 11 of the United Nations Sustainable Development Goals (SDGs), "Sustainable Cities and Communities," this study explores the potential for building sustainable cities through investments in key industries. The focus is on four critical domestic industries—electricity, gas, telecommunications, and construction—with companies in these sectors serving as the population for selection. In the first phase, a fundamental analysis was conducted

to narrow down the candidates to 20 companies based on financial indicators, market competitiveness, and long-term growth potential. Specifically, the evaluation considered financial metrics such as Earnings Per Share (EPS) growth rate, Book Value Per Share (BPS) growth rate, market capitalization growth rate, operating profit margin, Return on Equity (ROE), Return on Assets (ROA), and equity ratio. A composite score was calculated for each company by combining these metrics, helping identify the top performers in each sector. Subsequently, portfolio optimization techniques were applied to the selected companies to determine the investment ratio. Portfolios designed to maximize returns while minimizing risk were constructed to derive the respective investment ratios. Furthermore, the Geometric Brownian Motion model was utilized to simulate the value transitions of the portfolios over a 10-year period by analyzing long-term returns and risk fluctuations. This study presents a novel approach to achieve SDG Goal 11 through investment, contributing to the development of policies and strategies that enhance urban sustainability. These findings are expected to provide investors and policymakers with concrete measures to achieve their financial objectives and address societal challenges simultaneously.

Andrew Natera

TX - The University of Texas at San Antonio

Discipline: Biology

Authors:

#1 Andrew Natera

#2 Borna Sarker

Abstract Name: Assessing DNA Damage through Tunel Assay and H2AXP in Optic Neuropathy Murine models

Losing sight is one of the most feared disabilities, and optic neuropathies like glaucoma, which lead to blindness, currently have limited treatment options. Millions of individuals with these diseases lose their vision each year. In our study, we use the optic nerve crush (ONC) model of acute nerve injury to investigate retinal ganglion cell (RGC) degeneration, the neurons lost in glaucoma. Previous research has shown that while most RGCs are vulnerable to injury, a subset is highly resilient. Our goal is to explore the properties of these resilient RGCs and identify endogenous mechanisms that support neuronal survival and axon regeneration. One unexpected finding is that resilient and regenerating RGCs show an enriched gene expression profile related to DNA damage, including interferon signaling pathways. My project focuses on assessing DNA damage in RGCs following injury, comparing RGCs that have or have not received regenerative interventions. As proof of concept, we analyzed retinas from the ONC murine model at 3 and 7 days post-crush, immunostaining for DNA damage markers. Additionally, we examined a 14-day ONC model with regenerative interventions (Pten, Soc3 conditional knockout), and an interferon-gamma-stimulated uncrushed murine model. We stained retina sections with H2AXP and performed a TUNEL assay to detect DNA damage. Results showed variability between models. At 3 days post-ONC, intense staining was observed in the inner nuclear and RGC layers, indicative of DNA damage linked to apoptosis. At 7 days, staining decreased as apoptosis slowed, and was not directly induced by interferon gamma. Notably, Pten, Soc3 knockout mice exhibited diffuse DNA damage in the RGC layer, suggesting that regenerating RGCs may accumulate low levels of DNA damage. While the data is preliminary, it points to promising avenues for further research. A deeper understanding of retinal cell resilience could lead to targeted therapies for optic neuropathies.

Rohan Naval

DC - American University

Discipline: Economics

Authors:

Abstract Name: The Economics of Sports Betting

Sports betting as a legal matter was turned to state jurisdiction in 2018, with many states choosing to legalize the industry as a source of tax revenue. Numerous states have refused to legalize gambling, arguing that sportsbooks are often predatory and that legalizing the industry would have an adverse effect on poverty. Given the immense growth of the industry, it is worth asking whether legalized sports betting may affect poverty in different states across the United States. This paper looks at the ways in which sports betting is legalized across America, and whether states have taken up legalization based on generating tax revenue or other considerations. States with higher poverty rates could be more inclined to legalize the industry to help generate tax revenue, which could be used to help fund anti-poverty initiatives at the state level. The variables assessed will be the poverty rate of a state and the legal status of gambling, which can be measured with respect to time. From this, one can ask whether there has been a significant change in poverty rates after legalization of sports betting in a specific state. This could help inform policy decisions on whether states choose to legalize gambling. Existing academic literature on the topic surveyed different households and found that gambling has a negative impact on household debt, which is something policymakers must consider when discussing poverty and other public expenditures. The aim of this paper is to analyze whether the existing trends on poverty in a state after sports betting is legalized should cause concern or motivate policymakers to make the switch towards legalization. This will also help further academic conversation on the subject area on the causes of poverty, and start the discussion of whether sports betting can be considered either an economically beneficial or harmful activity.

Vanshee Navani

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Nikolai Makhov

#2 Kirill Kiselyov

Abstract Name: Evolutionary Rate Covariation Predicts Novel Lysosomal Protein Family

Lysosomes are organelles that degrade damaged cellular components and transport lipids to the terminal compartments such as the endoplasmic reticulum (ER). Lipids are essential for cellular structure and signaling, so their processing and transport mechanisms are critical. While the known cholesterol transporter NPC1 transports lipids from lysosomes to the ER, the sheer diversity of lipids creates ambiguity in identifying the remaining transporters, creating a significant gap in understanding lysosomal function. To address this gap, Evolutionary Rate Covariation (ERC) was utilized, a computational tool that analyzes the coevolution rate between proteins to predict functional relationships. Performing ERC on well-characterized lysosomal proteins, specifically the TRPML calcium channels integral in lysosomal function, revealed a novel TTYH(1-3) protein family co-evolves with the TRPML family. This suggests a co-functional association between TTYHs and TRPML within lysosomes. To characterize this, TTYH and TRPML1 constructs were transfected into human cell lines, and used fluorescent microscopy to assess TTYH colocalization with TRPML1 in lysosomal compartments. I utilized imaging studies to confirm the lysosomal localization of TTYHs with TRPML1, validating ERC predictions of TTYHs as a novel lysosomal protein family. Increased lysosomal localization of TTYHs with TRPML1 suggests their co-trafficking and functional interaction within lysosomes. Quantitative analyses show a strong correlation between TTYH and TRPML1 signals, reinforcing their co-functionality. Recent structural data identified a lipid pocket in TTYHs, similar to the NPC1 cholesterol transporter, supporting their role as lysosomal lipid transporters. Furthermore, TTYH knockdown caused impaired lipid trafficking mechanisms and lysosomal swelling. This research highlights

ERC as a tool for predicting protein functionality and characterizes TTYH as a functional lysosomal protein. TTYH expression within neuronal cells suggests specificity to lipids utilized highly in the brain such as sphingomyelin. By assessing the role of TTYH in lysosomal function, we aim to advance our understanding of lipid metabolism and neuronal functioning.

Josue Navarrete

CA - California State University - San Marcos

Discipline: Biology

Authors:

#1 Maxwell Neal

#2 Karsten Zengler

Abstract Name: Incorporating Strain-Specific Genetic Information to Improve Metabolic Models of *Bacillus subtilis*

Bacillus subtilis is a gram-positive bacterium, found in soil, humans and marine life. It produces antibiotic compounds, making it valuable in the development of tools to reduce the transmission of pathogens in built environments. M (metabolic) models, computationally describe gene-protein-reaction associations for the entire metabolic network in an organism. M models are used for the prediction of enzyme functions, pan-reactome analysis, modeling interactions among organisms, and understanding the spread of pathogens. M models of *B. subtilis* currently only consider whether a reaction is possible. We aim to incorporate reaction- and strain-specific exact gene sequences to upgrade models to include protein expression pathways (ME models). M models contain gene protein reaction rules (GPR), a boolean representation of the genes required for a reaction. GPR were be split into four distinct patterns handled separately in the algorithm: Edge Cases, Single gene reactions, Exclusive AND/OR reactions, and Mix of AND/OR. For each gene, we used an algorithm to retrieve corresponding gene identifiers specific to different strains. These genes were combined based on boolean operators within the original expression mapped into a final matrix of strain-specific information. This work resulted in a successful data mapping process which enabled the creation of a reaction-specific gene sequence matrix for various strains of *B. subtilis* and an RStudio function that can be used for other M models. We assessed the variability a single reaction may have across strains of *B. subtilis*. The results underscore the critical importance of strain-specific genetic information, especially in the context of complex reactions, such as those involved in antibiotic production. Future research includes upgrading to a metabolic and gene expression model (ME model), developing the algorithm to accommodate more complex GPRs, and replicating previous M model assessments to predict growth rates under diverse conditions and production rates of antimicrobial compounds through fermentation.

Sydney Navarro

CA - University of the Pacific

Discipline: Sociology

Authors:

#1 Marcia Hernandez

Abstract Name: Family Homelessness in California's San Joaquin County

This poster will discuss the current state of family homelessness in the United States (U.S.), California, and San Joaquin County, connecting the issue to local-level programmatic efforts by non-profit organizations.

Given major economic events, particularly the COVID-19 pandemic, research from the U.S. Department of Housing and Urban Development shows the number of families experiencing homelessness has begun to increase after a period of decline. This overall trend of housing uncertainty for families and the potential solutions that follow will be explored through various sociological theories. As one of the original counties of California, San Joaquin County is home to a diverse population of individuals, including those who are unable to economically advance into permanent housing. A lack of resource access and availability has led to a continuing crisis for historically oppressed communities, creating an extremely challenging journey in finding stability. To potentially mitigate the hardships an unhoused family may experience during this time, local, non-profit services that offer long-term assistance can provide support for both parents and children to foster the skills and confidence necessary to achieving a stable living situation. Applying an intersectional lens to the issue of family homelessness is necessary in this changing society, and when service providers and local non-profit program directors are knowledgeable of how social identities create significant hardship or advantages, these families will be able to get the most out of the assistance. Through an analytical literature review process, a deeper understanding of the homeless family experience on national, state, and local levels will be established to discuss additional initiatives that can be implemented to help and prevent this experience for future generations in the San Joaquin County.

Jessica Naylor

MI - Northern Michigan University

Discipline: Psychology

Authors:

#1 Jessica Naylor

#2 Amber LaCrosse

Abstract Name: THE ROLE OF MTHFR GENE MUTATION IN NEURODEVELOPMENTAL DISORDERS: EXPLORING POTENTIAL CORRELATIONS WITH ADHD AND ANXIETY AND DEVELOPING GENETIC TEST PROTOCOL

Attention Deficit Hyperactivity Disorder (ADHD) is a prevalent neurodevelopmental disorder, often comorbid with anxiety and depression. Symptom overlap and inconsistent diagnostic criteria contribute to underdiagnosis and misdiagnosis. Among adults, 20–30% report ADHD-like symptoms during screening, with nearly 90% being false positives. Additionally, 20% of children are misdiagnosed with ADHD, leading to unwarranted amphetamine use, which risks cognitive alterations and addiction. The methylenetetrahydrofolate reductase (MTHFR) gene is crucial for folate and homocysteine metabolism. The MTHFR single nucleotide polymorphism (SNP) C677T reduces enzymatic function by 30–60% and several publications report this genetic variant as a risk factor for ADHD, schizophrenia, and bipolar disorder. Despite this, the CDC currently states insufficient evidence to recommend genetic testing or interventions for individuals with this variant. This study evaluates whether the MTHFR C677T SNP correlates with ADHD and anxiety behaviors. Saliva samples from 30 participants were analyzed using loop-mediated isothermal amplification, a technique easily transferable to a clinical setting, for visual detection of the wild-type and mutant genetic variants. Participants completed surveys to collect information on formal diagnoses, ADHD- and anxiety-related behaviors, and demographics. Participants were grouped into two categories, those with behaviors of ADHD and anxiety and those without behaviors. We hypothesized a positive correlation between the C677T SNP and self-reported ADHD and anxiety behaviors. This study's primary goal is to develop an objective biological tool to aid clinicians in diagnosing ADHD and anxiety. A secondary aim of this study is to bolster support for treating individuals who have the SNP with a folate supplement, which is reported to reduce symptom severity in individuals with ADHD. Due to the heritability of ADHD and anxiety, increased folate and attention to formulation could optimize fetal neurodevelopment, potentially mitigating ADHD symptom severity in offspring.

Christina Ndayisenga

TX - The University of Texas at San Antonio

Discipline: Engineering

Authors:

#1 Marissa Wechsler

#2 Jordyn Wyse

#3 J. Jesus Rodriguez Cruz

#4 Nicholas Peppas

Abstract Name: Optimization of Thermosensitive In Situ Gels for In Vitro Evaluation of Traumatic Optic Neuropathy

Traumatic optic neuropathy (TON) is a rare neurodegenerative condition caused by head or facial trauma, often resulting in severe vision loss or irreversible blindness. Current treatment options, including observation, surgery, and corticosteroids, remain controversial and lack consensus on efficacy. This study explores an innovative injectable platform utilizing thermosensitive in situ gels formed from Pluronic F-127 to optimize drug delivery therapeutic strategies for TON. The in situ gels exhibit temperature-sensitive properties with gelation occurring at approximately 30°C, posing challenges in maintaining consistency under standard in vitro temperatures (i.e., room temperature-37°C). This study focused on developing a platform to ensure control of in situ hydrogel gelation for future cell studies. Pluronic F-127 was tested at varying concentrations (12–20% w/w) to assess gel stability in a 37°C water bath. Once gelation occurred, samples were removed, and the time required for reverse gelation (transition back to liquid) at room temperature was recorded. Additional reverse gelation studies were performed using transwells with permeable membranes for gel placement and transport without direct contact with cells. Transwells with pore sizes of 0.4 µm and 3 µm were evaluated for gel transport within 1 minute. Gels in larger-pored transwells (3 µm) crossed the membrane within 10 seconds, while those in smaller-pored transwells (0.4 µm) were retained. Gels synthesized from 18% and 20% Pluronic F-127 demonstrated the greatest thermal stability when used with 0.4 µm transwells. These findings convey optimized gel formulations for subsequent in vitro experiments to enhance thermal stability and functionality under physiological conditions. Future work will involve culturing human retinal epithelial cells to assess material biocompatibility, drug transport efficacy, and broader applications of this optimized gel formulation in biological systems, aiming to advance therapeutic options for TON and similar neurodegenerative conditions.

Madie Neely

CA - University of the Pacific

Discipline: English and Literature

Authors:

#1 Xiaojing Zhou

Abstract Name: Seeds of Resistance: Indigenous Ecofeminism in Gardens in the Dunes by Leslie Marmon Silko

This paper explores the ecological and feminist critique of settler colonialism in Leslie Marmon Silko's 1999 novel, *Gardens in the Dunes*. Through a narrative that contrasts settler colonial with Indigenous perspectives on horticulture, Silko exposes the enduring impact and violent repercussions of the anthropocentric domination over nature. The story follows Indigo, one of the last surviving members of the Sand Lizard tribe, who is forcibly separated from her family and taken on a journey through gardens worldwide with her white adoptive parents. Through an Indigenous ecofeminist lens, Silko critiques settler colonialism's exploitation of

nature and Indigenous communities, exposing the interconnectedness between ecological domination and the subjugation of Native peoples. Settler colonial horticulture is rooted in the anthropocentric exploitation and commodification of nature for ownership, display, and control. In contrast, Indigenous relationships to the land center on reciprocity, care, and integration of plants and people into a way of life of mutual sustainability and nurture. Indigenous ecofeminism recognizes the relationality of gender, culture, and ecology, exposing how settler colonial violence serves these bonds through the displacement and dispossession of Indigenous peoples from land and culture. Silko's novel continues to develop this idea as it unravels Indigo's experience with European botanical traditions as she is torn away from the values and practices of her Native American heritage. In my analysis, I examine the intertwined cultural and ecological consequences of settler colonialism, revealed through the opposing Indigenous and colonial ideologies towards land and nature. Indigo's journey in *Gardens in the Dunes* subverts the anthropocentric control of nature and offers an alternative grounded in Indigenous resistance, resilience, and the vital importance of reciprocal, sustaining relationships with the land. This paper will demonstrate how the novel emphasizes the inseparable connection between the treatment of people and the environment within the Indigenous experience.

Madeline Neely

CA - University of the Pacific

Discipline: English and Literature

Authors:

#1 Eric Sonstroem

Adam Koc

Abstract Name: Resisting Erasure: Polish Fairy Tales in the Partitions Era

This paper explores the role of Polish fairy tales during the Partitions Era (1795-1918) as a form of cultural resistance and a reflection of Polish nationalism. Amidst the oppressive rule of Russia, Polish identity was systematically suppressed. In 1862, Maude Ashurt Biggs translated A.J. Glinksi's collection of Polish fairy tales, offering a rare glimpse of Polish folklore during a time when national sovereignty had been erased from the map. Through a gothic lens, the fairy tales in this collection, specifically *Princess Miranda* and *Prince Hero and The Eagles*, symbolize the struggle for autonomy and the Polish people's enduring resistance against foreign domination. The gothic elements embedded within *Princess Miranda* and *Prince Hero and The Eagles* reveal how these fairy tales function as allegories of Polish resistance. In both stories, the central characters are besieged by malevolent forces symbolizing foreign invaders, and their loved ones fall into perilous situations. These narratives echo the paralysis of Polish national spirit and the forced assimilation of Polish people, particularly through Russia's Russification policies. These themes are mirrored through the gothic motifs of enforced dormancy, ensnared protagonists, larger-than-life entities, and the theme of the broken self. By drawing parallels between the fairy tale characters and real-life uprisings in the 1860s, this paper demonstrates that these stories not only captured the cultural oppression experienced by the Polish people but also embodied their deep belief in eventual liberation. The analysis of the gothic motifs within these fairy tales reveals how folklore served as both a cultural refuge and a form of resistance, offering hope amidst the erasure of Polish sovereignty. These narratives provided a space for resilience and resistance, reflecting the Polish desire for freedom and the eventual triumph of national identity, even in the face of seemingly insurmountable odds.

Nicole Nelson

MN - University of Minnesota - Duluth

Discipline: Biology

Authors:
#1 Jessica Savage

Abstract Name: How Does Floral Photosynthesis Relate to Climatic Niches?

Flowers exist in many beautiful forms and varieties to attract pollinators and reproduce, but some flowers' reproductive organs can photosynthesize. This means that some flowers can potentially create their energy. However, this comes with costs and benefits. For example, the cost is that it is an energy-intensive process, and it could increase damage to floral DNA by UV radiation. Another cost is that chloroplasts, the region of the cell where photosynthesis occurs, also often contain a large amount of chlorophyll which can make the flower appear green. The goal of my study is to survey floral photosynthesis and determine its costs and benefits related to variables found in climatic niches. To determine if the extent of floral photosynthesis is tied to habitat preference in plants, we will measure chlorophyll in flowers as a proxy for photosynthesis and compare our data to species distribution data that will be downloaded from WorldClim. To extract the chlorophyll from the tissue of the flowers, we first will separate the petals or showy organs of the flower from non-showy organs. We will next use 1000uL of acetone to extract the chlorophyll and 250uL of that to run under a spectrophotometer to measure absorbance. Species distribution data for the samples will be downloaded using the Global Biodiversity Information Facility website, and it will be cleaned to only have the plant's native range. This distribution data will next be analyzed by two WorldClim variables, annual precipitation and annual mean temperature on a Java-based software named Maxent to see how the species fare in certain climatic conditions based on those variables. Our predicted goal of this study will be that niches with lower water availability and a warmer climate will have less available chlorophyll for photosynthesis.

William Nelson

TX - Tarrant County College

Discipline: Chemistry

Authors:
#1 William Nelson
#2 Perla Diosdado
#3 Ethan Zavala

Abstract Name: Utilizing ^1H -NMR to Determine Protonation State in Oral Nicotine Pouches

Nicotine is a highly addictive psychoactive drug that stimulates the nervous system and alters the consumers mood. Depending on pH, upon consumption, nicotine is delivered either as protonated or freebase affecting the absorption, metabolism, and addictiveness of the product. Free base nicotine consumption is correlated to higher addictiveness than its protonated counterpart; it is readily absorbed through the skin providing a stimulant effect since it is absorbed and experienced at a more consistent rate than protonated nicotine. Whereas its protonated counterpart is less likely to diffuse across membranes, which could reduce nicotine absorption rate but exacerbate other shared health effects such as increased levels of inflammation at the mandibular vestibule and mucogingival junction. Previous research conducted by the University of Portland examined protonation state of various e-liquid cigarettes using a 600MHz ^1H -NMR. This research aims to evaluate if this method can be utilized to differentiate and determine protonation state of various oral nicotine pouches using a benchtop NMR. The pouches include nicotine HCl, flavorings, fillers, and pH stabilizers. The solution pH influences the protonation state of nicotine, in this study nicotine pouches were extracted with artificial saliva while mimicking similar conditions to the buccal region comparable to the intended use of the product. The pH of the solution was measured, and protonation state of nicotine was investigated. Statistical analysis indicates that protonation state can be determined from two protons on the aromatic ring

of the compound as well as the pyrrolidine methyl using low field ¹H-NMR. Although pH stabilizers are known to be present in these products, pH values ranged from 6.6 to 10.6 in the tested subjects.

Nikolaus Nelson

WI - University of Wisconsin-Stout

Discipline: Sociology

Authors:

Corey Brisiel

Abstract Name: Off-Campus Housing in Menomonie Wisconsin

Student's academic success in the classroom is impacted by student's mental and physical health. In addition, poor living conditions can have a critical impact on a student's wellbeing, including having detrimental outcomes on mental and physical health. Previous research has shown that 52.6% of off-campus students live in conditions that are negatively affecting their health (Johnson et al., 2009). Additionally, women and gender diverse individuals are more likely to experience negative housing situations than men (Heller et al., 2023). To add to this literature, this study aims to examine the housing conditions for off-campus students in Menomonie, Wisconsin, home to UW-Stout, by looking at how students view the fairness and trustworthiness of their landlords. Additionally, this research aims to observe both the positive and negative experiences of off-campus students to assist in ongoing community efforts to address housing concerns by passing effective local ordinances that aim to protect renters. By leveraging an original survey and in-person focus groups asking students questions about their living conditions, several trends emerged. Students report being happy living off campus but also report having multiple housing issues. Through interviews and focus groups, it became clear that this contradiction of being happy despite housing issues stemmed from a belief that on-campus conditions are worse; therefore, students are happy to be out of them. The preference for "anything but the dorms" has led to students being complacent about not receiving adequate living conditions. If universities and communities want to better understand the living conditions of their students, it may be true that surveys do not truly uncover the depth of their negative experiences and the problems students face in securing safe and secure housing. Instead, mixed methods research that includes focus groups is needed.

Chloe Nelson

AZ - Embry-Riddle Aeronautical University

Discipline: Psychology

Authors:

#1 John Woodman

Abstract Name: Exploring the Characteristics of Elder Perpetrators Through Systematic Review: A Profile-Based Approach

Objective: With longer lifespans and a substantial aging cohort, abuse against older adults is a growing concern yet often under investigated. Literature on elder abuse is typically focused on victims and types of abuse experienced rather than understanding the offenders. Articles which have suggested profiles of abusers have differing criteria. The purpose of this systematic review was to combine these criteria to create a common ground concerning abuser characteristic profiles. Methods: The initial search strategy across two databases yielded 820 non-duplicated articles. After reduction for specific relevance, five papers were included from the initial search as well as two additional from evaluation of sources from those papers.

Results: The included articles revealed numerous overlapping characteristics of elder abusers with four characteristic types despite the different labels throughout literature. The first type of abuser is characterized as a caregiver whose stress results in abuse. The second is a caregiver that is dependent on the financial or emotional resources of the elderly causing them to be exploited or neglected. Third, is a self-centered abuser who seizes an opportunity for exploitation. Last, is an abuser who planned to hurt or exploit the other person either for internal or external gain. Discussion: This systematic review identified commonalities in perpetrator profiles and some gaps in information. Notably, four distinct profiles of elder abusers and their application across types of abuse were uncovered. Defining profiles of elder abusers could facilitate new strides towards assisting common custodians of elders such as social workers, nurses, investigators, and family members to identify trends toward abuse. Future goals from this work include the creation of a comprehensive new measure that would aid in reporting elder abuse, and recognition of those more prone to be perpetrators of elder abuse for earlier intervention and prevention strategies.

Grant Nelson

SC - Coastal Carolina University

Discipline: Interdisciplinary

Authors:

#1 Grant Nelson

Abstract Name: Making Science Accessible Through the Humanities

Grant Nelson, a first year Marine Science major will be conducting research based on gauging the cognitive abilities of fish through food-based reward. The goal of the project will be to assess the cognitive abilities of fish to differentiate between colors by utilizing the fish's food drive. During this process, Grant will be documenting the research through social media and will be monitoring how it is perceived by an online audience to gauge social media's effectiveness as a tool to educate or gain funding for future research in science. Grant will focus on combining Marine Science and the Humanities into a dual-pronged research approach that tackles both at the same time to gauge if scientific research can gain traction and support through social media, and how much support and interest research can gain in an online setting. Additionally, the other goal of the project is to assess the cognitive abilities of fish when it comes to recognizing cues, such as different colors or sounds associated with feeding. Throughout this whole process, Grant will be documenting all of the results and putting them into an entertaining format on a social media account. For example, the results for the week/day of the fish's progress could be posted through a meme, and then the engagement the content gets would be observed and recorded. The significance this research would have within the humanities would be that it could be a useful tool for modeling how people react to research. Will research be perceived well and supported by the public? Can people care about research that doesn't solve any real-world issues? Can scientific research, when formatted in a way that mirrors social trends, gain traction both for the field and popular culture?

Colin Nemeth

PA - Villanova University

Discipline: Psychology

Authors:

#1 Colin Nemeth

Abstract Name: Impact of chronic stress on fentanyl intake: a comparison between male and female c57BL6

mice

This research proposal explores the impact of chronic stress on fentanyl consumption in C57BL/6 mice, with the goal of addressing the escalating crisis of opioid misuse. The study extends existing research by investigating how exposure to a non-social stressor influences fentanyl intake and related behaviors across both male and female subjects. Two cohorts of 16-20 mice will undergo 21 days of variable stress or handling as a control. Fentanyl consumption will be assessed using a modified drinking-in-the-dark (DID) paradigm over four days following the stress period. Statistical analysis will utilize repeated measures two-way ANOVA to evaluate the effects of stress, sex, and time. The findings aim to enhance our understanding of stress-induced vulnerability to opioid addiction and reveal sex-specific differences in substance use disorders. The research holds significant potential for informing targeted therapeutic strategies for opioid use disorder. Future directions will focus on examining cellular and molecular changes, optimizing stress exposure protocols, and evaluating stress-relief interventions. Ultimately, this study seeks to provide critical insights into the neurobiological mechanisms linking stress and opioid addiction, paving the way for more effective prevention and treatment strategies.

Grishma Nepal

VT - Norwich University

Discipline: Psychology

Authors:

Abstract Name: The Impact of Body Positivity on Mental Health and Wellbeing in South Asian Communities

This research explores the influence of body positivity on the mental health and well-being of South Asian communities, focusing on the effects of beauty standards and media portrayals of ideal body types. In South Asian societies, traditional beauty norms often prioritize fair skin and slim body types, which can lead to body dissatisfaction and contribute to mental health challenges, particularly among women. By analyzing existing surveys, interviews, and media representations, this study examines how these cultural ideals shape individuals' self-esteem, body image, and overall psychological well-being. The research also highlights the impact of promoting body positivity as a counter to harmful societal pressures, showing its potential to improve mental health outcomes, reduce stigma, and foster healthier body image perceptions. The study emphasizes the need for inclusive and culturally sensitive approaches to mental health interventions, aiming to challenge these beauty standards and promote positive self-image within South Asian communities. The findings contribute to the broader understanding of body image issues and mental health, suggesting that increasing awareness and acceptance of diverse body types can help mitigate the adverse effects of body image dissatisfaction.

William Nerad

WI - University of Wisconsin-Whitewater

Discipline: Geography/Geology

Authors:

#1 William Nerad

#2 John Frye

Abstract Name: An analysis of hail events to determine the location and vulnerability of "Hail Alley"

Hail storms heavily contribute to the significant amount of damage caused by natural disasters. With severe hail events rising, this topic's importance also rises. Historical hailstorm data was collected from the Storm Prediction Center for the U.S. and Environment Canada for Canada. Using this data, analysis was performed to try to identify the location of "Hail Alley", which is believed to be a region of North America where hail is more frequent and is also more severe (i.e., larger size). It is hypothesized that "Hail Alley" will closely align with Tornado Alley. This is due to the conditions leading to thunderstorms that are capable of producing large hail and can also produce tornadoes. The second part of this research examines and provides details about the vulnerability of this area. This examination will be an analysis of the various types of damage from hail storms where data is available to determine the most common occurring type of damage and the typical dollar amounts associated with them. Other factors that can determine vulnerability will include crop type, crop damage, and building material. The intended outcome of this project will allow many different groups of people (e.g. general public, insurers, meteorologists, etc.) to better prepare for hailstorms and create mitigation efforts.

Sophia Nevills

MN - University of Minnesota - Duluth

Discipline: Economics

Authors:

#1 Lacey Loomer

#2 Monica Haynes

#3 Lin Xiu

#4 Kim Dauner

Abstract Name: Age-Friendly Workplace Practices Among Regional Businesses in a Midwest State

The United States population is aging and driving an increase in the labor force participation of older adults. The proportion of older adults, aged 65 years or older, has increased 117% in the past two decades. Initiatives to become more age friendly are occurring at all levels, including states, communities, health care systems and businesses. The purpose of this analysis was to determine if businesses within the Duluth (MSA) area are implementing age-friendly workplace practices and if they aren't, what can be proposed to improve those working practices. This analysis used the Later Life Workforce Index (LLWI) which is a tool to assess an organization's practices to determine if they are catering to an aging workforce. The index categorizes the survey's questions into nine unique domains (e.g., organizational climate, leadership, work design). The analysis was conducted through the distribution of a survey. The survey was distributed to representatives of local businesses who were instructed to distribute it to their staff. In total, 16 businesses participated with 308 combined responses. The survey consisted of the LLWI domain questions along with some additional questions such as workplace demands, length of experience, educational attainment, and plans for after retirement. Our analysis examined the relationship between the LLWI domains and an individual employee's likelihood to leave their job. The findings identified several factors that could influence whether a person stays or leaves, including demographics, retirement options, and organizational climate.

sierra nevins

FL - Embry - Riddle Aeronautical University

Discipline: Business

Authors:

#1 Fernando D'Andrea

#2 Sierra Nevins

Abstract Name: Entrepreneurs make you fly: the business of Private Aviation

Using entrepreneurship theory, we investigate the private aviation industry, excluding corporate aviation, and how it proposes value to its consumers. To do so, we rely on secondary sources and, especially, on primary ones. We interview over twenty entrepreneurs involved in different parts of this industry - airport owners and operators, private flight brokers, private jet companies, original equipment manufactures, software developers, and more - and its value proposition chain. Contrary to the common conception about commercial aviation, the private aviation industry is guided by entrepreneurs and uses a lot of specialization, division of labor and coordination. Entrepreneurs in this industry must deal with constant changes in the market, in technology and in the regulatory environment to keep their businesses afloat. We see the private aviation industry as an insightful proxy to how understand entrepreneurship in general and how the market as a whole works.

Violet Newhart

KY - University of Kentucky

Discipline: Biology

Authors:

#1 M. Ashfaul Alam

Abstract Name: Developing Small Molecule Inhibitors to Block Agmatine Synthesizing Enzymes in Bacteria

Colorectal cancer (CRC) is the second most common cause of cancer-related death in the United States. Growing evidence suggests that bacteria may affect CRC directly or indirectly by secreting metabolites, invading tissues, and modulating host immune responses. Dysbiosis of the gut microbiome and specifically the overgrowth of *E. coli* is consistent with the toxic microbial environment of CRC. Additionally, it has been found that exogenous polyamines promote the proliferation of CRC cells. Therefore, this study aimed to develop a screening assay to inhibit polyamine production in *E. coli* by targeting a key biochemical pathway. The bacterial metabolic pathway of interest was arginine decarboxylase (SpeA), which converts arginine to agmatine and produces the polyamines spermidine and putrescine. Through inhibiting this potentially harmful biosynthetic pathway it could reduce exogenous polyamines in the CRC microenvironment and inhibit the overgrowth of *E. coli*. The results from the current progress of this project indicate that two transformant strains of *E. coli* capable of producing the SpeA protein have been created, His-tagged SpeA enzymes have been successfully overexpressed and purified, and an immunoblotting method to investigate the enzymatic functionality and inhibition of SpeA was developed. Thus, this research project led to the establishment of a molecular platform that will enable the identification of SpeA inhibitors and new therapeutic strategies for treating CRC.

Trista Newman

PA - Duquesne University

Discipline: Biochemistry

Authors:

#1 Nicholas Frankos

#2 Elias Griffin

#3 Aiden Lane

#4 Thomas Montgomery
#5 David Heisler

Abstract Name: Screening Triazole Derivatives for their Antibacterial Potential against Foodborne Pathogens

Antibiotic-resistant pathogens are one of the leading global health crises of the 21st century, causing ~48 million infections and \$75 billion in healthcare costs annually. It is estimated that by 2050, an average of ~3,000 people will have died from antimicrobial-resistant pathogens every minute. Thus, developing new antimicrobial agents has become crucial to improving public health. Recent works suggest that azole-containing compounds can be functionalized to bind to various enzymes, proteins, and receptors. As a result, they possess the potential to be developed into novel antibiotics. An initial library of azole-containing compounds was produced and then screened for their antibacterial potential against common foodborne pathogens (*Salmonella*, *E. coli*, *Shigella*, and *Listeria*) by determining their zone of growth inhibition. We identified two compounds that exhibit strong anti-*Shigella* properties, with half inhibitory concentrations (IC₅₀) of 76 µg/ml and 129 µg/ml. Next, we determined how toxic these compounds were to mammalian cell lines by treating them with similar doses to the bacteria. We found that short-term exposure to the compounds caused minimal damage to the cells, but over longer time frames, some compounds were very toxic. Work is ongoing to further develop these compounds to reduce the toxicity in mammalian cells while improving their anti-*Shigella* properties. Future research will focus on determining the mechanism of inhibition of these compounds on bacteria and determining how effective these compounds are at killing bacteria during bacterial infections of mammalian cells.

Ethan Newsom

KY - Morehead State University

Discipline: Biology

Authors:

#1 Christian Lowe

#2 Janelle Hare

Abstract Name: Identification, Quantification, and Modeling of Novel DdrR Interaction Partners

Acinetobacter baumannii is an opportunistic pathogen with increased mutagenesis opportunities that contribute to its high levels of antibiotic resistance. Unlike other pathogens, *Acinetobacter* represses its mutagenic polymerases, which are upregulated in response to DNA damage, with the coregulators UmuDAB and DdrR. Although UmuDAB is analogous to LexA, the unique DdrR protein provides *Acinetobacter* with additional regulatory control. Identifying the proteins that DdrR interacts with could provide new drug targets, considering the CDC declaring the pathogen “an urgent public threat”. Through extensive screening of a gDNA library created using the EUROMEDEX bacterial adenylate cyclase-based two-hybrid system (BACTH) protocol, we identified two protein fragments that interact with DdrR. These protein fragments come from KZA74_19365, a hypothetical plasmid replication protein, and KZA74_16005, a phosphogluconate dehydratase. We characterized these positive interactions by quantifying activity and modeling protein structures. We used a β-galactosidase assay to quantify the interactions between DdrR and the identified library protein fragments. The hybrid protein containing KZA74_16005 had higher Miller units when interacting with DdrR than the hybrid protein corresponding to KZA74_19365. We used the online modeling programs I-TASSER and AlphaFold2 to predict the interaction domain and configurations of KZA74_19365 and KZA74_16005 hybrid proteins with DdrR. AlphaFold2 modeling of each hybrid library protein with the associated DdrR hybrid protein showed the library insert peptide located adjacent to DdrR. Further testing will elucidate the mechanism by which the protein-protein interactions occur and if the interaction occurs *in vivo*. We will also continue to identify additional DdrR-interaction partners through the creation of new genomic DNA libraries with larger insert sizes of 1-2 kbp.

Jonathan Ng

CA - University of California - Los Angeles

Discipline: Biology

Authors:

#1 Erina Vlashi

#2 Justine Bailleul

Abstract Name: Targeting Serine Metabolism to Boost Immune Response to Radiation Therapy in Glioblastoma

Glioblastoma (GBM) is the most common primary brain tumor with a dismal prognosis despite aggressive treatments. Radiation therapy (RT) is an indispensable component of GBM treatment. RT initially controls these tumors, but they inevitably recur due to intractable radioresistance, and modern immunotherapy approaches have failed to move the needle in this disease. We have previously shown that metabolic plasticity is an important driver of RT resistance in GBM. Our current data point to serine metabolism as a crucial player in both tumor growth and therapy resistance in GBM, in part by modulating anti-tumor immune responses. In this study, we investigate the complex interplay between serine metabolism, immune checkpoint molecules (PD-L1), antigen presentation machinery (MHC-I), and immune cell infiltration in GBM. We hypothesized that manipulation of serine metabolism would impact these key immunomodulatory factors, consequently rewiring the tumor immune landscape. Depriving GBM cells of extracellular serine results in the upregulation of key enzymes involved in its biosynthesis from glucose, phosphoglycerate dehydrogenase (PHGDH), and phosphoserine phosphatase (PSPH), as measured via western blotting. Moreover, using flow cytometry we demonstrate that serine/glycine depletion leads to upregulation of both PD-L1 and MHC-I expression in GBM cells in vitro. This seemingly paradoxical effect points to a complex role of serine metabolism in shaping the GBM immune microenvironment, potentially influencing both immune evasion and recognition patterns. Our findings highlight the intricate relationship between serine metabolism and immune regulation in GBM, suggesting that targeted manipulation of this pathway could have far-reaching effects on the tumor immune landscape, potentially improving outcomes for GBM patients.

Alpha Ngo

KS - University of Kansas

Discipline: Political Science

Authors:

Abstract Name: Gaming in China: The Chinese Communist Party's 13th 5-year Plan effects on China's mobile gaming industry

As part of China's 13th 5-year Plan, the Chinese Communist Party (CCP) is trying to develop and promote Chinese soft power by implementing strategies to accelerate the development of new types of cultural enterprises. This research explores how the CCP utilizes the 13th 5-year Plan to mobilize China's mobile gaming industry in advancing Chinese soft power. The research will examine China's mobile gaming industry as a tool of soft power within the context of the 13th 5-year Plan's development goals to update information found in previous cultural industry development studies. I will examine the CCP's 13th 5-year Plan to identify the CCP's values in cultural enterprises and compare the CCP's attitudes on cultural development to Chinese mobile gaming organization's rhetoric highlighting policy influence on China's mobile gaming

industry. The results may show the CCP's 13th 5-year Plan on cultural development influences China's mobile gaming industry. The CCP is applying political pressure on China's mobile gaming industry to internationalize cultural gaming products thus increasing China's branding. Therefore, the research will illustrate how the CCP's 13th 5-year Plan deploys China's mobile gaming industry to increase China's international image amidst the destruction of language of culture of ethnic minorities in China.

Ryan Nguyen

NJ - Rutgers the State University of New Jersey

Discipline: Biology

Authors:

#1 Edward Chuang

#2 Monica Driscoll

Abstract Name: Elucidating the Role of Lipid Regulation and Membrane Dynamics in Exophergogenesis

Exophers, first discovered in the *C. elegans* model organism, are notably large (3-4 μm) membrane-bound vesicles containing protein aggregates and organelles that can be extruded from neurons. Hypothesized as a waste disposal system, this process has potential implications in the pathology and treatment of neurodegenerative disorders like Huntington's, Alzheimers, and ALS. Uncovering the mechanism underlying exophergogenesis can offer valuable insight on therapeutic targets for tackling these diseases. Triggered by multiple stimuli such as starvation and the presence of eggs, there is rising interest in exploring the role of lipids in this phenomenon. Specifically, knockdown of lipid synthesis genes essentially abolished the starvation induced exopher increase. Building on this foundation, this study aims to define a working model of how lipid regulation and the cellular membrane interact with exophergogenesis, constituting a significant advance in the mechanistic understanding of both lipid biology and large vesicle extrusion. To elucidate the role of cholesterol in exophergogenesis, we performed complete deprivation in worms via growth on cholesterol-free plates. Additionally, we conducted RNAi knockdown screens via bacterial delivery of dsRNA targeting genes involved in membrane dynamics and lipid pathways, with knockdown limited to neurons. These studies utilize *C. elegans* worms that express a fluorescent mCherry reporter in the touch neurons for clear visualization. Quantification will involve counting exopher-forming neurons in adult animals across triplicate trials of 50 animals each. To examine the lipid membrane structure of an exopher, we will conduct fluorescence recovery after photobleaching (FRAP) studies on the exophers of animals that have varying membrane fluidities. Ultimately, our results will determine the role of lipid regulation in exophergogenesis. We expect that disrupting lipid homeostasis will result in increased exophers.

Christine Nguyen

VA - Christopher Newport University

Discipline: Interdisciplinary

Authors:

#1 David Salomon

Abstract Name: Power, Psychoanalysis, and Teenage Chaos: A Freudian and Foucaultian Reading of Heathers

Although it seems that Freud's theories regarding psychoanalysis and Foucault's philosophy on power do not necessarily go hand-in-hand, both theoretical approaches offer perspectives on the 1998 teenage thriller movie Heathers. This paper asserts that combining the two thought systems provides an analysis that

addresses multiple themes and offers a rich interpretation of the film. By applying Foucault's work on power relations, discipline, and knowledge, the paper examines the power struggles between characters in the film and then proceeds to discuss the rationales behind those characters' actions using Freud's theories regarding consciousness. Standing alone, Foucault's analyses may only explain the apparent tensions regarding power, discipline, and control. Furthermore, Freud's interpretation of the film alone would merely serve as an explanation for a few themes regarding psychoanalysis among the multitude of subject matters that can only be complemented by Foucault's philosophical theories. Foucaultian power and Freudian psychoanalysis do not seem to be relevant to one another on the surface, but the complexity of the characters in *Heathers* demands a marrying of the two for a thorough interpretation. Foucault's philosophy on power relations speaks to the intended message of the film that society is manipulative and controlling while a Freudian approach examines the internal motivations of the characters as they are integrated and influenced by that society.

Duyen Nguyen

CO - Regis University

Discipline: Biology

Authors:

#1 Duyen Nguyen

#2 Thu Huynh

#3 Trinity Wright

#4 Thomas Nguyen

#5 Khanh Bui

#6 Kimberly Cadiz

#7 Bethany Lucas

#8 Allyson Sterling

Abstract Name: Exploring the domains of the protein Nur77 and its ability to bind to specific proteins present in immune cells

The immune system protects the body from infection by fighting against pathogens. The mature T-cell is a cell of the immune system and assists with killing pathogens. Mature T cells develop from immature T-cells to become fully functional. The T-cell receptor (TCR) plays an important role in recognizing specific pathogens and triggering T-cells to respond. Nur77 is a protein that regulates cell death response due to strong TCR during T cell development. Mature T cells also make Nur77 protein in response to TCR engagement, but its function in these cells is currently unknown. The Nur77 protein structure is composed of three domains: Activation Function 1 (AF1), DNA Binding Domain (DBD), and Ligand Binding Domain (LBD). This project aims to explore how the different domains of Nur77 can bind to other proteins in different types of T cells to further elucidate the function of Nur77 beyond its known role in developing T cell death. We created DNA that will make the Nur77 protein in yeast cells and divided the Nur77 protein into its multiple domains. Next, a yeast two-hybrid (Y2H) screen will be used to discover novel protein(s) that can bind to Nur77 and/or confirm previously described Nur77 binding partner(s). This research will advance our knowledge and understanding of T cell development and function by identifying Nur77 protein interactions, which will be used to more fully elucidate Nur77 function in different types of T cells.

Tiffany Nguyen

VA - George Mason University

Discipline: Engineering

Authors:

#1 Jeffrey Moran
#2 Amit Singh

Abstract Name: Nanoparticle-Mediated Delivery of Therapeutics for Idiopathic Pulmonary Fibrosis

Idiopathic pulmonary fibrosis (IPF) is a devastating and often fatal disease in which excessive scar tissue builds up in the lung, causing the lungs to stiffen and lose functionality. There is no curative treatment for IPF except transplantation. Furthermore, existing treatment options for IPF are limited: only two drugs have received FDA approval to treat this disease, and both have limited efficacy and severe side effects. This project aims to explore a nanotechnology-based strategy to selectively deliver therapeutic agents to targeted locations within the fibrotic lung tissue. Recent literature has shown that inflammation plays a key role in the progression of IPF, so as a model drug payload, we chose Tofacitinib (TOFA), an anti-inflammatory drug. To enable targeted delivery, we are testing whether decorating TOFA particles with magnetic iron oxide nanoparticles (IONPs), forming “TofaBots,” can enable magnetically guided delivery of TOFA directly to regions where the drug will have the greatest effect, namely the regions where fibroblasts (the main cellular drivers of fibrosis) and scar tissue accumulate. The size and morphology of IONPs and TofaBots are characterized using dynamic light scattering (DLS) and scanning electron microscopy (SEM). Using externally applied magnetic fields, we demonstrate that TofaBots can actively penetrate biomimetic hydrogels that function as in vitro models of fibrotic lung tissue; the speed of TofaBots’ magnetically driven motion increases as the gel concentration decreases. Finally, we are actively exploring whether the motility of the nanoparticles can be enhanced by coating them with an ECM-degrading enzyme, such as collagenase. We hypothesize that more effective drug distribution at disease sites can enable more efficacious therapies for this enigmatic and devastating disease.

Hiep Nguyen

PA - Villanova University

Discipline: Computer Science

Authors:

#1 Hiep Nguyen
#2 Justin DeBenedetto
#3 Lynn Yip

Abstract Name: Automatic Quality Estimation for Data Selection and Curriculum Learning

The accelerating increase in the size of language models (LMs) in recent years has led to an increase in the amount of training data required for training. While these larger models have shown strong performance, their use comes with added training and data costs, can be resource-prohibitive, leading to a shift of large LM research from academic to industry. This research focuses on exploring quality estimation as a method of data selection or filtering. This approach was applied to machine translation models with varying data sizes as well as to the BabyLM Challenge. Given the 100M word dataset provided in the BabyLM Challenge, we preprocessed data involving removing blank lines and special characters, with a focus on dialogue-related elements. The sentences within each dataset were then rearranged based on length to streamline the training process. After preprocessing, the sentences were translated from English to German using base translation models from fairseq. We then conducted several experiments to test out various strategies for selecting 10M words for pretraining and use a curriculum learning approach based on the quality estimation scoring. The experiments varied based primarily on: (a) the order of training – ascending or descending (original curriculum learning) order of xComet quality estimation scores (equivalently, reversed machine comprehension level); (b) the separation or combination of datasets from various sources; (c) the number of hidden layers and heads during model training. After filtering and training, models were evaluated using a standardized evaluation pipeline provided by the organizers to compute their scores on the BLiMP and EWoK benchmarks. We have found small improvements in certain data settings.

Anh Nguyen

PA - Allegheny College

Discipline: Communications

Authors:

Abstract Name: Divide and Rule: The Political Use of Humor in Trump's Tik Tok Campaign

Historically, humor has been used as a rhetorical tool for social and political critiques. The use of Millennial and Gen Z humor on social media today, highlights the way in which humor has become a norming strategy, particularly when it concerns ideologies about race and gender. A popular colloquialism in circulation, "It's just a joke," points to how humor can empty the political and trivialize serious socio-political issues. In this paper, I perform an ideological analysis of Trump's 2024 election campaign TikTok videos to examine how Team Trump effectively established the candidate's legitimacy and authenticity among online viewers, through the strategic use of humor in these communications. The findings show that online humor, even when it is scapegoating or derisive, can enhance a candidate's appeal by emotionally and ideologically resonating with an audience, and by successfully consolidating these appeals into an affective logic that builds off the social media platform's dynamics and communication rules. This research underscores the dual role of humor in political discourse as both a unifying and divisive force and contributes to earlier communication research on political humor (Bateson 2017; Meyer 2000; Lynch 2002; Becker & Baumgartner 2020; Penney 2020). Drawing on Carola Schoor's theorization of political style -- rhetorical, social, and ideological -- this analysis demonstrates how, in the cultural spaces formed by social media, humor triumphs above critical thinking by favoring relatability. The findings highlight the persuasive power of social media humor when coupled with political discourse in perpetuating discriminatory ideologies and enabling political divides.

Nhi Nguyen

WI - University of Wisconsin-River Falls

Discipline: Biology

Authors:

Abstract Name: Rapid "Blebbing" Large-scale Motility observed in 2D and 3D Cultures of Breast Ductal Cancer Cells (MCF-7)

Breast cancer is the most common cancer in women worldwide and second most common in the United States, with 670,000 deaths reported globally in 2022 and an estimated 42,250 U.S. deaths expected in 2024. Breast cancers result from a complex interplay between genetic backgrounds and microenvironments but are fundamentally a disease of tumor cell behaviors. Therefore, defining cancer-related behaviors and phenotypes provides an approach to understanding and addressing this important disease process. This poster presents preliminary results on the motility behaviors of breast ductal adenocarcinoma cells in 2D and 3D cultures, using "normal" ductal epithelial cells (MCF10A) as controls. First, we examined cellular cytoskeletal components actin and tubulin using fluorescent staining/immunolabeling in 2D cultures. This was followed by time-lapse photomicroscopy of 2D cultures to correlate labeling data with motility features like filopodia and lamellipodia. Finally, we employed SEM coupled to a 3D bone matrix to explore evidence of motility features at the ultrastructural level and sought to correlate these to observations from the other two study approaches. Results to date show: Time-lapse studies reveal significant differences in motility between breast cancer cells and ductal cells. MCF7 cells exhibit "blebbing" motility, while MCF10A cells display classic

lamellar motility. The studies also show that blebbing motility is substantially faster in positional change and directional shifting compared to lamellar motility. Ultrastructural studies of MCF7 cells in 3D bone scaffolds reveal blebbing structures, various filopodial forms, and modified lamellar-like features linked to matrix invasion activities. Staining/labeling studies show actin brightly staining the blebbing structures of MCF7 cells, while tubulin does not label these blebs substantially. However, tubulin is extensively present in lamellar-like structures in both MCF7 and MCF10A cells. These findings highlight distinct motility patterns in MCF7 breast cancer cells compared to normal MCF10A ductal cells, consistent across various culture microenvironments.

Vincent Nguyen

CO - Regis University

Discipline: Biology

Authors:

Abstract Name: Creating His-tagged Notch1 plasmid as a positive control for Nur77 protein binding assay

The immune system works to prevent disease and keep the body healthy. It is split into two primary systems: the innate (basic, quick defense) and the adaptive (specialized, targeted defense) systems. The adaptive system contains conventional T-cells that work using T-cell receptors (TCR) to identify and respond to harmful pathogens. Another type of T-cell, the regulatory T cell, also uses a TCR to identify targets, but its role is to suppress unwanted immune responses, preventing autoimmune diseases such as type 1 diabetes. After a TCR identifies and sticks onto its target, the amount of a protein in the cell called Nur77 increases. Since Nur77 protein amounts increase in both types of T-cells, and the conventional and regulatory T cells have different functions, we aim to specifically investigate the function of Nur77 in these different types of T-cells. To meet this goal, we first utilized a yeast screen to discover novel protein(s) that can bind to the Nur77 protein. Several candidates were previously discovered with this approach, so in this project we created the tools to confirm findings using a pull-down assay. The pull-down is a follow-up test to make sure the proteins actually stick together, directly visualizing binding between Nur77 and the other protein(s). We created the positive control plasmid DNA that will make the Notch1 protein linked to a His-tag so that the Notch1 protein can be easily isolated and purified. Notch1 is known to interact with Nur77 and will serve as a positive control for our pull-down. Future steps are to optimize protein purification and complete the pull down assay for the positive control. By understanding the role of Nur77 in different types of T-cells we can better understand the functions of T-cells as well as their unique functions in disease control and autoimmune diseases.

Linh Nguyen

FL - University of South Florida

Discipline: Biology

Authors:

#1 Shuai Wang

#2 Gopal Thinakaran

Abstract Name: The role of YTHDF1 in regulating neuroinflammation induced by lipopolysaccharide

YTH N6-Methyladenosine (m6A) RNA Binding Protein 1 (YTHDF1) is a classical reader protein that binds to m6A-modified transcripts to regulate their translation; but its role in Alzheimer's Disease (AD)

pathophysiology, particularly in neuroinflammation, a key factor of AD, remains poorly understood. Our goal is to explore YTHDF1's role in the context of neuroinflammation and gain molecular insights by employing mouse and cell models. We hypothesize that YTHDF1 modulates lipopolysaccharide (LPS)-induced neuroinflammation both in vivo and in vitro. Control and Ythdf1^{-/-} mice were injected with LPS, then RNA was isolated after 1 day (acute) or 4 day (chronic LPS challenge) and quantified by RT-qPCR. The result shows that YTHDF1 limits the induction of acute inflammatory response but attenuates chronic inflammation in response to peripheral LPS administration. We further explored the cellular mechanism by knocking out the YTHDF1 in microglia like cell line, C20. Lipid droplets and myelin phagocytosis experiments were applied to cultured YTHDF1 KO and WT cells. Loss of YTHDF1 reduces the myelin phagocytosis function of the cell and there is less lipid droplets observed compared with WT cells. This observation is extremely relevant because it is becoming evident that failure of immune resolution underlies chronic inflammation and subsequent neurodegeneration in AD. Overall, our findings suggest that YTHDF1 could play essential roles in a LPS induced neuroinflammation model.

Hoang-Vu Nguyen

TX - San Jacinto College

Discipline: Mathematics

Authors:

Abstract Name: Eudoxus of Cnidus and Method of Exhaustion

Eudoxus of Cnidus (c.390-c.340 BCE) was the world's greatest mathematician before Archimedes. He made significant contributions to astronomy and philosophy. History remembers him as the person who proposed a Method of Exhaustion. This project explores Eudoxus' formulation and application of the Method of Exhaustion, which is used to find the area and volume of a shape by inscribing polygons inside of it, with an increasing number of sides. This method was deemed a precursor to integral calculus and set a foundation for many concepts that were used by later mathematicians. Also, this study analyzes Eudoxus' invention in comparison to the modern limit theory. Owing to that, emphasized Eudoxus' mathematical thought and his influence on both ancient and modern mathematics.

Alexander Minh Tuan Nguyen

CA - University of California - San Diego

Discipline: Economics

Authors:

#1 Minh Tuan Nguyen

Abstract Name: Accessibility to Firearms and Dynamics of Domestic Violence Homicides in the United States

Domestic Violence (DV) is a rising concern in the U.S. that imposes social costs, such as by lowering productivity and labor force participation. The availability of firearms and deadly weapons elevates the chances of homicides, including those from DV incidences. Therefore, states have enacted Extreme Risk Protection Order (ERPO) policies to minimize homicides involving the use of firearms and their impacts. Compared to the state policy Domestic Violence Restraining Order (limited to intimate/dating relationships), this policy allows broader relationships to petition an immediate court order against those being suspected of harming others or themselves from possessing and purchasing firearms. My study will look into total cases involving extended family members, alongside controlling for the effects of DVRO. The average impact of ERPO and heterogeneity by gun ownership shares across states will be estimated using an event-study strategy with the panel data from the Uniform Crime Report from 2012-2021. After controlling for multiple factors, there is no evidence supporting the effect of ERPO on DV homicide cases, regardless of the type of relationship. The findings of the research will help inform policymakers on how to design effective policies against domestic violence.

Anya Thaovan Nguyenkhoa

CA - Chapman University

Discipline: History

Authors:

Abstract Name: Interwoven Histories of Los Angeles's Ethnic Communities

In modern day Los Angeles, the three largest minority groups that make up the city are Hispanic or Latino, Asian, and African American. These communities are credible pillars of the Los Angeles we know and love today, and are able to further warrant their place in Los Angeles culture through their complex and weaving histories. During World War II, those of Japanese descent were indiscriminately relocated and incarcerated into internment camps after the bombing of Pearl Harbor. The internment and thus the absence of Japanese in Los Angeles made room for Black Americans during a time of scarce segregated housing, introducing the development of Black communities like Bronzeville. As pillars of California's agricultural industry at the time, the absence of Japanese Americans also created a significant labor shortage that led to the creation of the Bracero Program, a short-term contract labor program that brought millions of Mexican workers to the United States. After the dissolution of the relocation and internment orders, Japanese Americans were confronted with newcomers that seemingly took their place. In this confrontation, Japanese Americans, Black Americans, and Mexican Americans were met with each other and their own biases and prejudices, thus leading to areas of both discomfort and conflict, and coexistence and coalition. My research demonstrates the interconnectedness of Los Angeles's ethnic communities and how their wartime experience shaped relations between African, Japanese, and Mexican Americans. This study illustrates how citizenship, race, ethnicity, and national boundaries have been dynamically constructed and negotiated. This project relies on Proquest's Historical Black Newspaper database and The California Digital Newspaper Collection to look at ethnic

affinity-organized newspapers like the Calexico Chronicle, the Los Angeles Sentinel, and the Pacific Citizen and how each publication wrote about Japanese internment and resettlement from 1942 through 1952.

Anya Thaovan Nguyenkhoa

CA - Chapman University

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

Abstract Name: Acting Religion: Analyzing the AIDS Crisis Through Religious Response

During the HIV/AIDS crisis of the 1980s, the association between the disease and homosexuality led the country down a dangerous path; homophobia created systematic barriers that restricted research, treatment, and a potential cure. For people with AIDS, community support served as one of the best treatments outside of medication and therapy. Across the country, communities—whether from partners, peers, family, or religious institutions—came together to provide aid and care. My paper demonstrates the different ways that AIDS fits into different religious frameworks regarding compassion and illness and how it manifested itself in the 1980s. In my research, I have categorized the varying response of different religious constructions into three groups: blame, embrace, and help. While these categories are distinct, they all demonstrate the ability of different religious constructions to separate sexual morality and illness which ultimately led to their support or abandonment of people with AIDS. Groups like Christian fundamentalists have defined AIDS as a divine punishment. Hence, they blamed those who have failed to comply with traditional norms of sexual morality and reasoned illness and death as natural consequences. In other cases, religious groups embraced people with AIDS, as the disease was separated from sexual morality and conceptualized as an illness. Representatives of these groups, like Buddhists and some Reform Jews, participated in community organizing for people with AIDS and pushed for preventative care measures. In the final example, religious groups acknowledged HIV/AIDS as a public health crisis but were careful to demonstrate their care and compassion for the sick without explicitly condoning the homosexuality. In this 'love the sinner, hate the sin' example, these groups were willing to help those with AIDS, but while also helping themselves by utilizing AIDS as clear medical validation for their moral teachings on homosexuality.

Mai Ly Nguyen-Luu

FL - University of Central Florida

Discipline: Sociology

Authors:

#1 Angela Vergara

Abstract Name: Attitudes and Perceptions of Mental Health in the Vietnamese Community: A Comprehensive Analysis

This thesis explores the complex and multifaceted landscape of attitudes and perceptions toward mental health within the Vietnamese community, emphasizing the cultural, social, and generational factors at play. Mental health issues remain a significant global concern, and understanding how these issues are perceived and addressed within specific cultural contexts is vital for effective mental health promotion and intervention. In the case of the Vietnamese community, the interplay of cultural values, stigmatization, and access to mental healthcare services makes this study particularly relevant. Additionally, the study highlights the role of cultural competency among mental health professionals and the availability of culturally relevant resources.

Key factors such as traditional beliefs, familial roles, collectivist values, social norms, and historical influences, like the Vietnam War, are briefly explored in their impact on attitudes. Fear of gossip and concerns about reputation emerge as primary barriers to seeking help. However, existing research often lacks a comprehensive analysis of these influences and fails to account for generational and locational differences. This thesis addresses these gaps by examining how age and environment interact to shape mental health perceptions within this minority group. Using survey data from Vietnamese individuals in both the United States and Vietnam, this study evaluates age and location as independent and combined factors. Findings suggest that immigrants often hold false beliefs of superior mental health, younger individuals and those in the U.S. exhibit more positive perceptions, and most participants attribute mental health challenges to life circumstances but still have faith in biomedically based treatment. By shedding light on the complexities of mental health within this community, this research contributes to the broader discourse on culturally competent mental healthcare and advocates for strategies that promote mental well-being while respecting cultural values and traditions.

Ariel Nicastro

TN - Middle Tennessee State University

Discipline: Physics and Astronomy

Authors:

#1 Ariel Nicastro

Abstract Name: Improving ZnO Nanoparticle Synthesis and Applications

Zinc oxide (ZnO) is a biocompatible inorganic semiconductor with light-emitting and semiconducting properties, making it ideal for use in technological applications. This study focuses on optimizing the hydrothermal synthesis of ZnO nanorods to achieve highly crystalline structures with diameters below 50 nm and optimized length-to-diameter ratios. These dimensions are essential for enhancing the performance of ZnO-modified electrochemical sensors, which rely on the properties of ZnO for improved sensitivity, accuracy, and scalability. The synthesis process was optimized by varying autoclave temperature and surfactant concentrations to identify the best conditions for ZnO nanorod growth. X-ray diffraction was used to confirm the crystallinity of the ZnO nanorods, while scanning electron microscopy (SEM) and transmission electron microscopy (TEM) provided detailed morphological characterization of the nanorods, confirming their desired size and shape. UV-visible spectroscopy showed strong absorption around 370 nm, indicating a direct bandgap of approximately 3.35 eV, consistent with the expected properties for ZnO. The electrochemical performance of the ZnO nanorods was evaluated using cyclic voltammetry, which tracks the current response under varying voltage conditions. The results are hypothesized to show significant improvements in sensitivity and stability compared to non-optimized ZnO, highlighting the importance of controlled synthesis in achieving the desired electrochemical characteristics. Future research will focus on further refining the integration of ZnO nanorods with electrode materials, and investigating potential applications in biosensors and photoelectric devices. By addressing challenges in the synthesis and characterization of ZnO nanorods, this study lays the groundwork for more reliable and cost-effective ZnO-based sensors, advancing their use across various fields such as environmental monitoring, medical diagnostics, and industrial applications.

Emma Nicholas

OK - University of Central Oklahoma

Discipline: Economics

Authors:

#1 Kuang-Chung Hsu
#2 Neil Metz
Callan Snider

Abstract Name: The Pressure Game: Linking Stress and Performance in College Soccer Players

The relationship between pressure and athletes' performance has been a longstanding topic of debate in the literature. Soccer players frequently encounter numerous stressful moments during games. Many studies have focused on examining the effects of stress on performance, often centering on high-pressure situations such as penalty kicks and shootouts. For example, Jordet et al. (2007) analyzed international soccer tournaments and found that players often underperform in high-pressure scenarios due to heightened anxiety. This anxiety disrupts motor coordination and decision-making, leading to execution errors. In this study, unlike previous research, we monitor players' performance under varying levels of stress throughout entire games. Each player wore a tracker during matches, which recorded metrics such as heart rate, running distance, recovery data, and workload management. We used heart rate as a proxy for mental pressure and team scores as a measure of team performance. After employing econometric regression analyses, our findings indicate that pressure significantly impacts the performance of college soccer players. Players who experienced elevated heart rates, indicative of higher mental pressure, often exhibited decreased physical output and decision-making efficiency during critical moments. Conversely, players who maintained a steadier heart rate performed more consistently, suggesting a potential link between emotional regulation and athletic success. These results underline the importance of mental resilience and stress management in competitive sports. Incorporating psychological training and stress-reduction strategies into athletes' routines may help optimize performance, particularly during high-stakes scenarios. Future research could explore interventions to mitigate stress and further examine the interplay between physiological and psychological factors in athletic performance.

Benjamin Nichols

OH - The College of Wooster

Discipline: Chemistry

Authors:

Abstract Name: Determination of Conditions Causing the Leaching of Anticoagulant Rodenticides in Water

Anticoagulant rodenticide contamination in the environment has become a concern in recent years due to the rise in the use of rodenticides worldwide and the potential for more potent forms to enter ecosystems. The anticoagulant classification of rodenticides works by preventing blood clotting in an organism which eventually leads to internal hemorrhaging and mortality. One specific mode of environmental contamination is chemical leaching, which causes these rodenticides to release their active ingredient into natural bodies of water. Once entering these water systems, rodenticides can harm non-target wildlife, and potentially humans. This experiment examined contamination caused by the leaching of two rodenticide active ingredients, warfarin and brodifacoum. Warfarin and brodifacoum were chosen due to them being commonly used rodenticide baits that are chemically similar to one another, with warfarin being a first-generation rodenticide and brodifacoum being a second-generation rodenticide that is more potent. A dissolution apparatus was used to simulate different leaching conditions and their effect on the concentration of the two rodenticides in water, as measured with high performance liquid chromatography with tandem mass spectrometry (HPLC-MS/MS). Variable parameters including pH and stir rate were used to determine the rate and extent of leaching for different commercially available baits. Results provide valuable information regarding conditions that induce and increase leaching, helping to minimize future rodenticide contamination in the environment.

Faye Nichols

WI - University of Wisconsin-Madison

Discipline: Biology

Authors:

#1 Faye Nichols

Abstract Name: The facilitative impact of drought on the allelopathic effects of *Rhamnus cathartica* on *Lactuca sativa* germination and growth.

The invasive species, *Rhamnus cathartica*, has rapidly invaded natural plant ecosystems throughout the United States with its allelopathic chemical, emodin. Droughts are increasing in duration and severity due to climate change, yet no research has been conducted studying the effects of drought conditions on buckthorn allelopathy. A 14 day factorial experiment was implemented that measured the germination, survival, and biomass of lettuce seeds under four experimental conditions of buckthorn and watering to understand the potential long-term effect that climate change induced drought could have on buckthorn allelopathy. The results determined that drought enhances the detrimental effects of emodin leading to a decrease in adjacent plant germination rate and survival. Germination time and dry biomass were not statistically different between lettuce grown under conditions of buckthorn only and buckthorn & drought. Statistical analyses were conducted in R and translated into Microsoft Excel to provide conclusions after conducting a two-way ANOVA test, a Chi-Squared test, and a Wilcoxon Ranked-Sum test. Further research will be necessary to test the strength and duration of droughts associated with these results, in addition to research regarding allelopathy of other invasive plant species. This experimental design should also be applied to native species found in buckthorn invaded areas in order to generalize the results to real ecosystems. These findings could be crucial predictors for biodiversity and ecosystem functioning in upcoming years as global warming progresses.

Brayden Nichols

KY - University of Kentucky

Discipline: Architecture, Construction Management, and Interior Design

Authors:

#1 Lindsey Fay

Abstract Name: Exploring Positive Distractions in Pediatric Healthcare Design

This research investigates the role of positive distractions in healthcare environments, focusing on the use of architectural elements to improve patient well-being. Specifically, it examines features such as access to nature, color, and art installations in pediatric spaces, aiming to understand their impact on reducing stress, enhancing satisfaction, and promoting healing. Healthcare design has traditionally prioritized clinical efficiency over emotional and psychological considerations. However, research highlights the importance of incorporating elements that redirect patients' focus away from the clinical environment, known as positive distractions (Ulrich, 2000a). This research examined a study of literature that found substantial evidence supporting that natural elements significantly calm young people (Gill, 2014; Tillmann et al., 2018). By integrating biophilic features, or elements of nature, this research contributes actionable insights into creating holistic environments that cater to patients' emotional and physical needs. This study's methodology began with shadowing professionals across various departments at Lexington Shriners Hospital to gain a deeper understanding of healthcare operations and observe the application of design elements. Additionally, modeling programs were also examined, which align closely with tools used in architecture. A site visit to MUSC Shawn Jenkins Children's Hospital further provided real-world implementations of positive

distractions. These experiences, combined with qualitative research and patient feedback, shaped the findings of this research. The study's key deliverable was a design concept called Zoo to You, an immersive space for pediatric patients and their families. By incorporating biophilic elements and interactive features, this design offers a sensory-rich experience that provides stress relief for all ages. The research demonstrates that when available, positive distractions are actively used by patients and effectively improve their healthcare experience. These findings underscore the importance of designing spaces that foster healing, comfort, and connection, aligning with the evolving priorities of patient-centered care.

Jonethan Nichols

TX - Student Inquiry and Research at TAICAM

Discipline: Health and Human Development

Authors:

Abstract Name: Examining the Potential Impact of Phytochemicals on Oral Mucositis in the Pediatric Population

Oral mucositis is the inflammation and ulceration of the oral cavity that occurs in over 80% of patients undergoing cancer treatment to the head and neck. Pediatric cancer patients diagnosed with solid tumors or hematologic malignancies will have an increased rate of oral mucositis due to the treatment regimen. The cytotoxic nature of chemotherapy, radiotherapy, and stem cell transplants adversely affect mucosal cells and the salivary glands. Pediatric patients are at higher risk of developing oral mucositis than adults receiving the same treatment because children have faster basal cell turnover rates. Severe inflammation and pain resulting from oral mucositis make eating, drinking, and oral hygiene difficult. This difficulty places the pediatric patient at risk for malnutrition, dehydration, and infections of the oral cavity and bloodstream, all of which can be life-threatening. The purpose of this review is to provide evidence-based recommendations that are alternative and complementary to current treatments. These novel recommendations will serve to update patient education and expand treatment guidelines. Current protocols to treat mucositis and improve oral hygiene practices in the pediatric cancer patient population can dehydrate and irritate the oral mucosa and exacerbate painful conditions that may discourage healthy daily habits. This review's thorough analysis of the research identifies phytochemicals that provide multiple modalities for treating moderate to severe challenges to oral health and hygiene caused by oral mucositis.

Olive Nichols

VA - Radford University

Discipline: Psychology

Authors:

#1 Jessica Cantlon

#2 Marissa Laws

Abstract Name: Strategy-Dependent Brain Activity During Mental Rotation Using fMRI

Mental rotation of 2D and 3D objects is a test of visual-spatial skills. Mental rotation and mathematical reasoning skills rely on many of the same cognitive processes and areas of the brain, and improving mental rotation abilities can improve grades and retention in calculus and geometry classes. However, one remaining question is whether the strategy an individual uses to solve mental rotation problems can influence their cognitive and neural processing, which may ultimately predict performance and brain activity. To answer this

question, we used functional magnetic resonance imaging (fMRI) to observe brain activity while 55 adult participants (mean age 23 years) performed a 3D mental rotation task. Participants filled out a lab-developed mental rotation strategy questionnaire which assessed tendencies. Two strategy tendencies were investigated: (1) Holistic strategies (gestalt/manipulation of an entire object) and (2) piecemeal strategies (part by part or feature-based manipulation of an object). While there was not a significant effect of strategy on most of the behavioral measures and performance, activity in two regions of the brain correlated with strategy tendencies: the frontal eye fields (FEFs) and the dorsolateral prefrontal cortex (dLPFC). As brain activity in the FEFs increased, the tendency to use piecemeal strategy also increased, whereas holistic strategy tendency decreased. Meanwhile, as activity in the dLPFC increased, holistic strategy tendencies increased. Based on these findings, a possible interpretation is that holistic strategy usage involves “capturing the image” and mentally rotating it, requiring greater working memory. In contrast, piecemeal strategy usage may involve parsing the visual stimuli with frequent eye movements. This suggests that certain mental rotation strategies rely on corresponding cognitive processes but are equally effective strategies. We plan to investigate this interpretation further by looking at correlations with accuracy on calculation and working memory tests and looking at outcomes post-mental rotation training.

Delainie Nichols

TX - Student Inquiry and Research at TAICAM

Discipline: Interdisciplinary

Authors:

Abstract Name: Examining Cybersecurity Challenges in K-12 Schools

Cyberattacks on the education sector in the United States have risen to alarming rates among K-12 institutions over the past decade. During the pandemic, the frequency of attacks increased exponentially when K-12 institutions began to rely heavily on technology to teach, making schools easy targets for cybercriminals. These attacks have compromised the privacy of millions of students and have caused major financial losses in addition to disruptions to the use of technology in schools. The purpose of this review is to examine the underlying causes and to identify potential solutions for K-12 institutions. Articles detailing K-12 cybersecurity challenges were analyzed to determine the causes, frequency and types of cyberattacks on K-12 schools. The research found that many schools lack the resources and budget to secure their information technology systems, contributing to the ever expanding threat landscape allowing cybercriminals to continue targeting the education sector. K-12 institutions lack cyber education programs aimed at students, faculty, and staff thus increasing the risk of cyberattacks due to a lack of cyber awareness. In addition, many K-12 officials state that they have had limited to no support from government agencies regarding cybersecurity concerns. This review’s careful examination of current cybersecurity challenges facing K-12 institutions may produce long term effective strategies such as creating centralized resources, increasing cybersecurity education, and establishing minimum federal cybersecurity requirements for schools in order to protect the education sector from further exploitation, disruption, and harm.

Constance Nichols

PA - Grove City College

Discipline:

Authors:

#1 Constance Nichols

#2 Celia Debronsky

#3 Dylan Lane

#4 Dalton Foore
#5 Brady Brungard
#6 Ashley Beauchamp
Celia Dobransky
Dalton Foore

Abstract Name: From Aspiring Educators to Advocates for Leadership and Change Through Community-Based Action Research

This presentation explores how community-based action research empowers pre-service educators to grow into advocates for leadership and systemic change. Rooted in the course Leadership for Teachers, this approach focuses on equipping future educators with the tools to address real-world challenges through collaboration, advocacy, and actionable solutions. The course utilizes an action research approach to challenge students to identify and respond to pressing educational and community needs, such as supporting adolescents facing mental health crises or increasing access to extracurricular sports for children living in poverty. Students work in teams to design solutions, collaborate with community partners, and leverage campus resources to bring their projects to life. Through mentorship, they gain essential skills in networking, community engagement, and iterative problem-solving. While traditional undergraduate research often emphasizes publication, this model centers on action and impact. Students experience the complexities of real-world advocacy, navigating obstacles, and learning resilience through reflective practice. Mentorship plays a pivotal role in guiding students through these experiences, connecting students to impactful networks, and helping students transform challenges into opportunities for growth. These projects deepen students' understanding of educational systems and prepare them to lead with purpose and confidence in their future careers as educators committed to advocacy and meaningful change. This work shares practical insights into guiding preservice educators through impactful action research projects, with an emphasis on highlighting student voices to share how such experiences cultivate leadership, advocacy, and the ability to effect meaningful change, positioning students to make a lasting impact in the communities they serve.

Nia Nicholson

PA - Duquesne University

Discipline: Physics and Astronomy

Authors:

#1 Nia Nicholson
#2 Daniel Terrero Cepeda
#3 Miranda Chitwood
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#5 Nathan Carpenter
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Nathan Carpenter
Mohamed Soukret

Abstract Name: Deep Inelastic Production of Protons

Studies of the proton structure have been of large importance through prior decades and recent focus turned to the investigation of the target fragmentation region. We present studies of beam single spin asymmetries for semi-inclusive protons ($ep \rightarrow e'p'X$), produced in the TFR. Such measurements were performed with the CLAS12 detector in Hall B at Jefferson lab using a longitudinally polarized 10.6-GeV electron beam on an unpolarized hydrogen target. Results of this study captured the transition between the TFR and CFR regions showing a clear sign change in the single spin asymmetries for the protons. An update on the progress of the

analysis will be presented with a focus on suppressing the contributions of exclusive resonances from the deep inelastic process.

Zachary Nickischer

PA - Duquesne University

Discipline: Physics and Astronomy

Authors:

#1 Monica Sorescu

Abstract Name: Mechanochemical Synthesis and Characterization of Dysprosium Oxide-Hematite Magnetic Ceramic Nanostructures

Mixed oxide nanoparticle systems recently attracted considerable interest, due to their potential applications in sensing, catalysis, and flexible electronics. In this study, we synthesized dysprosium oxide-hematite nanostructures using mechanochemical activation by high energy ball milling at two molar concentrations and ball milling times of 0, 2, 4, 8, and 12 hours. The prepared systems were characterized by transmission Mossbauer spectroscopy and analyzed by least squares fitting using Lorentzian lineshapes. For 0-hours, the spectrum was fitted using a sextet with hyperfine magnetic field of 51.9 T, characteristic to hematite. Spectra of the milled samples were analyzed using additional sextets according to the model of local atomic environment. These sextets had lower hyperfine magnetic field values due to substitutions of non-magnetic dysprosium ions at the iron sites. The subspectra could be assigned to dysprosium-doped hematite. A quadrupole-split doublet with a quadrupole splitting of about 0.7 mm/s was needed to account for the superparamagnetic dysprosium iron perovskite (dysprosium orthoferrite) phase, whose particles are too small to be magnetic at room temperature. The doublet's abundance increased up to 52% at longer milling times. The reaction mechanism can be described using the equation $\text{Dy}_2\text{O}_3 + \text{Fe}_2\text{O}_3 \rightarrow 2\text{DyFeO}_3$. Several sextets in the spectra indicate the formation of solid solutions in the milled system. This can be explained by the difference in the ionic radii of the dysprosium and iron ions. Our results demonstrate that Mossbauer spectroscopy is a powerful technique for the identification of crystalline phases and inequivalent lattice sites in the system, based on analysis of their hyperfine parameters.

Niah Nieuwenhuis

AZ - Northern Arizona University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Françoise Brosseau-Lapr 

Abstract Name: Speech Perception and Production Variability in Preschoolers With and Without Speech Sound Disorders

Project purpose: We investigated the relationship between speech production variability and phonological processing to determine markers of a phonological speech sound disorder. Children with speech sound disorders (SSD) struggle to produce and perceive speech due to various causes (such as motor planning, articulation, speech perception), but a large subgroup of children are diagnosed with a phonological disorder. The ability to manipulate and process sounds of a language is called phonological processing. Lexical variability is measured across multiple repetitions of the same word and is thought to reflect the instability of a child's phonological representations for words. However, lexical variability occurs in both typically

developing (TD) children and children with SSD. Previous research also indicates that speech error types may account for differences in phonological processing skills; namely, omissions and atypical speech errors have been identified as indicators of poor phonological awareness (PA). PA skills are crucial in literacy development; thus, children with a phonological SSD are at-risk for later reading difficulties. To investigate the relationship between speech production variability and phonological processing, we measured segmental variability, lexical variability, types of speech errors, and speech perception in children with TD and with SSD. Twenty-four 4- and 5-year-olds, 12 with TD and 12 with a phonological SSD, were included in the study. Participants completed a battery of speech, language, oral-motor, and PA tests, a speech perception task, and the Word Inconsistency subtest of the Diagnostic Evaluation of Articulation and Phonology Test. Results indicate that after accounting for receptive vocabulary, segmental variability explains the most variance in phonological processing. Our results offer insight as to why children with SSD are variable in their speech production and how this differs from TD children.

Niah Nieuwenhuis

AZ - Northern Arizona University

Discipline: Health and Human Development

Authors:

#1 Chloe Mathison

#2 Lauren Tice

Basha Baran

Abstract Name: Effects of Mindfulness Health Education Lessons for At-Risk Adolescents: A Pilot Study

Project Purpose: This project sought to improve the mental health of underserved high school students through mindfulness-based intervention activities. **Background:** Mental health issues are rampant in Coconino County, Arizona, and are associated with a lack of health insurance, food and housing insecurity, and low socio-economic status. These factors are present in our target population, which is an eleventh-grade English class at Summit High School in Flagstaff, Arizona. Poor mental health is linked to poor academic performance, increased likelihood of substance use, poor decision making, and strained interpersonal relationships. This may decrease their quality of life and inhibit them from pursuing successful careers. **Methods:** Three health education lessons were delivered weekly to students aged 17 to 19. Students were provided journals and guided prompts to practice mindfulness, with incentives offered for the participants who journalled the most days over the course of the intervention. Education on healthy relationships was fostered through group discussion, a jeopardy game, and a “red flag/green flag” activity, where students were tasked with proposing healthy and unhealthy traits of relationships. Pre- and post-intervention surveys were used to evaluate participants' relational knowledge. Lastly, students learned about healthy coping mechanisms and emotional regulation through a lecture and class discussions; qualitatively, we measured the coping mechanisms they utilized while playing board games in teams. **Conclusions:** On average, students journalled for 7.2 days during the 14 day period of the intervention. 100 percent of students increased their knowledge concerning healthy relationships between the pre- and post-test. During board game play, 80 percent or more of students were observed practicing healthy coping mechanisms. Our results display that a mindfulness-centered classroom intervention may be a promising method for improving the mental health of at-risk teenagers.

Joel Nikula

MN - University of Minnesota - Duluth

Discipline: Psychology

Authors:
#1 Keith Young

Abstract Name: Examining the Impact of Stress on Recall for Everyday Scenes

Research suggests that long-term stress can negatively affect one's ability for memory retrieval (e.g., Klier & Buratto, 2020). Furthermore, extremely traumatic or emotional events are well recalled, but retrieval of peripheral details is unreliable (e.g., Marloe et. al, 2020). The aim of the current study was to examine a gap in the literature by investigating whether more typical stress levels and scene complexity impact memory recall of everyday scenes. Eighty nine participants were recruited from an undergraduate psychology pool who all received research credit for participation and were randomly assigned to one of three stress groups manipulated through differing instructions and/or a displayed timer (high - shown a 20 second timer, moderate - "exactly 20 seconds to view this scene", low - "limited amount of time to view the scene"). All participants viewed and memorized five simple and five complex scenes presented in a counterbalanced and randomized order. Each scene was followed by a five question quiz regarding recall of specific scene details. A mixed factorial ANOVA resulted in no significant main effect for the stress level and no significant interaction between stress and scene complexity. There was a significant main effect for scene complexity, with recall of simple scenes ($M = 72.83$) better compared to complex ($M = 61.36$) scenes. While there was no significant difference of recall accuracy between stress groups, future studies should be conducted using a stronger stress manipulation. Additionally, more research should further investigate recall of everyday scenes.

Akshitha Nimmagadda Sai

FL - University of South Florida

Discipline: Psychology

Authors:
#1 Akshitha Nimmagadda Sai

Abstract Name: Evaluating the Healthiness of Lifestyle Features Among College Students: A Judgment Analysis

People may think differently about what makes a healthy lifestyle. Relatedly, people may have different standards about what makes a healthy lifestyle for men versus women. The purpose of this study is to assess the subjective weights assigned to various cues, or lifestyle features (Exercise, Vaping, Eating a Vegetarian Diet, Gender) as student participants form judgments of the healthiness of hypothetical students. The secondary purpose is to determine the extent to which the gender of the hypothetical student influences judgments of healthiness. A questionnaire included 16 hypothetical profiles ($2 \times 2 \times 2 \times 2$ factorial design), and participants were asked to rate each profile on a scale from -10 (extremely unhealthy) to +10 (extremely healthy). The SONA system was used to recruit participants, 56 completed the judgment task. SPSS was used to determine the correlation between each of the cues and judgments of health. These correlations indicate the strength of each cue's influence, and were cluster-analyzed to explore subgroups who used the cues differently. Analysis revealed that the Exercise and Vaping cues received the most weight when participants judged the health of the hypothetical students. The Gender cue showed a small and positive average correlation, indicating a slight bias towards considering females as more healthy than their male counterparts. Cluster analysis revealed that most participants perceived a Vegetarian Diet as healthy, but a small minority perceived a Vegetarian Diet as unhealthy relative to a Typical American Diet. Future studies building on these findings could examine how medical students and physicians make similar judgments.

Anitha Nyingenera

PA - Duquesne University

Discipline: Engineering

Authors:

#1 Wilson Meng

#2 Rana Zakerzadeh

#3 Manoela Neves

Norah Delaney

Abstract Name: Quantification of Shear Stress Distribution in a Microfluidic System via Computational Fluid Dynamics Simulation

Microfluidic devices are promising tools to better understand in vitro cellular behavior. Previous studies have shown that the fluid flow rate in these devices has a direct effect on shear stress, which may alter cell's growth rate and differentiation. Furthermore, microfluidic-based platforms can facilitate the understanding of transport processes and nutrient exchange in various human organoids such as tumors and lymph node-mimicking models. The purpose of this study is to incorporate computational fluid dynamics (CFD) techniques in simulating fluid flow in a microfluidic system. Two different applications for cell culture under flow and flow behavior through the human extracellular matrix (ECM) are considered. In the first model, by assuming the device channel is filled with moving fluid, the predictions of flow-induced wall shear stress are obtained. In the second model, the channel is assumed to be filled with porous material and the filtration flow through the permeable region is evaluated for a physiological range of ECM permeability values. Three-dimensional models of the microfluidic slide (Ibidi GmbH, Germany) are created using Autodesk Fusion 360. The mathematical form for the first model is defined using the Navier-Stokes governing equations to describe the laminar, viscous, and Newtonian flow properties, while the second model includes the Brinkman equations to describe the fluid perfusion in the porous domain, representing the characteristics of human-derived matrix. The fluid flow in both models have been prescribed by a constant mass flow rate boundary condition at the inlets and zero pressure at the outlets. The walls of the device are assumed to be non-slipping. ANSYS CFX software is used to carry out simulations that produce numerical data and contour representations of velocity and shear stress in the device channel. The relationship between flowrate and shear stress as well as the filtration flow and ECM permeability are analyzed.

Anitha Niyingenera

PA - Duquesne University

Discipline: Engineering

Authors:

#1 Rana Zakerzadeh

#2 Manoela Neves

#3 Anitha Niyingenera

#4 Margaret Lutz

Abstract Name: Computational Investigation of Vocal Fold Vascular Lesions Effects on Human Phonation

The vocal folds (VFs) are multi-layered structures composed of muscle tissue and ligament enclosed by a mucosal covering. The tissue vibration and glottal airflow dynamics in the larynx determine the production of phonation in mammals. Abnormal growths of VF tissue within or along its covering, referred to as lesions, can hinder VF vibrations and cause vocal difficulties. VF vascular lesions occur due to the enlargement or rupture of blood vessels along the VF mucosa layer and are characterized by a variety of symptoms and pathologies. The presence of these lesions leads to vocal fatigue and dysphonia by impeding VF oscillation

and causes hoarseness by altering the airflow dynamics through the glottis. In our computational investigation we use fluid-structure interaction (FSI) methodology to simulate the VFs where vascular lesions are present. A realistic three-dimensional-bilayer VF model is assumed, which considers the variation in mechanical properties of cover and body layers. FSI is simulated through the coupling of tissue vibrations and transient glottal airflow in ANSYS workbench platform. The geometrical model used in this study is created using Autodesk Fusion 360 software based on STL files provided from a computed tomography scan of a human larynx, with VFs designed to fit into the laryngeal space. Symmetry along the sagittal line is assumed for the VFs. The lesions are created to represent the presence of a dilated blood vessel, or vessel ectasia, and the presence of a blood clot, or vascular polyp. Lesions are located in the cover layer with varying size and mechanical properties. Two FSI models, one with lesions and one without, are created to assess the effect of lesion presence. Analysis of the glottal airflow dynamics and VF tissue vibrational patterns between these two models can be used to determine the impact of vascular lesions on biomechanical characteristics of phonation.

Adaobi Nnamuchi

WI - University of Wisconsin-Madison

Discipline: Nursing and Public Health

Authors:

#1 Michael Koenigs

#2 Madi Michels

Abstract Name: Breaking the Silence: Challenging Mental Health Stigmas in the Black Community

This poster delves into the critical intersection of mental health, systemic inequities, and advocacy within Black communities, underscoring the pressing need for systemic reform and inclusive approaches to mental health care. Using a meta-analysis of existing research alongside ongoing studies conducted in the Koenigs Lab, the project examines the unique mental health challenges faced by Black communities, which are shaped by a confluence of historical oppression, systemic racism, societal inequities, and intergenerational trauma. Due to a number of variables, including socioeconomic inequities, stigma, mistrust of healthcare systems, and the lingering effects of structural racism, Black people face disproportionately high obstacles to mental health care. These gaps are exacerbated by police-related violence and the criminalization of mental health crises, which leads to trauma loops and prevents people from receiving the care they need. The effectiveness of group PTSD therapy for jailed people, many of whom are members of Black and other underprivileged communities, is the current focus of study at the Koenigs Lab. In order to address the disregarded mental health needs of jailed populations, this research attempts to incorporate evidence-based mental health therapies into correctional settings. This work has important ramifications for creating systemic change and minimizing disparities both inside and outside of correctional facilities, as Black people are disproportionately represented in the criminal justice system. Proposed solutions center on a multi-faceted approach to dismantling barriers and promoting mental health equity that includes community education, crisis intervention teams, policy advocacy, peer-led initiatives, and more. By combining these tactics with thorough research, this study emphasizes how urgent it is to address inequities in mental health and advocates for practical changes that put inclusivity, equity, and cultural sensitivity first to eliminate structural obstacles, lessen stigma, and establish long-lasting structures to promote the mental health and general wellbeing of Black people and communities.

Samuel Noll

DC - American University

Discipline: Social Work and Human Services

Authors:
#1 Samuel Noll

Abstract Name: Impact of Climate Change and Environmental Disasters on LGBTQ+ Youth Homelessness

The increasing severity of climate change and the prevalence of environmental disasters, such as hurricanes and wildfires, pose significant challenges for marginalized populations, particularly LGBTQ+ homeless youth. This research explores how these youth, who already face systemic vulnerabilities due to factors like family rejection and discrimination, are disproportionately affected by climate-related crises. Utilizing qualitative methods, including interviews and case studies, the study aims to understand the unique experiences of LGBTQ+ homeless youth during and after environmental disasters. It examines barriers they encounter in accessing emergency services, shelter, and healthcare, as well as their coping mechanisms in the face of displacement. Additionally, this research highlights the intersections of homelessness and climate vulnerability, revealing how these dynamics exacerbate existing inequalities. The findings aim to inform policy recommendations that create inclusive disaster response plans and support services tailored to the needs of LGBTQ+ homeless youth. By emphasizing the importance of recognizing and addressing these intersections, this study seeks to contribute to broader discussions on environmental justice and social equity. Ultimately, understanding the impact of climate change on LGBTQ+ youth homelessness is crucial for developing effective strategies to protect and support this vulnerable population in an era of increasing environmental uncertainty and instability, as climate change continues to escalate worldwide.

Mason Novak

WI - University of Wisconsin-Milwaukee

Discipline: History

Authors:
#1 Arijit Sen
#2 Hidayah Osman
#3 Kahler Paulson

Abstract Name: Researching How Community Gardens Can Thrive

Community gardens in marginalized neighborhoods of Milwaukee are rich with historical value and provide a space for residents to gather and hold various activities. Media accounts and history textbooks fail to disseminate these positive stories of resilience and resistance, often reverting to a single story of decline and disinvestment. Since 2012, the Buildings-Landscapes-Cultures public humanities project at UW-Milwaukee has been exploring methods to identify and disseminate histories of Milwaukee's poor, underserved, and segregated communities. Recently, we worked with residents who are part of the Walnut Hill Community Garden in Milwaukee, Wisconsin. This presentation examines three methods that helped us recreate an alternative history that demonstrates the resilience and dreams of this otherwise ignored community. First, we investigated local archives to uncover the physical history of the land. Through permit record, Census, and Sanborn Fire Insurance Map research, we uncovered what buildings used to occupy the space, why they were removed or destroyed, and discovered when and how the community claimed the land back as their own. Our second method included participating in community-led walks showing local art, parks, homes, businesses, and other landmarks. We also collected oral histories where we listened to community residents' experiences in the neighborhood. Through these three interconnected approaches, we uncovered the immense number of relationships, families, businesses, and individuals that thrive in the Walnut Hill neighborhood. We worked with the gardeners to envision inclusive, holistic design ideas for the garden, while being respectful of the past. These ideas were disseminated back to the community as a community asset map booklet, cards with future garden aspirations, and resident biography cards. Our research ends with a hope that community-

engaged research methods will continuously explore ways to give back the collected history of the neighborhoods we work with.

Lance Nuique

MD - Bowie State University

Discipline: Biology

Authors:

#1 Sarah Owusu

#2 Lance Nuique

#3 Konda Reddy Karnati

Abstract Name: Structural Insights Into Wild and Mutant M1775K, G1656D and T1700A BRCA1 Proteins

Breast Cancer gene 1 (BRCA1) is a tumor suppressor gene that deals with repair and genomic stability. Due to its connection to breast cancer, understanding the structure provides insight into the cancer. BRCA1 wildtype and mutated structures were collected from the Protein Data Bank (PDB) and used for structure variability investigation. PyMOL was utilized to align these structures and enable a detailed comparison of wild-type BRCA1 against various mutants (M1775K, G1656D and T1700A). Molecular Dynamics (MD) simulations emphasized the structural differences between the wild-type and mutant forms, through these findings we aim to advance the understanding of BRCA1 mutations and their contributions to cancer predisposition.

Lance Nuique

MD - Bowie State University

Discipline: Biology

Authors:

Sarah Owusu

Abstract Name: Structural Insights Into Wild and Mutant M1775K, G1656D and T1700A BRCA1 Proteins

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Lance Nuique

MD - Bowie State University

Discipline: Biology

Authors:

#1 Crystal Amadi
#2 Meghan Tucker
#3 T-Yona Dobbins
#4 Krystal England
#5 Onyinye Ihearahu

Abstract Name: Biodiversity Assessment of Mushrooms in Bowie State University, Maryland, and Enugu State, Nigeria

This study examines the biodiversity of mushrooms collected from Bowie State University campus, USA and in Enugu State, Nigeria. Mushroom specimens, meticulously collected and documented, were employed to fulfill the objective of characterizing mushroom diversity. Utilizing the DNA Subway's phylogenetic analysis tool, DNA barcodes were analyzed, and phylogenetic trees were constructed to compare data. The findings of this investigation have the potential to deepen our understanding of local mushroom communities and provide valuable insights into the similarities among mushroom species found in Nigeria and Maryland. Notably, the results unveiled a genetic similarity spectrum of 59%-99% in Nigeria and 57%-99% in Bowie State University, Maryland. Moreover, distinct clustering of samples from Bowie State University and Nigeria was observed in the constructed phylogenetic tree.

Faith Nuss

IL - Eastern Illinois University

Discipline: Biology

Authors:

#1 Elliott Zieman

Abstract Name: Sarcocystis Prevalence and Distribution in Coyotes (*Canis latrans*) in Eastern Illinois

Sarcocystosis is a disease caused by single-celled protozoal parasites in the genus *Sarcocystis*. Known as rice breast disease in waterfowl, *Sarcocystis* spp. are common in tropical countries, with muscular *Sarcocystis* being commonly reported within Southeast Asia. More than 150 species of *Sarcocystis* infect numerous species of vertebrates, such as coyotes (*Canis latrans*) and humans as intermediate hosts. The definitive hosts have intestinal *Sarcocystis* spp. infections, while intermediate hosts have sarcocysts in the muscle cells. However, compared to intestinal *Sarcocystis* (*S. hominis* and *S. suis*), reports of muscular *Sarcocystis* spp. in coyotes are scarce with only four published findings. Two studies have reported muscular sarcocysts in captive coyotes infected with *S. hemionilatrantis* and *S. fusiformis*. All previous infections of North American *Sarcocystis* in coyotes have been documented from the western United States, with one study from Oklahoma, United States. More studies could help fill the knowledge gap on *Sarcocystis* in coyotes. In this study, we report the first case of *Sarcocystis* in coyotes as intermediate hosts, from the Midwest region of the United States. *Sarcocystis caninum* is suspected, as it is the only other species found intramuscularly within coyotes, aside from the two previously mentioned. Specimens were collected from a licensed nuisance fur trapper/hunter from the eastern portion of Illinois. Muscle samples from 43 coyotes were screened microscopically and through PCR for *Sarcocystis*, with a result of 9.3% of coyotes infected (4/43). These results suggest that *Sarcocystis* is among coyotes from this region, however, further species identification and characterization is necessary.

Obinze Nwkokochah

TN - University of Tennessee at Knoxville

Discipline: Nursing and Public Health

Authors:

Abstract Name: Effects of Respiratory Syncytial Virus Education on the Knowledge of Disease and Vaccination Rates for Individuals 60 and Older

Respiratory Syncytial Virus (RSV) is a respiratory condition known mainly to target toddlers and infants. Recently, the adult population of 60 and older have been affected. There is a lack of education, understanding, and awareness of RSV along often resulting in negative impacts including the need for hospitalization. The purpose of this study is determined if the implementation of an educational intervention about RSV vaccinations will result in lower barriers to seeking care and RSV hospitalizations. It is hypothesized that after implementing the nursing education intervention, these individuals will be more likely to obtain the vaccine and take the necessary steps to avoid the deteriorating consequences of RSV. A quantitative pretest/posttest quasi-experimental design will be used with a sample of adults older than 60 at senior centers. Analysis is to be determined.

Vital Nyabashi

IA - Iowa State University

Discipline: Biology

Authors:

#1 Vital Nyabashi

#2 Ryan Weaver

Abstract Name: Investigating the Role of Alternative Oxidase in *Fusarium oxysporum* Virulence and Potential for Targeted Antifungal Therapy

Fungal pathogens have historically caused agricultural and ecological damage. The Irish Potato Famine in the mid-19th century led to starvation and mass migration, while the early 20th-century chestnut blight devastated American chestnut trees, altering entire ecosystems. Today, we lose 10-20% of crops to fungal diseases annually, with an additional 10-20% lost post-harvest. For the project, we will be taking a biogeneric approach to disease ecology with the goal of identifying novel therapeutic targets for the treatment of fungal diseases. Alternative Oxidase (AOX) is a mitochondrial enzyme that has been proposed to help pathogenic fungi and protozoa maintain metabolic homeostasis under environmental stress. Our study looks at the role of AOX in the virulence of *Fusarium oxysporum*, a fungus responsible for Fusarium wilt in tomatoes. *F. oxysporum* infects plants through the roots and colonizes the vascular system, leading to wilting symptoms. We hypothesize the fungus relies on AOX to survive hypoxic conditions and oxidative stress within the host xylem. We will test this idea by performing testing inhibitor experiments on isolated mitochondria to test for AOX function. We will also inhibit the AOX of the fungal spores to evaluate the role of this pathway for stress tolerance. If AOX is important for the disease ecology of this fungus, it could be a powerful target for the treatment of fungal diseases in plants.

David Nziza

VT - Norwich University

Discipline: Education

Authors:

Abstract Name: ONE LAPTOP PER CHILD: The Use of Technology in Early Education in Rwanda

Rwanda's One Laptop Per Child program was started in the country with the goal of providing each child in primary school with their own laptop. Since the program was started, Rwanda has received the most OLPC laptops out of 64+ participating countries. Currently, the number of deployed laptops is 260,000 in more than 800 schools. This research project allowed a study of some education programs in Rwanda that enable students to have an equal opportunity to learn and develop their digital literacy skills like any other student around the world. The purpose of the research was to interact with different stakeholders to understand how students benefit from the availability of this learning tool and to shed light on the importance of exposure of this technology in a child's life. The research methodology involved interviewing teachers who used this tool the most. The best way to learn about the impact of this program was to get different perspectives from different types of teachers who used these laptops in different ways. With authorization from the Rwanda Education board, these interviews were conducted in 4 different schools in the country, each school was in a different district from the 30 districts in Rwanda. I focused my interviews on two teachers for per school, making the total amount of interviews 8. The stakeholders involved in this program describe the students' improvement of digital literacy skills and the overall experience as life changing and instrumental in their educational journey. Additionally, they spoke about the impact it has had beyond the classroom.

Armaan Oberai

CA - California Polytechnic State University - San Luis Obispo

Discipline: Engineering

Authors:

#1 Stefan Talke

#2 Serena Lee

Toma Grundler

Abstract Name: Incorporation of GNSS Technology for Water-Level Instruments

Central Research Question and Purpose This project aims to enhance the accuracy of water level measurements by embedding a Global Navigation Satellite System (GNSS[ST1]) module in the instrumental package. to achieve self-surveying elevation measurements within an error margin of 1 cm. This improvement is essential for applications requiring precise elevation data, such as vertical land motion detection, sea-level rise measurements, and flood prevention.
Scholarly Context Understanding current and future coastal and inland flood risk requires accurate data to support scientific modeling and analysis. Current elevation surveying tools [ST2] offer high accuracy but are expensive (~\$30k for a leading commercial brand). By leveraging inexpensive GNSS technology and software-based post-processing (<\$500), this project seeks to provide a more cost-effective and scalable solution while maintaining a high level of precision and accuracy. Reducing cost allows for more dense sensor networks, enabling the acquisition of a vertical elevation time series, thus improving the assessment of locally varying processes (such as subsidence or wave action).
[ST3] Methodology The project involves upgrading the GNSS module of the water-level system and conducting a field test at a known survey point to validate the accuracy of the elevation readings. Precise Point Positioning, a software-based post processing technique, was employed to improve the GNSS solution point accuracy. The hardware and software were designed to be robust, modular, and easily scalable to support a wide range of field deployments compared to the narrow scope for current surveying instruments.
Conclusions and Expected Results The field tests that were conducted this past summer yielded a sub 3 cm error. To potentially further increase the accuracy, the deployment time can be increased from 24-hours to a week. Future work includes an integration of the GNSS technology with radar and ultrasonic distance sensors to allow for concurrent tidal measurements.

Dajahneek Obrien

GA - Fort Valley State University

Discipline: Chemistry

Authors:

Abstract Name: Nutrient Effects on Differentiation and Reproduction in *Batrachochytrium dendrobatidis*

As an undergraduate research scholar, my contributions to this project focused on investigating the effects of nutrient conditions on the life cycle of *Batrachochytrium dendrobatidis* (Bd). Specifically, I was responsible for preparing and maintaining Bd cultures on TGhL agar, isolating zoospores through vacuum filtration, and setting up experimental conditions in 96-well plates. I conducted daily imaging of Bd cultures using light microscopy and analyzed the resulting data using Fiji software to quantify the impact of various nutrient treatments on life cycle progression. My work involved identifying the stages of Bd development and comparing how different treatments influenced germling formation, zoosporangia maturation, and zoospore release. Additionally, I contributed to discussions on the potential role of host-associated molecules, such as thyroid hormone and biliverdin, in Bd differentiation under nutrient-limited conditions. This experience enhanced my understanding of experimental design, data analysis, and the ecological implications of pathogen-host interactions.

Takara O'Brien

FL - Embry - Riddle Aeronautical University

Discipline: Biochemistry

Authors:

#1 Foram Madiyar

Rahela Dolha

Lauren Wilson

Abstract Name: Development and Characterization of Controlled-Release Drug-Polymer Complexes for Improved Inflammatory Bowel Disease Treatment Using Electrospray Techniques

Current inflammatory bowel disease (IBD) treatments, though effective in managing symptoms, often yield suboptimal outcomes and adverse effects. Nanoparticle-based drug delivery systems enhance treatment precision by providing targeted delivery to inflamed tissues. This research utilizes electrospray technology to fabricate drug-polymer complexes with improved drug loading, structural integrity, and release profiles, addressing critical gaps in existing systems. This research addresses the limitations of current IBD therapies by developing a novel, pH-sensitive drug-polymer complex targeting chronic gastrointestinal (GI) inflammation. The goal is to improve therapeutic efficacy while minimizing systemic exposure and side effects. This study focuses on encapsulating 5-aminosalicylic acid and select flavonoids using Eudragit S100 and L100 polymers, which leverage GI tract pH variations for controlled, site-specific drug release. Preliminary tests confirm the solubility of Eudragit polymers and active compounds in ethanol, with UV spectrophotometry optimizing detection wavelengths. Single-needle electrospray setups demonstrated that polymer concentration significantly affects fiber morphology; low concentrations (0.5–1% w/v) resulted in droplets, while higher concentrations (>10% w/v) yielded smooth, bead-free fibers essential for uniform drug encapsulation and release. This study highlights the potential of the drug-polymer complex as a promising advancement in IBD therapy. Efforts will focus on designing a multi-layered polymer system

capable of withstanding the digestive environment to enable optimal drug release, alongside exploring triaxial electrospray techniques to improve encapsulation efficiency and enhance the precision of drug delivery to inflamed tissues. Further evaluation will use advanced characterization techniques, including Attenuated Total Reflectance-Fourier Transform Infrared Spectroscopy (ATR-FTIR), Scanning Electron Microscopy (SEM), and Transmission Electron Microscopy (TEM), to analyze the complexes' physical properties, integrity, and drug loading capacity. Ultimately, this research aims to demonstrate that optimized drug-polymer complexes can overcome current therapeutic limitations, offering a more effective approach to IBD treatment and improving patients' quality of life.

Maeve O'Brien, BS

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

#1 Hailey Donald, BS

#2 Piper Rennerfeldt, BS

#3 Eleni Moschonas, PhD

#4 Ellen Annas, BS

#5 Jeffrey Cheng, BS

#6 Nicholas Race, MD, PhD

#7 Anthony Kline, PhD

#8 Corina Bondi, PhD

Abstract Name: Neurobehavioral and physiologic outcomes in spontaneously hypertensive rats exposed to pediatric traumatic brain injury

Objectives: About 500,000 yearly emergency room visits in the United States are due to childhood traumatic brain injury (TBI), which may render cognitive, behavioral, and emotional disturbances, along with failure to reach age-appropriate developmental milestones. Half of adults are diagnosed with hypertension, which can lead to cardiovascular complications and premature death. Pediatric TBI exposure prior to diagnosis of an underlying comorbidity like hypertension has not been previously investigated. We hypothesized that hypertensive rats will perform inferiorly to normotensive rats despite experiencing the same pediatric TBI. Design: Spontaneously Hypertensive (SHR) and the normotensive control Wistar male rats experienced either a moderate controlled cortical impact (CCI) parietal injury to the right hemisphere or a sham injury at postnatal day 17. Four tasks measured elements of post-TBI neurobehavioral recovery during adulthood after the hypertensive phenotype is expressed. These included the 3-Choice Serial Reaction Time test (3-CSRT) to measure sustained attention, T-Maze Attentional Set Shifting (AST) for cognitive and behavioral flexibility, Open Field Testing (OFT) to examine levels of anxiety, and the Shock-Probe Defensive Burying test (SPDB) observing active and passive coping mechanisms. Results: All injured rats required more training sessions to criterion on 3-CSRT. Normotensive TBI rats displayed lower performance accuracy and higher omissions on all three levels, while hypertensive rats omitted more trials on level 1 ($p < 0.05$). Additionally, SHR TBI rats showed impaired initial rule learning on T maze, while normotensive injured rats displayed deficits in set-shifting ($p < 0.05$). Injured SHR rats engaged in greater grooming times and reduced active burying times in the SPDB compared with control rats ($p < 0.05$), indicative of increased anxiety, while no group differences were detected in OFT ($p > 0.05$). Conclusions: These results support using hypertensive rats as a model for the desired patient population in order to further enhance bench to bedside translatability.

Vanessa Ocansey

SD - Dakota State University

Discipline: Biology

Authors:

#1 Kristel Bakker

Basbo Ayelazono

Abstract Name: Survey of Prairie Lakes for Microplastics in eastern South Dakota

Microplastics are plastics that have been worn down into small fragments that invade aquatic environments and have cultivated themselves into most corners of the world. They are less than 5 mm in size and categorized as either primary (manufactured small) or secondary (broken down from larger plastics). Microplastics have been found in ocean surface water and deep-sea benthic zones as well as freshwater systems. They can be harmful to organisms, ecosystems, and human health, though the full extent of their impact is not yet known. The purpose of our project is to survey prairie lakes for the presence of microplastics in eastern South Dakota, a region where little research on microplastics has been done, and compare findings with other regions of the U.S. We will survey 4-8 prairie lakes for the presence of microplastics by collecting samples from the shore and water in each cardinal direction at each lake, as access allows. The samples will be analyzed for the presence of microplastics using sifting, vacuum filtration, and microscopy techniques. We will present information on the presence and/or absence of microplastics in prairie lakes. Determining if microplastics are present in prairie lakes in eastern South Dakota will allow us to compare levels found in a less densely populated region to other areas of the United States and hypothesize about how they accumulate.

Noah Ochital

DC - American University

Discipline: Political Science

Authors:

#1 Ryan Moore

Abstract Name: Municipal Governance and Voter Turnout: Analyzing the Impacts of City Managers

Municipal elections have long been studied, regarding the large, documented disparity between national and local electoral turnout. These studies have attempted to describe how turnout is correlated with various demographic, institutional, and time-related factors, to identify strategies for increasing local turnout. This paper narrows the focus to one of these predictors: whether a city has a full-time manager. Prior studies have been limited by a lack of data, however, the recently published municipal elections database from Benedictis-Kessner and colleagues enables this analysis to occur. Combining this data, with U.S. Census estimates, and originally collected city manager data, I analyzed a random sample of 396 elections using several regression models. I improved the models' estimates further by pre-processing the data with a non-parametric matching algorithm to reduce confounding, which refined the sample to 194 elections. I find that despite significant differences in turnout between cities with and without managers, this difference diminishes after controlling the other covariates and becomes statistically insignificant after the matching process.

Grace Ochs

PA - Gannon University

Discipline: Chemistry

Authors:
#1 Matthew Heerboth
Moira Stanisch

Abstract Name: Potentiometric Analysis of the Titratable Acidity of Beer: A Laboratory Experience for General Chemistry Students

Acid-base titrations have been a fundamental part of general chemistry laboratory courses for many years. Although this analytical technique is quite dated when compared to many modern instrumental techniques, it continues to play a crucial role in modern chemical and biological analysis. Titrations, when utilized appropriately, can yield high accuracy, precision, and cost-effectiveness. Therefore, it is essential for undergraduate chemistry students to gain experience with titrations as they progress in their scientific training. A laboratory procedure for undergraduates has been developed to measure the titratable acidity (an approximation of total dissolved acid concentration) of beer samples using potentiometric acid-base titrations. In this analysis, the student begins with a raw beer sample, carries out a short sample preparation procedure, and then titrates the sample using a standardized solution of strong base. Continuous monitoring of the reaction with a pH meter allows the student to build an acid-base titration curve and calculate the titratable acidity. The sample preparation steps can be adapted to beers of varying acid concentrations to maintain titration curves of high quality. This laboratory procedure offers students more than just a routine titration exercise. It provides an opportunity to apply an important quality control measurement used in the beverage industry, as minor changes in pH can have major impacts on taste. The student gains experience with sample preparation, reagent standardization and a real-world application of acid-base titrations all within a single lab session.

Tonie-Kaprice Oclaray

AL - University of Alabama

Discipline: Health and Human Development

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#1 Olayemi Timothy Adekeye
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Abstract Name: From Exposure to Curiosity: Exploring Social Media's Influence on Adolescent E-Cigarette Use

Despite recent data indicating a decline in adolescent e-cigarette use, an estimated 1.63 million middle and high school students are still using e-cigarettes, posing significant public health concerns. Social media platforms often expose adolescents to e-cigarette content that glamorizes and normalizes the behavior, raising concerns about their influence on adolescents' curiosity and e-cigarette use. The purpose of this study is to investigate the relationship between adolescents' exposure to e-cigarette-related content on social media and their curiosity about e-cigarette use. This study utilized data from the 2023 National Youth Tobacco Survey (N = 22,069) to measure exposure to e-cigarette-related content on social media. We used regression analysis with a logit link function to assess the relationship between social media exposure to e-cigarette content and curiosity about e-cigarette use moderated by race. The results indicate a strong correlation between exposure to e-cigarette-related content on social media and adolescents' curiosity about e-cigarette use, specifically with a higher endorsed curiosity about e-cigarette use in adolescents frequently (weekly or daily) exposed to e-cigarette social media content, relative to those who endorsed never being exposed to e-cigarette-related

content (OR=4.12, $p<0.01$). With race as a moderator, individuals who identified as White and Asian showed a dose-response relationship between exposure to e-cigarette-related content and curiosity about e-cigarette use. White and Asian individuals with daily exposure to e-cigarette-related content were 5.29 and 4.03 times more likely to endorse curiosity about e-cigarette use, respectively, relative to those without this exposure. This study shows the significant impact of social media e-cigarette content on adolescents' curiosity about e-cigarette use, with demographic factors, such as race, further modulating these associations. The findings reinforce concerns that frequent social media use may harm adolescents' health.

Keely O'Connor

TN - University of Tennessee at Knoxville

Discipline: Nursing and Public Health

Authors:

#1 Casey Norris

Abstract Name: The Correlation between Pre-Operative Obstructive Sleep Apnea Screening and the Patient Risk for Post-Operative Respiratory Compromise

Obstructive Sleep Apnea (OSA) is a growing concern in healthcare and the perioperative setting because it can lead to serious post-operative respiratory complications. This study aims to determine the use of pre-operative OSA screening tools and the relationship to respiratory compromise post-operatively. It is hypothesized that use of OSA screening tools will be related to a decreased risk of complications in the post-operative period. This non-experimental study utilizes a cross-sectional retrospective chart review, a form of self-report, in which surgical data from the previous six months is analyzed to determine if any respiratory complications occurred post-operatively, and, if so, if pre-operative OSA screening was conducted or not. Data analysis will be conducted after collection is complete in Spring 2025.

Adeline Odunjo

GA - Kennesaw State University

Discipline: Computer Science

Authors:

#1 Adeline Odunjo

#2 Sofia Torres

Sofia Torres

Abstract Name: Scoring Success: Social & Economic Drivers of 2024 Olympic Female Gymnast Scores

This study examines disparities in Olympic Game performance, challenging the idea of equal opportunity in one of the most viewed sporting events, women's gymnastics. Despite 206 nations participating, over half of the total medals are often won by just 10 countries. Existing studies primarily explore the influence of country factors, rarely focusing on individual athletes. The purpose was to determine the extent to which training age, gold medal financial incentives, and country socioeconomic status (SES), influence Olympic gymnastics performance in female athletes. The scores of 58 female athletes in gymnastics, representing 32 countries in the all-around qualifying round for the 2024 Paris Olympic Games were analyzed. Data were scraped from the official Olympic Games website. A multiple linear regression analysis examined the relationship between Qualifying Points (dependent variable measuring athletic performance) and Training Start Age, Gold Medal Incentive (USD) and Gross Domestic Product (GDP, a proxy variable for country

SES). Statistical analyses were performed using SAS 9.4. Our model showed that 15.7% of the variation in Qualification Points was explained by all predictors ($R^2=0.157$, $F(3)=3.30$, $p=0.027$). Training Start Age was the only significant predictor of Qualification Points, showing that for every 1-year increase in Training Start Age, there is on average a 0.38-point increase in Qualification Points, while adjusting for all other factors ($t(1)=2.04$, $p=0.046$). This finding means that the later a female gymnast begins training, the better they perform. This study showed a significant, positive relationship between age when training began and athletic performance as measured by Qualification Points. This finding indicates that female gymnasts who started their career earlier may have endured more physical stress and mental pressure to succeed, ultimately inhibiting their ability to perform at their highest potential later in life. Future research is necessary to further explore intrinsic factors that may affect performance.

Mayowa Odunjo

GA - Kennesaw State University

Discipline: Architecture, Construction Management, and Interior Design

Authors:

#1 Mayowa Odunjo

#2 Ameen Farooq

Abstract Name: Safety Net: A Better Plan A

Lagos, Nigeria, home to over 16 million people, stands as Africa's most populous city. The African Giant of Nigeria holds over 260 million people with the workforce falling on the backs of Millennials and Generation Z. On the surface, this could be seen as an advantage; a youthful, energetic labor force that any economy would benefit from. However, in Nigeria, this demographic reality also presents a unique set of challenges that has been exacerbated by inadequate housing, overpopulation, and rapid urbanization. The housing crisis in Lagos, fueled by failed government support and initiatives along with rapid population growth, leaves many young professionals with few living options. They often resort to staying at home with long commutes into the city for work if not already nearby, renting out a unit at a hostel, or renting apartments with rent beyond what they can afford. Many developments in the city will not provide resources necessary for these young Lagosians to thrive, rendering their attitudes toward progressing in the city as very negative. Safety Net aims to shift these attitudes by proposing an affordable mixed-use residential complex adjacent to the Oshodi Transportation Hub in the Mushin LGA, a critical nexus in Lagos' public transportation system. By offering affordable housing within easy reach of business districts, markets, and recreational spaces, it alleviates the burdens of traffic congestion and accessibility. The development integrates co-working areas, business centers, and retail spaces, fostering a self-sustaining environment that supports entrepreneurship, community engagement, and mental well-being. By tackling the housing crisis and mitigating the "brain drain" of young talent, the program envisions a resilient, economically dynamic Lagos. The "Safety Net" initiative not only provides affordable living options but also serves as a foundation for growth, supporting Lagos' continued transformation into a thriving business hub and nurturing the aspirations of its youth.

Emily Oegema

MI - Hope College

Discipline: Education

Authors:

Grace Critchfield

Jacob Humbert

Abstract Name: An Exploration of Beliefs and Boundaries in the Classroom

The research, titled An Exploration of Beliefs and Boundaries in the Classroom, explores educators' perspectives on the intersection of personal beliefs and professional boundaries within the classroom. By conducting interviews and developing a subsequent survey, we collected responses from individuals regarding their views on how educators should address diverse religious and cultural practices in educational settings. Seventy people took part in this survey. Of these, nine were college professors, ten were K-12 teachers, and fifty-one were college education students. Questions such as, "Is the classroom a good place to discuss controversial issues/perspectives? What about when these specific issues pertain to religion?" and "What is the role of the teacher in confronting and correcting religious discrimination?" were posed to teachers and teacher candidates to gain insight into varying attitudes on accommodating religious practices and promoting cultural awareness. The analysis provides a comparative overview of these beliefs, examining how they influence various classrooms. Our findings highlight a similar trend: the proportion of groups that agreed or disagreed with the questions was similar. However, our survey revealed that many educators are prioritizing learning over students' religious identities. When asked if they would allow students to opt out of a lesson due to a conflict with their religious beliefs, a large majority of survey participants expressed their unwillingness to accommodate these students. We will provide our qualitative analysis at the conference.

Ashley Oglesby

NC - Western Carolina University

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: Multi-Residential Affordable Housing: SOP Theory & Environmental Psychology

This research delves into a critical and multifaceted topic: Affordable multi-residential housing, the application of the sense of place theory, and the integration of environmental psychology in design. These areas of focus are not just theoretical, they tackle some of the most pressing challenges in contemporary society. Within the United States, the availability of affordable housing is at a dreadful low. This scarcity leaves millions of families grappling with tough choices between paying rent and covering essentials like food or healthcare. "A unit is considered unaffordable if a household has to spend more than 30 percent of its income on it. The result is a system that perpetuates economic instability, health disparities, and community disconnection. Addressing this crisis within the interior design field is important and cannot be overstated. Affordable housing intersects crucial design considerations such as fostering social connection, improving mental and physical health, promoting sustainability, and driving economic efficiency. This research will be used to shed light on the extreme impact of affordable housing design within the multi-residential occupation type, (R-2), by weaving together insights from the sense of place theory and environmental psychology. The research will examine how these disciplines intersect and/or complement each other, and explore how the built environment influences residents' well-being, attachment, and identity within their communities. The goal is to reveal how thoughtful and universal design can help bridge the gap between housing as a necessity and housing as a foundation for thriving lives.

Ayotoye Oguntuase

MD - Naval Academy

Discipline: Chemistry

Authors:

#1 Ayotoye Oguntuase
#2 Julia Ham

Abstract Name: Ring Expansion Polymerization of Less Activated Vinyl Monomers

The goal of this research is to study the light-initiated ring expansion polymerization of “less activated” vinyl monomers. Prior research from the Ham lab focused on creating cyclic polymers via a radical-based ring-expansion polymerization from “more activated” vinyl monomers. The reaction conditions discovered previously led to the successful creating of cyclic polymers. However, the cyclic radical initiator is not a good mediator of polymerizations with less activated monomers. The focus of the work to be presented is the synthesis of a new cyclic polymerization initiator capable of mediating the polymerization of less activated monomers, and then studying the kinetics, polymerization behavior, and physical properties of the resulting cyclic polymers. There has not been research conducted on using less-activated/ more stable vinyl monomers to create cyclic polymers in a ring-expansion fashion.

Seongmin Oh

PA - University of Pittsburgh

Discipline: Computer Science

Authors:

#1 Seongmin Oh
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#6 Jacob Biehl
#7 Edward Andrews

Abstract Name: Hybrid CNN-LSTM Model for Enhanced Analysis of EEG and ECoG Data in Seizure Prediction

This project explores the integration of convolutional neural networks (CNNs) and long short-term memory (LSTM) networks with attention mechanisms for time-series classification tasks, focusing on electroencephalography (EEG) and electrocorticography (ECoG) data. CNNs extract spatial features, LSTMs capture temporal dependencies, and attention mechanisms enhance the model's focus on relevant features. This hybrid approach enables advanced applications like seizure prediction and brain state classification. While CNNs and LSTMs are independently used in neuroimaging, their combined potential in seizure modeling is underexplored. Intraoperative neuromonitoring, a growing technique in neurosurgery, highlights the value of analyzing brain signals. The methodology involves preprocessing EEG/ECoG data to standardize signal quality, followed by applying CNN layers to extract spatial features. These features are then fed into LSTM layers to capture temporal patterns. Attention mechanisms are applied to focus on the most relevant temporal or spatial features. The model is trained using labeled seizure datasets and validated on unseen data. Performance is evaluated using measures of classification accuracy, prediction latency, and computational efficiency. The model's hyperparameters, including those for CNN, LSTM, and attention mechanisms, are tuned to optimize performance. The hybrid CNN-LSTM model with attention mechanisms achieved an accuracy rate of 62.5% in detecting seizures based on the training dataset. While this result indicates the model's potential to capture spatial-temporal dependencies, it highlights the need for further improvements. Enhancements in data preprocessing, model architecture, and feature representation are essential to utilize the hybrid model's capabilities and achieve higher classification performance. The hybrid CNN-LSTM model with attention mechanisms is expected to outperform single-network models in capturing spatial-temporal patterns in EEG/ECoG data. It should achieve higher classification accuracy, particularly in seizure detection,

with reduced prediction latency. The hybrid model is anticipated to consistently outperform standalone CNNs and LSTMs, with attention mechanisms enhancing focus on key features.

Charlotte Oicles

CA - University of the Pacific

Discipline: Computer Science

Authors:

#1 Geoffrey Gonzales

#2 Loc Nguyen

Abstract Name: Engagement for Educational Games

Recursion is a notoriously difficult concept for many students to comprehend (Er, 1984), as it involves tackling problems in a new way, as more conditions and actions must be performed outside of a central algorithm (Baron 2024). In order to ease this learning experience, we sought to create an educational game focused on teaching recursive principles to introductory computer science students. Our student-developed educational game, Noisrucer, has been developed to analyze the way that students approach foundational concepts in recursive programming. By presenting these problems in a naturalized, and rational manner, the game seeks to demystify the persistent issues that hinder development. Noisrucer strives to deliver a challenging, and captivating experience through its intuitive gameplay and visually stimulating features. Educational games are oftentimes difficult to develop (Castronova et al, 2008), requiring players to cover a broad curriculum or engage in unintuitive gameplay. Our game seeks to circumvent these issues, providing players with their own agency to solve problems in new and creative ways that mimics programming itself. This is supplemented through student-driven ideas to help engage their generation z peers, aligning with other scholars calls for use of technology (Szymkowiak et al, 2021) nurturing their engagement with a sense of reward and using a mastery approach to learning. Through the use of a small classroom observation of 8 students as well as individual observational pilot playthroughs with four participants, we have found that tactile responsiveness and fluid interactions maintained engagement and interest. Though we have also found that participants collaborating as part of a group exhibited significantly more interest, engaging in exploratory behavior and motivating each to experiment with different solutions. We are actively making changes to reinforce these positive behaviors in order to measure their effect on learning and hope to discuss these with the greater student community.

Joy Okafo

MN - University of Minnesota - Twin Cities

Discipline: Health and Human Development

Authors:

#1 Uchenna Okafo

#2 Karan Topiwala

#3 Bharathi Jagadeesan

Abstract Name: Medium Term Outcomes of Low Profile Visible Intraluminal Support [LVIS D] Stent Assisted Cerebral Aneurysm Treatment: A Single Center Experience

Low Profile Visible Intraluminal Support Device (LVIS D) is a self-expanding braided low porosity microstent indicated for stent-assisted coil embolization (SAC) of unruptured intracranial aneurysms (UIA).

We retrospectively collected clinical and radiographic data from all patients with UIA treated with LVIS D SAC at our institution (December 2016-October 2019). Angiographic outcomes were retrospectively assessed by one interventional neurologist and a neuroradiologist. Data were analyzed using descriptive statistics. A total of 70 patients underwent LVIS D assisted UIA treatment (male:female =28:50, median age 58.5 years (IQR 49-66). Among them, nearly 64.1% patients underwent SAC with a median of one LVIS Blue stent placed within the supraclinoid ICA (n=19), basilar artery (n=17), anterior communicating artery (n=6), posterior communicating artery (n=6), vertebral artery (n=6), anterior cerebral artery (n=4), posterior inferior cerebellar artery (n=2), superior hypophyseal artery (n=2), posterior cerebral artery (n=1), superior cerebellar artery (n=1) and the anterior inferior cerebellar artery (n=1). At a median angiographic follow-up of 16 months (IQR) nearly 65.4% patients achieved a Raymond Roy class-I occlusion and 34.6% with minimal residual aneurysm neck/dome with only 10% of patients requiring re-treatment. On medium-term follow-up only 2.86% of patients suffered persistent neurological deficits at the last clinical follow-up with an overall mortality rate of 2.8% attributed to LVIS stent placement. LVIS D stent-facilitated treatment of UIA is associated with high rates of technical success, achieving complete and near-complete occlusion at 16 month angiographic follow-up, with an excellent safety profile.

Delight Okere

GA - University of West Georgia

Discipline: Biology

Authors:

#1 Delight Okere

#2 Mautusi Mitra

#3 Chukwuemeka Okpala

#4 Logan Chastain

Abstract Name: Development of a cost-effective minimal growth medium for screening bacterial vitamin B auxotrophs capable of xenobiotic degradation

The goal of this research is to develop a cost-effective, stringent minimal growth medium for screening bacterial vitamin B auxotrophs for their abilities to utilize xenobiotics as the sole carbon source, with potential applications in xenobiotic biodegradation. Conventionally, microbiologists supplement bacterial medium growth with laboratory-grade vitamin B to grow vitamin B auxotrophs in the laboratory. However, this is quite expensive, limiting widespread application. This study proposes the use of over-the-counter vitamin B supplements, which, although less pure, offer a significantly more economical alternative. The study specifically focuses on two vitamin B-dependent Actinobacterial strains, *Microbacterium* sp. strain Clip 185 and *Kocuria rhizophilia*, known to require an external vitamin B source for growth. We have used these two actinobacteria for testing the efficacy of the new minimal growth medium. We have developed three versions of the inexpensive, stringent and minimal growth medium each supplemented with a specific inexpensive source of vitamin B by modifying the basic recipe of the Tris-Acetate-Phosphate (TAP) medium, commonly used for green micro-algal growth. We have tested the growth of microbial vitamin B auxotrophs in these minimal media containing xenobiotic compounds, like polyethylene, phenanthrene, cellulose, etc. as the sole carbon source. Our results demonstrate that our modified Tris-Acetate-Phosphate (TAP) media can support the growth of vitamin B auxotrophs and promote the metabolism of xenobiotics, thereby validating this cost-effective alternative to traditional laboratory-grade supplements. These findings have the potential to advance microbial bioremediation research by providing an accessible method for screening vitamin auxotrophic strains in the context of environmental pollution.

Chinenyenwa Okolie

IL - Eastern Illinois University

Discipline: Biochemistry

Authors:

Abstract Name: Development of a Fluorogenic Chemical Tool to Study Human Carboxylesterase 2 in Live Cells

Carboxylesterases are enzymes that play a role in the hydrolysis of esters to carboxylic acid and alcohol. Human carboxylesterases (CESs) are involved in the metabolism of pharmaceuticals that contain a wide range of esters. CES activity is known to vary among individuals due to genetic and environmental factors. This interindividual variability in CES activity that has been demonstrated to cause varying outcomes when patients are treated with drugs metabolized by CESs. To study CESs, a variety of well-characterized fluorogenic chemical tools for examining one of the two major forms of CESs, carboxylesterase 2 (CES2), have been developed. These tools, however, have not achieved widespread use. We hypothesize that this is due to the difficulty in obtaining these CES2 fluorogenic chemical tools. Here, we seek to characterize a commercially available compound, Fluorescein Diacetate (FDA), as a chemical tool for use in live cells to study CES2. To characterize FDA, we carried out a variety of in vitro stability studies before deploying FDA in live cells to determine if it can be used to study CES2 activity using fluorescence microscopy. Overall, our studies seek to expand the availability and accessibility of chemical tools and methods to study CES2 which we believe will lead to better clinical outcomes for patients.

Mia Ola

PA - California University of Pennsylvania

Discipline: Biology

Authors:

Abstract Name: Isolation of a Novel *Methylobacterium* Species from the Monongahela River

The Monongahela River in Pittsburgh, PA has gone through many industrial cycles over the last two centuries. Heavy metals have been documented in the river, and this is likely due to the changes in utilization and waste disposal into the river. As a result, the Monongahela River is rich in microbial diversity, allowing for an opportunity to isolate and characterize bacterial species that were previously undocumented. In this experiment, a pink bacterial strain, Neon, was isolated from the Monongahela River. DNA was then extracted and sent for Illumina whole genome sequencing. The isolate was determined to be of the genus *Methylobacterium*, which is comprised of gram-negative methylotrophs. Genome assembly, annotation, and analysis indicated that the isolate may be novel with an ANI (Average Nucleotide Assembly) of only 85.73% similarity to its closest relative, *Methylobacterium mesophilicum*. Thus, several tests were performed to assess the general microbial characteristics of the organism, including digital DNA-DNA hybridization (dDDH), GC content evaluation, metabolic analysis, pH and salinity growth ranges, and lipidomics. These results were compared to the known properties of the two most closely related organisms, *Methylobacterium mesophilicum* and *Methylobacterium radiotolerans*. *Methylobacterium* species have been found to be resistant to heavy metals and ultraviolet radiation; the isolate Neon is consistent with this, as operons associated with arsenic, copper, cadmium, cobalt, zinc, and ultraviolet radiation resistance were identified. Due to its heavy metal resistance, the isolate may have future applications in environmental projects. These may include, but are not limited to, bioremediation in areas abundant with heavy metals, wastewater treatment, and rare earth element (REE) recovery. This project highlights the importance of continual screening and characterization of bacteria in the environment.

Ruth Olawumi

WI - University of Wisconsin-Madison

Discipline: Environmental Science and Sustainability

Authors:

#1 Darren Henrichs

Abstract Name: Developing an In Situ Method for Microplastic Detection and Quantification

When plastics are improperly disposed of, natural processes, such as exposure to sunlight and weathering, break them down into pieces small enough for consumption, inhalation, and absorption into skin by various organisms ranging from plankton to humans. Since the discovery of plastic fragments in oceans, researchers have used methods like Fourier-Transform Infrared Spectroscopy or Raman Spectroscopy to identify microplastics and learn more about them. However, these methods have limitations, such as requiring filtration and concentration prior to observing. This project explored using an Imaging FlowCytobot (IFCB) instrument, which does not require filtration or concentration, to quantify microplastics in marine environments. IFCBs can also be deployed underwater for extended periods of continuous sampling. The IFCB, coupled with a machine learning approach for automated image identification, was used to identify and quantify microplastics in natural seawater samples collected during a 3-day research cruise in the Gulf of Mexico. Microplastic control samples were created in the laboratory and run through an IFCB to create a training dataset for the machine learning model that was used to identify microplastics in the field. Over

150,000 images comprising 129 categories of phytoplankton and one category of plastic were used to train the model. Microplastic concentrations varied according to distance from shore and over depth. Some of the higher concentrations of microplastics, measured as particles per mL, were found <70km and >200km from land but still over the continental shelf. Concentrations were also found to be elevated in the surface samples and from samples collected within ~2m of the bottom. The utility of using an IFCB is that microplastic concentrations can be measured continuously out in the field allowing for changes in concentration due to natural events to be observed in real time.

Katherine O'Leary

NY - University of Rochester

Discipline: Biology

Authors:

#1 Erin Gibbons

#2 Brianna Minor

#3 Thomas Henson

#4 Stephen Hammes

Abstract Name: Estrogen Receptor α (ER α) Signaling and Tumor Cell-Derived Factors Mediate Pro-Tumor Neutrophil Activation in the Setting of Lymphangioleiomyomatosis (LAM)

Lymphangioleiomyomatosis (LAM) is a rare disease where smooth muscle tumors with tuberous sclerosis (TSC) mutations form cysts in the lungs. The resultant tumor growth causes cyst formation in the lung which leads to decline in respiratory function. LAM exclusively affects biological females; however, the origin of tumors is unknown. Our lab has utilized a conditional tuberous sclerosis-2 (Tsc2) knockout genetic mouse model of LAM to identify a possible myometrial origin of tumors. LAM has been shown to be estrogen-sensitive; however, LAM tumor cell lines respond poorly to estradiol in vitro. In tumors from our LAM mice, bulk RNA sequencing identified increased transcription of neutrophil elastase in response to estrogen stimulation. Previously our lab demonstrated that neutrophils are the primary infiltrate in the mouse LAM tumors, while neutrophil depletion has been shown to reduce tumor growth. Recent work suggests that estradiol signaling promotes neutrophil production via estrogen receptor α (ER α) signaling in the bone marrow. We hypothesize that estradiol, in concert with tumor-derived factors, may augment pro-tumorigenic functions of neutrophils in the setting of LAM. To address our hypothesis, neutrophils were isolated from the bone marrow of both C57BL/6 control and ER α knockout mice. Tumor conditioned media (TCM) containing potential tumor-derived stimulating factors was generated from a mouse model for LAM tumors. Isolated neutrophils were then cultured in fresh cell culture media or TCM for 24 hours. mRNA was collected and real-time quantitative PCR was performed to investigate changes in mRNA expression of known neutrophil activation markers. Our results show ER α was required for full expression of neutrophil elastase (ELANE), nitric oxide synthase 2 (NOS2), and programmed death-ligand 1 (PDL1/CD274), all markers of neutrophils activated to support tumor progression. Future experiments involving neutrophil function and activation will further elucidate the relationship between estradiol and neutrophils in LAM.

Rynn Oleszczuk

NC - Western Carolina University

Discipline: Chemistry

Authors:

#1 Curtis Beimbron

Abstract Name: Optimization of Octadecylamine Passivated Cesium Lead Bromide Nanocrystals by Varying Reaction Conditions

With applications in renewable energy, cesium lead bromide nanocrystals have grown to be increasingly salient in the science community. The use of such nanoparticles requires the optimization of the nanoparticle such that it is reproducible in a specific size and shape. We have conducted research to bridge independent variables in the synthesis process of these nanoparticles, to the results at which said variables produce. Using UV-Visible absorption spectroscopy, fluorescence spectroscopy, powder x-ray diffraction, and scanning electron microscopy, we are able to analyze how varying reaction conditions, using the ligand assisted reprecipitation, optimized the size distribution.

Bianca Olfert

IN - Valparaiso University

Discipline: English and Literature

Authors:

Abstract Name: Childhood, Innocence, and Imagination: The Pedagogical Power of Images in the Poetry of William Blake and Shel Silverstein

Throughout history, scholars have demonstrated the power of representation to awaken the mind to Truth, particularly in the formative years. William Blake's poems in his parallel collections Songs of Innocence and Songs of Experience stand out for their lyrical and artistic depictions of childhood bliss steeped in nostalgia, in stark contrast with adulthood, which he paints as comparatively bleak and dim. Similarly, contemporary children's poet Shel Silverstein is known for his compilation works Where The Sidewalk Ends, Falling Up, and A Light In The Attic, wherein he also develops the themes of childlike hope, curiosity, wonder and imagination. Comparing and contrasting these two different representations of childhood, both poets reflect and employ the expressive and communicative power of images. Both Blake and Silverstein demonstrate the power of images and apply them in pedagogical contexts alongside their writings on childhood, but the manner in which they do so differs. While Blake's visual images in his work to add meaning, familiarity, and depth. This variation in the application of the communicative power of images is related to the poets' different audiences, as they use their images to accomplish different purposes. While Blake writes for adult readers about the shared experience of childhood, Silverstein writes for an audience of children as well as for adults who may be reading the poems aloud. As these groups differ significantly in their perspectives, the effects, and thus the poets' applications, of visual elements also differ. Both Blake's Songs and Silverstein's various poems consistently demonstrate the capacity of images to influence and contextualize a reader's perception, and use this power in different ways to nurture more ideal development in children and reflection in their readers.

Kyra Oliver

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

#1 Kyra Oliver

Abstract Name: City Garden: Urban greenhouse and Community Center

"Third place" is a term coined by sociologist Roy Oldenburg, referring to spaces beyond work and home where people can socialize and engage in community activities. However, low-cost and accessible third places are becoming rare in America. Through surveys, case studies, and article analysis, City Garden, a third place that combines the benefits of both community centers and greenhouses. My research highlights the social, economic, and physical advantages of these types of facilities. Socially, City Garden serves as an inclusive space for people to meet and interact. It offers free access to areas that might not otherwise be available, with amenities such as greenhouses, fitness areas, classrooms, and activity spaces for children. Design solutions like varied seating arrangements and meeting rooms foster collaboration and interpersonal relationships. Noise-reducing materials and durable, easy-to-clean textiles ensure comfort and functionality. Economically, City Garden serves as a no-cost resource for professional and personal growth. It offers skill-building classes and networking opportunities that benefit the local community. The greenhouse provides affordable, locally grown produce, helping to reduce food disparity and circulate money within the local economy. Additionally, classrooms cater to different learning needs, such as fitness, nutrition, and DIY education, empowering people to reduce financial burdens or learn new income-earning skills. Physically, City Garden promotes active living with spaces like rock climbing walls, a tennis court, basketball courts, and walking paths. These facilities are designed with safety and durability in mind to encourage physical activity. The City Garden project focused on understanding how third places can benefit communities and identifying space planning and material solutions to ensure long-term functionality. The project combines diverse facilities to create a space that supports the community's social, economic, and physical well-being.

Sopheha Om

MN - University of Minnesota - Twin Cities

Discipline: Social Work and Human Services

Authors:

#1 Catherine Solheim

Abstract Name: Cambodian American Refugee Family Impacts from Deportation

The deportation of Southeast Asian refugees, particularly Cambodian Americans, has profound implications for family relationships in the United States. This research explored the impact of forced removal and family separation on parent-child relationships, socio-economic outcomes, and the well-being of Cambodian American families. As a first-generation Cambodian American, the researcher brings a personal perspective to this topic, aiming to shed light on the experiences of affected families and advocate for immigration policy changes. The study addressed gaps in existing research through a comprehensive literature review and qualitative interviews with affected individuals and family members. By synthesizing information from diverse sources, the project aims to provide valuable insights into challenges faced by Cambodian American families affected by deportation and advocate for positive change in their communities. Research conclusions underscore the urgency for policy reform that considers the lasting impact on families and the need for enhanced community support systems to help mitigate the hardships experienced by these families. These invaluable insights also advocate for a more compassionate and informed approach to immigration policies that honors human rights, upholds dignity, and recognizes the historical context of refugee resettlement in the United States. This work contributes to ongoing conversations about immigration justice in the Southeast Asian American communities and serves as a call to action for policies that support and protect families, emphasizing the need for solutions that reflect empathy and understanding.

Marwan Omran

EGY - The American University in Cairo

Discipline: Computer Science

Authors:

#1 Marwan Omran

#2 Khaled Hamza

#3 Mahmoud ElGhandour

Khaled Hamza

Mahmoud Ghandour

Abstract Name: Machine Learning in Autism Spectrum Disorder Detection and Classification

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition with a wide spectrum of symptoms that affect an individual's social communication and behavior. Early detection of ASD is crucial for timely intervention and improved outcomes. This study explores the potential of machine learning algorithms for detecting ASD through the analysis of gene expression. The dataset used in this study is the SFARI dataset, encompassing Transcript Per Million (TPM) gene expression values for 60,669 genes, of individuals with and without ASD. With a sample size of 3780 children, aged between 3 and 13 from North America, this dataset forms the basis of our research. Various machine learning algorithms are employed to decipher intricate patterns within the dataset indicative of ASD. To enhance the models' performance, feature selection and engineering techniques are applied, ensuring that the algorithms effectively capture relevant information for accurate detection. The study evaluates the models based on sensitivity, specificity, and overall accuracy to assess their efficacy in ASD detection. The research investigates the robustness and generalizability of the models across diverse demographic factors and clinical presentations. Ethical considerations and the interpretability of machine learning outcomes are emphasized to underscore transparency and accountability in the decision-making process. The study yielded promising results, achieving an accuracy rate of 79% and Recall of 90% using the AutisNN Framework. This level of accuracy represents a significant advancement in the field and underscores the potential of machine learning as a powerful tool for enhancing the diagnostic capabilities of ASD detection models. By providing evidence of the models' accuracy and generalizability, the study lays the foundation for the development of scalable and data-driven tools that can assist clinicians in the early and precise identification of ASD, thereby facilitating timely interventions and improving long-term outcomes for individuals affected by this complex disorder.

Marwan Omran

EGY - The American University in Cairo

Discipline: Computer Science

Authors:

#1 Marwan Omran

Khaled Hamza

Abstract Name: Advancing Customer Segmentation in Banking: Harnessing Machine Learning for Personalized Insights

In the contemporary banking landscape, understanding customer behavior is paramount for delivering personalized experiences and driving business growth. Customer segmentation, the process of categorizing customers into distinct groups based on shared characteristics, lies at the heart of this endeavor. Traditional segmentation approaches often fall short in capturing the nuanced and evolving nature of customer behavior. Therefore, this paper proposes a data-driven approach to advance customer segmentation in banking using state-of-the-art machine learning algorithms and techniques. We present a comprehensive framework for processing, cleaning, and clustering a large dataset of banking transactions and customer information. Through the application of K-Means, Hierarchical, and Gaussian Mixture Models (GMM) clustering

algorithms, we identify distinct customer segments based on transactional and demographic data. The effectiveness of each clustering algorithm is evaluated using silhouette scores, with the best-performing model selected for further analysis. Finally, we discuss the implications of our findings and offer recommendations for leveraging customer segmentation to enhance banking services and drive business growth.

Olivia Omundson

IL - Eastern Illinois University

Discipline: Psychology

Authors:

#1 Olivia Omundson

#2 Jeffrey Stowell

Abstract Name: Perceived Gender Identities and Perceptions of Interpersonal Violence in College Students

The purpose of this research project is to explore how people's perception of the perpetrator's gender identity affects perceptions of an incident of interpersonal violence (IPV). This is one of the first studies to explore specific gender identities and their relationship with perceptions of IPV. Previous research has shown that people perceive IPV situations differently depending on the gender of the people involved. For example, Harris and Cook (1994) found that when participants read a vignette about IPV, the abuser was held more responsible when it was a man abusing his wife rather than a wife abusing her husband. Additionally, Bates, Pennington, and Hamil (2019) found that male abusers were seen as strong while female abusers are seen as weak. It is important to further explore these findings in order to see if situations of IPV are being overlooked due to a person's gender identity. Similar to other research Hypothesis 1 is that cisgendered men perpetrators will be rated the most severe, violent, and responsible for IPV compared to the other gender identities. Hypothesis 2 is that scenarios involving people assigned male at birth (cisgendered men and transgender women) will be perceived similarly due to people's perceptions of transgender women being viewed as still "male." Finally, hypothesis 3 is that genderfluid people will be rated the most intermediately to the transgender and cisgender identities. Participants will be presented with a randomly assigned vignette depicting IPV in which the gender of the perpetrator will vary from cisgendered man, cisgendered woman, transgender man, transgender woman, and genderfluid person. Participants will rate the severity, violence of the incident, responsibility of the perpetrator and victim, and perceived victim's fear of the perpetrator. Mean ratings of the survey items will be compared across groups using a one-way ANOVA in SPSS, followed by post-hoc tests.

Jakob Onayo

IL - Northeastern Illinois University

Discipline: Communications

Authors:

#1 Angharad Valdivia

Abstract Name: Appropriation vs. Appreciation: Beyoncé and Madonna

This research examines the appropriation and exploitation of Harlem ballroom culture by non-community members, focusing on the works of Jennie Livingston and Madonna. Through a review of their projects, the documentary "Paris Is Burning" and the song "Vogue," this study explores the ways these artists have been critiqued for their voyeuristic and exploitative approaches. The research extends to evaluate Beyoncé's

"Renaissance" tour and album, assessing whether it represents a reclamation of Black culture by a Black artist or an exploitation of queer culture by a non-queer artist. The analysis is grounded in the historical context of Black media and spaces, addressing internal issues such as the rejection of queerness and the monolithic representation of Black culture. It further explores the responsibility of community representation, highlighting how Madonna and Livingston's lack of accountability contrasts with Beyoncé's more inclusive and accountable engagement with ballroom culture. The findings suggest that while Beyoncé's work signifies progress in the intersection of Blackness and queerness, it also raises questions about commodification and responsibility in artistic representation. This study underscores the need for artists to engage thoughtfully and ethically with the cultures they draw from, ensuring equitable representation and compensation.

Kiara O'Neal

GA - Kennesaw State University

Discipline: Computer Science

Authors:

#1 Da Hu

Abstract Name: Comparative Analysis of Deep Learning Models for Structural Defect Segmentation in Bridges

Automated structural defect detection is crucial for ensuring the safety and maintenance of civil infrastructure, particularly in bridges, where defects such as cracks, spalling, and corrosion can compromise structural integrity and pose safety risks. This research presents a comparative study of three semantic segmentation models—U-Net, Feature Pyramid Network (FPN), and DeepLabv3+—for detecting and classifying structural defects in bridge imagery. Each model was evaluated using two different encoder architectures, EfficientNet B3 and MobileOne S4, to assess the impact of varying feature extraction strategies on segmentation accuracy. The experiments were conducted using the DACL benchmark dataset, which includes a diverse range of defect categories, providing a comprehensive testing ground for evaluating model performance. Among the tested combinations, FPN paired with EfficientNet B3 demonstrated the highest mean accuracy across most defect categories, including common defects such as cracks and graffiti, making it the most effective approach overall. However, challenges were encountered in detecting certain more complex defect types, such as hollow areas and cavities, where all models showed decreased performance. The results of this study emphasize the potential of deep learning models in automating defect detection for infrastructure monitoring while also identifying key areas for improvement. Specifically, further refinements in feature extraction techniques and model tuning are needed to enhance detection accuracy in more complex defect scenarios. This research contributes to the ongoing development of AI-powered solutions for infrastructure inspection and provides insights for future improvements in automated structural health monitoring.

Halle O'Neil

PA - Pennsylvania State University

Discipline: English and Literature

Authors:

Abstract Name: Sit Still and Have Humility: Women's Writing and Religion in the Late Middle Ages

"Sit Still and Have Humility: Women's Writing and Religion in the Late Middle Ages" dissects early

women's writing through the lens of conduct literature. Conduct literature is a form of didactic literature that depicts how people, oftentimes women, are expected to behave as upstanding members of society. These texts served equally as advice and warning, damning those who refused to heed their teachings. While women in the Late Middle Ages were often not allowed to write and share their works, many found ways to subvert that expectation by channeling their passions through religion and mysticism. Notable female mystics include Julian of Norwich, Margery Kempe, and Christine de Pizan. The works of these women withstood the scrutiny of society not only because they showed literary promise, but because they additionally conformed to the standards expected of women as written in conduct literature. By utilizing texts such as "How the Good Wife Taught Her Daughter" as a lens for appropriate female conduct and "The Lament of Mary" as a lens for affective piety, this paper posits that the main reason that the works of female mystics are studied today is due to their meticulously selected subject material and careful word choice that allowed these authors to express their desires and thoughts under the guise of religious musings.

Gabrielle Oragui

OK - University of Central Oklahoma

Discipline: Nursing and Public Health

Authors:

#1 Gabrielle Oragui

#2 Leann Laubach

Abstract Name: Sleep Quality in School-Aged Children

Background: Sleep is a crucial component of growth and development in school-aged children, yet many fail to achieve the recommended nine–11 hours of sleep per night. Factors such as increased screen time, reduced physical activity, poor dietary habits, and inconsistent bedtime routines contribute to inadequate sleep, leading to significant consequences, including poor academic performance, behavioral issues, and an increased risk of chronic health conditions like obesity and cardiovascular disease. Purpose: This study aims to explore the effectiveness of specific sleep-promoting behaviors and assess how educating parents about these behaviors can improve their children's sleep quality and duration. By addressing gaps in parental knowledge and identifying barriers to implementation, this research will provide evidence-based strategies to improve sleep health in school-aged children. Method: Using a quantitative design, the study will employ the Children's Sleep Habits Questionnaire (CSHQ) to assess baseline sleep behaviors. Parents will receive tailored educational resources that emphasize reducing screen time, increasing physical activity, and establishing consistent bedtime routines. These interventions will be implemented over a four-week period. Post-intervention data will be collected via the CSHQ after four weeks to measure the impact of education and behavioral changes on sleep habits. Conclusion: By implementing sleep-promoting behaviors, physical activity, and screen time reduction, this project hopes to improve sleep quality and overall health outcomes in children. These findings will also implement sleep-promoting behaviors and physical activity and underscore the importance of targeted parental education and collaboration between nurses and families to address sleep deficiencies in school-aged children and promote healthier lifestyles. Keywords: sleep in school-aged children, bedtime routines, screen time, sleep quality, digital devices.

Daniel Ordeneaux

LA - Louisiana State University, Baton Rouge

Discipline: Exercise Science and Nutrition

Authors:

#1 Elio Villasamil Gonzales
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Abstract Name: Bell Pepper Strips as a Healthy Snack: Development and Evaluation of Physicochemical Properties, Consumer Acceptance, and Purchase Intent

Justification: This research investigated air-frying as a method to enhance the physicochemical properties of blanched, seasoned red bell peppers, addressing the gap in the existing literature. The goal was to upcycle excess bell peppers into a plant-based snack, aligning with consumer demands for alternatives to energy-dense foods. **Methods:** Red bell peppers were washed with warm water, cored, and cut into rectangular pieces (1 cm x 6 cm). Samples were microwave-blanching for 90 seconds, seasoned with onion salt, and then air-fried at 140°F for 5 or 6 hours. Control samples were plain without seasoning. The samples were deemed microbially safe and served to 103 consumers (n=103) to assess acceptance for different attributes on a 9-point hedonic scale, culinary applications by check-all-that-apply (CATA), and purchase intent (PI) on a yes/no scale. Data was analyzed using ANOVA and the Tukey test. **Results:** Moisture content ranged from 46.9% to 79.2%, and water activity showed significant ($p < 0.001$) differences among samples: plain-5h (0.9677), seasoned-5h (0.9685), plain-6h (0.8945), and seasoned-6h (0.8605). For sensory attributes, plain-5h had the highest scores in appearance (6.74), color (7.33), and flavor (5.83). Seasoned-5h scored highest in aroma (6.28) and overall liking (6.19). The top five culinary applications selected by consumers were pizza topping (67%), salad topping (56%), garnish with meals (50%), soup/stews (45%), and sandwiches (40%) while a single-serving healthy snack was selected by (27%) of the consumers. Positive PI responses were 45.6% (plain-5h), 34% (plain-6h), 52.4% (seasoned-5h), 47.8% (seasoned-6h), and 60.2% (proposed a single-serving packaging). **Significance:** An estimated 350 million pounds of bell peppers are wasted annually in U.S. supermarkets. This study demonstrated one way bell peppers can be upcycled prior to spoilage. **Summary:** Red bell pepper can be upcycled into a healthy snack through air-frying and may also be used for other culinary applications.

Ella O'Rourke

PA - University of Pittsburgh

Discipline: Nursing and Public Health

Authors:

#1 Sydney Layton
#2 Linda Christopher
#3 Teresa Thomas

Abstract Name: Self-Advocacy Experiences of Adolescents and Young Adults with an Invasive Cancer Diagnosis

Background: Adolescent and Young Adult (AYA) cancer researchers and clinicians aim to improve patient-centered care, but a lack of knowledge about how AYAs self-advocate makes this challenging. This qualitative, cross-sectional study aimed to describe self-advocacy experiences among of AYA patients with a history of cancer. **Methods:** Adolescent and Young Adult (AYA) patients (ages 12-29) with an invasive cancer diagnosis were recruited in person in clinic through UPMC Children's Hospital of Pittsburgh or through the Pitt+Me registry. Study participants described experiences of self-advocacy through an online survey and one-on-one semi-structured qualitative interviews in person or virtually. Interviews consisted of several questions surrounding challenges faced by participants, how they self-advocated for themselves, and factors that made it harder or easier to self-advocate. All interviews were audio-recorded and transcribed verbatim. Participants were compensated \$25 following participation. **Results:** 12 participants enrolled, with a mean age of 17.7 ± 1.1 years old. Most participants were female (75%), students (67%), with only few working

(33%), and half having a hematological cancer. Participants reported varying self-advocacy experiences, and with the challenges of diagnosis and treatment made feasible through positive support of friends and family. The adolescent population utilized parental guidance to communicate with physicians, while the young adult population communicated independently. Most participants experienced side effects including allergic reactions and varying hormone levels to treatment that were often dismissed by the healthcare team. Participants struggled with lack of physician understanding of personal values and needs. Conclusion: Self-advocacy experiences of AYA vary but demonstrate distinct themes. Results indicate a transition from reliance on parents to independently managing their cancer, though difficulties communicating with healthcare providers occurred across age groups. This pilot study demonstrates novel information that can be used to improve communication between AYAs with cancer and their healthcare teams.

Lauren Orozco

TX - Texas Woman's University

Discipline: Chemistry

Authors:

#1 Shiru Lin

Abstract Name: Experimental Efficiency: How Machine Learning Estimations Streamline Catalytic Density-Functional Theory Calculations

Density-Functional Theory (DFT) is a system of quantum calculations that provide information on the ground state of many forms of atomic systems, particularly with compounds and crystals. Despite the decades of refinement of these formulas, strictly mathematical DFT calculations cannot be effectively used for larger and more complicated structures due to outside factors that cannot be easily computed using the formula. In this case, use of machine learning (ML) can minimize experimentation and analyze similar structure behavior, such as electron affinity (EA), ionization energy (IE) and radius (r), along with the potential reactants of an experiment to output the most optimized set of those reactants. Using previously conducted research, I will explain how ML is used to predict optimized DFT calculations, and how ML can be used positively in the experimental space to save time and funding to create the most optimal experiment to then conduct testing on. DFT and ML methods and algorithms and their error metrics are also used to determine which of these metrics produce the most consistently accurate results without losing efficiency.

Sarah Orr

ID - Idaho State University

Discipline: Art History

Authors:

Abstract Name: Caspar David Friedrich: Spiritual, Theological, and Emotional Concepts in 19 c. Romanticism

Caspar David Friedrich's landscapes played an integral role in the innovation of the Romantic movement through the incorporation of spiritual, emotional and theological themes throughout his works. Through in depth research of Friedrich's works, Robert Rosenblum's studies, Ralph Waldo Emerson's writings on nature, and individual studies of solitude's connectivity to spirituality, this essay aims to prove just how much Friedrich portrays emotional and spiritual depth through his personal experiences in life. Friedrich, being capable of cultivating awareness and connection with life and nature through personal narratives, was able to

proficiently portray melancholic attributes of wistful remembrance and self contemplation, and gothic themes on life and death as well as the connection to the universe through adversity. Additionally, he successfully depicted serene joyous themes of life after death, spiritual tranquility, and personal serenity into landscape paintings encouraging the inclusion of emotional, spiritual, and theological subject matter, furthermore prompting viewers to connect to nature more profoundly.

Spencer Ort

PA - Penn State Behrend

Discipline: Biology

Authors:

#1 Spencer Ort

Abstract Name: The Possibility for Crayfish to Exhibit Food Preferences and Compounded Decision Making

Crayfish may exhibit food preferences and compounded decision-making processes during food selection. Crayfish are the primary benthic biomass feeders in many areas and while their stomach contents have previously been analyzed, their active food preference choices and the accompanied behavior have not. This study aimed to provide quantitative data on the food-choice preferences of three different crayfish species found in the Lake Erie Basin water shed. Ten individuals from each species were introduced to behavioral arenas with two food choices separated by a divider. These choices included tilapia (*Oreochromis niloticus*), Jungle Val (*Vallisneria americana*) and Japanese mystery snails (*Heterogen japonica*). Crayfish were allowed to move freely in these tanks while being monitored using EthoVision Software over a 55-minute period. Additionally, crayfish preference for deceased invasive Japanese mystery snails with and without operculums was determined using repeated, triplicate exposures with individual crayfish. These repeated trials were conducted to determine the ability of crayfish to make compounded decisions through learned behavior. Results indicated a preference for fish tissue when available and for Jungle Val over Japanese mystery snails with intact opercula. Over successive trials, crayfish spent less time with Japanese mystery snails possessing opercula, suggesting a potential compounded decision-making process. These findings provide insight into crayfish food preferences and decision-making behaviors.

Vanessa Ortega

IL - Joliet Junior College

Discipline: Biology

Authors:

#1 Vanessa Ortega

Abstract Name: Comparison of Assessing High Versus Low Effort Sampling Protocols for Benthic Macroinvertebrates

Numerous stream ecosystem studies have demonstrated that benthic macroinvertebrates serve as important indicators for determining stream quality. This is because these organisms are highly sensitive to environmental changes, their presence, diversity, and abundance can provide insights into the overall health of aquatic ecosystems. While various methods of stream sampling exist, researchers strive to determine which protocol is the most effective for collecting macroinvertebrates while maintaining high-quality data and efficiency. In this study, high-effort whole site and low-effort targeted site sampling techniques were conducted within a 61 m reach to collect macroinvertebrates, comparing taxa collected and stream quality

metrics in Lily Cache Creek, Plainfield, Illinois. The reach was sectioned off into four 15.2 m quadrants for a high-effort technique that focused on sampling using a dip net to collect specimens from riffles, runs, macrophytes, sediment, and/or snags within each quadrant. For the lower-effort targeted site, two riffles and one snag were sampled using a similar dip net collecting technique. Both methods were assessed for ecological stream quality indicators such as the Macroinvertebrate Biotic Index (MBI), Shannon Diversity Index (SDI), %EPT / %nonEPT (insect orders Ephemeroptera, Plecoptera, Trichoptera) individuals, %pollution tolerant / pollution intolerant individuals. Both methods produced mostly similar results. Taxa richness was higher for high-effort sampling but both techniques resulted in a rating of “Excellent” according to Illinois Riverwatch standards (14 and 18 respectively). There were no significant differences in EPT/non-EPT and pollution intolerant/tolerant comparisons, but high effort resulted in higher SDI (2.00 / 1.72) but lower stream quality (fair/good) than low effort sampling. Overall, the findings suggest that low-effort techniques can yield roughly similar results to high-effort techniques for stream quality metrics and can serve as an adequate alternative to high-effort sampling to save time and money for future conservation research.

Chidera Osaji

OK - University of Central Oklahoma

Discipline: Engineering

Authors:

Amarachukwu Oti

Abstract Name: Machine Learning for Diagnosis of Traumatic Brain injury and Developing tools for Educating the General Public

Identifying brain injuries in the preliminary stages through machine learning is crucial to prevent further complications, including long-term conditions like Alzheimer's disease and chronic traumatic encephalopathy. Recent advances in machine learning have shown promise in improving the early detection of traumatic brain injuries (TBIs), enhancing diagnostic accuracy, and reducing the need for multiple diagnostic scans. Studies in 2023 have demonstrated that advanced deep learning models can outperform traditional radiological assessments in identifying subtle patterns indicative of TBIs from MRI data, helping to reduce patient exposure to unnecessary radiation. In this research, we aim to utilize machine learning techniques to detect traumatic brain injuries using MRI datasets through classification and clustering approaches. The process begins by importing labeled datasets using Python, followed by visualizing the topographical brain images. Subsequently, the MRI image data will be converted into numerical form suitable for machine learning algorithms. We will then develop models to classify images as either normal or abnormal, indicating the presence of a traumatic brain injury. Our approach incorporates recent advancements in convolutional neural networks (CNNs) for improved feature extraction and classification accuracy. Finally, we will evaluate the model's performance using metrics like accuracy, precision, recall, and F1 score. Preliminary results indicate promising outcomes with models achieving accuracies exceeding 90% in distinguishing between normal and TBI-affected brains. This research demonstrates the potential of machine learning to significantly enhance early-stage diagnosis of brain injuries, reducing the risk of delayed intervention and long-term neurological complications.

Amelia Osborne

GA - Agnes Scott College

Discipline: Biology

Authors:

#1 Jennifer Kovacs

Abstract Name: Investigating Behavioral Effects of Conventional and Organic Pesticides in *Bombus impatiens*

Bees are vital pollinators for both agriculture and ecosystems. While there is plenty of evidence of sublethal behavioral effects caused by synthetic pesticides, there is a lack of research comparing the behavioral effects of synthetic pesticides to natural pesticides. The project aims to identify any differences in behavior caused by acephate (synthetic organophosphate) and neem oil (natural pesticide). The behaviors investigated include olfactory association, color association, and memory. Both pesticides are expected to negatively impact these behaviors. MethodsThe study used two treatments of one control and two experimental groups, which were fed acephate or neem oil at field specific doses. Bees were trained to positively associate blue color. Bees foraged for 15 minutes in the foraging chamber, containing a set of blue and yellow flowers with reservoirs. Yellow flowers contained water while blue flowers contained sucrose. Trials repeated every five days for a total of four trials, and activity was recorded. Recordings were analyzed and results were averaged over the number of bees in each group. Data were analyzed using ANOVA in R. Bees were trained to positively associate orange scent, by exposure to orange essential oil with each feeding. After 21 days, bees were placed in a choice maze and chose between orange oil or lavender oil. ResultsFlower color and date were significantly correlated with number of visits, and bees preferred blue flowers over yellow. Bees unanimously preferred the scent of orange oil. There was no significant difference between the control group and the experimental groups. ConclusionAlthough it is known that synthetic pesticides negatively impact behavior in bees, data did not support a significant handicap in visual or olfactory associations for bees exposed to the pesticides. There was strong evidence of the bees' abilities to learn and associate colors and smells with rewards.

T'Emimimo Oshin

MI - Wayne State University

Discipline: Biology

Authors:

#1 Vaibhav Diwadkar

#2 John Kopchick

#3 Phillip Easter

#4 David Rosenberg

#5 Jeffrey Stanley

Abstract Name: Stimulus-Response Uncertainty Impacts Cross-Cerebral Connectivity in Youth with Obsessive Compulsive Disorder and comorbid Anxiety

Various psychiatric disorders are comorbid with obsessive compulsive disorder (OCD). An understanding of comorbidities in OCD is immensely important for treatment planning and long-term management of the condition. Despite generalized anxiety disorder being one of the most prevalent comorbidities in obsessive-compulsive disorder (30% of OCD patients), few studies have researched its impact on the OCD phenotype. In this context, understanding mechanisms of brain network dysfunction may be useful in providing salient biological signatures of the impact of such co-morbidity, particularly in the context of uncertainty, a stressor that provokes the experience of anxiety. In this study, we will examine whether the presence of comorbid anxiety in OCD patients will be associated with differences in cross-cerebral functional connectivity in previously acquired fMRI data. Brain network interactions were evoked using a Perception – Action task where the relationship between percepts varied from certain (“always respond to the stimulus regardless of its color”) to uncertain (“only respond to a the green stimulus”). Data were acquired in healthy controls (HC), and OCD patients with or without comorbid anxiety (OCD, OCD+Anxiety). Image processing and connectivity analyses will rely on established methods. We expect uncertainty to disproportionately impact

functional connectivity in OCD+Anxiety patients (relative to OCD) because comorbid anxiety will make these participants more susceptible to interference of this condition on brain network function. Our results may contribute much needed information on the underlying mechanisms of comorbid anxiety in OCD.

Hidayah Osman

WI - University of Wisconsin-Milwaukee

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Her Stories: The Unseen Journeys of Southeast Asian Refugee Women in Milwaukee

This research investigates the lived experiences of Southeast Asian refugee women in Milwaukee through oral history, focusing on their food memories, food practices, and the ways they create a sense of home in a new country. Central to this study is the exploration of women's journeys, a narrative often overlooked in migration stories. Unlike the research on immigrant households, which centers on men who immigrate in search of work to support their families financially through labor, these women's stories highlight their resilience and contributions to domesticity and community. Many women left their parents' homes as teenagers, taking on significant responsibilities to provide for their families, despite enormous obstacles. Using oral history methodology, this research engages directly with Southeast Asian refugee women in Milwaukee, documenting their stories to understand the cultural and practical roles that food plays in these women's narratives. Food not only plays as a link to the past but also as a way to preserve culture and build community. By situating these personal narratives within broader frameworks of migration, gender studies, and foodways, the study aims to challenge the existing narratives that marginalize women's contributions in migration contexts. Preliminary findings reveal the transformative power of food in creating a sense of belonging and identity while showcasing these women's strength and adaptability. This work contributes to the broader discussion on migration by amplifying the voices of refugee women and acknowledging their vital roles in shaping their families and communities. It highlights the need for more inclusive narratives that recognize the complexity and diversity of migration experiences, ultimately offering a richer understanding of resilience and cultural preservation.

Muntas Osman

MN - University of Minnesota - Rochester

Discipline: Biology

Authors:

#1 Heather Holmes

#2 Michael Romero

Abstract Name: Water Transport and Kidney Stones Using a *Drosophila* Malpighian Tubule model

Kidney stones represent a significant clinical issue affecting approximately 10% of the global population, with no available treatment. Drinking more water is effective in reducing kidney stone occurrence by increasing urinary flow and decreasing ion supersaturation. In this study, we investigated Ca-oxalate (CaOx) crystal formation in *Drosophila* Malpighian tubules (MT) to determine whether genetic manipulation of water channels (Drip, Prip) and a salt transporter (NDAE1) in stellate cells could influence crystal formation. F1-knockdowns were generated by crossing 724-GAL4 flies with UAS-RNAi lines targeting Drip, Prip, and NDAE1. The resulting F1 flies were fed food supplemented with 10 mM NaOx for 4 days. MTs were then

dissected, and fixed on slides, and CaOx crystals were quantified using birefringence via polarizing microscopy. Previous studies have demonstrated that MTs secrete fluid at a faster rate on a per-cell basis than any other epithelium. Drip and Prip exhibit significant water permeability when expressed in *Xenopus* oocytes, and knockdowns of Drip and Prip lead to decreased fluid secretion and increased crystal formation. Our updated findings indicate that knockdowns of Drip, Prip, and NDAE1 result in statistically significant increases in both the number and surface area of CaOx crystals compared to control. This suggests that NDAE1-mediated ion transport supports transepithelial water movement and helps maintain dilute MT secretions, preventing crystal formation. Together, these results highlight that both AQP-mediated water transport and salt-driven water transport mechanisms are crucial in maintaining the dilutive capacity of MT secretions to avoid crystal formation. These findings also suggest that developing therapeutics to enhance urine flow, such as aquaretics, may offer new options for preventing kidney stone disease, especially when increased water intake alone is insufficient.

Lucia Otten

IN - Valparaiso University

Discipline: Political Science

Authors:

Abstract Name: The Eagle and the Dragon: US and Chinese Foreign Direct Investment in Latin America

Since enduring colonization by the Spanish and Portuguese and neocolonialism under United States capitalism-hungry policies, Latin American countries have been objectified for their material resources for centuries. The 21st century has seen a shift in investment and attention to another global superpower as China has stepped in to implement numerous foreign direct investment (FDI) infrastructure projects. As US government agencies and think tanks express concern regarding China's investment trends, Latin American countries now face the unique situation of being the point of political and economic competition between the eagle and the dragon. So that Latin American countries can best understand how investment strategies affect them, they must first recognize the potential relationships that the US and China display in their investment strategies. This matter of FDI relationship gives rise to the question: does US FDI reactively follow Chinese FDI in Latin American countries? This article compiles data from the US Bureau of Economic Analysis, the Inter-American Dialogue and Boston University Global Development Policy Center, and other sources in an analysis of Chinese and US government FDI in Latin America as a region and in individual countries from 2007 to 2023. Through statistical analysis of US direct investment positions abroad and loans from China's development finance institutions, I test the data for correlation between US changes in FDI levels in relation to previous Chinese FDI trends. While research is ongoing as I conclude the statistical analysis process, I hypothesize that US FDI trends will follow Chinese FDI increases and decreases in the region due to US-China political tensions and the question of future hegemonic power in Latin America. With this data, Latin American countries could exploit FDI patterns to negotiate improved FDI deals and gain traction on the world stage.

Albert Otto

PA - Duquesne University

Discipline: Environmental Science and Sustainability

Authors:

#1 Philip Reeder

#2 Harry Jol

Abstract Name: Searching for the Remains of the Jaundole Castle Near Riga, Latvia Using Ground Penetrating Radar (GPR)

This study explores the potential location of the subsurface remains of Jaundole Castle on Dole Island, Latvia, using ground-penetrating radar (GPR) to detect and interpret anomalies associated with the castle's ruins. Historical records show that Jaundole Castle, constructed in the 14th century by the Dome Chapter as a defensive and administrative structure, played a key role in regional governance and trade. In 1416, the Livonian Order assumed control of the castle. It then returned to the Dome Chapter, serving various functions, including a refuge for the Archbishop of Riga's servants. By the mid-16th century, it had become a crown estate under Polish rule. During the Polish-Swedish War in 1628, the retreating Poles deliberately destroyed the castle to prevent its use by Swedish forces. Over time, the ruins were buried, with little visible evidence remaining by the 18th century. In the summer of 2024, researchers from Duquesne University and the University of Wisconsin-Eau Claire conducted GPR surveys where historical maps and written accounts indicated the location of the castle near the mouth of the now-defunct Lebjava River, at the point where it enters the Daugava River. GPR data was collected using a Sensors and Software GPR system and a 500 MHz antenna. Visual interpretation of both slice view and cross-section data plots revealed linear features that are remnants of castle walls and circular patterns indicative of towers or other structural elements, which match historical depictions of the castle's layout and positioning. Based on GPR data, historical maps, and documents, the detected anomalies are likely remnants of the Jaundole Castle. Recommendations for future research include targeted test excavations to validate these findings, and a possible full-scale excavation to facilitate the conservation of the Jaundole Castle ruins, thus aiding in the preservation of Latvia's medieval heritage.

Albert Otto

PA - Duquesne University

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

#1 James Swindal

Abstract Name: Academic Burnout as Existential Crisis: Heidegger's Anxiety and Authenticity in Student Life

This paper argues that Martin Heidegger's ideas of anxiety and authenticity, presented in *Being and Time*, provide an understanding of academic burnout in students. Heidegger's analysis of anxiety as a mood that discloses an individual's confrontation with their potential for authentic existence offers a way to reinterpret burnout. Often reduced to psychological terms like exhaustion or inefficacy, burnout is reframed here as an existential crisis, where students are caught in inauthentic modes of being shaped by institutional and social pressure. The central thesis of this paper is that academic burnout reflects not just a psychological challenge but an existential one, involving a failure to confront or embrace one's authentic potential. The paper first introduces the phenomenological method and Heidegger's concepts of anxiety and authenticity, situating these within contemporary discussions on mental health in education. It contrasts Heidegger's existential anxiety with conventional understandings of anxiety, highlighting how the former offers more into the nature of burnout. The paper then analyzes burnout through Heidegger's framework, using ideas like temporality and intersubjectivity to show how academic expectations drive students into inauthenticity. Examples from student life are used to illustrate burnout as a confrontation with existential limits, one that goes beyond just academic stress. Finally, the paper examines resoluteness in reclaiming authenticity. It argues that while Heidegger provides no methodical steps for reaching authenticity, his idea of resoluteness points to a way of being that could help students transcend burnout. Treating burnout as an existential phenomenon challenges educators and institutions to rethink their approaches to education, emphasizing the need for learning environments that support authentic engagement and well-being.

Grace Oualline

PA - Carnegie Mellon University

Discipline: Biology

Authors:

#1 Xiaolei Brian Zhang

Abstract Name: skandiver: a divergence-based analysis tool for identifying intercellular mobile genetic elements

Motivation: Mobile genetic elements (MGEs) are as ubiquitous in nature as they are varied in type, ranging from viral insertions to transposons to incorporated plasmids. Horizontal transfer of MGEs across bacterial species may also pose a significant threat to global health due to their capability to harbor antibiotic resistance genes. However, despite cheap and rapid whole-genome sequencing, the varied nature of MGEs makes it difficult to fully characterize them, and existing methods for detecting MGEs often do not agree on what should count. In this manuscript, we first define and argue in favor of a divergence-based characterization of mobile-genetic elements. Results: Using that paradigm, we present skandiver, a tool designed to efficiently detect MGEs from whole-genome assemblies without the need for gene annotation or markers. skandiver determines mobile elements via genome fragmentation, average nucleotide identity (ANI), and divergence time. By building on the scalable skani software for ANI computation, skandiver can query hundreds of complete assemblies against >65 000 representative genomes in a few minutes and 19 GB memory, providing scalable and efficient method for elucidating mobile element profiles in incomplete, uncharacterized genomic sequences. For isolated and integrated large plasmids (>10 kb), skandiver's recall was 48% and 47%, MobileElementFinder was 59% and 17%, and geNomad was 86% and 32%, respectively. For isolated large plasmids, skandiver's recall (48%) is lower than state-of-the-art reference-based methods geNomad (86%) and MobileElementFinder (59%). However, skandiver achieves higher recall on integrated plasmids and, unlike other methods, without comparing against a curated database, making skandiver suitable for discovery of novel MGEs.

Sean Owens

FL - Embry - Riddle Aeronautical University

Discipline: Engineering

Authors:

#1 Leitao Chen

Abstract Name: Real-Time Fluid Simulations by a GPU-based Lattice Boltzmann Method

The purpose of this project is to demonstrate the capabilities of the lattice Boltzmann method, via a real time fluid simulation that replicates a partially fluid-filled box that can be manipulated in real time. LBM has been shown to outperform conventional computational fluid dynamics (CFD) methods in solving the Navier-Stokes equation in terms of computational efficiency. This is particularly true for complex problems involving multi-phase and multi-component flow. LBM models can be computed in parallel using OpenCL, which allows for significant speed improvements. When paired with a powerful graphics processing unit (GPU), the work can be distributed across thousands of cores, enabling real-time simulations of complex fluid dynamics. By combining this real-time capability with user-controlled fluid acceleration, via an Arduino

equipped with an Inertial measurement unit (IMU), the sloshing process in a partially fluid-filled box can be simulated and visually demonstrated.

Oreoluwa Owoseeni

TN - Fisk University

Discipline: Health and Human Development

Authors:

#1 Rejin Nepal

#2 Oreoluwa Owoseeni

#3 Oghenevwegba Ikuru

#4 Joshua Amosu

Rejin Nepal

Joshua Amosu

Abstract Name: A Case Study Analysis of Area Deprivation and Sleep Health: Results from the All of Us Research Program

Quality sleep underpins countless physiological and psychological processes, from regulating hormones to boosting cognitive function. Despite its importance, millions suffer from sleep disturbances, experiencing negative consequences ranging from cardiovascular disease and diabetes to anxiety and depression. Recent studies suggest that socioeconomic factors, impacting access to resources and living conditions, might contribute to these disparities. In this case study, we look to explore the potential link between sleep quality and socioeconomic status, using predetermined deprivation indexes for different zip codes as a proxy. By exploring this potential connection, we aim to elucidate the systemic factors influencing sleep health and address sleep inequities, enhancing the overall well-being across diverse communities. We ran a cross-sectional study in the All of Us database and after stratifying and cleaning our dataset for null values, we arrived at a cohort size of about $n = 9,600$. We ascertained sleep quality by the percentage of deep sleep the individual had and sleep efficiency by the ratio of time spent asleep against time spent in bed. We ran a regression analysis and visualized these variables against median income and neighborhood deprivation using the deprivation index, an aggregate derived from six American Community Survey (ACS) metrics. The correlation coefficient between the sleep quality and deprivation index was approximately 0 ($r = 0.0087$) and insignificant. The same was the case for the correlation between sleep efficiency and deprivation index with a value of $r = 0.05$. Among the study participants enrolled in All of Us, there are no significant relationships between neighborhood deprivation and sleep health. It is possible that the biggest effects on sleep health lie in genetics and other non-socioeconomic risk factors such as age, family history, and drug use.

Oreoluwa Owoseeni

TN - Fisk University

Discipline: Health and Human Development

Authors:

#1 Oreoluwa Owoseeni

#2 Fanwei Kong

#3 Alison Marsden

Abstract Name: Automating congenital heart disease patient-specific mesh creation from cardiovascular images

Congenital Heart Disease (CHD) is one of the most common types of birth defects and deaths worldwide, with nearly 40,000 babies born with CHD annually in the United States. As these conditions are remedied by high-risk open-heart surgeries, there is a need for personalized treatment and patient-specific interventions in the operating room. Computational modeling for CHD patients can facilitate treatment and surgery planning, with analysis done on patient-specific anatomical heart models generated from cardiovascular images (CT, MRI, etc.). However, the process of generating accurate heart models is time-consuming and painstaking, highlighting the need for automation. In this study, ground truth segmentations of 43 CHD patients' cardiac CT images were created using 3D Slicer, indicating the ventricles, atria, and great vessels, to form a training dataset (n = 165) for a previously developed UNet-based segmentation convolutional neural network. This dataset contained different CHD conditions and combinations such as ventricular septal defect (VSD), double outlet right ventricle (DORV), pulmonary atresia, Tetralogy of Fallot, atrioventricular septal defect (AVSD), d-transposition of great arteries, etc. Algorithm performance was assessed by manually scoring each segmentation in line with the patient's diagnosis and corresponding cardiac anatomical features. After training, an improvement of 28% ($p < 0.01$) was observed in the accuracy of heart model generation from the testing CT images (n = 30). In the future, these ground truth segmentations can be used to further improve machine learning methods to generate patient-specific heart anatomical models at high throughput with minimal user interaction and aid clinicians when planning and administering treatments for CHD patients.

Matthew Owusu

NC - University of North Carolina at Chapel Hill

Discipline: Biology

Authors:

#1 Daniel Krummel

#2 Caroline Mohammed

Abstract Name: Activation of Intrinsic Glioblastoma GABAA Receptors Impairs Cancer Viability

Glioblastoma (GBM) is a highly aggressive brain cancer with a 2-year survival rate of ~25%. GBMs are challenging to treat due in part to their molecular heterogeneity and the physical roadblock presented by the blood-brain barrier, which acts to limit therapeutic effectiveness. There is an urgent need for therapeutic approaches that can overcome this cancers' heterogeneity and the blood-brain barrier. Interestingly, brain and systemic cancers, including lung and melanoma, possess functional Type-A GABA receptors (GABAARs), which are the major inhibitor neurotransmitter receptors in the adult human brain. Furthermore, GABAARs in cancer cells functionally resemble embryonic GABAARs and move chloride ions out of the cell. In contrast, GABAARs in mature neurons move chloride ions into the cell. My laboratory discovered a new class of small molecules that bind to and activate GABAARs in cancer cells, eliciting a significant outward flow of chloride ions and ultimately cell death. My research is investigating if we can leverage the presence of GABAARs in GBM cells to impair their viability using this new class of small molecules and if so, their mode-of-action. We report that these small molecules can impair GBM viability by triggering autophagy, the cells 'self-eating' phenomena.

Brook Ozier

IL - Eastern Illinois University

Discipline: Environmental Science and Sustainability

Authors:

#1 Scott Meiners

Abstract Name: Morphological changes with foraging strategy in *Euonymus fortunei*

Euonymus fortunei, or wintercreeper, is a non-native evergreen liana that forms a dense groundcover as a juvenile and ascends trees when mature. Wintercreeper is considered an invasive species in the U.S. due to its ability to grow in a range of conditions, aggressiveness in colonizing new environments, and tendency to outcompete native species. While lianas tend to colonize disturbed areas, my research takes place in a relatively undisturbed, old-growth forest, an ecosystem which is increasingly rare and represents a significant conservation concern. The closed canopy conditions of old-growth forests transmit less light to the understory, which may impact the growth and foraging strategy of *Euonymus fortunei*. *Euonymus fortunei* has two distinct phases in its development, with potentially different morphological strategies. The juvenile form extends horizontally along the ground and forms a dense layer that can exclude native species. Once the liana encounters a suitable host tree, it ascends the trunk and may become reproductively mature, reaching up to 60 feet into the forest canopy. The goal of my work is to examine the morphological differences regarding foraging strategies of each phase. I investigate the morphological changes between juvenile, mature, and fruiting forms of *Euonymus fortunei* collected from Beall Woods State Park, an old-growth riparian forest. The samples were analyzed for internode length, branch length, petiole length, LAI, leaf water content, and stem density. If *E. fortunei* alters its strategy in seeking out host trees, I expect juvenile forms to exhibit a searching strategy, with longer internodes, more branching, and less dense stems and mature forms to allocate more resources to leaves and stems and to grow straight up a tree with less branching. Increasing knowledge about *Euonymus fortunei*'s ecological strategies may be crucial to effectively manage this invasive species.

Emmanuel Paalam

FL - University of West Florida

Discipline: Mathematics

Authors:

#1 Achraf Cohen

#2 Thuong Huynh

Abstract Name: A Machine Learning Approach to Predicting Student Dropouts on the ELS:2002 Study

Academic dropout concerns all levels of education, and a vast body of research attempts to interpret and minimize the issue. Machine learning models have become a topic of interest regarding the latter objective as a means of statistical prediction. This research delved into using machine learning models to predict student dropouts using data from the Education Longitudinal Study 2002 (ELS:2002), over 4000 variables, and 16,000 observations, comparatively utilizing various models and determining which makes the most accurate predictions on academic dropout. The dataset, which nationally represents the educational progress of the student body from high school to postsecondary years, contains a wide array of academic and non-academic characteristics of students, including academic performance, socioeconomic status, school engagement, and family background. We aimed to develop predictive models by using these attributes to identify students at risk of dropping out of high school. We made use of a variety of supervised, machine learning models appropriate for classification-focused prediction. The data first undergoes feature selection based on the number of missing values in each feature column to ensure that only high-quality attributes contribute to the prediction. Subsequently, various preprocessing methods, such as imputation, feature encoding, and oversampling, are applied to further format and clean the dataset. Precision, recall, and F1-score metrics were utilized to assess the model's classification performance. Ultimately, we found that applying XGBoost to the ELS:2002 dataset, which was preprocessed with SMOTE (Synthetic Minority Oversampling Technique) oversampling and data imputation, yielded the most favorable balance between these metrics. This research agrees with previous studies that confirm XGBoost's effectiveness in predicting student dropout while contributing findings with the ELS:2002 dataset, which, to our knowledge, has yet to be utilized for dropout prediction via machine learning methods.

Christian Packer

MI - University of Michigan - Ann Arbor

Discipline: Psychology

Authors:

#1 Michael Mignano

Abstract Name: The Self in Sport and Exercise: A Scoping Review

The purpose of this research study was to find all of the pertinent information available regarding the self as it pertains to sport psychology. The research team gathered work published on the topic of self and sports and summarized the key findings and ideas. The study examined what has been found regarding a numerous selection of self-related terms and their relationship to the world of sport. Through a specific search protocol, the research team conducted a scoping review of the literature. This research is important because it aims to give a strong conclusion on the role the self plays in sport, which can ultimately help to shape sport psychology consulting techniques. Though not yet concluded, the key findings will likely be that there was a substantial amount of research already conducted on the self in sport psychology, and the research team anticipates that the culmination of research will agree that the self plays a monumental role in sport and exercise, in many more aspects than would be readily apparent. Further, knowledge gaps in the literature will also be identified to help guide future research in this area.

Adyasha Padhi

CA - University of California - Davis

Discipline: Biology

Authors:

#1 Aldrin Gomes

#2 Gabriela Rivera

Abstract Name: Effect of Diclofenac on Cardiomyocyte Cells

Nonsteroidal anti-inflammatory drugs (NSAIDs), such as aspirin and ibuprofen, are commonly used to manage pain, decrease inflammation & fevers, and prevent blood clots. NSAIDs have also been linked with increased risk of gastrointestinal bleeding, myocardial infarction, and stroke. Diclofenac is an NSAID used around the world associated with the highest risk of stroke & heart attacks in clinical studies and recently became available over-the-counter in a topical form in the United States. However, the mechanisms of damage by diclofenac to cardiomyocyte cells are not well understood. The goal of my investigation is to determine if physiologically relevant doses of diclofenac increase oxidative stress and cause cardiomyocyte cell damage by conducting cell culture experiments using C2C12 mouse myoblast cells. These experiments include mitochondrial membrane potential experiments, cell survival assays, western blotting, superoxide ion detection, and proteasome biochemical assays. Preliminary results show that there were significant differences in mitochondrial membrane potential assays between control & diclofenac treatment showing that the mitochondria of cells treated with diclofenac will not be able to produce ATP as efficiently and were more likely to experience mitochondrial dysfunction. Mitochondrial membrane health is associated with oxidative stress and damage, which is supported by increased levels of reactive oxygen species in diclofenac-treated cells, and this damage is associated with higher risks of stroke & heart attack.

Carolina Padilla Gonzalez

CA - Medanos College

Discipline: Chemistry

Authors:

#1 Savannah Gomez

#2 Ashely Jimenez

#3 Jessica Rough

Abstract Name: Adsorption of Anionic and Cationic Dyes with Pumpkin Peels

Removal of cationic and anionic dyes from water using waste biomass is a growing area of bioremediation research. This research focused on the use of sugar and knucklehead pumpkin peels to remove hazardous dyes from water. Dye adsorption studies were conducted with crystal violet and acid green 5 at varying pH levels. The pumpkin biomasses were not effective in removing the crystal violet dye from the solution in neutral conditions but showed promising results in basic solution: 80% removal in 60 minutes with both sugar and knucklehead pumpkin peels. The biomasses showed little effectiveness in the removal of acid green 5 dye in neutral conditions, but could not be tested in acidic or basic solutions due to its role as a pH indicator. The sugar pumpkin appeared to have released a secondary pollutant (β -carotene) into the solution, making it a less ideal bioadsorbent. The use of a different anionic dye that does not change color with pH could potentially provide a more clear study of the adsorption of anionic dyes by pumpkin peels in acidic and basic conditions.

Cienna Paet-Gulstrom

HI - Kapi'olani Community College

Discipline: Environmental Science and Sustainability

Authors:

#1 Cienna Paet-Gulstrom

#2 Kainalu Steward

#3 Haunani Kane

Abstract Name: Automating Atoll Resilience: AI-Driven Geospatial Analysis at Lalo in the Face of Climate Change

The increasing vulnerability of atoll island communities to climate change, particularly due to sea-level rise (SLR) and intensified hurricanes, raises significant concerns globally. It is predicted that low-lying atolls, such as those within the Papahānaumokuākea Marine National Monument (PMNM), may face submersion within the next 100-200 years. Lalo, an open atoll within PMNM, plays a critical ecological role, as a nesting rookery for 90% of the threatened Hawaiian green sea turtle population. In 2018 a category 3 hurricane known as Walaka, struck Lalo, causing significant shoreline erosion and reef loss, which underscored the importance of understanding the recovery and resilience of these islands. This research aims to improve the geospatial analysis of shoreline change at Lalo, with a particular focus on East Island, through the newly developed Segment Island and Atoll Model (SIAM). SIAM automates the labor-intensive task of manually digitizing atoll shorelines, providing a more efficient and accurate solution. Currently, SIAM utilizes Python programming to process satellite imagery and generate metadata files compatible with GIS platforms, while also allowing future integration with machine-learning applications. Its user-friendly interface and batch processing capabilities significantly reduce analysis time by... The ultimate goal is to integrate SIAM with the

open-source program QGIS, enabling fully automated shoreline change detection for atoll and island communities. This study aims to assess SIAM's ability to monitor and quantify shoreline changes at Lalo. Expected results include faster, more accurate detection of coastal changes, significantly enhancing our understanding of atoll resilience in the face of climate-induced impacts. These insights are essential for supporting conservation efforts within the PMNM and ensuring the protection of biocultural ecosystems.

Tanisha Pagadala

PA - University of Pittsburgh

Discipline: Nursing and Public Health

Authors:

#1 Leonora Anyango

Abstract Name: Barriers to Healthcare Access for Refugees in Pittsburgh

In search of better living conditions, refugees often undertake migration journeys that are long, arduous, and detrimental to their health. Thus, it is a priority for refugees to receive high quality healthcare upon resettlement, but in the United States – despite having one of the largest refugee resettlement programs in the world – this is not certain. Pittsburgh, Pennsylvania, a major city in one of the top 10 states that resettle refugees in the country, is home to a significant number of refugees, but there is a lack of information about their healthcare experiences. This study aimed to fill these gaps by exploring the different barriers to healthcare access encountered by refugees resettled in Pittsburgh. Three refugees from Swahili-speaking nations and with an average of six years of residence in Pittsburgh were interviewed. In general, three major barriers to healthcare access were reported: (1) transportation, (2) language barriers, and (3) cost of treatment. Notably, participants indicated that they faced fewer of these barriers when assisted by a refugee agency in their first few months after resettlement. The lack of diversity in participants' countries of origin and the small sample size of this study limits its generalizability, revealing the necessity for larger, more diverse studies in the future. Despite the limitations, this study serves as an exploration into the barriers faced by refugees in Pittsburgh and emphasizes the need for improved access to high quality healthcare services for this population.

Shea Pagett

GA - Georgia College and State University

Discipline: Psychology

Authors:

#1 Shea Pagett

#2 Sophie Williams

#3 Adam Stern

#4 Stephanie Jett

Sophie Williams

Abstract Name: One Man's Trash: Influences of Urbanization and Land Connectivity on Scavenger Behavior
Data collection in progress

Scavengers are vital, yet often neglected, parts of the ecosystem. Urbanization creates complex gradients in landscape and food availability for scavenging species. While much research has focused on urbanization's impact on behavior, little has specifically addressed scavengers. Our study investigated scavenger behaviors

along a rural-to-urban gradient in Mobile County, Alabama, and Central Georgia (CG) using trail cameras at bait stations. Data from Mobile County, collected from 2015 to 2017, served as pilot and comparison data for CG, defined as areas south of Interstate 20 and north of Highway 280, including Baldwin, Washington, Hancock, Putnam, Jones, and Bibb Counties. We also examined the impact of land connectivity to resources like bodies of water, greenspaces, and stormwater handling systems. We hypothesized that urbanization would affect scavenger behavior in three ways: 1) Increasing species diversity from rural to urban areas; 2) Altering the succession of species at bait sites between urban, suburban, and rural areas; and 3) Influencing species composition based on land connectivity within levels of urbanization. Preliminary analyses from Mobile County indicated that while species diversity was not significantly impacted, the succession of species at bait stations was. Avian scavengers (e.g., turkey vultures) arrived first in rural areas, while small mammals (e.g., opossums, raccoons, domestic cats) arrived first in urban locations. Further investigation across more diverse sites is necessary. Geographical Information Systems (GIS) analyses will be conducted to confirm urbanization levels and examine land connectivity aspects. This study aims to enhance our understanding of ecosystem health and inform future research on animal behavior and cognition.

Kristiana Palacios

MD - Bowie State University

Discipline: Biology

Authors:

#1 Corey Bradley

#2 Alexandria Dubuclet

#3 Daliyah Brown

Abstract Name: Predators in Paradise: The Impact of Non-native Barn Owls on Kauai's Seabirds and Waterbirds

Invasive species are one of the leading causes of extinction, worldwide. They are particularly devastating on isolated archipelagos, such as the Hawaiian Islands where 67% of endemic birds have already been lost to human-induced extinction. Here, we study the diet and likely impact of invasive Barn Owls (*Tyto alba*) on the island of Kauai, Hawaii. Building on several previous semesters of class research, the Fall 2024 General Zoology class quantified the diet of Barn Owls using stable carbon and nitrogen isotope analysis of partially grown owl feathers and potential prey items. We found that waterbirds are isotopically distinct from other prey, including seabirds, rodents, and insects. However, waterbirds composed a small minority of Barn Owl diet, which was dominated by rodents and insects, followed by seabirds. To infer the dietary preferences of invasive Barn Owls, we also worked to generate a body condition index (BCI) using body mass and the length of cleaned tibiotarsi. We found a marginally significant effect of diet on BCI, wherein owls consuming >10% seabirds had a poorer body condition than remaining owls (who typically consumed >90% rodents and insects). Similarly, we found that owls with lower body masses were more likely to consume seabirds. Our results substantiate the concern conservation managers have about Barn Owls – a unique invasive predator in Kauai, given its ability to fly over predator-proof fences to kill critically endangered seabirds. However, our data also imply that seabirds are not high quality or preferred prey for Barn Owls. We suggest that owl control efforts keep pace with rodent control. Otherwise, loss of Barn Owls' primary prey (rodents) might further increase their depredation of seabirds.

Kristiana Palacios

MD - Bowie State University

Discipline: Biology

Authors:

#1 Corey Bradley

#2 Alexandria Dubuclet

#3 Daliyah Brown

Abstract Name: Predators in Paradise: The Impact of Non-native Barn Owls on Kauai's Seabirds and Waterbirds

Invasive species are one of the leading causes of extinction worldwide. They are particularly devastating on isolated archipelagos, such as the Hawaiian Island, where 67% of the endemic birds have already been lost to human-induced extinction. Here, we study the diet and likely impact of invasive Barn Owls (*Tyto alba*) on the island of Kauai, Hawaii. Building on several previous semesters of class research, the Fall 2024 General Zoology class quantified the diet of Barn Owls using stable carbon and nitrogen isotope analysis of partially grown owl feathers and potential prey items. We found that waterbirds are isotopically distinct from other prey, including seabirds, rodents, and insects. However, waterbirds composed a small minority of the Barn Owl diet, which was dominated by rodents and insects, followed by seabirds. To infer invasive Barn Owls' dietary preferences, we also generated a body condition index (BCI) using body mass and length of cleaned tibiotarsi. We found a marginally significant effect of diet on BCI, wherein owls consuming > 10% Seabirds had a poorer body condition than remaining owls (who typically consumed >90% rodents and insects). Similarly, we found that owls with lower body masses were likelier to consume seabirds. Our results substantiate conservation managers' concern about Barn Owls - a unique invasive predator in Kauai, given its ability to fly over predator-proof fences to kill critically endangered seabirds. However, our data also imply that seabirds are not high-quality or preferred prey for Barn Owls. We suggest that owl control efforts keep pace with rodent control. Otherwise, the loss of Barn Owls' primary prey (rodents) might further increase their depredation of seabirds.

Emily Palacios

TX - Texas Woman's University

Discipline: Biology

Authors:

#1 Nadine Yasin

#2 Zane Lybrand

Abstract Name: A Comparative Analysis of Sonic Hedgehog Activation and WNT Pathway Inhibition in Human Cochlear Organoids

The human auditory system detects sound waves and converts the vibrations into neural signals. This mechanism relies on inner ear hair cells—mechanosensory neurons found within the cochlea. These cells lack regenerative capacity, therefore strong or prolonged insults ultimately result in permanent hearing loss. Rodent models are used to study various aspects of auditory mechanisms, however, limitations persist due to anatomical and developmental differences between species. To address this limitation, we introduce human cochlear organoids. Cochlear organoids are 3D cell culture models designed to recapitulate the human auditory system. During inner ear development, vestibular structures arise dorsally, whereas cochlear structures originate ventrally. Activation of the Sonic Hedgehog pathway and inhibition of the WNT pathway, using Purmorphamine and IWP2, promote ventralization, potentially leading to the formation of functional cochlear hair cells. By day 18 of cochlear organoid development, otic placodes—precursors to the inner ear structure—should begin formation, eventually evolving into otic vesicles. After 60 days, these vesicles are expected to contain both hair cells and supporting cells. Otic placode formation marks the initial step of inner ear induction and plays a critical role in establishing necessary structures for hair cell generation. Currently, we are investigating which time point during placode formation exhibits the highest expression of PAX8, a

key marker of posterior otic placodes. This information is crucial for optimizing differentiation protocols and ensuring accurate development of cochlear structures. To validate the effectiveness of the PUR + IWP2 protocol, we will compare treated organoids to untreated controls. Assessments will include analysis of gross organoid morphology and marker expression patterns. Immunohistochemistry assays will be used to quantify the expression of PAX8 (an otic placode marker), SOX2 (a marker for supporting cells), and MYO7A (a hair cell marker). This approach will allow us to validate the protocol's ability to generate functional cochlear structures.

Risa Palmer

NY - Houghton College

Discipline: Biology

Authors:

#1 Abigail Guiher

#2 Ransom Poythress

Abstract Name: Effects of Low-Level Light Therapy (LLLT) on Differentiated Vascular Smooth Muscle Cell (dVSMC) Wound Recovery

Previous research in skeletal muscle has indicated that low-level light therapy (LLLT) can accelerate wound recovery under certain circumstances. The purpose of this study was to discover if LLLT had similar effects on differentiated vascular smooth muscle cell (dVSMC) wound recovery. One theory on the mechanism for LLLT suggests that red LED photons absorbed into the mitochondria cause increased ATP production for cellular processes, including the rate of cell division. If so, then dVSM could benefit from similar treatment. To test this, rat aorta cells (A7r5) were cultured in vented flasks and subcultured in six-well plates where they underwent a scratch wound assay. The scratch width was measured before and after ten, twenty, or thirty minutes of LLLT, where some treatment groups received constant LED light exposure and others received pulsing. Although there was no significant difference in wound recovery after the pulsed LED light treatment, this experiment showed for the first time a significant increase in dVSM wound recovery after constant LED light treatment, with the best results after thirty minutes of treatment.

Shelby Paluch

WI - University of Wisconsin-Whitewater

Discipline: Environmental Science and Sustainability

Authors:

#1 Shelby Paluch

#2 Ashton Albrecht

#3 Rocio Duchesne

Abstract Name: Phenological changes in Wisconsin deciduous forests

Phenology is the study of plant and animal life in relation to seasonal climatic changes. Historically, plant phenology studies were done using field data that, although valuable, were limited in extent. Remote sensing overcomes this limitation by utilizing satellites to acquire images of the Earth's surface at regular intervals. We are combining NASA's Harmonized Landsat Sentinel-2 (HLS) product and the Normalized Difference Vegetation Index (NDVI) to characterize phenological changes in deciduous forests from 2016 to 2024. We chose two locations in Wisconsin based on their relatively high density of deciduous forests. The first area is

located southwest, in a portion of Devil's Lake State Park in Sauk County. The second location is northeast of Antigo, surrounding Baker Lake in Langlade County. The HLS data offers high spatial and temporal resolutions, which is ideal for tracking rapid changes on the ground. The NDVI, an indicator of greenness, is widely used to produce temporal curves to identify the stages vegetation goes through. We removed pixels contaminated with clouds, cloud shadows, water, ice, or high aerosol from the imagery and extracted NDVI values for areas designated as deciduous forests according to the Annual National Land Cover Database maps. Through a time series analysis of the seasonal changes in NDVI, we will identify the length of the growing season (DUR), the start of the growing season (SOS), and the end of the growing season (EOS). Studying these phenological metrics will be crucial to understanding whether Wisconsin is experiencing a lengthening of the growing season.

Hanyu Pan

PA - Carnegie Mellon University

Discipline: Engineering

Authors:

#1 Thomas O'Connor

Abstract Name: Modeling the Force-Extension Response of Binary Copolymers With Molecular Dynamics Simulations

The mechanical properties of elastomers are governed by the force-extension response of individual polymer chains that make up their network structures. For many polymer chemistries, the force-extension response of a chain can be accurately captured by the freely-jointed chain (FJC) model. However, the FJC model assumes that the polymer is composed of 1 monomer species, but many natural polymers, like proteins, are copolymers composed of many different amino acids. Currently, there is no comprehensive theoretical model for the force-extension response of copolymers with chemically distinct units. We apply molecular dynamics simulations to study force-extension response in copolymers containing hydrophobic and hydrophilic monomers. We simulate copolymers at varying temperatures and externally applied tensions and measure the resulting chain extension $R(T,f)$. Consistent with experiments, we find copolymers display a coil-to-globule transition below a sequence-specific critical temperature. This transition produces abrupt jumps in force-extension response as chains partially unravel.

Muyu Pan

PA - Pennsylvania State University

Discipline: Computer Science

Authors:

#1 Aaron Falk

Matthew Walter

Abstract Name: Analysis of Automated Theorem Proving through Abstraction of Logical Expressions

Propositional logic, or first-order logic, defines the fundamental rules for modeling Boolean relationships. It is used extensively within the field of computer science to model logical scenarios and represent situations that evaluate to a value of true or false. Automated Theorem Proving (ATP) is the process of proving any mathematical theorem. In most cases, these theorems can be reduced to first-order logical expressions, and consequently, there are extensive tools to evaluate first-order logic. One method of ATP in logical expressions

is modeled in the Boolean satisfiability (SAT) problem. The SAT problem asks whether a set of propositional formulas under Conjunctive Normal Form (CNF) is satisfiable. The SAT problem can be solved algorithmically, with optimizations to SAT-solving still being studied today. The advancement of machine learning in natural language processing capabilities has led to a heightened interest in a machine's ability to understand and model natural language as propositional logic, independent of human intermission. If a machine could model natural language in such a way, then proving facts and consistencies in articles could be highly automated. Further, the capability to model natural language as propositional logic could have further applications in software development to assist with debugging, finding loop invariants, or adhering to specifications. This research bridges the gap between natural language and propositional logic by building and evaluating a novel end-to-end solution that takes English sentences modeled as logical scenarios and converts these into propositional logic expressions. From there, these expressions are converted to CNF and solved for satisfiability. This approach utilizes existing libraries and models to build this pipeline to evaluate methods of understanding English language as logical expressions.

Anita Panatch

PA - Westminster College

Discipline: Biology

Authors:

#1 Dr. Joseph Balczon

Abstract Name: Evaluating the Inhibitory Potential of Xylitol on Oral Biofilm Formation in Cariogenic Conditions

Streptococcus mutans is a known key contributor in dental caries development and flourishes in the presence of common dietary sugars such as sucrose. *S. mutans* forms biofilms on tooth surfaces, facilitating enamel demineralization and promoting dental caries development. This study examines the inhibitory effects of xylitol, a non-fermentable sugar alcohol, on biofilm formation. While xylitol is known to impede biofilm formation due to *S. mutans*' inability to metabolize it, this study aims to focus particularly on its potential inhibitory effects on *S. mutans* biofilm growth even in sucrose-rich conditions. Using extracted human teeth immersed in mucin-enriched artificial saliva as an artificial oral environment, biofilm formation was assessed using a crystal violet plaque assay, with quantification performed via spectrophotometric methods. The experimental conditions included 1% sucrose, 1% xylitol, and a 1% sucrose-1% xylitol mixture. The results reveal statistically significant differences in biofilm accumulation between treatments, with pronounced biofilm accumulation observed in sucrose conditions and minimal biofilm accumulation in xylitol conditions. Most notably, the sucrose-xylitol mixture treatment exhibited lower levels of biofilm accumulation with significantly attenuated growth compared to sucrose alone, implying a potential antagonistic interaction between the two sugars. These findings highlight the potential of xylitol as a preventative agent for dental caries, even under cariogenic conditions. Furthermore, this study contributes to the growing amount of evidence supporting the use of xylitol in oral health strategies, suggesting its potential to be integrated into dental care regimens aimed at reducing caries risk and promoting oral health. Future research should focus on exploring the biochemical mechanisms underlying xylitol's inhibitory effects and its potential antagonistic interactions with other common sugars and cariogenic bacteria.

Stuti Panchal

PA - University of Pittsburgh

Discipline: Biology

Authors:

Abstract Name: Investigating the effects of noise exposure on endoplasmic reticulum stress-linked molecules and their contributions to the pathogenesis of noise-induced hearing loss

Noise-induced hearing loss (NIHL) is a highly common form of acquired hearing loss with no preventative biological therapies. Pathological noise exposure (NE) causes damage and/or death to cochlear hair cells, causing NIHL. However, the underlying molecular mechanisms by which noise-induced hair cell damage leads to hearing loss is not well understood. One potential mechanism by which NE causes NIHL is elevated or prolonged endoplasmic reticulum (ER) stress, triggered by a buildup of misfolded proteins in the ER and high levels of reactive oxygen species. Cells attempt to resolve ER stress by initiating the unfolded protein response (UPR), which can be beneficial or detrimental, and includes gene expression changes, signaling cascades, and cell survival/death pathways. To investigate the role of ER stress in NIHL, we utilized a mouse model of pathological NE. Adult mice were exposed to 105 decibels (dB) of 8-16 kilohertz (kHz) noise for 2 hours. Auditory brainstem response (ABR) testing conducted one day post NE confirmed that our NE model causes significant hearing loss. To assess dynamics in ER stress in response to NE, we examined cochlea-wide expression patterns of critical ER stress genes (Hspa5, Ddit3, Atf6, Atf4, and Atf3) using quantitative PCR. Results revealed upregulation of Hspa5, Ddit3, and Atf4 mRNA one day post NE, consistent with elevated ER stress. We are performing immunohistochemistry and will present our results on potential cochlear hair cell protein expression dynamics in ER stress-linked molecules. To validate and contextualize our findings, we are comparing our results to mice subjected to Tunicamycin-induced ER stress, a well-established model of ER stress. In summary, our results implicate ER stress molecules in the pathogenesis of noise-induced hearing loss. Future research will contribute towards a continued understanding of the ER stress response in cochlear hair cells and the underlying pathophysiology of NIHL.

Chelsea Pankiewicz

MI - University of Michigan - Ann Arbor

Discipline: Biology

Authors:

#1 Andrea Thompson, MD/PhD

Abstract Name: Turbo-Flag-MYBPC3 normally localizes to the sarcomere, enabling proximity labeling experiments to evaluate the effect of pathogenic missense variants within the sarcomere.

MYBPC3 is the gene most commonly mutated in hypertrophic cardiomyopathy (HCM) located within the A-band of the sarcomere. It has been previously demonstrated that N-terminally flag-tagged MyBP-C, the protein encoded by MYBPC3, normally localizes to the sarcomere within neonatal rat cardiomyocytes. Proximity labeling is a technique that involves using a mutated form of biotin ligase (TurboID) to rapidly label proteins with biotin in proximity to the protein of interest. The proximity proteins of MyBP-C within cardiomyocytes have not previously been identified. We hypothesized that TurboID could be attached to the N-terminus of our Flag-MyBP-C construct while still maintaining its ability to localize to the sarcomere. If our hypothesis is correct, this would enable us to label proximity proteins within the sarcomere with biotin. This hypothesis was tested by transfecting TurboID-Flag-MYBPC3 into induced pluripotent stem cell derived cardiomyocytes that have been genetically modified not to express MyBP-C. This study answered questions about the localization of TurboID-Flag-MyBP-C using immunofluorescence staining with antibodies for MyBP-C and Flag. To evaluate the localization of biotin-labeled proximity proteins, fluorescently labeled streptavidin protein was used that tightly binds to biotin. This study reveals that TurboID-Flag-MyBP-C localizes to the sarcomere and labels proteins in the A-band for both wild-type MyBP-C and mutant forms of MyBP-C that carry pathogenic missense variants causing hypertrophic cardiomyopathy (R495Q, R502W, W792R, R810H). This work validated essential protein constructs which will enable proximity labeling mass spectroscopy to be performed. We hope this future work will identify changes in proximity proteins caused by pathogenic missense variants.

Milan Panthi

MN - Minnesota State University - Mankato

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Milan Panthi

#2 Katheryn Zielinski

#3 Jennifer Schultz

Abstract Name: Breaking Barriers: Researching the Underrepresentation of Female Pilots in Aviation, Education and Training

Although most professional fields have evolved, aviation still remains male-dominated, with women making up only 5% of the total airline pilots in the world. This disparity is rooted in cultural, educational, and systemic challenges. This study investigates how specialized training, and education can help bridge this gap and incorporate more women into aviation. Using statistical analysis, we analyzed student Psychological Capital survey results. Our preliminary results indicate that there is a significant difference between male and female efficacy. These findings suggest that addressing educational and systemic barriers can enhance the persistence of female pilots in aviation. Building on these findings, our current work examines additional variables, such as motivations, barriers to entry, and perceptions of the aviation profession. We are also

developing strategies to address systemic barriers: mentorship programs, inclusive education curricula, and closer partnerships between academia and aviation companies. These will create an even more enabling environment that should see more women participate in aviation and see them sustain careers in this industry. By exploring these factors, we aim to identify actionable solutions to increase female participation in aviation.

Evelyn Papalimberis

PA - Lafayette College

Discipline: Environmental Science and Sustainability

Authors:

#1 Ernest Nkansah-Dwamena

#2 Trent Gaugler

#3 John Wilson

Abstract Name: Air Quality and Environmental Justice in the Lehigh Valley, PA: A Comparative Analysis of Disparities

PURPOSE: Air pollution disproportionately affects marginalized communities, yet little empirical research has focused on the Lehigh Valley region. This study addresses the following objectives: (1) to analyze air quality data across different towns in the Lehigh Valley and correlate it with demographic data (race, socioeconomic status, immigration status) and (2) to assess the role of economic activities, such as warehouse traffic, in exacerbating air pollution levels in marginalized communities. **METHODOLOGY:** This study employs a cross-sectional, correlational design using geographic information systems (GIS) and statistical modeling to analyze air quality and demographic data from U.S. Census Tract data over multiple years. The analysis uses multiple regression and ANCOVA models to assess correlations between air quality and demographic characteristics. Additionally, qualitative data is incorporated to explore the role of local economic activities, particularly warehouse and transportation hubs, in air quality disparities. Environmental policy effectiveness is evaluated by reviewing local air quality standards and enforcement practices.

RESULTS: Preliminary results indicate that towns with higher proportions of people of color, low SES populations, and immigrants show elevated levels of particulate matter and other pollutants. Economic activities, especially those related to warehouses and truck traffic, appear to contribute to higher pollution levels in these communities. Current environmental policies show limited effectiveness in addressing these disparities, as pollution levels remain higher in marginalized communities despite existing regulations.

CONCLUSIONS: This study highlights significant disparities in air quality across the Lehigh Valley, disproportionately affecting marginalized groups. The findings suggest a need for stronger environmental policies and targeted interventions to address both the pollution sources and their effects on vulnerable populations. **Keywords:** air pollution, people of color, low SES, immigration status, environmental justice

Alexis Papp

MS - University of Southern Mississippi

Discipline: Education

Authors:

#1 Stacy Reeves

Abstract Name: The Effects of COVID-19 on Educators in South Mississippi

This study was focused on discovering what may have caused educators in kindergarten through 8th grade classrooms in mid-south Mississippi to leave or consider leaving the profession as it relates to the COVID-19 pandemic within different content areas. Participants identified issues within the system that diminished their abilities to educate their students effectively and that related directly to the pandemic. Research from “Mississippi Teachers Are Eyeing the Exit” (Ballard, 2023) and “Teachers’ Dissatisfaction during the COVID-19 Pandemic: Factors Contributing to a Desire to Leave the Profession” (Gillani, 2022) showed that teachers were having strong difficulties during the pandemic which led to many leaving the profession. Research also proved that, throughout all areas of Mississippi, teacher retention was reaching an all-time low. Administration neglected their educators during some of the most challenging times of their careers, and, as a result, the teacher shortage is now at critical levels (Wright & Betz, 2019). A lack of support by administration could have caused an uptick in the number of educators considering leaving their jobs or leaving the profession all together. Participants conveyed feelings of being overworked, with limited resources and support from their administrators or district. The study demonstrated how varying content areas struggled more than others. A survey was given, and through the use of descriptive statistics, t-tests, and ANOVAs, statistics showed that more educators now, more than ever, are struggling to find a purpose in the classroom and they feel as though they no longer have a healthy balance of home and work life (Brouwers, 2020).

Piper Pardee

PA - Duquesne University

Discipline: Biology

Authors:

#1 Margaret McQuaid

#2 John Pollock

Abstract Name: Optimization and Assessment of CD45 and CD3 Protein Expression in Chronic Constriction Injury of Male and Female Rat Sciatic Nerve

Even though females and males develop hypersensitivity within the same time frame and to the same quantitative degree with equivalent nerve injury, they have distinct neuroinflammatory responses. Past research has suggested that T cells play an important role in peripheral nerve injury in females, not males, and IL-18 is a central mediator of neuropathic pain. Based on these observations, it is now important to look at the various proteins that work with T cells and the role they might play in these types of injuries. Glycoprotein CD45 appears to be required for the function of T cells, as the CD45 receptor activates the T cell antigen receptor complex. Protein CD3 has been shown to promote pro-inflammatory CD4–IL16 signaling in T cells. Using sciatic nerve tissue from a female rat that underwent chronic constriction injury, an immunohistochemical double primary antibody experiment was performed to optimize visualization of these proteins. Immune cells with expression of both these proteins demonstrated infiltration into the injured nerve epineurium, as well as the fasciculated nerve bundle. Further analysis will explore the neuroinflammatory accumulation of CD45 and CD3 positive cells in both injured females and injured males.

John Paredes

KY - University of Kentucky

Discipline: Engineering

Authors:

Abstract Name: Optimizing Brain Control Interfaces Performance through EEG- Based Critical Feedback: A Time and Frequency Domain Analysis Approach

Brain-computer interfaces (BCIs) enable individuals to control external devices through brain-generated electrical signals, typically captured via electroencephalography (EEG). While these systems hold significant potential, their prolonged use can lead to cognitive fatigue, necessitating the development of shared autonomy models to alleviate user strain. A novel strategy in this domain involves leveraging participants' EEG-based feedback, allowing users to act as critics of the system's performance. This feedback aids in distinguishing correct from erroneous decisions, thereby enhancing system efficiency. This study employs a publicly available dataset from BNCI Horizon 2020 to advance collaborative innovation within the BCI community. By applying time and frequency domain feature extraction methods, the research develops a classification model aimed at accurately interpreting user intentions with minimal trials, paving the way for more efficient and user-friendly BCIs.

Aditya Parekh

NJ - Kean University

Discipline: Computer Science

Authors:

#1 Aditya Parekh

#2 Daehan Kwak

Abstract Name: Evaluating Travel Time Accuracy in Navigation Systems

GPS-based navigation applications, such as Google Maps, Waze, BingMaps, and MapQuest, have become part of our daily travel, offering users real-time traffic information and ETAs to help construct the best routes possible. Yet, the accuracy of such ETAs in relation to observed ground truth data is under-explored, raising questions about the reliability of these systems in making route decisions. This study aims to determine the quality of traffic information provided by major navigation services by comparing ETAs with observed travel times from physical sensors and traffic data systems. The methodology used in this work has two major components. First, we design a Python-based web mining system to collect real-time traffic data, including estimated time of arrivals (ETAs) from four well-known navigation platforms: Google Maps, Waze, MapQuest, and BingMaps. Second, we collect ground truth traffic data from publicly available sources, including electronic toll tag readers and loop detectors provided by the New York Department of Transportation (NY DOT). The datasets are classified based on specific time frames, which include rush hours, non-rush hours, and weekends. We conduct a case study of densely populated urban areas, using New York City as the experimental setting. Using statistical methods, we compare differences between predicted and actual travel times. Descriptive statistics are also used to identify trends and anomalies across different navigation systems. Our results aim to improve the knowledge of ETA reliability, helping users make better-informed route decisions, while also enabling navigation providers to enhance their systems. These insights can be integrated into a user-friendly dashboard, bridging the gap between raw traffic data and actionable route recommendations. This work contributes to advancing technology in intelligent transportation systems and interdisciplinary research in data science, computer science, and smart cities.

Meghan Parisi

PA - Slippery Rock University of Pennsylvania

Discipline: Dance

Authors:

Abstract Name: The AIDS Epidemic: Dance as a Platform for Social Commentary and Reflection

First recognized in the United States in 1981, Acquired Immunodeficiency Syndrome (AIDS) was an epidemic that affected the lives of many. As early cases were most common in young gay men and intravenous drug users, people were quick to blame patients' lifestyles. Popular theories focused on lifestyle created fear and prejudice directed at those affected by this epidemic. Among the gay men affected by AIDS were dance artists. Artists involved in dance performance and choreography often develop a strong sense of community and connection. As members of this dance community witnessed close friends and family members lose their lives to AIDS, dance works were created in reaction to this crisis. Two specific works created in response to the tragedies of the AIDS epidemic were Garth Fagan's *The Disenfranchised* and Bill T. Jones' *Still/Here*. These pieces express different perspectives of those experiencing the AIDS epidemic. Fagan focused on the suffering of the people in disenfranchised groups while Jones took inspiration from working with individuals living with terminal illness. In examining *The Disenfranchised*, I had the opportunity to interview Natalie Rogers-Cropper, the current executive director of Garth Fagan Dance, to discuss her experience during this creative process. During a time of crisis, creative works serve as platforms for social commentary and reflection.

Lauren Park

CO - Colorado State University

Discipline: Biology

Authors:

#1 Lauren Park

#2 Rachel Doser

#3 Tom LaRocca

Abstract Name: Intertissue Double-Stranded RNA Signaling as a Driver of Age-Related Inflammation in *C. elegans*

Age is the primary risk factor for various diseases including cardiovascular disease, cancers, and multiple neurodegenerative diseases. Because of this, understanding age-associated processes that contribute to disease is an important research priority. Chronic inflammation is a central hallmark of aging that has been repeatedly shown to contribute to disease progression, but the drivers of age-related inflammation remain incomplete. Although the origins are currently unknown, double-stranded RNA (dsRNA) accumulation has emerged as a potential driver of chronic inflammation in aging and age-related diseases. Our lab and others have shown that endogenously-originated dsRNA accumulates with age and instigates inflammation that negatively impacts cellular health and longevity. More recently, intercellular and intertissue dsRNA signaling was found to regulate the lifespan of the model organism *Caenorhabditis elegans*. This intertissue dsRNA signaling requires the dsRNA transporter encoded by the *sid-1* gene. Others recently showed that overexpression of *sid-1* decreases *C. elegans* lifespan, thus, we tested whether *sid-1* overexpression negatively impacts longevity by allowing for accelerated dsRNA accumulation with aging. To do this, we analyzed dsRNA accumulation, immune activation, healthspan (maximum crawling velocity), and lifespan in *sid-1* overexpression and null strain at different ages. Then, to understand if excessive intertissue dsRNA signaling causes inflammation and reductions in lifespan, we treated the *sid-1* overexpression strain with the autophagy activator, Urolithin A, to increase cytoplasmic clearance of dsRNAs. These experiments will provide insight into whether intercellular and intertissue dsRNA signaling and accumulation contribute to the aging process, and may unveil novel targets (e.g., dsRNA transporters) for anti-aging interventions.

Hyewon Park

WI - University of Wisconsin-Madison

Discipline:

Authors:

#1 Ryan Grady

#2 Sarina Strnad

Dr. Cheri Barta

Catherine W.M. Chan

Abstract Name: Benefits of NCUR Participation: Analyzing Mentored versus Non-Mentored Research in the Context of Active Learning and Intersectionality

This study explores the differential benefits of attending the National Conference on Undergraduate Research (NCUR) for students engaged in mentored research compared to students without research faculty mentorship. By implementing a structured approach that includes testimonial data collection from students at a R1 institution, we aim to assess how Principal Investigator mentorship influences student experiences and outcomes at NCUR. Our previous experience over the past two years revealed two distinct groups: those engaged in faculty-mentored research who demonstrated higher levels of engagement and confidence, and students who were able to follow through and achieve successes but faced challenges when navigating the research landscape independently. Additionally, this research seeks to illuminate the varied experiences of diverse student populations by incorporating intersectional factors such as first-generation status and socioeconomic background. We will present qualitative data measuring engagement, satisfaction, and research self-efficacy, that provide deeper insights into individual journeys. We will illustrate specific instances of success among mentored students, highlighting how structured support enhances their academic and professional trajectories. By analyzing these approaches, we intent to contribute valuable insights to the existing literature on undergraduate research and active learning, particularly in the context of NCUR. Our findings will inform educators and institutions on best practices to foster inclusive environments that support all students in their pursuit of research and scholarship.

Thomas Parker

WI - Carthage College

Discipline: Communications

Authors:

Abstract Name: The Ethical Considerations of Utilizing Artificial Intelligence in Public Relations

The rapid integration of artificial intelligence (AI) into the public relations (PR) industry has fundamentally reshaped professional practices and methodologies. PR practitioners have had mixed emotions regarding the utilization of AI technology in PR, acknowledging both opportunities and ethical concerns. To discover the ethical barriers of AI in PR, a secondary content analysis study was conducted using scholarly articles and supplementary industry reports from credible entities. These sources provided insights into the capabilities of AI when harnessed for PR, along with relevant ethical dilemmas. This study also examined James Grunig's Excellence Theory and how one may apply the theory in context to implementing AI in the PR industry. Findings reveal that AI tools, such as generative AI programs, can innovate the PR industry by quickly generating high-quality content, managing PR campaigns and crises, and aiding practitioners with redundant tasks. However, risks such as misinformation, data privacy violations, biases, and the diminishment of the human touch emphasize the importance of balancing AI's capabilities with the industry's fundamental values. Mixed opinions regarding the integration of AI highlight the need for universally observed ethical guidelines. This study contributes to the ongoing dialogue surrounding ethical AI integration, offering

recommendations for PR practitioners on responsibly utilizing AI technology. By addressing both the opportunities and risks associated with AI, this study guides PR practitioners in leveraging AI to enhance their work while maintaining credibility, authenticity, and public trust. These characteristics are crucial as AI becomes commonplace in modern PR practices.

Lily Parsley

OR - Portland State University

Discipline: Art History

Authors:

#1 Lily Parsley

Abstract Name: Understanding Vermeer's Intention through Art Conservation

Art conservation changed the previously perceived art history of Johannes Vermeer's 1657 painting "Girl Reading a Letter at an Open Window." In 1979, art historians took an X-ray of the Vermeer painting, and a framed painting of a nude Cupid appeared in the background. After the 1979 scholars rejected suspicion of tampering, modern historians reevaluated the X-rays in 2017, and several evaluation tests were run. The tests resulted in the criminal discovery that the nude Cupid was covered forty years after Vermeer's death. After the painting of Cupid was revealed, the iconography and symbolism of the prominent factors in the painting, the girl and the letter, changed from reflecting unusual independence to domestic femininity. With the Cupid found to be criminally covered, a microscopic cross-section was done to evaluate the layers further. The 2021 investigation found that the layer of paint to cover the cupid was painted to match the already-aged Varnish used by Vermeer approximately sixty years before the repainting. The difference in the material caused a yellow stain to blemish Vermeer's original varnish layer. Since Vermeer intended the varnish to add muted tones to create a melancholy and calming effect, when the conservators ultimately removed the varnish layer, they also removed the impact of the muted tones. The conservation team claims they regret the unfortunate decision they had to make as they recognize that future viewers will never experience the full intensity of the painting. A scientific study was conducted in November 2023 on the viewer's visual opinion of the painting "Girl Reading a Letter at an Open Window." The conclusion was that viewers preferred the before version when they saw the side-by-side comparison of the painting before and after the conservation. Concluding that art conservation can change the previously perceived and the assumed future art history.

Adam Parsons

NC - Elon University

Discipline: Biology

Authors:

#1 Andrea Perreault

#2 Maggie Josling

Abstract Name: Predicting 3D protein structure of gene fusions in AMKL patients using AlphaFold

The organization of DNA in 3D space is important for gene regulation. Changes in DNA organization and resulting gene expression can have effects on cellular development and function, and have been linked with numerous diseases such as cancer. One way DNA organization may be altered is through binding of fusion proteins containing an intrinsically disordered region (IDR) and DNA binding domain. Fusion proteins form when two portions of independent genes fuse together – which occurs via structural rearrangements

(predominantly translocations). This project aims to help fill the gap that recent literature has highlighted regarding the structure of fusion proteins. This will be done using AlphaFold: an artificial intelligence program that uses amino acid sequences to predict 3D protein structure. This research project aims to predict the 3D structure of two gene fusions which were previously predicted by the Perreault lab to be found in Acute Megakaryoblastic Leukemia (AMKL) patients. ColabFold, a software within Google Colaboratory that makes use of AlphaFold, will allow the prediction of numerous proteins simultaneously. A program called ChimeraX will then be used to visualize and analyze the protein structures. Uncovering the protein structure of genes linked with cancer is key for obtaining a clearer picture of tumorigenesis. Thorough analysis of predicted protein structure may illuminate features that may be useful for future drug development for AMKL. Preliminary results have shown that both fusions likely contain intrinsically disordered regions as well as DNA binding domains – possibly suggesting that these combined features play a role in AMKL development.

Sri Parvatha

IN - Indiana University Purdue University Indianapolis

Discipline: Psychology

Authors:

#1 Marian Logrip

Abstract Name: Effects of Adolescent Social Isolation on Serotonin Responsiveness and Anxiety-Related Behaviors in Rats

Early-life stressors, such as post-weaning social isolation, profoundly influence mental health outcomes, as demonstrated by rodent models. This study investigates the impact of social isolation on serotonin receptor 2A (5-HT_{2A}) expression and anxiety-related behaviors, and whether these differ by sex. Rats were housed individually or in pairs from postnatal day 21 to day 42, followed by pair-housing until young adulthood (approximately postnatal day 70), when behaviors were assessed or brains collected for analysis. Behavioral assessments included two maze tests to evaluate anxiety-like behaviors: open field testing, where wall-oriented movement indicated anxiety, and social interaction, where anxiety should decrease rats' sociability. Following behavioral testing, brains were coronally sectioned, with analyses of differential serotonin receptor levels focused on the medial prefrontal cortex and basolateral amygdala. Specifically, fluorescent immunohistochemistry was performed to assess 5-HT_{2A} receptor expression and its presence in parvalbumin interneurons vs. principal projection neurons. Preliminary findings suggest that post-weaning isolation may alter serotonin system responsiveness and anxiety-related behaviors.

Akhila Pasupunuri

CA - University of California - Santa Barbara

Discipline: Political Science

Authors:

#1 Musa Malik

Tashvi Bansal

Manushri Pitale

Abstract Name: Analyzing Media Narratives with Machine Learning: Topic Alignment and Sentiment in Trump's Rally Speeches and News Media Coverage

Considering pivotal democratic elections like those of 2020 and 2024, understanding the role of news media in shaping political polarization is critical: media influence profoundly impacts democratic processes. Using agenda-setting theory and ingroup/outgroup dynamics from social identity theory as frameworks, this study examines the framing of Trump's rally speeches and their coverage by liberal and conservative news sources. Study 1 uses a BERT-based LLM and the probabilistic LDA model to analyze the relationship between topics in liberal versus conservative media coverage, examining how media outlets' political alignments influence the alignment and selective emphasis of topics in relation to the topics present in Trump's rally speeches. This led to further inductive analysis of topics using a neural-network based topic modeling pipeline. In Study 2, the political alignment of media outlets in connection to the sentiment of news articles was examined using another BERT-based LLM, while also considering the sentiment expressed in Trump's rally speeches. Our findings revealed that despite significant differences in topic alignment throughout sources, both liberal and conservative sources exhibited predominantly negative sentiments. Further analysis revealed that each outlet selectively criticizes the other to express ideological bias, rather than merely advocating its own views. This conclusion exemplifies a pervasive issue in contemporary media: the emphasis on adversarial coverage over constructive discourse. Such coverage inundates the public with divisive narratives, heightening political polarization and weakening trust in media institutions, thus impairing informed decision-making. Our research demonstrates the need for increased media literacy to safeguard against a misinformed electorate, reduce polarization, and strengthen democratic processes. Keywords: topic modeling, sentiment analysis, agenda-setting theory, ingroup-favoritism, outgroup-discrimination, social identity theory, media literacy, polarization

Hyma Patel

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:

#1 Cameron Sheeler

#2 Amy Soulis

Kaleb Driskill

Annsley DeMent

Abstract Name: The Identification of a Safer Alternative to BPA Using a Zebrafish Model

The prevalence of Bisphenol compounds, such as Bisphenol-A (BPA) found in plastics, may pose health risks and have been linked to diabetes, obesity, infertility, and hormone-dependent cancers. BPA, an endocrine disruptor, exerts its effect by binding to and activating estrogen receptors. BPA and BPA (Bisphenol-B (BPB) and Bisphenol-C (BPC)) replacements are found in many products, such as thermal receipts, linings of food cans, and other food packaging. Previous studies have identified Bisguaiacol-F (BGF) as a potential replacement for BPA. BGF is derived from paper pulp and has been shown to lack estrogenic activity. Our present research uses a zebrafish model to determine the effects BPA, BPB, BPC, and BGF have on development and determine if BGF is a safer alternative. Our current work has determined that BPC is the most toxic of the compounds tested, followed by BPB and BPA, with BGF being the least toxic. Our present studies include examining the expression levels of known estrogen-responsive genes such as *vtg1*, *vtg3*, and *cyp19a1b*. We will also look at the effects of the estrogen receptors $ER\alpha$, $ER\beta1$, and $ER\beta2$. RNA-seq analysis (at 24, 48, and 72 hpf) is used to generate a genetic profile for each compound. Genes identified from RNAseq whose expression levels appeared to be altered would be confirmed and quantified using real time quantitative polymerase chain reaction (PCR). Once genes of interest are identified, they will be classified according to their function. Our studies using a zebrafish model will help further understanding of the health risks posed by potential environmental toxins.

Om Patel

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:

#1 Makenna Roberts

#2 Andrea Bennett

#3 Kristin Chapleau

Akshar Patel

Jordan Holloway

Abstract Name: Enriching Communities through Impactful Service-Learning Projects

Service-learning combines community service with academic learning for practical application. Often, service-learning is overlooked as a method of conducting research. However, it can be highly beneficial in enabling students to develop effective problem-solving skills, foster personal growth, and make a positive impact on the community. Through various fundraising methods, volunteering, and providing emotional support, we aim to eliminate disparities in the Birmingham community while empowering freshmen students in this crucial year of their college experience. This study consists of seven different freshmen groups (e.g., Blazer League, Fire Starters, and One For All) who partnered with various community partners such as First Light, Leukemia and Lymphoma Society, and Magic Moments. Remarkably, The Alphas have raised over \$700 for Light the Night hosted by the Leukemia and Lymphoma Society. Through mentorship with freshmen students, they gained guidance, developed critical thinking skills, and fostered a sense of community within the campus, ultimately improving their college experience. In the near future, we plan on assessing the impact each individual freshman group has on the Birmingham community. The assessment will be conducted through ongoing communication and collaboration with the community partners. Challenges such as a lack of communication between mentees and mentors, lack of awareness of project timelines, and time constraints for the freshman groups are hindrances that we will address for future success.

Dax Patel

PA - Pennsylvania State University

Discipline: Physics and Astronomy

Authors:

#1 Asif Ud-Doula

#2 Gillian Pearce

Aum Dave

Abstract Name: Decoding the Sunspot Lifespan: The Influence of Solar Cycles and Zurich Classified Sunspots

This study investigates data analyzed from the Debrecen Heliophysical Observatory Fenyi and Specola Solare Ticinese databases. Our study was to investigate the factors influencing a sunspot's lifespan. We also address potential discrepancies with sunspot analysis due to different sunspot counting methods. The data in our study is based on the timeframe for solar cycles 19 to 24. Our analysis focused on the lifespan of sunspots through various solar cycle activity levels. We defined our parameters as sunspot decay and growth states (Zurich classification method) and solar activity (solar minimum and maximum cycles) to find factors that influence the lifespan of a sunspot. When comparing solar maximum and minimum periods we noticed an average difference of 2.47 days between activity levels, showing a relationship between solar cycles and sunspot lifespan. Our study also shows the Zurich classification plays a role in determining the lifespan of the sunspot. However, undeveloped sunspots remain largely independent of the solar cycle's activity level.

Conversely, we noticed an increased sensitivity regarding developed sunspots and from sunspots that transitioned between undeveloped and developed sunspots based on solar activity. This behaviour may indicate a relationship between the individual magnetic fields of sunspot groups and solar cycles. Additional factors like whole spot area and umbra area, can be used to further investigate the relationship between sunspot types and the sunspot lifespan.

zena Patel

AL - University of Alabama at Birmingham

Discipline: Exercise Science and Nutrition

Authors:

#1 Camille Worthington

Abstract Name: Timing of energy intake and associations with adiposity among postpartum women: A pilot study

Approximately 60-75% of postpartum women fail to return to their pre-pregnancy weight (i.e., postpartum weight retention, PPWR) and many women gain weight postpartum. Interpregnancy weight gain and PPWR negatively impact women's cardiometabolic health and increase the risk for complications in future pregnancies. Conventional postpartum weight management interventions (i.e., modifying caloric intake and diet quality, increasing physical activity) have limited success. Therefore, novel strategies to manage PPWR are needed. Eating late into the day/overnight has adverse effects on weight and metabolism. Postpartum women may be more likely to eat overnight due to infant-related sleep disruptions. Yet, data characterizing eating patterns postpartum are scarce and no studies have considered the timing of food intake as an intervention target for managing PPWR. Therefore, this study aims to characterize postpartum women's eating schedules, assess associations between meal timing and body composition, and explore factors impacting meal timing postpartum. Women (N=55) who are 5-24 weeks postpartum will be recruited and complete three 24-hr diet recalls and a qualitative interview to understand factors influencing eating patterns and barriers/facilitators to reducing late-night eating. Weight/height will be measured and body composition will be assessed using dual-energy x-ray absorptiometry. Histograms will be used to determine the distribution of energy intake over the 24-hr period. Associations between night-time (8pm-5:59am) caloric intake and total body fat will be examined using multiple linear regression modeling. Findings will inform the development of a novel postpartum diet intervention focused on meal timing.

Rahi Patel

NC - Wake Technical Community College

Discipline: Environmental Science and Sustainability

Authors:

#1 Sarah Horstman

#2 Tanesha Cameron-Cole

Abstract Name: Nourishing Communities: Food Security and Sustainability in North Wake and Durham

Food security and sustainability are critical challenges requiring community-driven solutions to combat hunger and ensure equitable access to resources. In North Wake County, a population of 1.18 million faces economic inequality and high housing costs, despite a median household income of \$102,918. In Durham County, with 295,845 residents and a 13.6% poverty rate, economic disparities exacerbate food insecurity for

low-income families and seniors. Local organizations address these challenges while fostering sustainable practices for long-term community resilience. In North Wake, Wake Forest Community Table provides free meals and fosters community connections, while Hope House supports underserved families with food pantries, mentorship programs, and senior services. The Food Shuttle Farm integrates food distribution with chemical-free farming and composting, promoting eco-friendly practices and reducing waste. In Durham, Meals on Wheels delivers meals and wellness checks for seniors, Farmer Foodshare links marginalized farmers with food-insecure communities, and Durham Farmers' Market supports local vendors and improves food access with initiatives like SNAP/EBT and Double Bucks. These organizations use innovative approaches such as chemical-free farming, composting, and partnerships with local businesses to address root causes of food insecurity, including economic inequality and limited access to fresh food. Programs like The Food Hub and Mini-Grants empower small and BIPOC-owned farms, creating a sustainable food system while supporting local economies. By fostering collaboration and addressing systemic challenges, these efforts provide essential resources to vulnerable populations, strengthen resilience, and raise awareness of equitable food access. This study underscores the transformative potential of community-driven initiatives in aligning food security and sustainability. By addressing hunger, supporting vulnerable populations, and promoting environmental stewardship, these organizations offer a scalable model for building resilient, inclusive communities.

Aryan Patel

WI - University of Wisconsin-Parkside

Discipline: Psychology

Authors:

#1 Markie Peroutka

#2 Zach Wilson

Abstract Name: Effects of Ventral Pallidum-Nucleus Accumbens Shell Neural Pathway Modulation on Sucrose Consumption and Motivation in Female Rats: a Chemogenetic Manipulation Study

Background: The neural control of food intake involves interactions between homeostatic and non-homeostatic systems. The shell of the nucleus accumbens (AcbSh) and the ventral pallidum (VP) play key roles in regulating ingestive behavior and project to each other. Previous studies have shown that these projections influence food consumption, with sex differences reported in modulation of sucrose intake by VP projections. Objective: This study aimed to investigate the effects of chemogenetic activation or inhibition of projections from the VP to the AcbSh on sucrose consumption and the motivation to work for sucrose in female rats. Methods: Female rats were used for the study. Chemogenetic tools (DREADDs) were employed to selectively activate or inhibit VP projections to the AcbSh. Rats were trained on a progressive ratio (PR) operant task to assess motivation to work for a food reward. Additionally, sucrose consumption tests were conducted using a 20% sucrose solution. Results: Chemogenetic manipulation of VP projections to the AcbSh did not significantly affect the motivation to work for sucrose in the PR task. However, a significant interaction between DREADD type and drug administration was observed in the sucrose consumption test. Activation of the VP-AcbSh projection (using excitatory DREADD) decreased sucrose intake, while inhibition (using inhibitory DREADD) increased sucrose intake. Conclusions: The study shows that projections from the VP to the AcbSh modulate sucrose intake but do not affect the motivation to work for food. Chemogenetic activation reduced sucrose consumption, while inhibition increased it, suggesting that distinct neural circuits within the VP-AcbSh pathway may differentially regulate feeding behaviors. These findings highlight the role of this pathway in the consumption of palatable foods and indicate that future research should consider factors such as sex, food type, and specific neural subpopulations to better understand its role in feeding behavior.

Priyanka Patel

VA - Virginia Commonwealth University

Discipline: Chemistry

Authors:

#1 Aishwarya Patel

#2 Xuewei Wang

Abstract Name: Potassium Sensing using Ionophore-based Optical Sensors

Physiologic monitoring systems are critical in acute and ICU settings, but existing devices lack the ability to monitor chemical and biochemical parameters, such as electrolytes and blood gases, essential for managing critically ill patients. Blood-contacting sensors for continuous monitoring face challenges like biofouling, component leaching, and risks of thrombosis and infection. To overcome these issues, this research proposes an innovative droplet microfluidics-based platform that uses immiscible oil with sensing agents to detect analytes like sodium, potassium, calcium, chloride, and oxygen through fluorescence or absorbance changes. This project focuses on developing ionophore-based optical sensors (IBOS) for cations, designing sensors for anions and neutral molecules, and fabricating IBOS for real-time critical care monitoring and bioimaging.

Dev Patel

FL - University of Central Florida

Discipline: Biology

Authors:

#1 George Aranjuez

Abstract Name: Determining the location of interaction between the Hippo signaling pathway and *C. trachomatis* Tarp N-terminal region using *Drosophila melanogaster* as an in-vivo model

Chlamydia trachomatis is the most prevalent bacterial sexually transmitted infection in the United States, yet its secreted effectors remain largely unexplored. Effectors are proteins that aid in infection of *Chlamydia*. One effector is the translocated actin-recruiting protein (Tarp). Tarp's C-terminus bundles and polymerizes actin subunits into filaments and is well understood, but its N-terminus's (N-Tarp) function remains unknown. Tarp is present across *Chlamydia* species, indicating its importance to *Chlamydia* infection. Using *Drosophila melanogaster* as an in-vivo model, we are able to observe phenotypic changes induced by N-Tarp expression and trace them back to the perturbed pathway, a unique strength of the model. When Tarp's N-terminus is transgenically expressed in *Drosophila*, we observe overgrowth of tissue in the wings, resulting in crumpled wing phenotypes, consistent with altered host Hippo pathway signaling. The Hippo signaling pathway controls cell proliferation and apoptosis. Yorkie, a co-activator of the Hippo pathway, causes these phenotypes due to its over-expression. We confirmed that N-Tarp interacts with the Hippo pathway when a Yorkie mutants demonstrated a genetic rescue from the N-Tarp induced crumpled phenotype back to normal straight wings. I aim to discover where N-Tarp and the Hippo pathway interact through a series of genetic experiments. Because N-Tarp interacts with the Hippo signaling pathway and *Chlamydia trachomatis* delays host apoptosis, a potential impact of this research may be establishing a link between N-Tarp expression and the anti-apoptotic effects observed in *Chlamydia* infection.

Dev Patel

FL - University of Central Florida

Discipline: Nursing and Public Health

Authors:

#1 Deidra Newville

Deidra Newville

Abstract Name: Identifying risk factors in adolescence that contribute to metabolic syndrome in Asian Americans using the National Longitudinal Study of Adolescent to Adult Health

Metabolic syndrome (MetS) is a cluster of risk factors that significantly increases the likelihood of type 2 diabetes and cardiovascular disease. The consensus definition of MetS incorporates criteria from the International Diabetes Foundation, the American Heart Association, and the National Heart, Lung, and Blood Institute and consists of elevated waist circumference, elevated triglycerides, low HDL cholesterol, high blood pressure, and high fasting blood glucose levels. Three of five criteria are needed to establish MetS. Despite having lower average BMIs, Asian Americans exhibit a disproportionately higher prevalence of MetS compared to other ethnic groups. This study utilizes data from Waves I (1994-95, ages 11-18), III (2001-02, ages 18-26), IV (2008-09, ages 24-32), and V (2016-18, ages 33-43) of the National Longitudinal Study of Adolescent to Adult Health, to explore early-life and adulthood dietary and lifestyle risk factors associated with MetS. We will identify participants who meet consensus MetS criteria, based on biomarker and anthropometric data during Waves IV and V. We will identify potential MetS risk factors using survey data measured in Waves I and III and use multivariable logistic regression to estimate associations between risk factors and MetS to identify common and unique risk factors across racial and ethnic groups[JS1] [MOU2] . We expect to uncover specific dietary and lifestyle risk factors that contribute to the high prevalence of MetS in Asian Americans. These findings will provide a foundation for public health strategies aimed at reducing metabolic health disparities among Asian Americans. [JS1]Not sure what we decided for the groups - White and Asian Americans only, or do you want to include Black and Hispanic participants too? I think either way is fine, just specify what the groups will

Vraj Patel

CT - UConn Health

Discipline: Biology

Authors:

#1 Daylin Gamiotea-Turro

#2 Mary-Katherine Cormier

#3 Rajkumar Verma

Abstract Name: Enhancing Recovery: The Efficacy of Encephalomyosynangiosis in Promoting Angiogenesis Post-Ischemic Stroke

Ischemic stroke represents a sudden neurovascular injury with enduring long-term consequences. Each year, approximately 650,000 stroke survivors in the US face permanent functional disabilities. There are many existing treatment options for post ischemic strokes like transient plasminogen activators (TPAs) and stent placement, but they do not provide neuroprotection or support functional recovery beyond the acute phase of ischemic stroke. This makes the discovery of a novel treatment imperative for ischemic stroke imperative as there is no effective treatment for stroke patients. The diminished blood supply, both directly and collaterally, following an acute ischemic stroke results in dysfunction of brain cells and networks, leading to sudden neurological deficits which limits the brain's ability to recover and self-heal. The primary objective of stroke therapy remains the restoration of blood supply to the affected region. Enhancing angiogenesis to improve blood flow in ischemic areas presents a promising therapeutic strategy. However, previous attempts using erythropoietin, statins, and growth factors have been hampered by significant toxicity or limited

translatability. Encephalomyosynangiosis (EMS), a surgical technique originally developed for moyamoya disease, involves partially detaching a section of the temporalis muscle, performing craniotomy, and grafting the muscle onto the affected cortex. EMS stands out from other treatment options due to its relatively straightforward grafting procedure using the nearby temporalis muscle, which does not require complete excision or disconnection from its blood supply. The resulting angiogenesis supports neurovascular protection and recovery following ischemic stroke, suggesting a preventive role in stroke management. We hypothesize that EMS promotes angiogenesis around the infarcted area and create an enriching environment that allows the brain to quickly recover from an ischemic stroke. The results come from a histological assessment using immunofluorescent techniques to identify if EMS promotes angiogenesis after an ischemic stroke.

Serina Patel

TX - Texas Woman's University

Discipline: Biology

Authors:

#1 Kimberly Castro

#2 Rinki Dasgupta

#3 Christopher Brower

Abstract Name: IlluminATE1

Protein arginylation is important for the removal of damaged proteins and has implications for human disease. Arginylation is catalyzed by the enzyme, Arginyltransferase 1 (ATE1). The loss of ATE1 in mice was shown to cause defects in fat metabolism as well as neurodegeneration. However, in these studies ATE1 loss occurred in all tissues throughout the body. Therefore, it is unclear in which tissues ATE1 is important. We have observed differences in ATE1 activity between tissues with similar ATE1 protein levels. This predicts the existence of tissue- or cell type-specific regulators of arginylation. As a means to survey the spatial and temporal regulation of ATE1 in a comprehensive manner, we recently generated transgenic ATE1-reporter mice which express a dual-fluorescent reporter sensitive to its activity. Here, we are validating transgenic founder mice and confirming propagation of the ATE1 reporter through genotyping of genomic DNA isolated from tails.

Dhani Patel

PA - Pennsylvania State University

Discipline:

Authors:

Laura Cruz

Subhadra Ganguli

Abstract Name: Cost Benefit Analysis of the Sustainability of EV Bikes in Lehigh Valley Region of PA-Community Partnership Project Through Common Intellectual Experience

One of the aims of SDG 11 (Sustainable Development Goals) of the United Nations by 2030 is the establishment of sustainable communities. The main aim of such sustainable communities is to create cities and human settlements safe, resilient, inclusive and sustainable. Our research focuses on the application of microeconomic theory of externalities and calculating costs and benefits of the EV bikes production business in the Lehigh Valley of PA. The project was developed in consultation with local business as part of Common

Intellectual Experience project in a university, for undergraduate students. This project studies the impact of EV bikes in the Lehigh Valley (LV) region vis- a- vis the use of a gas driven car or motor bike through data on improvement of public health, reduction of pollution and economic growth. The negative externalities associated with infrastructure development and costs of the production of EV bikes along with forecasted increase in costs of production through potential higher tariffs on raw materials and parts imported from outside the USA will also be calculated. The potential benefits of the business for the LV region along with potential growth of ancillary businesses will be forecasted. The research will calculate the costs and benefits to society with emphasis on those costs which are otherwise neglected and excluded in private benefit and cost calculation. The results of the research will be shared with the local business which will enable the local business to seek funding or investments for future growth and expansion.

Riya Patel

KY - University of Kentucky

Discipline: Biology

Authors:

#1 Christian M. Gosser

#2 Christine Brainson

Abstract Name: Investigating Targeted and Epigenetic Therapies for EGFR Mutated Non-Small Cell Lung Cancer

Lung cancer is one of the most diagnosed cancers globally and remains the primary cause of cancer-related fatalities, accounting for around 1.76 million deaths annually. Notably, Kentucky experiences an age-adjusted lung cancer incidence of 84.4, significantly surpassing the national average of 54. Over the past two decades, advancements in treatment approaches have made remarkable strides toward progress in patient outcomes, but improvements can still be made. Non-Small Cell Lung Cancer (NSCLC) is the prevailing type of lung cancer, with EGFR (Epidermal Growth Reception Factor) emerging as a critical component. EGFR mutations can trigger aberrant cell signaling and growth activation, leading to uncontrolled cell proliferation and tumor growth. Targeting EGFR with Tyrosine Kinase Inhibitors, specifically Osimertinib, has shown promise, but therapeutic resistance is common. Within tumor epigenetics, the enzyme EZH2, part of the Polycomb Repressive Complex 2 (PRC2), is instrumental in adding methyl groups to histone H3, leading to repressive histone modifications and gene silencing. EPZ6438 (Tazemetostat), an FDA-approved EZH2 inhibitor, has shown potential in targeting this process. In this study, we sought to investigate the mechanisms in which resistance arises through apoptosis, cell cycle, immunofluorescence imaging, and synergy experiments and to see whether targeting EZH2 could enhance the response to EGFR-targeting drugs in both the parental and resistant H1650 cell lines. The results so far have shown that we can produce an Osimertinib-resistant H1650 cell line, although the parental cells show some intrinsic resistance. Combination of Osimertinib with EPZ6438 is predominately additive, with some synergy at highest doses in the parental and resistant H1650 lines. EPZ6438 treatment drives strong de-repression of the PI3K negative regulator PI3KIP1, suggesting a mechanism for synergism. Our findings shed light on the complex interplay between EGFR-targeted therapies, tumor resistance, and epigenetic regulators in NSCLC that may help researchers find combination therapies to improve treatment outcomes.

Aryan Patel

PA - Villanova University

Discipline: Engineering

Authors:

Abstract Name: Optimizing Carbon Dioxide Hydrate Formation for Carbon Capture and Storage: The Key to Climate Change Mitigation

Currently, carbon capture, storage, and utilization (CCSU) promises a great role in climate change mitigation as the global greenhouse gas (GHG) emission has been rapidly increasing over the last 50 years. The COP29, headed by UN Secretary-General Celeste Saulo, highlighted the urgency of drastic reductions in GHG emissions to net-zero in 2050 so that global warming could be controlled below 2oC. Carbon dioxide (CO₂) hydrates stand out among many potential solutions for CCSU because of the low energy consumption and low cost. Specifically, CO₂ hydrates are crystalline compounds that form as a lattice structure of water ice trapping CO₂ molecules within, containing the CO₂ in a solid stable form. Hence, understanding the thermodynamic properties driving this phase-change reaction is essential to developing an efficient method of capturing and storing CO₂. This investigation aims to elucidate the parameters influencing formation hydrates and maximize the quantity of gas contained within with nanoscale additives for an improvement in efficiency. In this study, we utilized an over-pressurized system to enable a high solubility of CO₂ in water, leading to high quantities of CO₂ trapped within the water ice lattice as the hydrate nucleates and forms. In doing so, we have determined that higher pressure yielded greater solubility in water and more efficient hydrate formation. This was because more CO₂ was available to dissolve into the water, and the high pressure encouraged greater nucleation. Hence, using the conditions found from the experimental results, we can begin to explore additives including carbon nanoparticles (CNPs) to offer more nucleation sites and further enhance the quantity of CO₂ trapped within the hydrate. It has been hypothesized that the high surface area to volume ratio of the nanoparticles in conjunction with the high pressure of CO₂ will allow for the formation of a more efficient and stable hydrate.

Naiya Patel

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

#1 Robin Gandlely

#2 Caterina Rosano

#3 Janet Catov

Abstract Name: Race and a History of Preeclampsia Influence Circulating Neuroinflammatory Biomarker Levels in Women

Introduction: Preeclampsia (PE) is a multisystem, pregnancy-specific hypertensive disorder linked to systemic inflammation, posing significant cerebrovascular risks and increasing susceptibility to long-term cognitive decline. Black women are at increased risk for both preeclampsia and dementia. This study investigates the association between race, history of PE, and neuroinflammatory biomarker profiles, shedding light on mechanisms underlying cognitive and neurodegenerative vulnerabilities. Methods: In a cohort of 144 Black and White women approximately 15 years postpartum, we analyzed 37 biomarkers spanning vascular injury, angiogenesis, chemokines, and proinflammatory cytokines in plasma (Meso Scale Discovery, Neuroinflammation Panel 1). Results: Significant demographic differences were observed, with Black women having a significantly lower age and higher BMI compared to White women. After controlling for these variables, 11 biomarkers demonstrated significant racial differences. Most of these biomarkers, including IL-15, IL-17A, MIP-1 α , MCP-1, CRP, and IL-8, showed higher concentrations in Black women. IL-12/IL-23p40 and VCAM-1 were the exceptions, with elevated levels in White women. Although fewer biomarkers showed significance based on preeclampsia status alone, the combined effects of race and PE revealed intricate interactions shaping biomarker variability. These findings align with prior research indicating that Black women with PE experience disproportionately higher rates of cognitive decline, potentially due to the

heightened neuroinflammatory responses observed in this population. Discussion: These findings highlight race as a critical factor in neuroinflammatory responses, independent of age and BMI, and underscore the disproportionate burden of cognitive decline among Black women, particularly those with a history of PE. This research emphasizes the need for further investigation into inflammatory pathways contributing to health disparities. Future work will explore correlations between these biomarkers and cognitive and cardiovascular health, advancing efforts to mitigate risks associated with systemic inflammation and vascular dysfunction.

Shivansh Patel

IA - Iowa State University

Discipline: Engineering

Authors:

#1 Anuj Sharma

#2 Kojo Adu-Gyamfi

Abstract Name: MobiScout: A Comprehensive Mobile System for Driver Monitoring Through Multi-Modal Sensing

Driver monitoring systems have become increasingly important for improving road safety and understanding driving behavior. However, existing solutions often require expensive specialized hardware or lack comprehensive data collection capabilities. This paper presents MobiScout, a cost-effective iOS mobile application that leverages smartphone sensors and video analytics to monitor and analyze driver behavior in real-time. The application integrates multiple data streams including video footage, vehicle sensor data through OBD connectivity, and physiological measurements to provide a comprehensive assessment of driving patterns and potential safety risks. MobiScout captures and processes video data of the driver's face and road conditions while simultaneously collecting speed, acceleration, and engine performance metrics through Bluetooth-connected OBD devices. The system implements real-time analysis of these multimodal inputs to detect signs of fatigue, distraction, or unsafe driving practices. A key innovation is the application's ability to synchronize and correlate different data streams, enabling deeper insights into the relationships between physiological states, driving conditions, and vehicle handling. The collected data is stored securely and can be reviewed through an intuitive interface that presents both historical trends and instant feedback. The application includes features for video playback of recorded trips, speed monitoring, location tracking, and detailed trip statistics. MobiScout's architecture emphasizes data privacy and efficient storage management while maintaining real-time processing capabilities. Future work will focus on conducting comprehensive user studies to validate the system's effectiveness in real-world driving conditions and expanding the analytical capabilities to include predictive safety features. This research contributes to the field of intelligent transportation systems by providing an accessible, smartphone-based solution for comprehensive driver monitoring that can be widely deployed without significant infrastructure investment. The proposed system could serve as a valuable tool for both individual drivers seeking to improve their driving habits and organizations managing vehicle fleets.

Nidhi Patil

VA - Virginia Commonwealth University

Discipline: Biology

Authors:

#1 Mary Boyes

Abstract Name: Bridging Perception and Recovery: Synesthesia Neural Connections as a Pathway for Traumatic Brain Injury Rehabilitation

Traumatic Brain Injury (TBI) often results in diffuse axonal injury (DAI), disrupting connectivity within and between intrinsic neural networks, which can occur in 40% - 50% of TBI patients. Synesthesia, a condition where one sensory experience involuntarily triggers another, provides unique insights into heightened sensory connectivity and multisensory integration. This research looks at brain connections in synesthesia, specifically grapheme-color, sound-color, and color-hearing, for potential as a model for developing neurorehabilitation techniques for patients with TBI. Examining studies on synesthetic brain connectivity, highlights functional and structural network differences in synesthetes, particularly in regions like the parietal and temporal cortices and the V4 color-processing area. Synesthetic brains exhibit distinctive cross-modal connectivity patterns, characterized by stable and atypical neural connections. These connections could be harnessed to develop innovative therapies and enhance rehabilitation for TBI patients. Current neurorehabilitation methods—such as Constraint-Induced Movement Therapy (CIMT), Robotic Therapy Training (RTT), and sensory relearning therapies—might be enhanced by adopting principles of synesthetic neuroplasticity, including cross-modal facilitation, consistency, and sensory binding. By analyzing synesthetic connectivity—such as increased integration in visual, auditory, and parietal networks—this study aims to map these unique patterns to guide rehabilitation strategies. Methods include a comprehensive review of neuroimaging and behavioral studies, examining the intrinsic connectivity networks of synesthetes and individuals with TBI, alongside comparative analyses of neural integration. Synesthetic training studies show how stable neural pathways can be induced, suggesting a framework for improving sensory integration, motor recovery, and cognitive resilience in clinical populations. The findings underscore the transformative power of synesthetic networks as a promising avenue for advancing personalized neurorehabilitation protocols, curating the need for deeper exploration into how these neural patterns might unlock unexpected pathways toward recovery. Keywords: traumatic brain injury (TBI), diffuse axonal injury (DAI), synesthesia, neurorehabilitation, cognitive, function, cross-modal connectivity, neuroplasticity, networks

Shrijan Paudel

MN - Minnesota State University - Mankato

Discipline: Computer Science

Authors:

Abstract Name: From Earth to Algorithm: Enhancing Soil Quality with AI

Agriculture significantly impacts the economy. The population is increasing rapidly, and with this increase, the demand for food and employment is also rising. Traditional farming methods, once used by farmers, are no longer sufficient to meet these demands. According to the research, one of the major reasons for less production of food on huge land is the lack of proper management of soil. Here Soil Management comes into play; AI in soil management could be a solution to these problems. It's very hard to predict the quality of soil and what minerals are required for it, but we can use AI to analyze this, with the help of an electrochemical sensor combined with the auto feature of AI, which can analyze the data and read the PH value of soils finally provides us details about the soil. Although various methods are used in collecting sample data, Precision Farming and AI revolutionize soil management by analyzing data to optimize nutrient levels. Algorithms process information from sensors, historical data, and soil samples. Machine learning algorithms process the collected data to generate detailed soil maps, identifying areas with nutrient deficiencies, excessive moisture and other important factors. Based on the AI analysis, farmers can receive targeted recommendations on where and when to apply fertilizers, irrigation, or other soil amendments. These recommendations only work where the farmers are aware of Artificial Intelligence paradigms and understands the applications of it. Spiio method can be used to non-tech savvy farmers. Spiio is a sensor-based device, which is capable of sensing ground soil temperatures, moisture, salinity, and even light. This device is not sufficient to eliminate the current limitations, but we can further develop a better sensing device with the current knowledge to create it more capable of detecting the level of nutrients present in soil.

Grace Pavel

NC - Western Carolina University

Discipline: English and Literature

Authors:

#1 Grace Pavel

Abstract Name: Will The World Weep When We Are Gone? Ariel Francisco's Guide to the End of the World

The first step to fixing a problem is often recognizing that there is one in the first place. Francisco's book is a portent written to cure people of their ignorance and prepare them for the inevitable. In *A Sinking Ship is Still a Ship*, Ariel Francisco warns that there is not enough room on this small Earth for everything, and due to rising water and the rapacious lifestyle of tourists, residents of Miami, Florida may not be left with a space they can call home. Ariel Francisco depicts water as the main threat in *A Sinking Ship is Still a Ship*. In his poems, "Spring Break Forever," and "305 Till I Die," Francisco cautions that the inhabitants of Miami cannot survive the water that will eventually drown the city. The speaker of the poems suggests that everyone will die, and all things that humans created will be lost. In "Poem Written in the Parking Lot of a Tattoo Shop While Waiting For My Appointment," he argues against the permanence of human presence on the Earth; he instead admits that the end is inevitable. Francisco's poems suggest that most people remain purposefully ignorant to their own end by pushing the idea away, pretending it does not exist, or making it a future generation's problem. Francisco calls them out for their ignorance. In "Don't Ever Come to Florida," he points out what is being ignored and displays it in a way the readers cannot ignore in hopes that they will stop escalating the problem.

Hanna Pawela

PA - Duquesne University

Discipline: Biology

Authors:

#1 Jill Dembowski

Abstract Name: Effects of RECQL Overexpression on Herpes Simplex Virus Type 1 Infection

Herpes Simplex Virus 1 (HSV-1) affects 50-80% of the general population in the United States. Symptoms typically present as cold sores or fever blisters but can also cause genital herpes and more severe effects such as keratitis leading to blindness or encephalitis. Multiple viral and cellular proteins act on the viral genome during viral infection. Previous studies found that human RECQ Like Helicase (RECQL) associates with the HSV-1 genome during viral DNA replication. RECQL is a DNA helicase enzyme that helps repair DNA damage and maintain a stable genome. The function of RECQL during viral replication has yet to be defined. Prior research in the lab found that RECQL knockdown resulted in a slight increase in viral yield. Therefore, it is hypothesized that RECQL is inhibitory during HSV-1 replication and that overexpression of RECQL will result in less efficient HSV-1 DNA replication. To test this, RECQL was successfully cloned into the pLEX305-c-dTAG vector and transfected into HEK293 cells. Proteins were collected, and a western blot was run, indicating that RECQL was successfully overexpressed in the cells. The HEK293 cells were also infected with the HSV-1 laboratory strain KOS to determine how RECQL expression affects viral yield. Virus was collected from infected cells, and a plaque assay will be completed. Fewer plaque-forming units are expected to be present with the overexpression of RECQL, indicating less viral replication. If the expected results

occur, the hypothesis will be accepted that RECQL acts as an inhibitory protein during HSV-1 replication, and further research must be done to define the pathways or mechanisms of the inhibitory effects.

Emmaline Payne

GA - Kennesaw State University

Discipline: Architecture, Construction Management, and Interior Design

Authors:

#1 Emmaline Payne

#2 Ameen Farooq

Abstract Name: Invisible Scholars

In the United States, every year there are approximately 1.3 million students who are homeless, an individual who lacks a fixed, regular, and adequate nighttime residence. Homelessness among students has a significant impact on their academic performance, mental health, and behavior. Factors like higher absenteeism, constant movement, and lack of support can all contribute to decreased academic achievement. Ultimately, this leads to students having to repeat grades or not graduating high school, compromising their abilities to succeed in the future. In addition to the decrease in academic achievement, behavioral and mental challenges exacerbated by the stress of housing instability also affect the student's development. In Macon, Georgia, there are currently five hundred students aged six to seventeen, who lack stable housing. These students have access to assistance through programs like the McKinney Vento Homeless Assistance Act and Rapid Rehousing. McKinney Vento Homeless Assistance Act helps students to have access to school and stay in school, while Rapid Rehousing aims to provide housing resources for students and their families. However, these programs have differing definitions of homelessness that lead to gaps in how many students are able to receive housing support. In downtown Macon, there is an urban renewal occurring aimed at bringing more life downtown. This, along with social and community services, influenced the decision to create a space for homeless students right in the heart of Macon. The aim of my thesis is to connect these students with resources and the community, as well as provide them with stability in their most developmental years.

De'vonte Payton

GA - Fort Valley State University

Discipline: Biochemistry

Authors:

#1 Will Pedersen

#2 Stefan Clarke

#3 Serge Smirnov

#4 John Antos

Abstract Name: Probing the Interactions Between Dematin's Headpiece and the IDR via solution NMR

We aim to understand an internal, non-covalent interaction between an N-terminal intrinsically disordered region (IDR) and C-terminal HP domain in human protein dematin, central for the regulation of shape and function of mature red blood cells through binding/bundling actin filaments (F-actin). Headpiece (HP) domain phosphorylation triggers a functional change in dematin: from an F-actin bundling to F-actin binding protein (regulatory effect). We hypothesize that the interactions between dematin's N-terminus of the IDR (d160N) and headpiece can be modulated by HP phosphorylation. 2D NMR spectra can help decipher the

interaction but are complex and hard to analyze: segmental isotopic labeling may help (REU 2023 work). By introducing sortase as a catalyst, we aim to create two ligation products: wild type dematin headpiece (DHP) ligated to a ¹⁵N labeled d160N and dematin phosphomimetic (Ser381Glu) headpiece (DPHP) ligated to a ¹⁵N labeled d160N. We aim to use NMR spectroscopy to scan for any differences in peak intensities or positions between d160N and the two ligation products. By understanding these intermolecular interactions, we may be able to modulate dematin's ability to bind and bundle F-actin in red blood cells.

Paula Pazos

FL - Miami Dade College

Discipline: Physics and Astronomy

Authors:

#1 Adolfo Mendez

#2 Hector Peralta

Ricardo Uzcategui

Abstract Name: Spring-Variable Mass System: Study With Different Fluids

The present work describes the oscillations of an inexpensive and easily built-up physical oscillatory spring-mass system with mass varying in time. We used different fluids in this study, including both liquids and granular media: freshwater, acetone, clean and dirty sand, and a sugar-salt mixture. Instead of the most reported classical oscillating pendulum, this spring-mass system allows us to inquire about the deposition of mass and the effect of mass loss on the variables that describe the system's oscillation of a granular media. In this case (granular media), we studied avalanche occurrence during the deposition of the grains and the possible effect of downward-upward motion during the losing mass as the fluid column length varies with each oscillation. A description of the apparatus is given.

Hayden Pearson

CO - Regis University

Discipline: Biology

Authors:

#1 Milo Marsh

#2 Sarah Bramlett

#3 Mike Ghedotti

Gabe Rodriguez

Abstract Name: Lower Jaw Shape Rather than a Unique Cartilaginous Margin Likely Facilitates Periphyton Scraping in Stoneroller Minnows (Genus *Campostoma*).

Stoneroller minnows in the genus *Campostoma* are common and abundant inhabitants of eastern North American streams, known for rolling rocks during the construction of their nests as well as for a diet usually including stream periphyton scraped off of surfaces. Like all minnows, stonerollers lack jaw teeth, and previous literature described the lower jaw in stonerollers as having a prominent and distinguishing cartilaginous edge. After general gross examination of jaws in *Campostoma* wherein we did not observe distinctive cartilage anatomy, we hypothesized that obvious cartilaginous structures may not comprise the primary specialization for scraping of periphyton in stonerollers. We used clearing and staining and paraffin histology using Masson's trichrome and toluidine blue staining of multiple *Campostoma*, *Nocomis*, and other

related minnow species to explore differences in jaw structures. In *Campostoma* we found marginal hyaline-cell cartilage (not hyaline cartilage) at the anterior edge of bony shelves on the dentary bone with an overlaying thickened keratinized epithelium. However, in the closely related, non-periphyton-scraping genus *Nocomis* we found a similar anatomy except without bony shelves. Other minnow species examined had less hyaline-cell cartilage and a less extensively keratinized epithelium. This suggests that the shelf-like extension of the dentary likely is a specialization for scraping but that the keratinization and extensive hyaline-cell cartilage may not be uniquely associated with periphyton scraping, and may be associated with the rock moving during nest building observed in *Campostoma* and *Nocomis*. Future work will include greater species sampling and more specific analysis in the context of phylogeny.

Stephanie Pedraza Marin

IL - Northeastern Illinois University

Discipline: Psychology

Authors:

#1 Linda Rueckert

Abstract Name: Language Development and Stuttering

Research on bilingualism has been important for understanding language and cognitive processes. The research has resulted in debates about whether speaking more than one language increases cognitive capacities such as flexibility, ability to learn languages, and executive function or potentially limits these capacities. Therefore, efforts to identify language behaviors that reflect cognitive capacities in bilinguals have been at the forefront of this area of research. One behavior that has been examined as a reflection of decreased executive functioning is stuttering, which has been studied as far back as 1937. While some studies show no difference in stuttering rates between bilinguals and monolinguals, others suggest a correlation. This study used an online survey to explore bilingualism and stuttering experiences. Most previous studies reported whether participants who stuttered had been diagnosed by a speech therapist/doctor. That could overlook people who stutter but do not have the resources to get an official diagnosis. The present study asked participants whether or not they felt they stutter often. Bilinguals may stutter more in a secondary-language, indicating emotional influences often overlooked in stuttering research. In an online survey, 71 participants were asked how many languages they spoke and whether or not they stuttered: 33-identified as multilingual, 37-as monolingual, and one did not specify. Only 5 had a formal stuttering diagnosis, but 28 reported experiencing stuttering. 2 did not report on stuttering, while 41 reported no issues. Among multilinguals, 51.5% (N=17) felt they stuttered, versus 48.5% (N=16) who did not. In monolinguals, 30.6% (N=11) reported stuttering, and 69.4% (N=25) did not. This multilinguals vs. monolingual difference approached statistical significance, $\chi^2(1, N = 69) = 3.14, p = .077$. Participants reported stuttering equally in their first and second-languages, with no relationship to second-language fluency or age of acquisition. Findings suggest multilingual individuals may be more likely to stutter than monolinguals.

Ethnan Pedro

PA - Carnegie Mellon University

Discipline: Engineering

Authors:

#1 Derin Sevenler

Abstract Name: Hybrid Microfluidic Devices Using Photolithography and 3D printing

Microfluidic devices have transformed numerous fields, including chromatography and DNA sequencing, due to their ability to manipulate fluids at the microscale. These devices are pivotal in creating compact, efficient systems for applications ranging from point-of-care diagnostic tests to high-throughput drug screening. Devices are often made by photolithography, which allows for high resolution but leads to significant challenges like integrated nozzles or intricate routing, since the channel pattern must be two-dimensional. 3D printing has emerged as a potential approach to overcome these limitations, but its current resolution of 50µm holds back the fabrication of features at the scale required for precise microfluidic operations. Therefore, our group has proposed that a hybrid device that combines a 3D-printed part and a microfabricated part would offer favorable results for processing single cells at a high throughput. We fabricated a device that consists of a complex microfluidic channel system with an onboard 3D-printed reservoir and two external nozzles. Preliminary parts were modeled on OnShape's CAD software, printed through Formlabs with Tough1500 resin, then iteratively optimized to meet the required volume capacity and nozzle dimensions. Separately, photolithographically-patterned microfluidic chips were fabricated from transparent epoxy - to allow for visibility of cells within the device. Finally, the micropatterned part was bonded to the aforementioned printed parts and finalized devices were tested against a predetermined quality control checklist. Altogether, these devices demonstrate successful integration of high-resolution channels with 3D-printed routing and nozzle systems. Our approach resolves the limitations of planar fabrication and enhances the functionality of the device by enabling multi-layer and complex geometries. This innovation is significant because it paves the way for complex microfluidic devices with enhanced capabilities, fostering advancements in fields such as personalized medicine and synthetic biology. Furthermore, it underscores the importance of combining technologies to meet the evolving demands of microfluidics.

Andrea Peguero Gonzalez

IL - North Central College

Discipline: Visual Arts

Authors:

Abstract Name: Fruits of My Labor: Writing, Illustrating, and Designing a Picture Book About Creativity and Burnout

Picture books are a powerful tool for displaying both visual and verbal storytelling techniques. At a time where breaking into the creative industry seems like a daunting task, a picture book serving as a reminder to believe in one's artistic voice can offer a feeling of comfort to a young maker. Expressing the bumpy yet exhilarating experience of creative work through whimsical allegory, *Ada and the Lemon Tree* tells the struggles of Ada, a mythical being born of a lemon seed with a single task: to care for and aid in the growth of her lemon tree. Being the only lemon tree in the orchard she resides in, she embarks on a journey of finding confidence in her abilities, her work, and sense of self, reflecting the growth of an artist. The illustrations for the picture book were made on illustration board using paint markers and colored pencils. Rendered with expressive lines and layered markmaking, the characters and environments contrast traditional Western fairytale imagery with contemporary color and design. After completion, the drawings were scanned and digitally edited using Adobe Photoshop software, and later formatted with the story text using Adobe InDesign software. The final product resulted in a ready-to-print picture book able to be distributed both physically in print, and in a digital format. Using visual and verbal storytelling tools, *Ada and the Lemon Tree* is a picture book focused on portraying the ups and downs of creative work in a world of spectators and makers alike, and seeks to encourage young adult artists to have faith in who they are and what they can create.

Karissa Pelichet

Discipline: Psychology

Authors:

#1 Cheryl Woods-Giscombe

#2 Shellae Versey

#3 LaBarron K. Hill

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Abstract Name: Anticipating and Acting: Exploring the link between Race-Related vigilance and Superwoman Schema

Objective: Superwoman Schema (SWS) reflects multiple dimensions of coping with life stressors (i.e. depression) among African American (AA) women. Similarly, race-related vigilance (RRV), a pattern of anticipatory coping behaviors linked to prior exposures to discrimination, has been linked to increased depression risk directly, and indirectly through rumination. Currently, no studies have examined the association between SWS and RRV. In the present study, we examined the relation between SWS and its associated subscales; the obligation to present strength, the obligation to suppress emotions, the intense motivation to succeed, a resistance to vulnerability, and the obligation to care for others, and race-related vigilance. Method: We ran a correlational analysis to examine the relationships between SWS and RRV in a sample of (n=53) Black women (100% female, Mage =19.77 SD=1.67). Our sample had a mean SWStotal score of 67.64 (14.26), which is in the moderate range for SWS endorsement (36-70). Our sample also had a mean score of 2.48 (.84) for RRV and 49.3 (13.88) for rumination. The mean score for depression was 2.14 (.35). Results: RRV was positively correlated with SWStotal, $r(51) = .319, p = .02$, and the subscales, SWSstrength, $r(51) = .479, p < .001$, and SWShelp, $r(51) = .276, p = .046$. In follow up regression analysis, controlling for rumination and depression, RRV reliably predicted SWShelp and SWSstrength, but the effect for SWStotal was diminished. Conclusion: SWS and RRV are correlated independently and indirectly through depression. This means that RRV and SWS may represent distinct but similar methods of coping, both of which have been linked to greater risk for depression amongst African American women. Future research should examine whether women who utilize RRV to cope are also more likely to feel the need to present strength and help others despite one's own needs.

Genesis Pena-Lozada

KY - University of Kentucky

Discipline: History

Authors:

Abstract Name: A Franciscan Friar's Defiant Journey: The Extent of Individual Power in Colonial Mexico, 1782

During Spanish occupation of Mexico from 1521 to 1821, religion was used as an extension of the Spanish Empire as Mexico's indigenous populations were forcibly converted to Catholicism. Religious orders, including Franciscan friars, a group of men who wandered and preached to help the poor and sick, were used in the systematic conversion of indigenous populations. Utilizing a 1782 diary written by an unidentified Franciscan friar held at the University of Kentucky Libraries Special Collections Research Center, this research will explore the work and experiences of one friar within the institution of Catholicism and the Spanish Empire itself. The diary is handwritten in 18th century Spanish, which is significantly different from contemporary Spanish. Research will create a transcription of the full 62 page diary in order to better analyze its content. Critical discourse analysis will be employed to uncover hidden meaning in the original diary text to view how the Franciscan friar's use of language reinforces his power relationship and place in the social

hierarchy within Spanish Catholicism as his actions become increasingly defiant. To supplement the diary, existing literature on Franciscan friars will be put into conversation to gauge previous interpretations of Franciscan friars's power. Ultimately, the research will uncover the power of an individual in the face of institutional power, a power struggle that is immortal in its relevance.

Ella Penca

IL - Eastern Illinois University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Nichole Mulvey

Abstract Name: Accurate Assessment of Social Skills for Differential Diagnosis in Young School-Age Children

Social communication disorder (SCD), autism spectrum disorder (ASD), and developmental language disorder (DLD) often have overlapping symptomology in young, school-age children, with a core feature related to difficulty adequately using language to be social. The current study aimed to determine whether children in first through third grade with language-based goals (e.g., morphosyntactic, semantic) on their Individualized Education Programs (IEPs) use qualitatively and quantitatively different social responses from their typically developing peers. Skills were elicited through targeted social conversation language samples using three standardized prompts. Through individual video and transcript analysis and Systematic Analysis of Language Transcripts (SALT) programming, qualitative and quantitative data were collected. Qualitative analysis examined the quality of social responses using a Likert scale that reflected the appropriateness and specificity of the response by context. Quantitative data examined the number of social bids given by the examiner compared to the number of responses by the child. Additional quantitative data gathered from SALT programming examined Mean Length of Utterance (MLU) and Number of Different Words (NDW). Data has been collected and is currently being analyzed. Group differences and trends will be discussed. Challenges to eliciting verbal social skills during authentic assessment and finding measurement tools for this purpose will also be shared. Adequately and accurately assessing social communication skills to discover trends in characteristics will help increase efficiency in differential diagnosis, leading to increased evidence-based practice for intervention.

Lakshmi Pendela

IN - Indiana University Purdue University Indianapolis

Discipline: Nursing and Public Health

Authors:

#1 Scott Coven

Abstract Name: Navigating Pediatric Hematology/Oncology Care Before and After the COVID-19 Era: Understanding the Influence of Social Determinants on Telehealth Visits

Telehealth has emerged as a vital tool for healthcare delivery, particularly during the COVID-19 pandemic, offering the potential to address many social determinants of health (SDOH) for pediatric patients, particularly those in hematology and oncology. These patients often encounter significant barriers to care, such as transportation challenges, financial strain, and disruptions to their education and social networks. By reducing the need for frequent in-person visits, telehealth has the potential to alleviate some of these burdens

while maintaining access to specialized care. However, the extent to which telehealth impacts these social factors equitably remains uncertain. This study investigates how SDOHs, including race, insurance status, language, location, and socioeconomic factors, influence access to telehealth and health outcomes for pediatric patients at Riley Children's Hospital's division of hematology/oncology. The research specifically examines trends in telehealth usage across three distinct periods: pre-COVID-19, during COVID-19, and post-COVID-19. By evaluating these trends, the study aims to assess the impact of telehealth on care access, health outcomes, and equity within this patient population. The hypothesis guiding this research is that, with the widespread adoption of telehealth, healthcare providers may exhibit a preference for certain patient populations, particularly favoring those with lower social determinants of health for virtual visits. To explore this hypothesis, the study seeks to identify barriers to telehealth adoption and assess whether these barriers disproportionately affect certain demographic groups. Understanding these factors is essential for developing targeted interventions that ensure equitable access to telehealth services, particularly for underserved populations within pediatric hematology and oncology. By examining the intersection between telehealth and SDOHs, this research aims to inform strategies that can optimize the delivery of virtual care and improve health outcomes for all patients, regardless of their social or economic circumstances.

Storm Pendleton

IN - Valparaiso University

Discipline: Health and Human Development

Authors:

Abstract Name: Exploring Awareness and Perceptions of Hospice Care Among Meals on Wheels Clients: A Mixed-Methods Study Through the Visiting Nurse Association

This research study investigates the awareness levels and perceptions of hospice care among clients receiving Meals on Wheels (MOW) which is being conducted through the Visiting Nurse Association (VNA). We hypothesize that clients will exhibit varied levels of awareness regarding VNA services, which correlate with their overall attitudes toward hospice care. Our study explores two main hypotheses: (1) a significant portion of clients will demonstrate limited awareness of VNA services, particularly concerning hospice care, leading to negative associations with these services; and (2) clients with higher awareness will exhibit more positive attitudes towards hospice care, influenced by their understanding and information received. Moreover, we expect there to be a correlation between the amount clients pay for MOW services and their awareness of all services. Additionally, the study addresses the need for services as shown in client responses regarding their primary care providers, medications, and the assistance required for managing daily tasks and assistive devices. By analyzing these factors, we aim to better understand the connection between awareness of VNA services and clients' needs for more comprehensive care. Using a mixed-methods approach, we are going to collect data from approximately 30 clients, examining demographic variability and identifying patterns between awareness, perception of hospice care, and the necessity for supportive services. We will employ qualitative coding and statistical analyses, to uncover relationships between these variables. A thematic analysis will show common themes in client responses, which will magnify misconceptions and positive associations with hospice care.

Megan Penrod

PA - Duquesne University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Samantha Hauck
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Samantha Hauck
Kylie Bracken

Abstract Name: Understanding Students' Judgements During Laryngeal Image Interpretation

Overview Developing a future clinician's ability to make visual-perceptual judgments about video recordings obtained during diagnostic laryngeal imaging procedures is a key component of Speech-Language Pathology (SLP) education. These recordings are commonly obtained using a scope passed through the nose or mouth and capture real-time vocal fold vibrations. Such imaging allows for a more detailed analysis of the voice and voice disorders. This study aims to understand how students learn to interpret laryngeal imaging through the use of eye-tracking technology. Eye-tracking provides insight into cognitive processes (e.g. memory, decision-making, and associative learning) being used when examining laryngeal imaging samples.

Method/Procedures Students in the 1st, 3rd, and 5th years of the SLP Program at Duquesne University were asked to sit in front of a computer to watch videos while their eye movements were tracked using the Gazepoint eye tracker, galvanized skin response, and the iMotions software. The study included three experiments where students were asked to make judgements about laryngeal exam videos given case histories, rate physiologic variables (e.g. glottal gap, mucosal wave) and provide how confident they were in that rating, and visually label/verbally describe anatomical structures. **Results** The impact of experience (student seniority and exposure to laryngeal imaging in class content) on necessary knowledge & skills associated with laryngeal exam interpretation will be discussed. Additionally, this study evaluated students' ability to integrate their knowledge of anatomic and physiologic deficits with applicable diagnostic details. Finally, students' confidence of decision when evaluating vibratory characteristics was investigated. Together, these results can have significant implications for teaching students to interpret laryngeal exam findings and may be able to generalize to inform new competency-based techniques to assess student learning.

Annabelle Pentland

NC - Western Carolina University

Discipline: Chemistry

Authors:

#1 Annabelle Pentland
#2 Curtis Beimborn

Abstract Name: The Relationship between Temperature and the Binding of Surface Ligands on Cesium Lead Bromide Nanocrystals

Recently, there has been an increased interest into the research of nanocrystals and their properties. This is due to their facile synthesis and bright photoluminescence emission. One facet of nanocrystal research focuses on the ligands that bind to the crystal's surfaces and play an important role in their physical and chemical properties. This experiment is focused on understanding how the connectivity of ligands bound to cesium lead bromide nanocrystals is influenced by temperature. Cesium lead bromide nanocrystals will be synthesized using oleylamine through the ligand-assisted reprecipitation method under controlled conditions in the laboratory. The bound and unbound populations of ligand molecules were monitored using proton NMR at various temperatures. This data was then used to do a pseudo-Van't Hoff analysis to get thermodynamic trends. This analysis will help us gain a deeper understanding of nanocrystal surface chemistry and the strength of ligands-nanocrystal interactions when variables like temperature are introduced.

Alexandra Perazzo

PA - University of Pittsburgh

Discipline: Nursing and Public Health

Authors:

#1 Karlyn Edwards

Abstract Name: The Effect of Obesity Stigma on Chronic Pain and Opioid Prescription

Previous research has determined that obesity is related to poor health outcomes, particularly due to the associated comorbidities and stigma. Weight stigma is defined as devaluation because of one's weight. Chronic pain is a common comorbidity for obesity. There is an intersection between weight stigma and pain stigma as a study determined a positive correlation between BMI with weight bias and BMI with pain stigma, pointing to an overlap between these two forms of stigmatization. This review explores a biopsychosocial approach to weight and pain and how obesity stigma affects chronic pain treatment, particularly in the prescription of opioids. One study determined that obese patients have a higher burden of pain and adults who are overweight are more likely to receive pain medication than people of normal weight. There is a gap in research looking for correlations between obesity and over prescription of opioids. Additionally, there is a lack of studies determining if opioids are effective in facilitating weight loss. Opioids are prescribed to improve quality of life and reduce suffering. This is at odds with the likelihood of harm – addiction and overdose. Long-term use of opioids for pain management is linked with increased risk of opioid use disorder. Opioids should be used conservatively and in conjunction with other methods for pain control. Particularly for obese patients, weight loss is associated with pain relief. If opioids help facilitate weight loss, there is a reason for increased instances of prescribing to patients. However, if opioids hinder weight loss, the trends observed in increased prescription to obese patients points to overtreatment. This may also stem from physician bias, which indicates that comprehensive treatment plans for chronic pain may be lacking. This review also discusses other behavioral and medical interventions for weight loss and pain management and highlights provider-level interventions.

Genevieve Pereira

MI - University of Michigan - Ann Arbor

Discipline: Physics and Astronomy

Authors:

#1 Lennart van Sluijs

#2 Emily Rauscher

Abstract Name: Spectral Cartography of Exoplanet Atmospheres

Hot Jupiters are giant gaseous exoplanets in close orbits to their host stars. Their proximity results in high (>1000 K) atmospheric temperatures, providing the best opportunity for observational characterization of exoplanets to date. High-resolution emission spectroscopy has been on the frontier of characterizing hot Jupiter atmospheres, as the spectral features of these atmospheres provide critical insights into their atmospheric dynamics and composition. In particular, hot Jupiter atmospheres are expected to exhibit large day-night temperature differences, suggesting that the emitted spectra may vary depending on the region of the planet under observation. While 3-D models of hot Jupiter atmospheres exist, isolating and analyzing spectral features from specific atmospheric regions has yet to be explored. In this project, we have adapted code to calculate regional spectra and analyze the spectral features using 3-D atmospheric models of the quintessential hot Jupiter WASP-76 b. We find differences in spectral features between the east and west sides of the planet, which may likely indicate distinct chemical and thermal structures for each region. This project expands the field's knowledge of exoplanet atmospheres by understanding their physical properties regionally rather than exclusively globally. Combining this with cutting-edge observational techniques, we can further our understanding of hot Jupiters as complex 3-D objects.

Guadalupe Perez Posada

TX - Texas Woman's University

Discipline: Biology

Authors:

#1 Temiloluwa P. Olaoluwa

#2 Dayna L. Averitt

Abstract Name: Neural Plasticity and Affective Pain Behaviors in a Preclinical Model of Pain Associated with Burn Injury

Burn injuries cause severe, long-lasting pain that is challenging to manage, and many patients transition to intractable chronic pain following resolution of the initial injury. Current treatments for burn pain include opioids, non-steroidal anti-inflammatory drugs, and gabapentinoids; all of which come with serious, limiting side effects. To support the discovery of novel therapeutics, it is necessary to improve our understanding of burn pain mechanisms. Preclinical studies are largely conducted in rodents where similar tissue damage, inflammation, and pain occur following burn injury. However, most preclinical studies measure reflexive pain responses and only test male subjects, which limits clinical relevancy. In the present study we examined the affective aspects of pain using the Mechanical Conflict Avoidance System as a clinically relevant behavioral assay. We hypothesized that full thickness thermal injury to the hindpaw evokes significant affective pain behavior in male and female rats. We tested baseline latency to cross nociceptive (injurious) probes from a lit to a dark (preferred) chamber. We re-tested latency 72 hours post-injury, a time point we previously reported reflexive pain behaviors to peak. We report both male and female rats with thermal injury displayed significantly longer latencies to cross the nociceptive probes as compared to sham-injured (negative control)

rats. Following behavior testing, blood was collected, rats were perfusion fixed, and spinal cords were extracted and sectioned onto glass slides. We are currently using fluorescent immunohistochemistry and cytokine arrays to quantify sensory nerve fibers, pain-generating ion channels, and inflammatory mediators to determine changes following burn injury that could ultimately be targeted to reduce burn pain and its chronification. Our data indicate burn-injured rats displayed a significant increase in several key inflammatory mediators known to increase in burn-injured humans. We have further observed a significant increase in pain-generating ion channels that likely contributes to burn pain chronification.

Yesenia Perez-Velazquez

WI - Alverno College

Discipline: Biology

Authors:

#1 Yesenia Perez-Velazquez

#2 Megan Krueger

Abstract Name: Investigating Bacteria Resistant to Pathogens in Remediated versus Non-Remediated Soil

The investigation aimed to incorporate Tiny Earth, a student research initiative focused on discovering new antibiotic-producing microbes from soil samples. Soil samples were collected from three different sites at Kettle Moraine State Forest in Wisconsin. Sampling selection was based on differences in soil characteristics of the three sites investigated. The three sites investigated were a burned, sterilized, & remediated site, a burned & sterilized site, and a control site providing a natural representation of the environment. Soil samples were analyzed through microbiological methods, including staining procedures, fermentation testing, motility testing, respiration preference, and more. The primary objective of this investigation was to determine the probability of discovering bacteria with antibiotic-producing capabilities in the different sites sampled. The number of bacteria with antibiotic-producing capabilities, compared to the total number of bacteria tested, resulted in the following probabilities: 0% for the solely sterilized sample, 1.25% for the sterilized and remediated sample, and 3.75% for the control sample. The percentages indicate that the discovery of antibiotic-producing bacteria within all sites sampled is rare. The probability suggests there is a low but greater chance of discovering bacteria with antibiotic-producing capabilities in the undisturbed sites.

Moira Periappuram

MI - Wayne State University

Discipline: Engineering

Authors:

#1 Howard Matthew

#2 Greta Mulbauer

Abstract Name: Tensile Testing of Hyaluronic Acid-Chitosan Polyelectrolyte Complex Hollow Fibers

Polysaccharide based hollow fibers have shown promise as a platform for tissue engineered implantable tissues. Specifically, glycosaminoglycan (GAG)-chitosan hollow fibers have shown to support the growth and differentiation of myoblasts as a potential treatment for volumetric muscle loss (VML). This study investigated how fiber composition and structure influenced their suitability as muscle fiber scaffolds by characterizing mechanical properties such as elastic modulus, breaking strain and maximum stress. Fibers formed with varying concentrations of hyaluronic acid (HA), chondroitin sulfate (CSA), and collagen were

fabricated and tested. Hollow fibers were fabricated using a coaxial extrusion process via a 3D-printed coaxial extrusion nozzle, using HA/CSA/collagen as the core fluid and chitosan as the shell fluid. Ionic interactions between the two fluids forms a polyelectrolyte complex constituting the wall of the extruded hollow fiber. Tensile properties of the fibers were measured using a custom-built apparatus comprised of a load cell and a linear actuator to control strain and strain rate. Stress-strain data was collected for fibers of varying GAG concentrations under various strain rates to evaluate the fiber's response to physiological loading. Preliminary results showed that higher HA concentrations and with the incorporation of CSA both increased the elastic modulus. Increasing the GAG concentrations increased the fiber wall thickness, which improved the fibers tensile strength. At higher strain rates, fibers exhibited a higher elastic modulus, indicating viscoelasticity behavior of these ionic complex materials. Future research includes advanced testing, such as stress relaxation and cyclic loading, to further understand fiber behavior. Additionally, preliminary cultures of endothelial cells and smooth muscle cells in hollow fibers to assess responses to varying GAG compositions.

Jenna Perkovich

KY - University of Kentucky

Discipline: History

Authors:

#1 Jenna Perkovich

Abstract Name: Disease, Populations and Maize Cultivation

The presence of disease in prehistoric North America is a difficult concept to study due to the lack of physical evidence that is available to study, as most ailments aren't preserved in bone. However, with diseases such as iron deficiency anemia and osteoarthritis leaving evidence on human remains, archaeologists and early historians have been able to draw certain connections between the prevalence of these conditions, the emergence of large-scale agriculture and the boom in populations that we see happen within these communities. Explored will be how each factor, disease, agriculture, and population, affected each other in North America prior to European contact. Most previous scholarly work focuses on one or two of these factors, but not much found in the process of researching was able to connect all three together. Most common was the tie between agriculture and disease, and agriculture and population boom. Archaeological findings and examination is a large part of the information known of diseases, as there was no written language, and most cultural artifacts do not imply disease as a major factor in life at the time. However, there is knowledge of mythological beliefs that can also help with the understanding of the cultural impact of these different factors, along with the scientific evidence such as mtDNA and radiocarbon methods. Research was conducted through both online and physical sources, the University of Kentucky's library database allowing for much of the information to be found. Considerable ties between agriculture, disease and population change are found through combining scientific, archaeological, and mythological evidence, pointing to all three factors working together to create similar conditions as to how we as humans live today. The spread of disease, large-scale agriculture and malnutrition, and a growing population has carried on since it began to become prevalent in North American prehistoric populations.

Isabel Perozek

MA - Amherst College

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

#1 Lloyd Barba

Abstract Name: Redacted or Otherwise: Religious Exemptions to the COVID-19 Vaccine

The COVID-19 pandemic presented the most rapid development of vaccines of all time, and, in response, scientists introduced a new type of vaccine: one that uses mRNA. The novelty of the vaccine mechanism, the speed at which they were produced, and the involvement of fetal stem cell lines in growing viruses or testing efficacy caused an unprecedented number of people to reject the vaccine on religious grounds. One major difficulty for the government in trying to control vaccination rates is the fact that there is no federal standard for evaluating exemption requests. As such, when certain states and private companies mandated the vaccine, there was no format for approval or denial, and the burden fell largely on Human Resources employees to make the call on whether a belief was sincerely held; the result was sweeping approvals, generally regardless of reasoning. This presentation, based on my Senior Honors Thesis, examines over 1,000 letters submitted by American employees in public and private sectors requesting religious exemptions to the COVID-19 vaccine, obtained through public records requests. The thesis differentiates those that were based on truly religious reasons (objections to fetal stem cell lines) from those that were not (e.g., fears over the chemical contents of the vaccine). It has been widely reported that Evangelical Christians are the group most likely to believe in conspiracy theories and reject the vaccine, so the question is: to what extent are the ideas surfacing in COVID-19 vaccine exemption request letters Evangelical? How are these ideas disseminated via the internet and social media? These findings will be used to inform a new framework for evaluating religious exemptions to civil law that is fair to those who have religious beliefs and also does not threaten public health and safety.

James Perreault

PA - University of Pittsburgh

Discipline: Computer Science

Authors:

#1 James Perreault

#2 Rishi Basdeo

#3 Regan Shanahan

#4 Kenji Shimada

#5 Jacob Biehl

#6 Andrews Edward

Abstract Name: Modeling Reconstruction Of Fragmented Bones Using MRI Imaging And AI

Background: Traumatic events can cause severe bone fractures, leaving bones fragmented and requiring intricate reconstruction by surgeons. Traditionally, x-ray imaging has been the primary tool for locating breaks and guiding bone realignment. However, x-rays are limited in detecting tissue damage, small bone fragments, and depth details. Increasingly, MRI imaging is used for severe fractures due to its superior contrast and depth capabilities. These features also enable software-based analysis to map bone outlines. Augmented Reality (AR) enhances spatial reasoning, making it a valuable tool in preoperative planning, particularly for complex cases like skull reconstruction. Methods: Using MRI imaging combined with machine learning (ML) to identify and differentiate between bone fragments and imaging artifacts. A mixed-reality (MR) approach will be employed to visualize and assist in the reconstruction process, enhancing spatial understanding for surgeons. The ML model will analyze MRI images to identify bone fragments and propose reconstructions, which will be visualized through AR for surgeon evaluation. We plan to evaluate the approach by comparing the Euclidean distance between key anatomical points in surgeon reconstructions and ML-assisted reconstructions, assessing precision and spatial accuracy. Results: While data collection is ongoing, preliminary testing with simulated MRI data demonstrates the potential of ML models to outperform human accuracy in differentiating bone fragments from image artifacts. Conclusion: The integration of ML, MRI imaging, and AR offers significant potential to enhance surgical planning, particularly in complex cases like

skull reconstruction. AI-assisted MR visualizations could improve preoperative planning accuracy and efficiency, enabling surgeons to achieve better alignment and faster reconstructions. By bridging the gap between imaging and spatial reasoning, this approach could redefine fracture management and improve patient outcomes.

Christopher Perrier

TX - Lone Star College

Discipline: Geography/Geology

Authors:

#1 Bryn Benford

Abstract Name: Effects of Rainfall on Conductivity in the Spearford Gully, Houston, TX

This study investigates whether sediments deposited into the water by rainfall influence the conductivity levels within the Spearford Gully at Lone Star College-University Park. Previous research in this gully in 2022 determined that temperature had a measurable effect on the quality of the stream water and that an unknown factor influenced the conductivity of the water (Flores, 2022). Conductivity is a key metric for evaluating water quality, especially in streams, due to its ability to detect the introduction of organic material. Data collection for this research involved hourly monitoring of conductivity, depth, and turbidity over 24 days in March 2024 with a water sonde placed into the Spearford Gully. A nearby Harris-county rainfall gauge was used to collect rainfall data for this period. In the five recorded rainfall events, heavy rainfall resulted in increased sediment turbidity and decreased conductivity, confirming the effect of rainfall on turbidity and suggesting a potential relationship with conductivity. However, further data on larger rainfall events is necessary to confirm this relationship. Additional unexplained external factors (e.g., human activity) affected the data, highlighting the complexity of natural water sources and the various ways water quality can be influenced. This investigation into how rainfall affects conductivity is a significant step toward better understanding the factors impacting water quality such as organic material content. Post rainfall events, lower conductivity values (i.e., fewer dissolved ions or impurities within the water) indicate higher water quality in the Spearford Gully.

Joseph Perry

TN - University of Memphis

Discipline: Engineering

Authors:

#1 Thomas Watson

#2 Eddie Jacobs

#3 MD Rafi Ur Rahman

Abstract Name: Chimaera: a tethered UAV enhancement to proximal sensing carts and UGVs

Small Uncrewed Aerial Vehicles (sUAVs) are a commonly used tool for agricultural remote sensing due to their capability of carrying a variety of sensors including hyperspectral and LIDAR. Tethered Uncrewed Aerial Vehicles (tUAVs) offer theoretically infinite endurance while maintaining most of the flexibility of a UAV. Proximal sensing carts (PSCs) and Unmanned Ground Vehicles (UGVs) offer large payloads and increased endurance compared to UAVs. Combining UAVs and PSCs can be used to provide a flexible sensor mounting platform that is less dependent on the terrain, is flexible in height, and offers dynamic flexibility in

positioning the sensors, all while increasing endurance. Presented here is a bolt-on solution for a marsupial tethered UAV designed to operate either in tandem with or independently from its mother vehicle. It is designed to work either as a part of a Manned-Unmanned Team (MUM-T) with a human powered cart or work autonomously with an UGV. The tradeoffs of the system are analyzed focusing on weight, cost, and complexity. The use of a tUAV is demonstrated by gathering hyperspectral imagery from local area winter crops. Usability can then be determined by comparing it with ground based and non-tethered UAV sensing by using IMU data and changes in the Modulation Transfer Function to determine the stability of the drone and image quality of the camera, respectively.

Natalie Peter

NY - Eugene Lang College The New School for Liberal Art

Discipline: Education

Authors:

#1 Natalie Peter

Abstract Name: Clashes in American Civics Education: Tulsa, Philadelphia, and Generation Citizen

The importance of civics education is well studied in the field of American education. The Political Science and Politics journal has recognized civics' role in a functioning democracy since the early 2000s. Although most Americans agree on the importance of civics, an increasingly politicized climate has created tensions over how it should be taught. My research addresses the disagreements within the field and examines the underlying causes of these tensions in American communities. Focusing on the case studies of Tulsa and Philadelphia—two cities with very different responses to the civics program Generation Citizen—this study sheds light on the factors that shape how civics education is implemented and perceived. Through interviews with school board members, Generation Citizen staff, participant observation, and local research, I highlight the role of grassroots organizations, local politics, and specific civics pedagogy in shaping the perception of a civics program. Additionally, the project explores the role of civics in different political communities and the concept of neutrality in the American classroom. These insights contribute to the broader conversation about the civics education gap and the growing political polarization in the United States.

Victoria Peter

OK - Southern Nazarene University

Discipline: Biology

Authors:

#1 Natalie Shreffler

#2 Devin Rovito-Bruckner

#3 Caio Franca

#4 Erika Podest

Abstract Name: Environmental Predictors of Mosquito-Borne Diseases

Some mosquito species are vectors of diseases like Malaria, Dengue, Yellow fever, West Nile virus (WNV), and more. The culex species is the main vector of WNV, the predominant mosquito-borne disease in Oklahoma. This project aims to understand how different environmental variables contribute to the abundance of mosquitoes and the presence of certain species and create models to predict mosquito abundance and the diseases they carry. Google Earth Engine (GEE), leveraging advanced remote sensing

technologies, was used to obtain datasets from which environmental variables (air temperature (Modis), solar radiation (NLDAS), precipitation (GPM), wind speed (GLDAS), soil moisture, and relative humidity (Gridmet)) were examined, visualized, and extracted. Scripts made in the GEE code editor were translated into Google Colab, which was used to update and expand the code to examine, visualize (using charts, tables, and interactive maps), and extract the environmental data for mosquito trap sites in Central Oklahoma and Tulsa. To ascertain the accuracy of the remote sensing & modeled data, they were compared to reference data collected from the Oklahoma Mesonet, a network of ground-based environmental monitoring stations. ANOVA was used to determine if the differences between the data from the various sources were statistically significant. The ultimate goal is to identify which environmental variables and land cover characteristics are the best predictors of mosquito abundance, potentially revealing species-specific conditions that could inform disease transmission risk. Initial results indicated that maximum temperature data from 2018-2023 obtained from Modis was significantly different than that of Mesonet with p-values much less than 0.05.

Verona Peterman

CA - California State Polytechnic University - Pomona

Discipline: Biochemistry

Authors:

#1 Rohit Bhide

Genevieve Huynh

Abstract Name: Advance textiles as heterogeneous photocatalysts for synthesizing complex organic compounds

The use of textile materials as substrates for heterogeneous catalysts can revolutionize the synthesis of pharmaceutical drugs and fine chemicals. The state-of-the-art protocols to synthesize complex organic compounds suffer from the use of toxic heavy metals as reagents or homogeneous catalysts. Extensive purification must be performed to remove these metal contaminants, which makes the overall process less efficient and more expensive. Herein, I propose a method to develop cleaner and greener heterogeneous photocatalysts by covalently attaching metal-free molecular photocatalysts to textile substrates such as glass wool and cotton. These metal-free photocatalyst-dyed textile substrates will have low toxicity and drive organic reactions under visible light illumination. In this research, I will assess how the extent of photocatalyst loading on textile substrates affects the reaction yields and selectivities. Moreover, the textile substrates will greatly facilitate the recycle and reuse of these catalysts, making organic syntheses more sustainable. We're in the process of synthesizing sulfoxides through the oxidation of sulfides, which are important functional groups used in pharmaceutical drugs.

Elyssa Peters

IL - Trinity Christian College

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

Abstract Name: How does one allow another to be an Other? Philosophical dimensions of guilt and forgiveness

Present-day cultural commentators often call attention to the increasingly siloed character of modern society: more and more, it seems that when people do gather, it tends to be with those who are already like

themselves. This tendency to gather only with those who are like us reflects the violence that philosopher Emmanuel Levinas diagnosed as the reduction of the Other to “the same,” that is, to what one already knows, expects, or is comfortable with. In response to this violence, Levinas developed an ethics of Otherness, based on preserving the otherness of the Other in our encounters with her. However, this ethics of otherness risks its own violence—for example, keeping the other at a distance—as pointed out by James Olthuis in his recent book *Dancing in the Wild Spaces of Love*. My project uses Olthuis’ understanding of “non-oppositional difference” to develop an ethics of community that avoids these twin violences, based on a radical vision of love as healing division without erasing otherness. To do this, I explore the influence on Olthuis’ thinking of philosopher and psychoanalyst Julia Kristeva, whose discussion of guilt and forgiveness explores how both meaning and healing can come through the linguistic encounter in which psychoanalysis is conducted. Together, Olthuis and Kristeva chart a path toward reconciliation and community that requires us to relearn and redefine the ways in which we encounter one another.

Elyssa Peters

IL - Trinity Christian College

Discipline: Sociology

Authors:

Abstract Name: Nina Simone for Social Change

Music has been used globally and historically as a tool to bring about change. It’s a way to amplify voices that may otherwise not be heard and to share ideas on a broad scale. Nina Simone (1933-2003) was an American singer and pianist who used music to advocate for change, to address oppression and the need for equality of every kind. Her early training was as a classical pianist and Gospel musician, but she grew to make music that also encompassed jazz, Blues, Soul, Rhythm & Blues, pop, and protest. She was sometimes seen as a controversial figure both because she did not fit into one defining musical genre, and, more so, because she unapologetically spoke out against societal injustices of every kind. In this paper, I address the following research question through the lens of the social theory of feminism: How does Nina Simone use anger, grief, and self-determination in her music to address marginalization and fight for social justice? After briefly explaining my personal connection with Nina Simone’s music, I will introduce my perspective on the social theory of feminism. My approach is particularly informed by bell hooks, who defined feminism as “to want for all people, female and male, liberation from sexist role patterns, domination, and oppression.” I will then consider Nina Simone in relation to feminist movements. I will explore reasons that the second-wave feminism of the 1960s and beyond did not resonate with Simone as an African-American woman, but also argue that Simone’s life and works can be considered instead as resonant with modern conceptions of feminism in intersectional contexts. Finally, I will analyze three of Nina Simone’s songs in light of such an intersectional feminism: “Mississippi Goddamn” (1964), “Pirate Jenny” (1964), and “Four Women” (1966).

Ella Peterson

OH - College of Wooster

Discipline: Psychology

Authors:

#1 Kasia Myslinska-Szarek

#2 Felix Warneken

Abstract Name: Children's Generalizations of Other's Fairness and Competency

How do children pick peers to cooperate with or be friends with? Prior research has shown that children can use prior behavior to predict future behavior; however, the findings on how this occurs are mixed. They may assume that people who are good at one thing are good at all things, or they may be able to identify specific character traits. Two important behavioral domains related to children are competency (behaviors indicating task performance) and fairness (behaviors indicating sharing tendencies). This pilot study examined if children generalize behaviors within domains (within competency or fairness) and between domains (from competency to fairness and vice versa). Participants included 31 children aged 5–10. Half of them observed a child performing well or poorly on a task (competency manipulation), and half observed a child sharing equally or unequally (fairness manipulation). After this observation, the children predicted how well this child would perform on a task and how fairly they would share. We hypothesized that children would generalize within the competency domain to a lesser extent than they would generalize within the fairness domain. Opposed to this, preliminary results found that the competency manipulation had a larger effect on later competency predictions ($d = 1.29$) than the fairness manipulation had on fairness predictions ($d = 0.63$). Furthermore, the fairness manipulation had a larger effect on later competency predictions ($d = 0.82$) than the competency manipulation had on fairness predictions ($d = 0.49$). This suggests that 5- to 10-year-old children do generalize within and between domains; however, future research will analyze a larger sample size to investigate the effect of age and draw more accurate conclusions on if and how children generalize between and within domains.

Lukas Peterson

MN - Minnesota State University - Mankato

Discipline: Engineering

Authors:

#1 Lukas Peterson

#2 Brady Bigelbach

Brady Bigelbach

Abstract Name: Dimensional variability in 3d prints

In this research we try to find out the causes for the difference found between print dimensions and design dimensions. When a part is designed on a computer, the dimensions measure slightly off after being printed. We came up with a simple “pin” geometry that was printed and measured with a micrometer many times, changing different variables. The variables studied were, layer height, print speed, nozzle temperature, and variability between printers. Geometry was kept the same, filament stayed as PLA, and infill stayed at 10%. Design-of-experiments was used to analyze the data and draw conclusions as to what variables affected dimensional variability the most. We found that nozzle temperature had the greatest effect on dimensional variability. Using the results of this research 3d printed parts can be designed with greater accuracy and less guesswork. Further research will help to someday eliminate measurable variability when printing.

Ella Peterson

OH - The College of Wooster

Discipline: Psychology

Authors:

#1 Dan Scheibe

Abstract Name: How Making Decisions on the Behalf of Others Influences Temporal Discounting

People often value rewards less when they are delayed, leading to a preference for smaller immediate rewards over larger delayed ones; this is called temporal discounting. The context of these decisions influences discounting severity and can promote self-control (choosing the delayed option) or impulsivity (choosing the immediate option). In particular, social distance is important when people decide on behalf of others; however, the limited existing research has provided mixed results. There are open questions regarding how the subjective value of rewards depends on who receives the reward and how many people are impacted. This study aims to investigate how temporal discounting rates are influenced by choosing between smaller immediate and larger delayed rewards for others. I will recruit 200 online participants through Cloud Connect. Participants will be randomly assigned to conditions in a 2 (social relationship: friend or acquaintance) x 2 (group size: individual vs. group) fully crossed between subjects' design. Based on condition, participants will choose between monetary rewards for one friend, one acquaintance, five friends, or five acquaintances. I will utilize analysis of variance to test for main effects of each independent variable and the interaction terms between both variables. I hypothesize that (1) participants deciding for friends will discount more than those deciding for acquaintances, (2) those deciding for five friends will discount more than those deciding for one, and (3) those deciding for five acquaintances will discount less than those deciding for one. This would indicate that, when people make decisions for people they do not know, they are more likely to focus on long-term consequences; however, when people make decisions for people they know well, they are more likely to focus on short-term consequences. Additionally, when people make decisions for groups, the increased number of people exacerbates the tendencies already shaped by social relationships.

Abigail Petteys

NY - SUNY New Paltz

Discipline: History

Authors:

#1 Abigail Petteys

Abstract Name: Mommy's Gone Down the Rabbit Hole: Understanding the Intersection Between Motherhood and Conspiracy Theories in the United States From the 1970s to the Present Day

When picking up my sister from school, I noticed a woman wearing a shirt that read, "Unvaccinated, Conservative, Meat Eating, Gun Owner. How else can I piss you off today?" Such provocative messaging reflects the growing polarization in the United States over the past decade, accompanied by a surge in conspiracy theories. Historically, women have often been overlooked as active participants in conspiratorial thinking, yet motherhood frequently serves as a driving force behind such ideologies. This phenomenon is visible in groups like Moms for Liberty and viral school board confrontations, as well as in QAnon's "satanic pedophile deep state" conspiracies. While these trends are often framed as new, their roots run deep. This study examines the work of Mae Brussell, a prominent figure in the 1970s and 80s whose obsession with the JFK assassination and "deep state" conspiracies mirrors modern rhetoric. Interestingly, Brussell was embarrassed by the far left, including figures in the Yippie movement, highlighting an earlier, left-leaning orientation in conspiratorial discourse. How has the pendulum shifted from left to right in conspiracy thinking? How does gender influence conspiratorial belief and the motivations behind it? By exploring the intersection of motherhood and conspiracy theories, this study provides historical context to better understand these contemporary dynamics.

Kiran Pfaffinger

Discipline: Interdisciplinary

Authors:

Abstract Name: Individualizing Memorialization Practices of Mass Death

Efforts to memorialize cases of mass death, such as war, genocide, or epidemics, face the challenge of remembering both the enormity of loss and the individuality of victims. In this paper, I investigate the way that communities and loved ones seek to individualize victims of mass death, through the case study of quilts made to commemorate those killed in 9/11. I draw from a body of research by anthropologists and historians who study cultural memory, memorialization, and individuation. Although anthropological research on the topic of memorialization and personhood is available, there is a lack of anthropological research on practices of individuation in contemporary memorialization. I seek to bridge this gap by utilizing the work of historians and other memory studies scholars who document trends of memorialization throughout history. A purposive sampling interview with experts and practitioners in the field of 9/11 memorialization serves as the foundation for my detailed analysis of quilts made in memory of victims who died in 9/11. The 9/11 Memorial and Museum's collection of quilts is an assemblage of multimedia quilts of varying scales and sizes, made by both amateur and professional quilters across the world. They cover a variety of themes, ranging from peace and spirituality to memorials for both individuals and groups of victims. Out of the larger collection, I have chosen to analyze a sample of four quilts which best display the diversity of individualizing techniques often used in these projects, such as naming, images, symbols representing the victim's life and interests, 3D objects, and representation of the loved ones left behind. Each of these elements documents the life and personhood of the victim, combating the anonymity that mass death often imposes on victims.

Shay Pfeifer

KY - University of Kentucky

Discipline: Engineering

Authors:

#1 Bakhyt Alipova-Turner

Abstract Name: Modeling Blood Flow Dynamics and Arterial Wall Mechanics in Stenting Surgery Using COMSOL

Stenting surgery is a critical intervention for restoring blood flow in occluded arteries, yet it alters the biomechanical environment of blood flow and arterial walls, which can influence long-term outcomes. This research investigates the dynamics of blood flow and arterial wall mechanics before and after stenting surgery using computational modeling. The study aims to address the central question: How does stenting affect hemodynamic parameters and arterial wall stress, and what insights computational models can provide for optimizing stent designs. The project builds on prior research highlighting the interplay between blood flow dynamics and arterial wall responses with a focus on improving patient outcomes. However, this study uniquely integrates pulsatile blood flow modeling and arterial wall deformation using COMSOL Multiphysics 6.2, providing a comprehensive analysis that bridges fluid dynamics and solid mechanics. The methodology involves creating a 3D model of a stenosed artery, stimulating pulsatile blood flow using the Navier-Stokes equations, and coupling it with the structural mechanics module to analyze arterial wall deformation. Pre- and post-stenting conditions are compared to evaluate changes in flow patterns, wall shear stress, and strain distributions. Expected results include identifying critical regions of altered flow and stress that could predict restenosis or complications. The findings will be contextualized within clinical considerations, offering insights for stent design improvements and personalized surgical planning. By

integrating advanced computational tools and physiological modeling, this research aims to contribute to the optimization of stenting procedures and enhance vascular health management.

Kevin Phalhouvong

WI - University of Wisconsin-Madison

Discipline: Health and Human Development

Authors:

#1 Andrea Gilmore-Bykovskyi

#2 Alison Coulson

#3 Jess Fehland

#4 Kayla Dillon

Abstract Name: Development of Data Processing Procedures to Facilitate Detection of Lucid Episodes in Dementia

Lucid episodes (LEs) are described as an unexpected return of abilities previously believed to have been lost among individuals with Alzheimer's disease and related dementias (AD/ADRD). Due to the early stage of lucidity research, standard definitions have not yet been developed and their rare presentation makes them difficult to study. Audiovisual observations can advance research on this phenomenon and support progress toward a precise definition. But the time-intensive nature of processing high volumes of audiovisual data presents challenges for timely detection of LEs and subsequent analysis. As part of a prospective observation study, over 1800 hours of audiovisual data have been collected from participants living with AD/ADRD in a dementia-specific hospice unit. Standardized data processing methods were developed to 1) support systematic review of data to detect LEs and 2) create segments to facilitate analysis. All data is reviewed for significant variations from a participant's expected routine fluctuation in abilities, thereby identifying potential LEs, and prioritized for further analysis of verbal/nonverbal activity within identified LEs and baseline segments. Video data is classified and parsed into two categories: codable and non-codable data. Codable data contains participant verbal and/or nonverbal activity, included within the pre-defined coding scheme (e.g., eye gaze, gestures, vocal communication). These data segments are advanced to coding and analysis procedures, along with identified LEs. These procedures present opportunities for increased efficiency of audiovisual data processing, review, and analysis. This is important when LE validation relies on informant appraisal, conducted in close temporal proximity to the occurrence. However, subtle LEs, defined as non-apparent LEs, are challenging to detect through an expedited data review and will not be detected unless indicated in previously prioritized codable data during analysis. Overall, these procedures achieve the goals of expedited LE detection and efficient data segment creation for coding and analysis.

Bao Pham

AL - University of Alabama at Birmingham

Discipline: Biochemistry

Authors:

#1 Theo Hines

#2 Ruba Ghanam

#3 James Kizziah

#4 Jamil Saad

Abstract Name: Structural Basis for HIV-1 Matrix Maturation

Considerable interest is directed towards identifying the structural determinants of Human Immunodeficiency Virus Type 1 (HIV-1) assembly and maturation. In recent years, numerous discoveries and advancements in technology have contributed toward understanding assembly but the structural basis of HIV-1 maturation is not well understood. During the late phase of the HIV-1 infection cycle, the newly synthesized Gag polyproteins are targeted to the plasma membrane (PM) for assembly, a process mediated by interactions between the matrix (MA) domain and phosphatidylinositol 4,5-bisphosphate (PI(4,5)P₂). Recruitment of the envelope (Env) protein to the PM for incorporation into virus particles occurs concurrently with Gag assembly. Mounting evidence suggests that a well-formed MA lattice is essential for Env incorporation and infectivity of the mature virus. Recent studies revealed that the MA forms distinct lattices during assembly and upon maturation. Moreover, it has been shown that a small peptide in Gag, spacer peptide 2 (SP2), plays an integral role in MA maturation. The structural details of mature and immature MA lattice bound to lipid membranes emulating PM, factors that govern the MA conformational switch, and components that (de)stabilize the lattice during assembly and upon maturation are still lacking. Our lab employs biochemical, biophysical and structural biology techniques (cryo-electron microscopy (cryoEM), NMR, and x-ray crystallography) to investigate HIV-1 assembly, maturation and Env incorporation. We devised a “controlled assembly” approach coupled with cryoEM to generate biologically authentic substructures of the immature and mature MA lattices. We also used these techniques to directly explore and map the interaction of SP2 with HIV-1 MA. Our discoveries may pose an opportunity to develop new targeted antiviral therapeutic agents that precisely disrupt assembly, MA maturation, and ultimately virus production.

Doanh Pham

KS - University of Kansas

Discipline: Political Science

Authors:

#1 Doanh Pham

Abstract Name: Discrimination of the Hoa: Historical Tension, Threat Perception, and the Country-of-Origin Effect on the Ethnic Chinese Community in Vietnam

In the richly intertwined history of China and Vietnam, the Hoa, or ethnic Chinese communities, have long existed in both rural northern regions and urban centers such as Saigon, developing a mixed identity. By the end of 1979, following the Sino-Vietnamese War, 250,000 Hoa sought refuge across Southeast Asia due to discrimination against their Chinese identities. Since then, similar incidents of discrimination have arisen in Vietnam. Often in response to protests against the People's Republic of China, such as the 2014 protests over the South China Sea, protests have led to the burning of Chinese-owned businesses. In recent years, the geopolitical rivalry between China and Vietnam has intensified, particularly over territorial disputes and Chinese foreign direct investment. This paper explores whether discrimination against the Hoa is driven by nationalism—defined as loyalty to one's country—or by ethnonationalism, rooted in shared cultural and ethnic attributes. It also examines how Vietnamese citizens define national identity, or "Vietnameseness." The study conducts a survey-embedded question-wording experiment with 600 Vietnamese citizens currently residing in Vietnam, focusing on individuals with college or higher education. Additionally, the study compares attitudes toward discrimination across different ethnic migrant groups in Vietnam, such as the Hoa, Thai, and Khmer, to determine whether discrimination is generalized or driven by specific ethnic identities. Understanding the form of nationalism is crucial for determining whether discrimination is a response to geopolitical tensions or whether it is a broader social phenomenon independent of such tensions.

Quynh Pham

CO - Regis University

Discipline: Biology

Authors:

#1 Quynh Pham

#2 Christy Niemeyer

Abstract Name: The Gut-Brain Axis of Alzheimer's Disease: Understanding the Cellular Changes in the Gut and Its Implications for Future Diagnosis Approach

Alzheimer's Disease (AD) is a neurodegenerative disorder that leads to gradual decline in cognitive function. This study examines the difference between goblet cell counts in healthy individuals and AD patients, and how those differences, if any, correlate with AD pathology. Recent studies suggested that AD might manifest its pathologies in the enteric nervous system via the gut-brain axis. The gut-brain axis is a bidirectional communication network between the central nervous system (CNS) and the enteric nervous system (ENS), which is the collection of nerve cells lining the gut. The ENS, also known as the "second brain", directly communicates with the CNS via the vagus nerve. Within the ENS, goblet cells play a critical role in maintaining homeostasis in the colon and small intestine by synthesizing and secreting mucus. Depletion in goblet cell counts, which results in a lack of mucus, can lead to intestinal inflammation in the ENS and subsequently neuroinflammation in the CNS. Rats that expressed Alzheimer's symptoms had a significant goblet cell loss in both the colon and small intestine. Such decrease in goblet cells associates with AD's pathology. We collected colon and small intestine samples from healthy individuals and AD patients, followed by comparing the goblet cell counts from collected tissue samples between the two groups. We expect to see less goblet cells in AD patients in comparison to healthy individuals, which would align with how there was less goblet cells in AD-rats than control-rats. With our expected result, we could potentially improve the current diagnosis process by monitoring goblet cell counts in at-risk AD patients before their symptoms onset, thus making this a more definitive diagnosis method.

Evan Phan

PA - University of Pittsburgh School of Nursing

Discipline: Nursing and Public Health

Authors:

#1 Evan Phan

#2 Tammy L. Eaton

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#9 Kelly M. Potter

Abstract Name: Associations Between Recalled Memories of the ICU Stay, Delirium, and Mental Health Outcomes in Critical Illness Survivors at 1-Month Follow-Up in a Critical Illness Recovery Center

Rationale: Critical illness survivors often experience anxiety, depression, and PTSD due to traumatic experiences, sedation, and delirium. Early interventions of psychological support may help mitigate mental health deficits post-ICU. Memory of the ICU stay may play a key role in addressing trauma. We sought to determine the relationship between ICU memory recollection, in-ICU delirium, and mental health outcomes at 1-month follow-up in a critical illness recovery center. Methods: We analyzed data collected at 1-month follow-up in a critical illness recovery center seeing adults who had ICU stays of ≥ 4 days with sepsis,

respiratory failure, or delirium. Patients were asked, “Do you remember your experience in the ICU, and if so, can you describe your most impactful memories?” and we qualitatively coded responses for presence and type of memories described. We analyzed associations between demographic, clinical, and mental health measures and memory recollection using unadjusted comparisons. Results: Among 196 patients seen at 1-month follow-up, 96 (49%) reported memories of their ICU stay. Of these, 44 (46%) described support they received in the ICU, 36 (38%) recalled delusions and/or hallucinations, 35 (37%) remembered specific treatments, and 33 (34%) described symptoms. Baseline characteristics and critical illness features are shown in the Table. Those without memories had more delirium days than those reporting memories ($p=0.02$). Although PTSD and anxiety symptoms at 1-month follow-up were not associated with memories, patients who remembered their ICU stay had fewer depression symptoms ($p=0.04$). Conclusions: One month after critical illness, half of survivors recalled their ICU experience, with memories ranging from supportive interactions to distressing experiences. Memory recollection was associated with fewer depressive symptoms during follow-up. Memories of the ICU may provide a therapeutic foundation for interventions targeting depression after critical illness, like exposure therapy or ICU diaries, which may improve mental health outcomes in critical illness survivors.

Naia Phelps

KY - University of Kentucky

Discipline: Biology

Authors:

#1 Andrea Thompson

#2 Simon Fisher

Abstract Name: Severe Hypoglycemia causes Neuronal Inflammation and Cell Death

Background: Severe hypoglycemia is a serious complication for individuals with insulin-treated diabetes, and may cause brain damage resulting in memory deficits and cognitive impairments. The areas most affected by severe hypoglycemia are the learning and memory areas of the brain, such as the hippocampus. This project aims to examine pathologic mechanisms by which insulin-induced severe hypoglycemia induces brain damage in a novel rodent model. Methods: To induce brain damage, 10-week-old male Sprague-Dawley rats underwent a single episode of severe hypoglycemia (10-15 mg/dL for 90 minutes) via a subcutaneous injection of Humulin R insulin (15U/mg.kg) and compared to a control cohort of saline injected rats that maintained euglycemia (90-120 mg/dl). One week following the intervention, the animals were sacrificed, perfused and their brains extracted. To identify potential mechanisms by which neuronal damage from severe hypoglycemia occurs, brain sections (40 μ m) of the hippocampus were obtained for immunohistochemistry staining using Iba-1/CD68 (microglial immunoactivity marker), Cleaved-Caspase-3 (CC3 – marker for apoptosis), and Fluoro-Jade-C (FJC -marker for neuronal degeneration). Stains were analyzed using ImageJ software and total number of cells were analyzed using a Student's t test. Results: In comparison to control rats, rats that underwent insulin-induced severe hypoglycemia had four-fold more FJC+ cells ($p<0.05$). Similarly, the severe hypoglycemic group had a four-fold higher number of cells that expressed CC3 in comparison to control animals ($p<0.001$). Iba-1/CD68 staining was five-fold higher in the severe hypoglycemic group in comparison to controls ($p<0.0001$). Conclusions: In this novel rodent model, insulin-induced severe hypoglycemia caused hippocampal brain cell death indicated by increased FJC and CC3 immunohistochemistry staining. Severe hypoglycemia also caused neuronal inflammation indicated by Iba-1/CD68 staining. Identifying mechanistic pathways of brain cell death induced by severe hypoglycemia will help direct potential treatment modalities

Samantha Phillips

NE - Creighton University

Discipline: Computer Science

Authors:

#1 Kaylee Van Handel

#2 Cole Krudwig

Kaylee Van Handel

Cole Krudwig

Abstract Name: Development of Synthetic Palliative Care Data through Generative Adversarial Networks

In this study, we developed a method to generate synthetic palliative care data utilizing a Generative Adversarial Network (GAN) architecture comprising a generator and a discriminator, in compliance with the standards outlined in the Palliative Care Clinical Data Set: Guidance and Definitions. Initially, the Faker library was employed to create a preliminary dataset that emulates real-world palliative care data, including variables such as patient initials, birth dates, gender, ethnicity, referral dates, care settings, and various health status indicators like functional status, pain levels, breathlessness, and anxiety distress. The dataset underwent normalization via MinMaxScaler and was divided into training and testing subsets to prepare for GAN training. The generator model was architected with dense layers and batch normalization to produce realistic data samples from random noise inputs, while the discriminator model was designed with dense layers and dropout regularization to effectively distinguish between authentic and synthetic data samples. Both models were compiled using the Adam optimizer and a binary cross-entropy loss function to optimize performance. The GAN underwent training over 10,000 epochs, during which the generator incrementally enhanced its capability to produce data that the discriminator could not differentiate from actual data, thereby refining the quality of the synthetic outputs. Post-training, the generator was employed to generate new synthetic data, which was subsequently rescaled to its original value range using inverse normalization techniques. The resultant synthetic dataset was saved in CSV format for ease of use in subsequent analyses. This approach not only illustrates the potential of GANs in generating high-fidelity synthetic palliative care data but also provides a framework that can be leveraged for research and analytical purposes, particularly in areas where data privacy and scarcity are significant concerns. We want to thank the Kingfisher Institute Mini-Seminar for supporting our research.

Bailey Phillips

PA - Washington & Jefferson College

Discipline: Biology

Authors:

#1 Bailey Phillips

#2 Michael Brackney

#3 Joseph Panahandeh

Michael Brackney

Joseph Panahandeh

Abstract Name: Evaluating Protective Effects of Vitamin B12 on Amyloid-Beta Toxicity in *Caenorhabditis elegans*

Previous studies have demonstrated a neuroprotective effect of vitamin B12. This study investigates these effects on paralysis induced by amyloid-beta in *Caenorhabditis elegans* (*C. elegans*) to determine an effective dose of vitamin B12. The transgenic strain CL4176, which expresses amyloid-beta upon a temperature shift, was used to model toxicity and subsequent paralysis. A paralysis assay was conducted over eight hours to evaluate time-to-paralysis in four experimental groups: control, and animals grown on plates supplemented with 75 nM, 150 nM, or 300 nM vitamin B12. Our results show that *C. elegans* expressing amyloid-beta

exhibit an 80% reduction in motility compared to the wild-type strain CL802. However, motility was rescued in animals grown on plates containing vitamin B12, regardless of the concentration. Immunostaining confirmed amyloid-beta aggregation following the temperature upshift, although vitamin B12 treatment did not reduce aggregate size. This study builds on existing research by reaffirming vitamin B12's neuroprotective effects against amyloid-beta toxicity and highlighting the complexity of its mechanisms. These findings contribute to a deeper understanding of potential therapeutic interventions for amyloid-beta pathology.

Ann Phillips-Breese

WI - Alverno College

Discipline: Biology

Authors:

#1 Megan Krueger

Emerald Nickens-Simpson

Abstract Name: Environmental Factors Affecting E.coli Levels in Kinnickinnic River

The purpose of this investigation was to determine the environmental factors affecting E. coli levels in the Kinnickinnic River at three sampling sites in Milwaukee: Zablocki Park, Wilson Park, and Jackson Park. This research holds significant value for the community, as the data collected is shared with Milwaukee Riverkeeper, a nonprofit organization dedicated to monitoring the river's overall health. E. coli, a pathogenic bacterium found in waterways, can cause illness in humans, making it crucial to monitor its levels to ensure public safety and health. During the summer, water samples were collected four times from each of the three sites along the Kinnickinnic River. These samples underwent a series of tests, including a presumptive test, a confirmed test, and a completed test. The presumptive test is when the water sample is aseptically added to lactose broths; tubes were incubated for 24 hours at 37°C. Durham tubes with a gas bubble of 5mm or greater were marked as positive. Second, the confirmed test is where an Eosin-Methylene Blue (EMB) agar plate was inoculated for every positive lactose tube and incubated at 37 °C for 24 hours. After 24 hours, all plates with metallic green were recorded as positive for E. coli. Last, the completed test is where all EMB plates that were positive for E. coli were used to inoculate an agar slant. The slants are gram stained, and microscopy is used to determine the presence of E. coli. The results indicated that E. coli levels were impacted by water and air temperature, water velocity, pH levels, trash, and wildlife.

R. James Philpott

FL - Flagler College

Discipline: Mathematics

Authors:

#1 R. James Philpott

#2 Thomas Luckner

Abstract Name: d-translated Unit Sensitive Primes

Erdős first introduced the concept of covering systems in order to study the integers with a finite set of arithmetic progressions. In recent years this technique has been replicated to construct arithmetic progressions of Sierpiński numbers, Riesel numbers, Brier numbers, digitally delicate numbers, widely digitally delicate numbers, and many more. We use this technique to construct an arithmetic progression of unit sensitive and

d-translated unit sensitive integers. Let an integer be d-translated unit sensitive when translating the number d digits forward and changing the new unit digit to any base 10 digit results in a composite number. We provide the first known example of such a prime number that is d-translated unit sensitive for any positive integer d.

Connor Phutawon

IN - Indiana University Purdue University Indianapolis

Discipline: Biology

Authors:

#1 James Marrs

Abigail Walton

Sania Sheifud

Abstract Name: Behavioral and Developmental Effects of Lead Acetate Exposure in Embryonic Zebrafish

Lead toxicity poses a major threat to organisms exposed to high concentrations, particularly affecting development and behavior. This investigation uses AB strain zebrafish (*Danio rerio*) as the model organism to examine environmental lead's effects on both development and behavior. Zebrafish were harvested post-fertilization and exposed at gastrulation to 0.4 and 0.8 $\mu\text{g/mL}$ lead acetate concentrations. Following two days of lead exposure, the embryos were washed and incubated for three or seven days. The zebrafish exposed to 0.4 $\mu\text{g/mL}$ concentration underwent the light/dark locomotion test seven days post-fertilization. This assay uses Zebrabox for automated tracking of speed and distance. Light/dark locomotion test results showed lower activity in response to light/dark compared to controls. The optomotor assay, which examines response to simulated current, found reduced response in exposed compared to controls. For circle swimming behavior, a video of the response to light/dark was recorded three days post-fertilization. The fish exposed to 0.4 $\mu\text{g/mL}$ and 0.8 $\mu\text{g/mL}$ at three days showed circle swimming in the groups treated with lead, which was absent in controls. The 0.4 $\mu\text{g/mL}$ concentration group showed slightly more circle swimming behavior than the group treated with the 0.8 $\mu\text{g/mL}$ concentration. For the thigmotaxis behavior assay, the measurement of larvae staying near dishes periphery, a video of the response to light/dark was recorded seven days post fertilization. Thigmotaxis increased in the group treated with 0.4 and 0.8 $\mu\text{g/mL}$ concentration, relative to untreated controls, but the group treated with the 0.8 $\mu\text{g/mL}$ concentration was unexpectedly less than 0.4 $\mu\text{g/mL}$ concentration. Future steps include examining morphological defects.

Marianee Pichardo-Luna

AL - University of Alabama at Birmingham

Discipline: Education

Authors:

#1 Teaira McMurtry

Abstract Name: Using the Black Immigrant Literacies Framework to Establish Relevance to Teaching

My co-authorship of a book review of Black Immigrant Literacies: Intersections of Race, Language, and Culture in the Classroom examines the Black Immigrant Literacies framework that Dr. Patriann Smith proposes to support Black immigrant students by redefining the standard of "acceptable literacy." She proposes leveraging their unique literacies and lived experiences to establish relevance to teaching. My co-author and I compiled the book review by analyzing other works by Smith, connecting to relevant educational theory, and by sharing our lived experiences. Research will continue to be conducted by referencing scholarly

articles and engaging in discussions with educators. Smith's framework consists of five key pillars: the claim to the struggle for justice, the myth of the model minority, a transraciolinguistic approach, a focus on local-global approaches, and the use of holistic literacies. Three elements of her framework—the claim to the struggle for justice, the myth of the model minority, and the repurposing of local-global approaches discuss the unique struggles that Black Americans and Black immigrants face within the United States, but they also recognize that both Black Americans and Black immigrants still possess literacy rates well below the standard, which creates a need for unification to bridge the literacy gap. The transraciolinguistic approach discusses how understanding the interplay between race, language, and culture, contribute to how we make meaning of the world by examining literacy through a metalinguistic, metaracial, and metacultural approach. This framework equips educators to explore how reshaping the standard of literacy to be more holistic will leverage student assets and funds of knowledge to inform pedagogy.

Jessica Pichat

PA - Duquesne University

Discipline: Chemistry

Authors:

#1 Stephanie J. Wetzel

Abstract Name: Touch Chemistry: Detecting Over the Counter Drugs (OTC) in Developed Fingerprints

Latent fingerprints can be key evidence in criminal investigations because they are unique identifiers. However, more information than just the identity of the person can be found in fingerprints. Touch Chemistry examines fingerprints for other materials or substances that have previously been touched. This is based on Loccard's exchange principle that says when two items come into contact there will be an exchange that results in physical evidence. Touch Chemistry can have practical applications to identify both the substance that was handled as well as the individual handling it. Substances that can be detected include explosives, paints, blood, and drugs. This research will focus on detecting drugs. There have been many forms of drug testing in the forensic science field over the years, including blood and urine testing. However, Touch Chemistry can allow forensic scientists to test for the presence of drugs from fingerprints. It has been found through various instrumentation that drugs can be extracted from undeveloped fingerprints. However, minimal research has been performed to analyze the effect of fingerprinting techniques on the detection of drugs from fingerprints and none of them utilized liquid-chromatography triple quadrupole mass spectrometry (LC-QQQ-MS) for analysis. This research will evaluate a variety of fingerprinting techniques to determine if the development will interfere with the detection of over the counter (OTC) drugs by LC-QQQ-MS. Popular fingerprinting techniques such as black powder, magnetic powder, ninhydrin, DFO, and cyanoacrylate fuming will be tested. OTC drug contaminated fingerprints will be deposited onto glass slides and paper. Various methods for collection, extraction, and detection will be utilized and analyzed by LC-QQQ-MS. The results will show the effects of the fingerprinting techniques on the detection of the drugs.

Oli Pierce

WI - University of Wisconsin-Milwaukee

Discipline: History

Authors:

#1 Rachel Buff

#2 Gwyn Parker

#3 Javi Perez

Abstract Name: The Gangster Buffs of Charleston: Jewish Safety in a Small Southern City

This project revolves around understanding and closely examining the history of Jewish refugee trauma and immigrant search for safety and kinship within the racial and capitalistic community in Appalachia. Our aim is to better understand how the Ashkenazi Jewish community came to the Appalachian region, specifically the small city of Charleston, West Virginia, USA, and how they adapted to life there. Our primary methods in doing so revolve around genealogical research pertaining to the family of Dr. Rachel Buff and exploring the history of West Virginia, which includes studying the Native tribes of the area and impactful events that would have affected the Buff family in this region, such as the Coal Miners Unions and the KKK.

Christian Piercy

TN - Lincoln Memorial University

Discipline: Biology

Authors:

#1 Stan Kunigelis

Abstract Name: Finding the Wnt Signaling Pathway in Labidocera Copepods

The Wingless-Related Integration Site (Wnt) Signaling Pathway is an evolutionarily conserved pathway crucial to numerous biological processes, including embryonic development, cell polarity, immune system regulation, stem cell production, gene expression control, and tissue homeostasis. The purpose of this research is to confirm the existence of this pathway in copepods, specifically Labidocera. Labidocera copepods are zooplanktonic crustaceans that are amongst the most numerous multicellular organisms on planet Earth, making them very desirable as potential model organisms for therapeutic drug research. However, based on current research context regarding this species of zooplankton, one major obstacle holding them back from usage in clinical research is that their recorded genome is mostly incomplete, including crucial proteins found within the Wnt signaling pathway. As such, we seek to identify two of these important proteins: β -Catenin and Frizzled (Fz). For our methodology, we will use an immunofluorescence staining protocol to demonstrate the presence of these proteins in Labidocera. To prepare for immunofluorescence, we embedded our samples in paraffin wax molds and serially sectioned each sample into 7-micron slices using a rotary microtome. Following this, we mounted each section to histological slides to be exposed to fluorescent-tagged secondary antibodies targeting β -Catenin and Fz. Finally, we will confirm the presence of these proteins utilizing a fluorescent light microscope. Based on the evolutionarily conserved nature of the Wnt Signaling Pathway, we expect to find these proteins and confirm that this pathway is conserved in Labidocera copepods. This outcome has the potential to significantly impact clinical research as the discovery of these proteins in an inexpensive, accessible species like Labidocera copepods will allow for increased rates of medicinal drug synthesis and experimentation for potentially treating severe conditions involved in this pathway such as colon cancer induced by mutated APC.

John Piergrossi

PA - Duquesne University

Discipline: Biology

Authors:

#1 John Piergrossi
#2 Meghan Wells
#3 Wook Kim

Abstract Name: Exploring the competitive role of a RsmE-regulated type-VI secretion system in a crowded population of *Pseudomonas fluorescens*

Bacteria secrete diverse compounds that collectively manifest a complex extracellular matrix, which helps individual cells to stick together and on surfaces to form a densely structured biofilm. In a colony model of *Pseudomonas fluorescens* Pf0-1, we have previously demonstrated that a post-transcriptional regulator, RsmE, modulates the production of an extracellular polysaccharide (EPS) and a biosurfactant that collectively function to create localized space of low cellular density within an overcrowded population. However, how this space prevents the encroachment of neighboring cells that do not produce these secretions remains a mystery. Global transcriptomics and proteomics profiling of the wildtype and its rsmE knockout isolate revealed numerous RsmE-specific secretions, including a bioinformatically predicted type VI secretion system (T6SS). T6SSs inject degradative effector proteins directly into neighboring cells to function as an effective weapon in competition for space and resources. We thus hypothesize that the T6SS plays a key role in preventing the encroachment of neighboring cells into the low-density space. Knocking out the T6SS indeed reduced the relative fitness of the mutant in direct competition with the wildtype and confocal microscopy confirmed death of wildtype cells within the low-density space. However, knocking out the T6SS in an isolate that lacks both the EPS and biosurfactant did not further reduce its relative fitness, which suggests that the T6SS plays a relatively minor role. To gain further understanding of the molecular interactions among the RsmE-specific secretions, we are currently knocking out the T6SS in an isolate that lacks the EPS and also in an isolate that lacks the biosurfactant to assess additive effects with individual secretions. Understanding both individual and additive functions of diverse extracellular secretions that are commonly produced across the bacterial taxa carries broad implications in industrial, environmental, and clinical settings.

Joel Pierson

UT - Utah State University

Discipline: Computer Science

Authors:

#1 Xiaojun Qi
#2 Brent Chamberlain
Logan Liddiard

Abstract Name: An AI-Driven Framework for Assessing Intersection Infrastructure and Accessibility

Collecting pedestrian intersection infrastructure data has typically been a tedious process, requiring manual in-person efforts, or more recently, crowdsourcing this data using street view images. This time-consuming and costly process has left many cities with incomplete or outdated datasets. To address this challenge, we developed a cost-effective and efficient system using a YOLOv8-based deep learning computer vision model trained on over 10,000 street view images. To ensure robust performance, we addressed class imbalance during preprocessing and included diverse images representing variations in infrastructure design from four U.S. cities: Logan, Utah; Salt Lake City, Utah; Fort Smith, Arkansas; and Manhattan, Kansas. The model automatically detects eight key intersection features with an overall accuracy of 88.75%: pedestrian signs (93.22%), crosswalks (95.98%), stop signs (97.45%), traffic light poles (92.24%), traffic signals (81.54%), traffic buttons (80.36%), curb ramps without tactile paving (82.24%), and curb ramps with tactile paving (86.83%). These eight key intersection features were implemented in the proposed system which aims to compute infrastructure and accessibility metrics for each intersection based on OpenStreetMap road hierarchy and federal standards. The scoring metrics were validated, achieving correlations of 80% and 91% with

human assessments for infrastructure and accessibility scores, respectively. Finally, we generated citywide visualizations using infrastructure and accessibility scores to provide city planners with intuitive, quantitative insights into intersection quality, highlight pedestrian-friendly areas, and identify locations needing improvement. The proposed AI-driven framework is easily scalable, with potential for refinement by incorporating additional training data from diverse rural and urban areas. It can also integrate with other urban planning tools, offering a fast, cost-efficient way for city planners to collect and assess pedestrian infrastructure and accessibility data and prioritize infrastructure and accessibility improvements.

Veronica Pimenova

PA - Carnegie Mellon University

Discipline: Computer Science

Authors:

#1 Veronica Pimenova

Abstract Name: Enhancing Learning Platforms for Individuals with ADHD

Individuals with Attention Deficit Hyperactivity Disorder (ADHD) often face unique challenges in digital learning environments, including difficulties with sustained focus, task organization, and managing cognitive load. This study seeks to address these challenges by developing a segmented learning intervention, which breaks down instructional tasks into smaller, more manageable steps and incorporates brief pauses after each segment to reduce cognitive load. We conducted a controlled experiment comparing the experiences and performance of ADHD and non-ADHD participants using both traditional instructional videos and segmented videos. Results indicate that segmented videos significantly reduced errors and hesitations for individuals with ADHD, enhancing their task performance and comprehension. These findings underscore the importance of tailoring educational tools to neurodivergent individuals and offer valuable insights for creating more inclusive digital learning platforms. This work holds implications for educators, researchers, and policymakers aiming to improve educational outcomes for neurodiverse populations.

Samantha Pine

PA - University of Pittsburgh School of Nursing

Discipline: Nursing and Public Health

Authors:

#1 Kelly Tan

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Kaitlyn Acker

Abstract Name: Differences in Health Related Quality of Life Domains among LGBTQ+ Cancer Caregivers by Relationship to Care Recipient

Background: Cancer caregivers experience health related quality of life issues (HrQOL). Limited information exists on caregiving HrQOL among LGBTQ+ caregivers, particularly differences by relationship to care recipient. Methods: The UPLIFT study is an ongoing cross-sectional survey of LGBTQ+ cancer caregivers' experiences across the United States. HrQOL domains were assessed using the PROMIS-Short Form 4-item version of depression, anxiety, fatigue, and sleep disturbance. Relationships to the care recipient were

categorized into caring for a spouse/partner/ex, sibling, parent/parent-in-law(pil), child, grandparent, friend, and other. Domain T-scores were calculated by converting raw summed scores for each domain using PROMIS Health Organization conversion tables (T-score greater than 50 indicating worse HrQOL). Differences in mean T-scores for each outcome across relationship types were assessed with ANOVA tests and post-hoc Tukey sensitivity tests. Results: To date, of the n=294 caregivers who have participated, 43.7% were lesbian/gay, 47.7% were bisexual and 13.9% were transgender/gender diverse. Most respondents were White (58%), Black (25%), or Asian (10%). Mean T-scores were as follows anxiety (59.57), depression (56.46), sleep disturbance (53.91), and fatigue (54.71). The ANOVA tests showed significant differences between groups by relationship to care recipient across all outcomes ($p < 0.005$). Tukey post-hoc sensitivity tests demonstrated that those caring for siblings had better HrQOL: less anxiety than those caring for parents/pils or others; less depression than individuals caring for parents/pils, child, grandparent, or others; less sleep disturbance than individuals caring for parents/pils or others. Conclusion: Among LGBTQ+ cancer caregivers, those caring for siblings may be at lower risk for poor HrQOL compared to those caring for other types of family members. Interventions aimed at improving HrQOL among LGBTQ+ cancer caregivers should consider relationship to care recipient.

Christopher Pitcher

PA - Duquesne University

Discipline: Engineering

Authors:

#1 Christopher Pitcher

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Aaron Stasko

Abstract Name: Innovative Exoskeletons: Enhancing Safety and Efficiency in Heavy Lifting Tasks

Heavy lifting injuries are a persistent issue in industries such as warehousing and transportation, often leading to overexertion and bodily strain. These injuries account for billions in annual costs and productivity losses, emphasizing the need for innovative prevention strategies. This project addresses the central question: How can we design a cost-effective and ergonomic exoskeleton to reduce lifting-related injuries while improving workplace efficiency? Existing lifting aids, including mechanical exoskeletons, often face limited adoption due to high costs and complex operation. By integrating principles of biomechanics and human motion dynamics, this research aims to develop a novel exoskeleton that enhances user support during heavy lifting. The proposed design includes a unique locking/releasing mechanism synchronized with the arm's angle, ensuring intuitive and seamless functionality. The methodology involves conceptual design through detailed sketches, theoretical modeling, and ergonomic analysis to optimize compatibility with human motion. Early-stage prototypes will be tested through simulation and user studies to evaluate the system's effectiveness in reducing physical strain and enhancing productivity. Expected results include a cost-efficient, user-friendly solution that minimizes injury risk and enables broader workforce inclusion by reducing the physical demands of heavy lifting tasks. This design has the potential to transform workplace safety by offering an accessible alternative to current market options. Findings will be discussed in the context of improving occupational health, addressing labor shortages, and fostering innovation in injury prevention technologies. By addressing both economic and operational challenges, this project aims to make a unique contribution to the fields of workplace ergonomics and injury prevention through a practical and inclusive solution.

Ella Pitman

CT - Eastern Connecticut State University

Discipline: Education

Authors:

Abstract Name: Study of Programming Behaviors by Preschoolers and Its Impact on Their Math Abilities

Tangible robots such as the Beebot have opened up programming for children as young as preschoolers. Recent studies have explored the value of programming for children's overall development and found positive results. However, few studies have identified the specific programming behaviors demonstrated by preschoolers or studied their impact on specific content development, such as Math. In this study, eleven preschoolers of mixed-age and gender, worked in groups of 2 or 3, on four sets of intentionally planned programming sessions with a Beebot. All sessions were recorded and later analyzed for evidence of select programming behaviors culled from previous studies. Children's Math's abilities were measured, before and after the programming sessions using the Tools for Early Assessment in Math. Findings revealed that preschoolers demonstrated several programming behaviors including planning and explaining the programming. Of these behaviors, modularity (breaking up a task to smaller components) and representation (symbolically representing planned programming commands with gestures) both significantly impacted the preschoolers' post-Math scores. Additionally, planning (deciding on a path) was positively correlated with behaviors associated with recognition of problem (as in identifying an error in their programming commands), subsequent solving of problem (or debugging), and explaining the sequence of codes. None of these findings were impacted by age or gender. These results offer deep insights into young children's development and care. First, programming is a viable and effective teaching strategy for enhancing Math in the early years. Second, modularity, often a skill purposefully practiced by adult programmers is evidently both possible and helpful for young children also. This, along with representation (acknowledged as an effective cognition tool), could both be encouraged and modeled for young children by teachers, to further support their growth. Children may also benefit from distinct planning time during class projects.

Sadie Pitre

MS - University of Southern Mississippi

Discipline: Chemistry

Authors:

#1 Sadie Pitre

#2 Julie Pigza

Abstract Name: Using WebMO to Introduce Computational Chemistry at the University of Southern Mississippi

Computational chemistry is a rapidly evolving specialty within the field of chemistry. Computational chemistry utilizes theoretical calculations to simulate properties of molecules and chemical reactions. Computation is vital to many different industries like medicine, engineering, and environmental. Despite its significance, there are currently no computational chemistry courses offered at the University of Southern Mississippi (USM). This study investigates the integration of computational chemistry into the undergraduate laboratory curriculum using WebMO. Computational laboratory exercises were developed for Organic Chemistry I and II laboratories. The first lab was designed to help students visualize molecular shape and structure and includes Newman projections, dipole moments, functional groups, and isomers. The second lab is to aid students in viewing key molecular orbitals as they play a significant role in reactions such as electrophilic aromatic substitutions. These exercises were administered to students in conjunction with their regular laboratory content as a hybrid lab, with the computational exercises added as bonus. Surveys were administered both pre- and post-lab. This presentation will detail the exercises, describe the impact on student

learning, and give suggestions for how to improve in the future. The ultimate goal of the research is to incorporate computational chemistry throughout the curriculum and within the research group.

Ayusha Pokharel

IN - DePauw University

Discipline: Biology

Authors:

#1 Ayusha Pokharel

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Philips Akinwole Akinwole

Abstract Name: Evaluating Hydroxyl Radical-Generating Device (Strl Air) Against Pathogens Linked to Healthcare-Associated Infections

Healthcare-associated infections (HAIs) are a major health concern as they are actively contributing to increased morbidity and mortality and affecting approximately 136 million people globally each year. Emerging studies on the use of hydroxyl radicals to treat bacterial and fungal infections have offered a potential new approach to antimicrobial treatment for HAIs. A previous study of the Hydroxyl Radical Generating Device (Strl Air) in a hospital setting in India showed that surfaces exposed to Strl Air showed lowered fungal and bacterial load; however, it was unclear whether the device effectively eliminated HAI-related pathogens. Therefore, this study aimed to address this uncertainty by analyzing and assessing the effectiveness of the portable Strl device in inactivating HAI pathogens: *Pseudomonas aeruginosa* and *Klebsiella pneumoniae*. In a 2 x 3 factorial design experiment, we examined the effectiveness of the device on proximity (1 foot, 2 feet, and 3 feet) and time (24 hours, 48 hours, and 72 hours) of microbial exposure. Two-way ANOVA ($p < 0.05$) showed that the percent of bacterial reduction on nutrient agar plates was significantly lower compared to the control as the time of exposure to the device increased. However, the relationship between percent bacterial reduction and proximity of the device remains uncertain. This uncertainty might be related to the less studied hydroxyl radical circulating pattern, which may be a confounding variable in our experiment. Additionally, we observed the effect of Strl Air on a fungal pathogen, *Aspergillus niger*, grown on Cornmeal peptone dextrose agar plates and found that the device exhibited a fungistatic effect on the pathogen. These findings suggest that Strl Air can be used as a preventive measure for HAI in clinical settings. However, more in-depth studies are required to maximize the effectiveness of the device, especially in combat settings.

Pranav Polapragada

MI - University of Michigan - Ann Arbor

Discipline: Health and Human Development

Authors:

#1 Kaushik Banarjee

#2 Maria Castro

Abstract Name: Role of IDH1-R132H in the epigenetic rewiring of Senescence and Immune modulation in glioma

Glioblastoma is an aggressive form of brain cancer that has a low 5-year survival rate of 5%. There are many

challenges when it comes to treating this: tumor heterogeneity, treatment resistance, an immunosuppressive tumor microenvironment, and the blood-brain barrier. In the glioma, the mutant isocitrate dehydrogenase-1 can produce the oncometabolite 2-hydroxyglutarate (2HG). 2-HG was found to epigenetically modulate the DNA repair mechanism, reduce the resistant property of the tumor, and modulate the immune microenvironment of the glioma. This is one of the main focuses of the Castro-Lowenstein lab: the impact of the IDH1-R132H through epigenetic modifications on the glioma tumor microenvironment. Since 2-hydroxyglutarate reduced the proliferation rate of the tumor, the lab inferred the possibility of senescence playing a role throughout this mechanism. Literature has found while senescence stops tumor cells from reproducing, these senescent tumor cells create a microenvironment that suppresses the immune system, leading to the proliferation of new tumor cells. Even with the use of chemotherapy and radiotherapy, the microenvironment allows for new gliomas to proliferate. This could be a cause of cancer remission. Based on this background, the lab is investigating how the IDH1-R132H mutation rewires senescence through epigenetic modulation and immune modulation as well as how these mutations modulate the response to radiation. We are investigating these topics through the use of in vitro and in vivo genetically engineered mouse models, human models, and patient-derived tumor biopsies. The research done in the Castro-Lowenstein lab can provide valuable insight as to the reasons why the recurrence of glioma in the brain is so high despite methods like surgery as well as ways to utilize the immune system to combat glioma.

Rachel Poley

PA - Commonwealth University - Bloomsburg

Discipline: Education

Authors:

#1 Carolyn Reid-Brown

Emily LaCoe

Abstract Name: From Awareness to Action: Tackling Racial Disparities in Educational Settings Across Pennsylvania

This research investigates the racial representational inequities prevalent in Pennsylvania's education system, encompassing both K-12 and higher education, and their detrimental effects on student outcomes and overall well-being. It emphasizes the significant role that classroom teachers and higher education institutions play in both perpetuating these disparities and fostering equitable environments. The study will analyze critical statistics, analyzing the demographic makeup of teachers in the field, as well as university students going into the field of education. Our research is rooted in an initial literature review that reveals the racial representational disparities in education as well as teacher attrition rates in Pennsylvania. We have also conducted a set of interviews to share insights from current teachers as well as students preparing to go into the field. By implementing Universal Design for Inclusion (UDI) within a Diversity, Equity, and Inclusion (DEI) framework, this research aims to create inclusive educational settings that celebrate diverse identities. Strategies will be outlined to address these inequities, including data-driven equity audits, proactive recruitment of diverse faculty, and culturally relevant professional development for educators. Additionally, the presentation will highlight the importance of an inclusive curriculum that reflects a variety of perspectives, thereby enabling all students to see themselves represented in their learning environments. Ultimately, this presentation seeks to contribute to the ongoing efforts aimed at establishing a more equitable educational landscape in Pennsylvania, with broader implications for educational policy and practice nationwide.

Rachel Poley

PA - Commonwealth University - Bloomsburg

Discipline: Education

Authors:

#1 Carolyn Reid-Brown

Emily LaCoe

Abstract Name: Unpacking Disparities, Building Community: Culturally Responsive Solutions for Equity in Special Education

This research investigates the persistent disparities in special education that disproportionately impact students of color, significantly affecting their educational experiences and outcomes. The study highlights how students of color are frequently overrepresented in subjective disability categories, such as intellectual disabilities or emotional disturbances, often leading to placement in lower-quality programs with reduced expectations. Using a literature review methodology, it explores the historical roots and systemic biases—such as implicit bias, testing inequities, and socioeconomic disparities—that contribute to these inequities despite legislative efforts like IDEA. Central to this research is the introduction of Culturally Responsive Teaching (CRT), an approach that recognizes and values students' diverse cultural backgrounds as assets rather than deficits. CRT empowers educators to create inclusive learning environments that validate students' identities, foster belonging, and encourage active engagement. The presentation provides attendees with an understanding of the historical context surrounding these disparities while offering practical strategies for incorporating CRT into special education settings. These strategies include integrating culturally relevant curricula, fostering positive teacher-student relationships, and addressing systemic biases through professional development. By leveraging CRT principles, educators can disrupt deficit-based perspectives and promote equity within classrooms. Ultimately, this research aims to equip educators and stakeholders with the tools needed to address the root causes of inequity in special education. It contributes to ongoing efforts toward creating culturally responsive communities where all students have equitable opportunities to thrive academically and socially. The findings also have broader implications for educational policy reform aimed at reducing racial disparities in special education nationwide.

Alandria Polk

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: Providing a Creative Environment for Students Pursuing the Arts

Over the years, school districts have had to make the hard choice of cutting art programs such as drama, music, and visual arts due to budget constraints and the focus on state and national academic priorities that focus on math and English achievement. Schools with access to private resources, such as independent and private institutions, have been able to withstand these budget cuts by raising private funds, and these cuts have mainly happened to low-performing and low-income schools. However, the arts offer many benefits to students, including enhancing student achievement, critical thinking, self-expression, confidence, and self-esteem. This project aims to create an environment where students can express themselves while learning about the professional world of the arts, preparing them to transition smoothly into the professional industry. Using precedent studies of art academies around the United States of America helps form the foundation of the fine arts academy. Also using literature reviews to understand the construction and things needed for schools, and art academies that will make it practical. This project was designed to accommodate 500–800 middle and high school students, offering six major areas: writing, dance, music, theater, visual arts, and business. The major design strategies are acoustic considerations, creativity-enhancing features, space planning considering wayfinding, and attention to safety, security, mental health, and ergonomic functions. The layout includes specialized spaces and classrooms for each major, alongside core classrooms for general

studies. Private and group study rooms, practice spaces, collaboration rooms, and staff and student break areas are also incorporated. The main theater is designed to replicate a professional stage, providing students with real-world experiences and lessons. In conclusion, implementing these design solutions in an arts academy will create a learning environment that helps students learn and pursue the arts, ultimately preparing them for success in their careers.

Azriel Pollock

PA - University of Pittsburgh

Discipline: Biology

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- #12 Lee Harrison

Abstract Name: Comparing Long-Read and Short-Read Whole Genome Sequencing for Genetic Clustering of Healthcare-Associated Bacterial Pathogens

Background: Whole genome sequencing (WGS) and the use of core-genome SNP (single nucleotide polymorphism) comparisons enable precise clustering of genetically-related pathogens for outbreak investigation in healthcare settings. Historically, SNP-calling has been limited to short-read WGS data due to concerns over base-calling accuracy in long-read WGS data. Recently, improved base-calling algorithms have raised the possibility of using long-read SNP comparisons in outbreak investigations. We conducted SNP-based analyses for multiple healthcare-associated bacterial transmission clusters from a single hospital using both short- and long-read WGS. Methods: Study isolates were collected from clinical cultures and sequenced on the Illumina (short-read) platform as part of the Enhanced Detection System for Healthcare-Associated Transmission (EDS-HAT). Included isolates were collected between November 2021 and November 2024 and contained transmission clusters with low SNP distances (≤ 15 SNPs) and known epidemiological linkages. All isolates were re-sequenced on the Oxford Nanopore (long-read) platform, and pairwise core-genome SNP comparisons were generated using Snippy(Illumina) and bcftools(Nanopore) between consensus sequences of clustered isolates with $\geq 75\%$ of the genome at coverage $\geq 10\times$. Agreement between Illumina and Nanopore SNP-based clustering was assessed. Results: Using Illumina and Nanopore, we sequenced 48 total bacterial isolates across nine species of hospital-associated pathogens; 21 isolates (7 clusters) passed QC for both sequencing methods. We calculated SNP distances between isolates of the same genetic lineage using each sequencing method, and assigned clusters using a stricter, epidemiologically-relevant threshold of ≤ 10 SNPs. Nanopore and Illumina agreed on cluster assignments for 25 out of 27 SNP comparisons made, demonstrating substantial agreement ($\kappa=0.81$, 95%CI:0.56–1.00). Nanopore SNP distances were slightly higher than Illumina distances for the same pairwise comparisons (median difference=1 SNP). Conclusions: Our results indicate that SNP-based comparisons using Nanopore long-read WGS only are consistent with those from Illumina short-read WGS and could potentially be used for bacterial hospital outbreak investigations.

Sydney Pollock

NC - North Carolina State University

Discipline: Environmental Science and Sustainability

Authors:

#1 Angela Allen
Jessie Schroder
Elizabeth Adams

Abstract Name: Monitoring Water Quality Throughout Stages of Sewer Infrastructure Construction Within the Walnut Creek Watershed in Southeast Raleigh, North Carolina

In the City of Raleigh, efforts to improve the sewer infrastructure, particularly the downtown area, and its impact on water quality in Little Rock Creek have been the initial focus of this study. The sewer pipe replacement project, which began in Fall 2021, brought about concerns regarding the water quality within the lower portion of the Walnut Creek Watershed. Others in the training program have studied the impact before and during the sewer project. Since the completion of phase one, the purpose of this monitoring study has been to determine the impact of the water quality after the project's completion. The objectives are to (1) collect and measure several parameters over time and (2) compare the findings before, during, and after the infrastructure improvement. Water quality parameters such as dissolved oxygen (DO), specific conductivity (SPC), pH, nutrients, and bacteria with weather patterns will be of importance to the Southeast Raleigh residents in the understanding and effectiveness of the sewer infrastructure improvement project. The expected result of this study is an improvement in water quality compared to data collected last year as a result of this sewer infrastructure project. The results of our study will be important for creating inferences regarding the current water quality of the greater Walnut Creek Watershed and the effectiveness of sewer infrastructure improvements in Southeast Raleigh for the residents living there. These results can be used to inform future work completed by the City of Raleigh concerning sewer infrastructure.

Josselin Ponce Gallardo

FL - Florida International University

Discipline: Engineering

Authors:

#1 Derin Çayır

Abstract Name: Investigating the Impact of Haptic Vibrations on Cursor Movements in Virtual Reality Systems.

As Virtual Reality (VR) continues to redefine immersive experiences, the precision of sensors is vital in accurately translating users' real movements into the virtual realm. From apps simulating high-speed races to those used for educational purposes, the accuracy of VR devices significantly impacts the realism of the user experience. This research aims to evaluate the performance of hand controllers during haptic vibrations by developing an application in Unity to analyze the IMU sensors of Meta Quest 2 Hand Controllers. By accessing the raw data of an accelerometer within Unity, we collect users' positions, rotations, button presses, and corresponding timestamps in the presence of haptic feedback. The primary objective of this research is to explore whether IMU sensors mistakenly interpret haptic vibrations as true user movements, potentially undermining the precision of motion capture. Preliminary findings demonstrate that the application effectively tracks and logs user interactions with high precision, yielding data essential for comprehending user movements. Future research will concentrate on rigorously analyzing the impact of haptic feedback on IMU sensor recordings under various conditions, aiming to enhance the quality of VR interactions.

Giselle Ponce-Bautista

PA - Moravian University

Discipline: Biology

Authors:

#1 Natasha Woods

#2 Julie Zinnert

Abstract Name: Characterization of the Microhabitat of Encroaching Shrub *Morella cerifera*

Shrub encroachment into grasslands is a worldwide phenomenon. When shrubs encroach, ecosystems can shift from being dominated by grasses to being dominated by shrubs. A shift in plant dominance can impact wildlife habitat, plant species richness, and ecosystem structure. This transition of plant dominance from grass to shrub has occurred rapidly on Hog Island Virginia, a Long-Term Ecological Research site. On Hog Island, plants experience warmer winter temperatures that contribute to the expansion of native shrub, *Morella cerifera* into grasslands. The presence of shrubs is not ubiquitous throughout the grassland. The purpose of this study was to compare differences in microhabitats that may contribute to shrub presence. Understanding these differences can allow researchers to anticipate which conditions favor shrub encroachment and allow scientists to model future expansion. The study established five plots in grass-dominant areas (grassland plots) and five in shrub-dominant areas (transition plots). Within these plots differences in woody plant cover, relative water content, and soil chlorides were examined. For plant cover in the grassland plots, the results show that woody species make up 1% of the plant cover, whereas in the transition plots, woody species make up 41%. The relative water content for each plot was $12.13 \pm 0.78\%$ (grassland) and $12 \pm 0.72\%$ (transition) $p=0.75$. These plots were not significant for relative water content. Differences in soil chloride were $93 \pm 22.81 \mu\text{g/g}$ and for the transition plots, it was $395 \pm 139.7 \mu\text{g/g}$, $p=0.70$. Even though there are stark differences between woody plant cover in the grassland and transition plots, it does not appear to be due to relative water content or soil chlorides. More research is needed to determine other potentially relevant factors.

Elizabeth Pond

CO - University of Colorado at Boulder

Discipline: Communications

Authors:

#1 Elizabeth Skewes

Abstract Name: Women in Journalism and Lack of Newsroom Leadership Response to Inequality

The experience of women in journalism is rife with hurdles not often given attention by newsroom leadership and by the journalism field. Struggles that come into play for women include: lack of leadership opportunities (Arguedas, et al., 2024, Urbániková, M., & Čaladi, T. 2024), underrepresentation for minority groups and people of intersectional identities (Bharat Dhiman, Dr., 2023, Wallace, L.R., 2019, Urbániková, M., & Čaladi, T. 2024), variance in beat assignments (Kassova, L. 2020), economic inequality (Bharat Dhiman, Dr., 2023), harm and harassment (Kelly, A. 2024, Khan, I. 2021), unreasonable aesthetic expectations for female broadcast journalists (Engstrom, E., & Ferri, A. J., 1998, Bernard, P., et al., 2020), lack of acceptance in sports journalism (Hardin, M., & Shain, S. 2006), and physical considerations such as menstruation and pregnancy (Ponzo, S., et al. 2022). Newsroom leadership and the infrastructure currently in place do not include methods for easing the strain and inequality female journalists experience, despite evidence suggesting that efforts towards equality from newsroom leaders could have

overwhelmingly positive outcomes (Kassova, 2020). Historical context illustrates that female journalists have experienced unique struggles and have been advocating for themselves for generations (Whyte, M. 2017). Despite this, stumbling blocks for female journalists remain across the field, from broadcast to print, and across all professional journalistic titles and positions. This project, informed by a 25+ page literature review, tells the stories of female journalists in podcast form. This podcast features several episodes and includes lived experiences of adversity, inequality, and forward/backward motion from journalists in the field, as well as interviews with journalism leaders in order to investigate paths forward to address these issues. This podcast seeks to explore whether the potential steps forward discussed in this review are attainable and feasible, either at this point in the journalism landscape or in the future.

Varsha Ponnala

TX - The University of Texas at San Antonio

Discipline: Biology

Authors:

- #1 Aranis Muniz Perez
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Abstract Name: Utilizing Human Brain Organoids to Understand How APOE4 Influences Inhibitory Neuron Susceptibility to SARS-CoV-2 Infection

Worldwide, over 750 million people have contracted SARS-CoV-2, the coronavirus responsible for the COVID-19 pandemic, with over 7 million of these infections resulting in death. Although primarily a respiratory virus, up to 30% of COVID-19 patients also report acute and chronic neurological symptoms following infection. Recent studies show that APOE4, the leading genetic risk factor for sporadic Alzheimer's Disease (AD), is associated with severe SARS-CoV-2 outcomes, such as patient hospitalizations and more severe SARS-CoV-2 neurotropism in human stem cell-derived cortical neurons and astrocytes. In AD, APOE4 also contributes to GABAergic interneuron dysfunction and circuit hyperexcitability, suggesting GABAergic neurons are more vulnerable to APOE4. While APOE4's impact on SARS-CoV-2 neurotropism has been explored in cortical neurons and astrocytes, it is unknown whether APOE4 makes GABAergic inhibitory neurons selectively vulnerable to SARS-CoV-2. To address this question, we generated human ganglionic eminence organoids (GEOs) enriched with GABAergic interneurons from induced pluripotent stem cells (iPSCs) derived from patients with either the neutral APOE3/3 or at-risk APOE4/4 genotype. Eight months in vitro, when organoids express mature inhibitory neurons and astrocytes, we infected GEOs with SARS-CoV-2 for 1 hour and harvested tissue 7 days post-infection for RT-qPCR and immunohistochemistry. Preliminary results suggest that there are no genotype-dependent differences in overall levels of SARS-CoV-2 infection. However, infected APOE4 GEOs show elevated expression of immature neuron marker doublecortin and a reduction in mature neurons. These findings suggest that APOE4 may influence COVID-19 susceptibility and severity by increasing GABAergic neuron vulnerability. Understanding the mechanisms by which APOE4 influences COVID-19 susceptibility will help identify potential long-term outcomes in at-risk populations and possible therapeutic targets.

Joey Poon

NY - Brooklyn College

Discipline: Art History

Authors:
#1 Joey Poom

Abstract Name: Parental Abuse in Asian American Families during the COVID 19 Pandemic

This study focuses on reported parental verbal and physical abuse among Asian American high school students during the COVID-19 pandemic. As in many immigrant groups, domestic violence is a taboo subject in Asian American households. Additional stressors during the pandemic, including anti-Asian rhetoric and violence, may have further aggravated parental abuse. In this project, data from the 2021 Adolescent Behavior and Experiences Survey (ABES) were analyzed, specifically self-reported verbal and physical abuse among Asian American students. Participants were asked, “During the COVID-19 pandemic, how often did a parent or other adult in your home swear at you, insult you, or put you down?” and “During the COVID-19 pandemic, how often did a parent or other adult in your home hit, beat, kick, or physically hurt you in any way?” Overall, female and male Asian American students reported similar rates of parental abuse. However, female students reported significantly higher rates of verbal abuse than male students. These findings support the literature about gendered cultural norms in Asian American communities and the disproportionate burden of emotional labor on women and girls. The finding that both male and female students reported similar rates of physical abuse may challenge some gender role expectations but may also indicate the greater acceptance of corporal punishment among these families.

Codrina Popescu

MN - University of St. Thomas, Minnesota

Discipline:

Authors:
#1 Rose Johnson
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Abstract Name: Multi-disciplinary Study of the Material Composition of Ceramics Fragments from the Soline Bay Roman Villa in Croatia

The multidisciplinary approach of material culture investigation using physical methods from the natural sciences is known as archaeological science or archaeometry. In the past two decades archaeometry studies of ancient pottery from archaeological digs from the Mediterranean and Adriatic Coasts have illustrated the ability of physical methods to enrich our knowledge about the composition of pottery dating back to the Roman and Hellenistic periods. At the University of St. Thomas, a group of faculty and undergraduate students from history, art history, geology, and chemistry have studied ancient artifacts from an archaeological site on the island of St. Clement, off the Dalmatian Coast of the Adriatic Sea. Our analysis ranges from examination of the texture of pottery fabrics to semi-quantitative analysis for major and minor elements with X-ray fluorescence (XRF) and internal morphology with scanning electron microscopy (SEM). While the diverse members of the group have different goals aligned with their disciplines, the goal of the research is to uncover insights into the provenance, production techniques, and trade networks of the Roman era on the island. Undergraduate students have travelled with faculty, dug and surveyed the site, collected data at the site and brought samples back to the University of St. Thomas. In several summer and academic year research projects we have studied the XRF spectra of pottery sherds from the site. Applying quantitative chemical and geological approaches, we are attempting to relate our results with those from the archaeological literature on other Dalmatian sites. In this presentation we will show the results from X-ray fluorescence collected by students in collaboration with chemistry and art history faculty and explore the potential of this project to advance learning and the future careers of young researchers.

Faith Porter

OK - Langston University

Discipline: Biology

Authors:

#1 R. Hal Scofield

Abstract Name: SLE-associated risk alleles, TASL and SLC15A4, show strong genetic synergism among lupus male subjects.

SLE is a systemic autoimmune disease that predominately affects women, with a female-to-male ratio of approximately 10:1. SLC15A4, TLR7, and TASL are known SLE risk genes that play a role in TLR7-signaling IFN production which is related to common pathogen-mediated immune responses. We predict the presence of these associated risk variants could adversely affect IFN and autoantibody production in male SLE subjects. Our goal, through genotyping, is to assess the presence of SNPs SLC15A4, TLR7, and CXorf21 in SLE-affected and unaffected male subjects, and measure genetic synergism. We genotyped the DNA samples of 95 male SLE subjects and 132 unaffected male subjects from the OMRF Lupus Family Registry and Repository. For each subject, We ran Taqman probes TLR7(RS3853839), SLC15A4(RS1059312) (RS1385374)(RS10847697), and CXorf21(RS887369) using the real-time polymerase chain reaction (PCR) TaqMan-based allelic discrimination assay. To assess genetic synergism between the associated SLE risk variants we will initially calculate the Synergy factor for each binary combination of the three genes in question – namely, SLC15a4xCXorf21, SCL15a4xTLR7, and CXorf21Xtlr7. We found that SLE-affected AA male subjects were at least 3 times more likely to have Cxorf21 and SLC15A4 risk alleles than healthy male controls (p-value: OR, CI). Additionally, genetic synergy calculations suggest positive gene-gene interaction in all groups of SLE subjects. These data suggest that the presence of RS887369 and RS1053912 risk variants among SLE-affect men may be important in predicting disease susceptibility.

Victor Portillo

FL - Miami Dade College

Discipline: Environmental Science and Sustainability

Authors:

#1 Jaeson Clayborn

Abstract Name: Inside Out: Breeding Critically Endangered Goodeids (*Ameca splendens*) in Vice City (Miami)

The butterfly splitfin (*Ameca splendens*), native to Mexico, is critically endangered due to water pollution, competition with nonnative species, and habitat loss. Conservation efforts by various groups, including aquarists and hobbyists, have focused on raising awareness, developing captive breeding programs, and preserving natural populations and habitats. Educational institutions, such as schools and colleges, play a crucial role in these efforts through integrated lesson plans and captive breeding projects. At Miami Dade College, during the Fall and Spring semesters, we conducted a study to compare the reproductive success of butterfly splitfins in different environments. Paired butterfly splitfins were raised in large indoor aquariums and outdoor tubs over several months to determine whether natural or controlled conditions, indoors or outdoors, would yield more offspring. Our results indicated that while more offspring were produced in

outdoor tubs, the difference was not statistically significant. This suggests that both indoor aquariums and outdoor tubs are viable breeding habitats for these fish. Future research will extend this project into the summer months, addressing the additional challenge of high temperatures in Miami.

Gabriel Portugal

KY - University of Kentucky

Discipline: Engineering

Authors:

#1 Kristi Bartlett

#2 Mitzi Vernon

Abstract Name: Research and Development of a Hands-Free Jar Opener for Consumers with Limited Arm Strength

Background: From baby food to pickles, food jars are a common find in American homes. Unfortunately, the task of opening a stiff jar lid can be very difficult for consumers with lower grip strength, parkinsons, or arthritis. While there are a variety of products on the market to help make this easier, there exist few jar openers that can be used by these consumers. Objective: This project aimed to research and develop (R&D) an improved hands-free jar opener that is accessible for consumers with the most advanced cases of limited arm strength. Methods: R&D followed a Design Thinking approach with the phases of Discovery, Synthesis, Exploring Solutions, and User Testing. The Discovery phase included a market analysis of current jar opening solutions and need-finding interviews with community members. The Synthesis phase involved synthesising the gathered data into actionable insights and tools to keep the product design user-centered. In Exploring Solutions, a variety of concepts were explored as potential jar opening solutions through physical and digital prototyping. User Testing took the form of interviews with potential users where they were presented with the proposed solution and asked questions to validate the design and gather feedback. Results: A review of current products on the market revealed that there are only two hands-free jar openers available. Interviews with stakeholders showed that participants or someone they knew would greatly benefit from an improved solution to open stiff lids. Concept exploration yielded a hands-free appliance as the most successful design. User testing validated the functional and aesthetic design of the proposed solution and revealed that the target user group would like to have this.

Swarangi Potdar

TX - Southern Methodist University

Discipline: Visual Arts

Authors:

Abstract Name: what remains: the cyclicity of the material and the immaterial

“What Remains” is a multimedia exhibition that explores the intricate interplay of identity, memory, and transformation, as shaped by the emotional and intellectual journey of a young women entering into her 20s. The central question driving this project is how experiences of love, loss, vulnerability, and resilience coalesce into the “becoming” of an individual. Through 10-15 mixed-media artworks, the exhibition invites viewers to reflect on their personal narratives while engaging with universal human themes. Drawing inspiration from Daniel Eakin’s hyperrealism, Magdalena Abakanowicz’s textural anatomies, and Shirin Neshat’s symbolism, “What Remains” fuses technical precision with emotive depth. Eakin’s detailed portraits

ground the work in raw emotional realism, while Abakanowicz's fragmented forms influence the layered representation of complex identities. Neshat's use of cultural symbolism informs the integration of materials like fabric, plaster, and glass, allowing the works to convey stories of growth, pain, and renewal. Methodologically, the project employs diverse techniques including charcoal portraits, ceramics, plaster, wire, fabric, and oil paintings that layer textures and narratives. Highlights include a diptych of intergenerational self-reflection, triptych diving into the emotional cycle of growth, vessels representing the cyclical nature of life and death, and glass sculptures symbolizing the fragility and resilience of the human psyche. Each piece is meticulously crafted to evoke a tactile and visual dialogue, bridging the gap between personal and shared experiences. Preliminary findings suggest the works successfully provoke visceral and intellectual engagement, though balancing cohesion across varied media remains a challenge. This exhibition serves as a capstone for me, synthesizing skills and insights gained through rigorous academic and professional experiences. "What Remains" not only solidifies a foundation for future artistic endeavors but also underscores the transformative power of art to connect diverse audiences through shared emotional landscapes. It is a celebration of identity's fluidity and the universal quest for self-discovery.

Anna Claire Potier

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Anna Claire Potier

#2 Alexis Cox-Holmes

#3 George Green

#4 Gillian Marlow

#5 Braden McFarland

Abstract Name: The Impact of Propionate on Glioma Cell Migration: A Potential Therapeutic Target

Glioblastomas are an aggressive type of brain tumor and are the most common primary malignant brain tumor in adults. Due to their invasiveness, glioblastomas are highly challenging to treat, driving research into potential strategies to improve patient survival. Studies have shown that manipulating the gut microbiome can alter the brain's signals; this relationship is called the gut-brain axis. The gut microbiome has a variety of functions, including nutrient metabolism, regulating immune responses, and helping control brain processes. Disruptions to the body's "normal" microbiome are likely related to a decrease in immune system responses, enhance tumor proliferation, and affect the outcome of immunotherapies. Within the gut microbiome, metabolites, like propionate, serve as an energy source for cells, reduce inflammation, and support metabolism. However, the effect of metabolites on cancer growth remains controversial, with some suggesting it inhibits tumor growth, while others suggest it may promote it. Elevated propionate levels have been found in HuM1 naive mice models, indicating a potential role in immune response and tumor suppression. This T-scratch experiment aimed to investigate the effect of propionate on glioma cell migration. Glioma cells were cultured in a multiwell plate and were exposed to either a serum-free or 10% FBS media with increasing propionate concentrations for 72 hours. Although the T-scratch analysis was not statistically significant, a trend was observed: propionate increased the area of invasion in serum-free media compared to the control. These preliminary results suggest elevated levels of propionate may influence glioma cell migration, but more data is needed to validate.

Sri Sruthi Potluru

NC - University of North Carolina at Chapel Hill

Discipline: Engineering

Authors:

#1 Sri Sruthi Potluru

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Abstract Name: Optimizing Alginate Biospheres For Microbe Viability During Drug Delivery

Inflammatory bowel disease (IBD) describes chronic health disorders characterized by inflammation and pain in the gastrointestinal tract. IBD prevalence is rising, proving necessity for engineered therapeutics that can reduce gut inflammation and improve quality of life. Our lab has genetically engineered a strain of *Saccharomyces boulardii* (*S. boulardii*) with the ability to secrete therapeutics and enhance probiotic effects in the gut. However, if left unprotected to travel through the gastrointestinal (GI) tract without encapsulation, there is degradation due to environmental factors such as pH variations. To address this issue, we propose a novel drug delivery method of loading *S. boulardii* and other therapeutic microbes into alginate biospheres to improve microbe viability and transport. Particles were produced by releasing droplets of 2 % w/v sodium alginate into a 0.05 M CaCl_2 crosslinking bath using the syringe infusion pump system and the electrospray technique. Particle diameters were identified and the data was statistically analyzed. The results show that as the needle gauge diameter or sodium alginate concentration decreased, the crosslinked particle diameter decreased. Other factors such as calcium chloride concentration didn't have an effect on particle diameter. The trends show that parameters such as particle composition and needle gauge diameter influence particle size and shape, and these parameters can be optimized to load engineered *S. boulardii* into the particles for maximum viability. Our research justifies that this is a promising drug delivery method to improve microbe retention and containment during transport through the GI tract.

Jada Potter

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Discipline: Sociology

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#1 Emily Talen

Abstract Name: Transit in Theory and in Practice: The Undervalued Influence of System Unreliability and Lived Experience on Transit Accessibility and Justice

Transit accessibility, the degree to which individuals can access opportunities (eg. jobs or grocery stores) by transit in a given timeframe, has been well studied in American cities in an effort to promote transportation equity. However, there is often a discrepancy between the findings of studies utilizing system-level data such as scheduled travel times (processes) and the actual experiences of transit users (outcomes). Studies of transit outcomes have shown various additional factors, including unreliability, safety, and comfort, to greatly impact the degree to which one can access opportunities via transit. I therefore propose a new method for evaluating transit accessibility that integrates process-based methods with user outcomes in order to more accurately identify transit gaps and inequities. The implementation of this new method is demonstrated by creating a model that calculates transit accessibility using schedule data from regional transit agencies in Chicago (using the General Transit Feed Specification (GTFS)), weighted by official spatial data on transit system performance, customer satisfaction, walkability, and other transit outcome metrics. By comparing the results of this model with another model that utilizes unweighted schedule data alone, I will identify locations in which traditional methods may under- or overestimate transit access and characterize them by their demographics to highlight any equity issues this could cause. My preliminary results concerning walkability suggest that traditional, process-based methods greatly overestimate transit access in areas with poor pedestrian infrastructure and land use, which in Chicago tend to be low-income, majority-Black areas. This innovative method will therefore not only provide a more accurate transit access measure, but can

additionally highlight issues of equity that might otherwise be overlooked under traditional approaches, thus allowing decision makers to plan transportation improvements in a manner that better meets the needs of underserved populations.

Madeline Potter

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Discipline: Engineering

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Abstract Name: Fluorescence Excitation-Scanning Hyperspectral Imaging with AI for Colorectal Cancer Detection in Mice

Colorectal cancer is the third most prevalent type of cancer, behind lung and breast cancer, and is one of the leading causes of death of all types of cancers. With most diagnoses occurring at a late stage, early detection is key in improving the prognosis of the patient. Artificial Intelligence (AI) has been used in many health-based applications, especially in those related towards cancer detection. In the case of colorectal cancer detection, AI can be used to show areas where cancer is present that may be overlooked, or not easily noticeable, which can occur during a colonoscopy. This project seeks to develop an AI model that can detect colorectal cancer in images of mouse tissues in an accurate and efficient way. A mouse colorectal cancer model was selected due to the ability to reproducibly induce primary tumors that can be imaged at selected time points, allowing assessment of different size (different grade) tumors. The AI model was developed from a previous model that detected colorectal cancer in images of human tissues through the use of transfer learning. This previous model was very accurate with the human data, but took a long period of time to process its dataset. Additionally, human tissues were only available for late-stage cancers, and the AI model was likely insensitive to more subtle changes that occur in early cancer development. Future progress will involve refining the transfer learning techniques to improve the accuracy with the new data, and finding ways to make it run fast and efficiently, so that it can eventually run on an edge device in real time, detecting colorectal cancer during a colonoscopy. This work was supported by NSF OIA2218046 and the Alabama EPSCoR Graduate Research Fellowship.

Anika Potu

CA - University of California - Merced

Discipline: Computer Science

Authors:

Abstract Name: Visualizing Agricultural Digital Twin Data

Digital twins, virtual representation of physical objects, offer significant benefits for visualizing agricultural output. By integrating real-time data from sensors and drones, digital twins enable farmers and agronomists to monitor and accurately predict crop growth, soil health, and environmental conditions. For this, we are designing a front end, in JavaScript, and a back end, in Rust programming, of a website to make all the data

from the Experimental Smart Farm (ESF) accessible. All the primitives displayed on the front end are various models that contain the data which is queried through the back end. As a result, agricultural workers can easily visualize the impact of different variables, such as weather patterns and irrigation schedules, on crop performance. This enhances their ability to implement precise agriculture practices, therefore improving sustainability. In essence, digital twins represent a transformative tool for agriculture, driving innovation and efficiency to achieve optimal agricultural output.

Sritanvi Potukanuma

VA - Virginia Commonwealth University

Discipline: Health and Human Development

Authors:

Abstract Name: The Emerging Role of Telemedicine in Managing Glaucoma

It is estimated that 50% of people with glaucoma worldwide remain undiagnosed. Glaucoma is an eye disease that involves the deterioration of the optic nerve, which can cause vision loss and even blindness that is irreversible. Since it is such a slow-progressing disease, many people do not realize they are experiencing symptoms of the disease until a significant amount of their vision is impacted. Due to the detrimental impact of this disease, it is essential for physicians to monitor the onset of glaucoma, especially if the patient is part of one of the groups that are predisposed to the disease, including elderly populations of 60 and over, people with a family history of glaucoma, young adults of African American descent, and people with diabetes. An up-and-coming method to efficiently monitor glaucoma is through telemedicine. Since the COVID-19 pandemic, telemedicine has been further developed and is now used more commonly in the medical field. In the field of ophthalmology, many tests have become available through virtual visits, such as visual acuity tests like basic psychologic, neurologic, external adnexal, pupil, motility, alignment, anterior segment, iris, and corneal light reflex exams. This work focuses on the recent developments and efficiency of telemedicine and why it is essential in monitoring and managing the detrimental disease of glaucoma. Research shows that telemedicine allows patients to successfully get treated for their conditions in a convenient manner before the disease progresses beyond recoverability. Despite the optimism that comes with this newly growing field of technology, further study will be done to resolve the many issues that come with telemedicine and explore the limited amount of treatments available for glaucoma.

Jessica Powell

AL - University of Alabama at Birmingham

Discipline: Psychology

Authors:

#1 Samantha Giordano-Mooga

Abstract Name: The Role of Racial Stress on College Student Academic Outcomes

College students face academic, personal and professional challenges that cause elevated levels of stress. Stress can be modulated by additional factors associated with a person's identity, including race, socioeconomic status (SES), sexual orientation, etc. Our study was conducted at a university in the Southeastern United States where race impacts societal inequities. While there have been many improvements in racial tension, marginalized groups still experience unconscious biases, racial microaggressions and systemic discrimination which impact academic success. This study's purpose is to determine the role of

stress on academic outcomes, and to determine if race and racial stress impacts academic success. Qualtrics was used to collect data for the following validated tools: Brief Cope: Abbreviated Coping Orientation to Problems Experience (BC), Generalized Anxiety Disorder – 7-item (GAD-7), Minority Student Stress Scale (MSSS), Perceived Stress Scale (PSS), and Patient Health Questionnaire – 9 (PHQ-9) for depression. High school demographics and SES were gathered from the National Center for Education Statistics (NCES). Participants self-reported their Grade Point Average (GPA) on a 4.0 scale. The data is currently being analyzed. It is hypothesized that stress will have negative outcomes on student academic success, with racial minority students experiencing higher levels of minority and perceived stress than their white peers. We anticipate different academic responses to anxiety, depression and coping skills based on race. Lastly, we hypothesize that SES may have an impact on all students' stress levels, psychological well-being, and overall academic success. These results will help us to better understand ways to improve student academic outcomes by modulating stressors.

Avery Powers

KY - University of Kentucky

Discipline: Psychology

Authors:

#1 Julie Cerel

Abstract Name: A Thematic Analysis of Psychiatric Pharmacists Navigating Suicide Grief

This study presents a thematic analysis of de-identified qualitative data gathered from the Living Through Loss survey conducted by the American Association of Psychiatric Pharmacists (AAPP). Participants included 15 practicing pharmacists asked to reflect on their experience with suicide loss in their career field. The survey explored the varied experiences and coping mechanisms of psychiatric pharmacists navigating the complexities of suicide loss in patients, students and co-workers. We identified common themes that emerged from participants' narratives, shedding light on their emotional journeys and the support systems they engage during difficult times. Utilizing a systematic approach to thematic analysis, the data revealed nuanced perspectives on personal experiences of these types of losses, highlighting the intersection of mental health and grief in these professionals following the suicides. Participants shared stories reflecting a range of emotions, including sorrow, hope, and resilience, offering a rich tapestry of lived experiences that contribute to a deeper understanding of the grieving process for these non-family losses. Most notably, the participants described guilt about their role in not preventing these suicides even though there was actually little they could have done. In addition, they expressed a desire to change stigma and increase outreach to fellow pharmacists after these losses. The findings inform clinical practices and support strategies for individuals experiencing work-related suicide exposure emphasizing the importance of empathetic engagement and tailored therapeutic interventions. By illuminating the voices of those who have navigated suicide loss in the course of their work, this research contributes to the ongoing discourse surrounding grief, providing valuable implications for mental health practitioners and care providers. Overall, this thematic analysis serves as a foundation for future research in understanding the psychological impact of work-related loss and the diverse healing pathways individuals may pursue.

Stephanie Pozuelos

IN - Indiana University Purdue University Indianapolis

Discipline: Health and Human Development

Authors:

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#3 Ann Marie Martin

Abstract Name: Exploring the Impact of Health Literacy and Language as Barriers to Accessing Autism Diagnostic Services in the Latine Community

Background: Latine children face greater disparities in autism diagnosis which may be attributed to differences in caregiver understanding of the healthcare system and access to interpretation and related services. Objectives: This project examines how health literacy influences access to autism diagnostic services and experiences with medical interpreters in Spanish-speaking Latine families. Results: Participants were 11 Spanish-speaking Latine mothers (M=31 years; M=6 years lived in US; M=44% completed 13+ years of school; M=73% monolingual Spanish) of children with autism (M=28 months; 82% male) who completed an autism diagnostic evaluation. Mothers completed a social validity interview and survey on experiences obtaining a diagnosis (86 items across 8 domains rated on a 4-point Likert scale: “strongly disagree” to “strongly agree”) and demographics. 73% of mothers did not know where to go for help prior to their child’s diagnosis (M=1.82). When asked about the best ways to improve the diagnostic process, 36% of caregivers noted that interpreters should be more available for families that need them. Although 91% of mothers found medical interpreters helpful (M=3.64), the process of getting an autism diagnosis caused stress within families (M=3.09) and caregivers found it difficult to understand how the medical system worked (M=2.60). Discussion: Spanish-speaking families, particularly those who recently immigrated to the United States, do not feel fully equipped to make well-informed health decisions for their children with autism. Although medical interpreters are a useful tool, they are not the solution to the health literacy barrier experienced in the Latine community.

Maanya Pradeep

FL - University of Central Florida

Discipline: Health and Human Development

Authors:

#1 Delaney Gunnell
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Abstract Name: Assessing Qualitative Perspectives for a Novel Hands-Free EMG Controller Training Platform

Amyotrophic lateral sclerosis (ALS) causes progressive deterioration in motor neurons, which can inhibit independent use of a joystick-based wheelchair. To improve patient autonomy, a wheelchair interface controlled by electromyographic signals from the temporalis muscle was developed. The wheelchair operates based on the magnitude of muscle contraction, with a “hard” flex indicating a forward movement, a “medium” flex corresponding to a right turn, and a “light” flex initiating a left turn. A clinical trial conducted at Mayo Clinic evaluated the efficacy of this interface among ALS patients. Although independent wheelchair control was established, the trial participants expressed the need for a training platform to facilitate learning muscular discretization. Limbless Journey, a serious video game, was developed as a training platform that simulates the controls required to operate the wheelchair. The game’s virtual environment minimizes stress and helps users practice flex discretizations while supporting learning of the temporalis muscle-controlled interface. To explore additional options for autonomous practice, interaction with the computer interface via

eye-tracking technology was examined. To evaluate and improve training, both quantitative and qualitative data were collected during a usability study. Quantitative data collection methods included the Game User Experience and Satisfaction Scale and the Systems Usability Scale. Both measures showed positive perceptions of the game. Qualitative data was collected using a think-aloud methodology, encouraging users to verbally express their thoughts during gameplay. These recordings were transcribed and coded into categories such as game environment, user interface interactions, and controller usability to assess user sentiment. Positive comments primarily referred to the game environment, while negative perceptions focused on flex controller usability challenges. The user feedback will be implemented into desktop and virtual reality versions of the game for expanded autonomy and access.

Heran Pradhan

PA - Duquesne University

Discipline: Engineering

Authors:

#1 Isen Furr

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#3 Bin Yang

Abstract Name: Developing Color Fundus Laser Speckle Contrast Imaging for Investigating Ocular Biomechanics and Hemodynamics

Glaucoma is a leading cause of progressive and irreversible vision loss. While the cause of glaucoma is not clear, it is believed that this condition is related to the interplay between intraocular pressure (IOP) and cerebrospinal fluid pressure (CSFP), which alters the biomechanical and hemodynamic environment within the optic nerve head at the back of the eye. Existing imaging modalities, such as optical coherence tomography angiography and super-resolution ultrasound, provide valuable insights into structural details or blood flow but lack the capability to comprehensively visualize and quantify both. To address this limitation, we developed a color fundus laser speckle contrast imaging (CF-LSCI) platform that enables comprehensive visualization of vascular structures and quantification of blood flow within the optic nerve head, offering new perspectives on vascular health and ocular conditions. The CF-LSCI platform consists of two primary subsystems: an illumination subsystem and an imaging subsystem. The illumination subsystem uses a low-power red laser diode to generate laser speckles for blood flow quantification, while the imaging subsystem incorporates a 20D ophthalmic lens to create retinal conjugate images, which are captured using a dual-sensor camera. To evaluate the platform's performance, an anatomically accurate eye phantom was developed using 3D printing and silicone tubing to simulate blood vessels. Whole milk, chosen for its light-scattering properties analogous to blood, was used as the flowing medium, with a syringe pump regulating flow rates to mimic physiological blood velocities. Benchmark testing demonstrated the platform's reliability in maintaining consistent flow rates and capturing high-resolution images of ONH vessels. The CF-LSCI platform successfully acquires detailed vessel images and flow quantification within a circular region approximately 10 mm in diameter. Future work will focus on integrating CF-LSCI with an ex vivo eye model to explore the effects of IOP and CSFP on ONH structural and hemodynamic behaviors.

Saatvik Pradhan

PA - Pennsylvania State University

Discipline: Computer Science

Authors:

#1 Jaideep Kukkadapu
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Abstract Name: A Smarter Compiler Framework Empowered by Large Language Models

Traditional compilers are good at translating and optimizing code but have serious limitations. They rely on predefined rules and static algorithms, which makes it hard for them to handle the complex requirements of modern software development. For example, during the optimization phase, compilers can accidentally introduce security issues called Compiler-Introduced Security Bugs (CISB), like memory corruption or race conditions. While machine learning (ML) techniques have been added to compilers to fix some of these problems, ML-based approaches also have their downsides, such as needing to be more focused on specific datasets and helping to adapt to different coding scenarios. This project suggests an approach using a large language model (LLM)-based compiler. LLM-based compilers go beyond traditional and ML-based compilers by being more flexible, adaptable, and better at understanding code context. They can be fine-tuned for specific tasks like spotting security vulnerabilities, such as CISB, or optimizing performance. For instance, an LLM trained on security datasets can find subtle issues like buffer overflows or suggest optimization strategies suited to specific systems. Our project uses the CodeT5-small LLM as part of an LLM-compiler toolchain. We chose CodeT5-small because it is specifically designed for code-related tasks, unlike general-purpose language models like GPT-4, which focus more on natural language. CodeT5-small is pre-trained on code, which helps it understand complex code structures, such as syntax and logical flow. When compiling C code, the LLM reviews the Intermediate Representation (IR) after the optimization phase and identifies any potential issues. We trained the LLM using a dataset of Compiler-Introduced Security Bugs (CISB) to enable it to detect these security vulnerabilities automatically. LLM-based compilers improve on traditional and ML-based systems by combining flexibility, adaptability, and task-specific training. They make software development safer and more efficient.

Shriya Prakash

PA - Conestoga High School

Discipline: Nursing and Public Health

Authors:

#1 Sudeep Sharma
Meher Garg
Medha Venigalla

Abstract Name: The Role of Emotional Intelligence in Managing Anxiety, Burnout, and Stress in Health Care: A Meta-Analysis

Objective: This study meta-analytically examines the effect of emotional intelligence on reducing anxiety, burnout, and stress among healthcare professionals. **Background:** Emotional intelligence (EI) is the ability to recognize, understand, and manage one's own and others' emotions. EI has garnered increasing attention as a potential protective factor against mental health challenges. Given the prevalence of burnout, stress, and anxiety in healthcare, understanding EI's role is critical. This meta-analysis evaluates the association between EI and burnout, stress, and anxiety among healthcare workers and students. **Methods:** We conducted a meta-analysis of studies from 2001 and 2024 on PubMed examining the relationship between EI and burnout, stress, or anxiety in healthcare workers and trainees. Studies published in English with quantitative analyses focusing on healthcare professionals or students were included. Analyses assessed whether theoretical and methodological moderators influenced effect size heterogeneity. Effect sizes and moderator analyses were conducted using Comprehensive Meta-Analysis (Version 3) software, based on the Hedges and Olkin (1985) approach. Based on reports of means and standard deviations, zero-order correlations, raw proportions, t-tests, and F ratios were conducted. **Results:** We examined the effect sizes between EI and anxiety, burnout, and stress. Results showed significant negative effect sizes for EI, indicating higher EI is associated with lower

anxiety ($r = -.23$, $k = 6$), burnout ($r = -.39$, $k = 24$), and stress ($r = -.29$, $k = 22$). The 95% confidence intervals excluded zero for anxiety ($-.31$, $-.14$) and burnout ($-.66$, $-.02$), but not for stress ($-.59$, $.09$). High heterogeneity in all three effects indicates significant variance across findings, warranting further investigation into theoretical and/or methodological moderators. Discussion: These findings indicate that higher EI correlates with lower burnout, stress, and anxiety among healthcare professionals, highlighting the importance of developing tools to enhance EI in medical training and healthcare workers to mitigate mental health challenges in this sector.

Rohan Prasad

CA - Adrian Wilcox High School

Discipline: Computer Science

Authors:

Arnav Biruduraju

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Abstract Name: Advancing Meta-Analysis in Medical Research Through Open-Source MATLAB Models

The rapid advancements in computer technology have significantly accelerated the generation of medical data, particularly in drug testing. Early-stage drug testing often involves multiple research groups with varying opinions and outcomes, leading to potential confusion for readers. Meta-analysis has emerged as a powerful method for synthesizing such conflicting data. However, existing commercial meta-analysis tools are often prohibitively expensive and lack transparency due to restricted access to their underlying code, limiting their adaptability. To address this gap, this study introduces open-source meta-analysis models developed in MATLAB. Data were sourced from the Harvard Library's extensive collection of medical databases. Three MATLAB models were designed to perform meta-analysis using fixed-effect and random-effects approaches. The fixed-effect model supports both continuous and binary data, employing corrected standardized mean difference (Hedge's g) and odds ratios to measure effect sizes, respectively. The random-effects model incorporates variability across studies, accommodating differing true effects. The models estimate effect sizes with high accuracy and evaluate their robustness across the analyzed datasets. Statistical significance of summary effects was assessed using Z-values, enabling testing of null hypotheses and generating deeper insights from the data. These models were validated using diverse datasets from established meta-analysis databases in the medical domain, including studies on heart failure, diabetes, and obesity. Meta-analysis results were cross-verified with findings reported in the literature. For example, six obesity-related studies yielded a computed standardized mean difference of ~ 0.4145 with a 95% confidence interval ranging from 0.2-0.54, a Z-value of 6.47, and statistically significant P-values for both one-tailed and two-tailed tests (< 0.0001). These results align closely with published findings by Borenstein et al. Results indicate that the MATLAB models are accurate, robust, and scalable for synthesizing diverse medical datasets. This presentation will detail the model designs, validation results, and their broader implications for advancing medical data analysis.

Harvest Prater

TX - Lamar University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Elizabeth Long

Abstract Name: Care Intervention in Aphasia Among Nursing & Speech and Hearing Undergraduates

This study examined interdisciplinary roles between speech and hearing- and nursing students toward care interventions for aphasia. Previous researchers discovered a significant contrast in competence between nursing and speech-language pathologists when working with patients with aphasia. The objective is to assess a potential need for workplace or educational training for aphasia. Participants were interviewed about their knowledge and experiences with aphasia using a qualitative, structured interpretative phenomenological approach that identified and evaluated shared trends and perspectives on interdisciplinary pre-professional roles among the interviewees. Interviews suggested speech and hearing students (n = 3) possessed limited knowledge of aphasia. Despite the lack of knowledge, the students recognized a nurse's capabilities when aiding aphasia patients. Similarly, nursing students (n = 3) understood speech pathologists' role in care intervention but were more aware of aphasia. When asked about nursing intervention tactics for aphasia, nursing students understood the responsibilities within their field. Their knowledge came from exposure to aphasia in classroom and practicum settings. Overall, participants from both disciplines had various levels of expertise about aphasia, and only nursing students could define care interventions and relate the concept to aphasia. However, both groups recognized the other occupations' role in aphasia. Future directions for this research will be expanding the sample size and academic level of participants and working with those interested in aphasia focusing on care interventions rather than general knowledge of aphasia. Keywords: aphasia, care intervention, nursing intervention, nursing undergraduates, speech and hearing science undergraduates, interdisciplinary roles

Harvest Prater

TX - Lamar University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Asexuals of Color: Experiences of an Invisible Identity

Asexualism, or the lack of sexual activity attraction or low sexual interest, is a relatively new and growing orientation within the LGBTQIA+ community. The identity's meaning and related history have continued to be studied by anthropologists, scientists, and activists as the community continues to find acceptance and understanding. As asexuality became more mainstream in Queer and youth culture, the orientation has continued to expand its representation. However, due to the lack of accurate and open-minded knowledge, the orientation has become white-centric and discouraged by minority groups due to cultural contrasts and racial stereotypes. This study delved into the shared experiences and stories of ten participants who identified as an Asexual of color. This project utilized Interpretative phenomenological analysis- a qualitative methodology that identifies trends in data to create assumptions about a population or demographic. The study conducted private-personal interviews consisting of eight open-ended questions and found five central trends across the participants' testimonies: (1) Becoming and identifying as Asexual, (2) Disclosure of identity, (3) Sexualization and Fetishization of BIPOC Asexuals, (4) BIPOC Asexuals within Queer and Asexual community (5) Self-acceptance. This research aims to bring attention to asexuality and the lived experiences and journeys of Asexuals of color. Keywords: asexuality, people of color, racial minorities, aromanticism, Queer community

Nicolas Prather

TX - The University of Texas at San Antonio

Discipline: Biology

Authors:

#1 Jadelynn Aki

#2 Sean Jeffreys

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Abstract Name: Evaluation of an *Acinetobacter baumannii* Multi-epitope Vaccine, AMEV5

Multi-drug resistant (MDR) *Acinetobacter baumannii* (Ab) is an opportunistic pathogen associated with hospital-acquired infections. Patients with the highest risk of acquiring Ab infections include immunocompromised individuals and those hospitalized for an extended duration. The most frequent clinical manifestations of Ab infection are ventilator-associated pneumonia and catheter-related bloodstream/urinary infection. The extensive MDR and increasing prevalence of Ab underscores the urgent need to investigate and develop alternative strategies such as vaccines as immunotherapeutics to combat Ab infections. Our lab previously developed a multi-epitope vaccine, AMEV2, and demonstrated its ability to provide partial protection to mice against a lethal challenge with a virulent strain of Ab. To improve the efficacy of the AMEV2 vaccine, we incorporated two additional antigenic peptides into the construct design named AMEV5. This study was conducted to evaluate the protective efficacy of AMEV5 against *Acinetobacter* septicemia. The AMEV5 vaccine was constructed using an Ab thioredoxin A (TrxA) leading protein sequence followed by 7 peptide antigens ranging from 37 to 67 amino acids which we identified using immunoinformatic analysis. The His(6x)-tagged recombinant AMEV5 (rAMEV5) was expressed in an *E. coli* system, purified to high homogeneity using metal affinity chromatography, and its sequence was confirmed by LC-MS/MS. BALB/c mice (n=10 per group) were subcutaneously immunized with rAMEV2 (10 µg) or rAMEV5 (10 µg) emulsified in the AddaS03 adjuvant and then boosted twice at two-week intervals. Mice that received AddaS03 alone served as mock control. Immunization with AMEVs result in high antibody titers to the antigen and the constitutional peptide components. AMEV2 and AMEV5 immunized mice were protected from a lethal intraperitoneal challenge with a hypervirulent strain of Ab, 4 weeks post-final vaccination, and achieved survival rates of 70% and 90%, respectively. This study underscores the utility of immunoinformatics in developing expedient and efficacious immunotherapeutic alternatives to combat MDR infections.

KayDee Pratt

KY - University of Kentucky

Discipline: Health and Human Development

Authors:

#1 Mitzi Vernon

Abstract Name: Protecting the Girls: Innovating Breast Protection Gear for Athletes through Technology and Customization

Designing sports equipment that ensures proper fit is crucial for safety and performance, creating a biomechanical system between the athlete's movements and how the gear responds. As the market shifts towards customized gear, technologies like 3D scanning, 3D printing, and extended reality, enable the creation of personalize gear unique to an athlete's body. An estimated 7 million female athletes in the U.S., and 50% will sustain a contact breast injury (CBI) during their careers. However, only 10% of these athletes report their injuries to coaches or medical staff. Most breast injuries go unassessed or untreated, despite the potential for symptoms that can last for weeks. Unaddressed CBIs can lead to chronic, and perhaps lifetime, conditions such as breast fat necrosis, fibrous lumps, deformities, asymmetries, and damage to the milk ducts. The shift to customized equipment and emerging material innovations has transformed the industry, such as mouthguards and swimwear, making tailored gear essential for enhancing performance and reducing

injuries. This research aims to leverage customization to protect against contact breast injuries in women participating in contact sports. This research hypothesizes that customized breast protection, tailored to an athlete's unique body shape, will reduce the risk of contact breast injuries while enhancing safety and performance. To assess female athletes' awareness of breast injuries, the availability of breast protection gear, and the role of breast protection in medical assessments, I am conducting a participatory survey. Data collection is ongoing through Google Forms, with 11 multiple-choice questions, 1 multiple-response question, and 1 open-ended question. Early insights from the responses are already informing the design and feature decisions for the customized breast protection prototypes. I anticipate that this protection will lower the rate of contact breast injuries in female athletes participating in high-impact sports.

Bryan Preer II

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:

#1 Stephen J. Thomas

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Soorya Ramesh

Abstract Name: Differences in Dipping Status: Relationships Among Dipping Status, Demographic Differences, and Subjective Sleep Quality

BackgroundNocturnal blood pressure (BP) dipping, a phenomenon where BP decreases by 10% during sleep, is a critical marker of cardiovascular (CV) health. Non-dippers have worse CV outcomes overall. Perception of sleep duration (over or under recommended amounts) and quality are also linked to worse CV outcomes. This study investigated how demographic factors and perceived sleep parameters are associated with dipping status.**Methods**We analyzed data from 30 adult participants in Alabama who completed 24 hours of ambulatory blood pressure monitoring and a consensus sleep diary as a part of the Sleep and Circadian Contributions to Nighttime Blood Pressure (SCN-BP) study. Chi-square tests were used to determine differences in dipping status based on race, sex, perceived sleep duration, and perceived sleep efficiency (SE) categories. Sleep duration was analyzed in groups of short (<7 hours), recommended (7-9 hours), and long (>9 hours) duration. SE was divided into two groups: recommended ($\geq 85\%$) and poor SE ($< 85\%$).**Results**The sample was 60% male and 40.0% White, 36.7% Black, 16.6% Middle Eastern/North African (MENA), and 6.7% Asian. Among this sample, 26.7% of participants had short sleep duration, 50.0% had recommended sleep duration, and 23.3% had long sleep duration. Ninety percent of the sample had recommended SE. Chi-square tests showed no differences in dipping status among sex, sleep duration, or SE groups. However, disparities in dipping status among different racial categories were found $\chi^2(3, N=30) = 8.97, p = 0.03$.**Conclusion**There are disparities in dipping status among racial categories, with Black individuals most likely to experience non-dipping, Asian and White individuals most likely to experience dipping, and MENA individuals falling in between. There were no differences in perceived sleep duration or quality on dipping status. Future research should focus on mechanisms and solutions to nocturnal BP regulation across diverse populations.

Sanduki Premaratne

TX - San Jacinto College

Discipline: Health and Human Development

Authors:

Abstract Name: Exploring the Intersection of Tradition and Modern Science: The Medicinal Potential of Sri Lankan Herbal Medicine

This research explores the intersection of traditional Sri Lankan herbal medicine and modern scientific validation. The central research question addresses how traditional remedies, passed down through generations, align with contemporary scientific understanding of their medicinal benefits. While Sri Lankan herbal medicine is widely practiced by Vedamahaththayas (traditional healers), its role in modern healthcare remains underexplored. By analyzing both the cultural significance and scientifically-backed benefits of widely-used herbs like Gotu Kola, Cinnamon, Polpala, and Tulsi, this study aims to bridge the gap between folklore and pharmacology. The research contextualizes traditional practices within the broader scope of global herbal medicine, emphasizing the unique contribution of Sri Lankan herbs to modern health practices. The methodology involves interviews with Vedamahaththayas, supplemented by a review of scholarly literature and clinical studies on the pharmacological properties of the selected herbs. Data analysis cross-references traditional healing practices with findings from peer-reviewed studies, particularly focusing on the chemical compounds and therapeutic applications of the plants. Preliminary findings indicate that many of the herbs traditionally used to treat conditions such as urinary diseases, skin issues, and inflammation are supported by scientific studies that confirm their bioactive properties. For instance, Gotu Kola is shown to improve cognitive function, while Polpala demonstrates potential diuretic effects. These results suggest a promising integration of traditional medicine into modern healthcare systems, enhancing the therapeutic potential of herbal remedies. This study contributes to the growing body of research on ethnomedicine by demonstrating the value of integrating traditional knowledge with modern scientific methods. It encourages future studies to further validate the efficacy of these remedies and promote their incorporation into global health practices.

Benjamin Price

PA - California University of Pennsylvania

Discipline: Chemistry

Authors:

#1 Benjamin Price

#2 Kimberly Woznack

Abstract Name: Deposition of Mesoporous HKUST MOF via Surfactants in Solvothermal Deposition and its Absorption of Crystal Violet in Aqueous Solutions.

MOFs (Metal Organic Frameworks) are novel materials that have garnered significant interest in the last 30 years due to their remarkable absorptivity and high surface area. MOFs consist of metal ions and organic linkers to form larger crystal structures with micropores within the lattice. To artificially increase the surface area of these structures and create larger pores (mesoporosity), surfactants can be used in solvothermal synthesis of MOFs. This project explores the solvothermal deposition of HKUST, one of the most studied MOFs to date, the use of a surfactant to make these MOF films mesoporous, and its application to increase the absorption of crystal violet in aqueous solutions. This presents possibilities for increasing the absorbance of MOF films for wastewater treatment. Both regular and mesoporous HKUST will be synthesized as a powder and deposited on to a variety of substrates. These powders and films will then be tested using FT-IR, X-Ray Diffraction, and scanning electron microscope analysis to confirm characterization and determine morphology.

Matthew Price

Discipline: Biology

Authors:

#1 Susan Villarreal

#2 Christine Weingart

Abstract Name: Title: Impacts of Blood Feeding and Rearing Conditions on the Mosquito Microbiome: Insights from *Culex pipiens*

Mosquitoes are vectors for numerous pathogens, including malaria, yellow fever, West Nile virus, and Zika, posing a critical global public health challenge. In attempting to control the spread of the above diseases, recent research has identified the mosquito microbiome as a promising target for vector control strategies. Despite blood-feeding being essential for egg production in female mosquitoes, how blood-feeding affects bacterial load and species composition within the mosquito microbiome remains poorly understood. Our study aims to characterize prokaryotic microbiome changes in female *Culex pipiens* mosquitoes following blood feeding under typical laboratory-rearing conditions. To accomplish this, midgut samples from blood-fed females, non-blood-fed females, and male *Culex pipiens* mosquitoes were homogenized and cultured on broad-spectrum and selective agar media. Individual bacterial colonies were subcultured, and bacterial DNA was amplified using universal primers via PCR. The resulting amplicons were visualized by gel electrophoresis and sequenced to identify bacterial isolates at the genus level. These procedures were repeated three times using three independent blood-feeding events. Preliminary findings revealed a marked increase in bacterial diversity and density in blood-fed females compared to both non-blood-fed females and males. What drives these differences in bacterial communities is currently being analyzed. This study contributes to the expanding body of research exploring how the mosquito microbiome varies with sex, reproductive status, and laboratory-rearing conditions, within the broader aim of identifying universal patterns within the microbial community of *Culex pipiens*.

Matthew Price

PA - Duquesne University

Discipline: Biology

Authors:

#1 Sarah Woodley

Abstract Name: Secretion Patterns of Salamander Biofluorescent Skin Glands

Biofluorescence is characterized by the absorption and re-emission of light in living organisms. Biofluorescence is widespread in amphibians, but the function is unknown. I study *Desmognathine* salamanders, which have a highly glandular skin rich in biofluorescent skin glands. To gain insight to the function of the biofluorescent skin glands, it is important to understand the stimuli that cause the glands to empty. I hypothesized that the skin glands empty in response to contraction of myoepithelial cells surrounding the glands. I predict that the number and size of biofluorescent skin glands will decrease after application of a weak transcutaneous electrical stimulation. To test this, I imaged biofluorescent glands using a fluorescence microscope before and after transcutaneous electrical stimulation. Changes in the biofluorescent glands were analyzed using an image processing software. I also used standard histological stains to determine if biofluorescent skin glands correspond to mucous or granular glands. I found that transcutaneous electrical stimulation did not cause biofluorescent skin glands to empty. I am currently analyzing skin samples using histological stains. These results will increase understanding of a potential signaling or antimicrobial function of animal biofluorescence.

Liberty Prieb

PA - Carnegie Mellon University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Queer Experience in the Manga of Oshimi Shuzo

The purpose of my research is to analyze themes of adolescent sexuality in the work of Japanese manga artist Oshimi Shuzo, specifically his two series *Inside Mari* (2012-2016) and *Welcome Back, Alice* (2020-2023). In both of these series, Oshimi presents normative gender and sexuality as a stifling, constraining force from which his characters try desperately to escape. In *Inside Mari*, I argue that this force is represented by the gaze, borrowing Laura Mulvey's term from film studies. In *Welcome Back, Alice*, I apply Judith Butler's theory of gender performativity to understand how cissexism and strict gender roles influence the characters and their resistance strategies. I also argue that these two works show a development of Oshimi's thinking about gender, with *Welcome Back, Alice* depicting gender as more fluid, eroticized, and central to ones' identity than *Inside Mari*. In my analysis of these works, I pay special attention to Oshimi's use of imagery and comic tropes. Imagery plays a large role in both the cinematic gaze and gender performance, making graphic novels an especially apt medium to explore these themes. Oshimi also critically engages with and subverts common tropes in manga, especially manga aimed at teenage audiences, such as high school drama, romantic comedy, erotic fan service, and cross dressing. While there has been a lot of research into queer manga in general, there has been no academic English-language study of Oshimi's work, despite his popularity and critical success. I hope to help bring Oshimi's work to the attention of other scholars of manga and queer literature, as I believe his entire body of work is unique, complex, and fruitful for further study.

Marisa Prisco

OH - University of Findlay

Discipline: Biology

Authors:

#1 Marisa Prisco

#2 Paige Grum

#3 Abby Kalkstein

#4 Justin Rheubert

Paige Grum

Abstract Name: Qualitative Analysis of the Viral Genome Harbored by *Dermacentor variabilis* in Hancock County, Ohio

The increasing prevalence of emerging tick-borne diseases presents a significant public health concern, driven by the northern shift in tick species distribution facilitated by climate change. Ticks have been known to harbor various pathogens, ranging from bacterial infections like Lyme disease to viral illness such as tick-borne encephalitis. Accurate estimations of tick species populations are critical for effective disease prevention and biosecurity. To address this, 374 ticks were collected from April 2024 to July 2024, in order to analyze the species present in Hancock County, Ohio and examine their seasonal prevalence. Collection numbers increased throughout the period, peaking in mid-June, consistent with previous research on seasonal fluctuations. Historically, ticks of the species *Ixodes scapularis* (Deer tick) and *Dermacentor variabilis*

(American Dog tick) have been common in this region. However, all ticks collected in this study belonged to the species *D.variabilis*. This unexpected overabundance of a single species, compared to historical data, raises important questions about its implications for disease transmission dynamics in this region. Pathogens are often shared between tick species, but the absence of a species in a region could alter transmission pathways. Given the dominance of *D.variabilis* in this region, understanding its role as a potential vector of disease requires further molecular investigation. The viral genome harboured by these ticks is of particular interest, not only as a public health concern, but also due to the symbiotic relationships that may be at play. Identifying the viruses these ticks harbour will provide crucial insights into the dynamics of virus transmission and the potential public health impact in this area.

Raleigh Pritchard

GA - University of West Georgia

Discipline: Anthropology and Archaeology

Authors:

#1 Raleigh Pritchard

Abstract Name: Digging Deeper into Public Archaeology: Redefining Best Practices to Educational Programming in Archaeological Practice

Public Archaeology is an important approach in the discipline that helps archaeologists engage with the public in a number of ways with the goal of getting the public invested in archaeology and with stewardship of the past. Education is an significant component to this approach, serving as one of the primary means of bringing archaeology to the public, and it can take many forms, ranging from K-12 classroom visits to working with local libraries to participating in large community events. The Antonio J. Waring, Jr. Center for Public Archaeology is explicitly concerned with educational programming to help achieve its goals of community engaged work. While the Waring Center has certain methods in place to educate and engage with the public, it is always important to periodically assess the effectiveness of these methods. Recently, a SWOT (Strength, Weakness, Opportunity, and Threat) analysis was conducted to analyze the different methods and strategies of the Waring Center. As with all SWOT analyses, weaknesses and threats were identified for each method. This poster focuses on proposing solutions to those weaknesses and threats. Drawing on some of the recent literature on the effective use of SWOT analyses, these solutions will make use of alternative options that can be developed by crossing the SWOT matrix to create areas of innovation. All solutions proposed are based solidly within well-defined pedagogical frameworks, especially those found within embodied learning and experiential learning, and public archaeology literature. The primary goal of this research is to determine new guidelines for best practices in Public Archaeology work, which can help inform not only the methods used at the Waring Center but also those used by other Public Archaeology programs across the globe.

Stephanie Procopio

LA - Louisiana State University, Baton Rouge

Discipline: Environmental Science and Sustainability

Authors:

#1 Kanchan Maiti

#2 Songjie He

Abstract Name: Weather Event Impacts on Soil Characteristics of a Salt Marsh in the Barataria Basin, Louisiana

Hurricanes and other storms can greatly affect salt marsh soil characteristics. Thus, marsh soil characteristics can be used to determine when different weather events occurred. Elements in the soil are proxies for marine vs terrestrial factors. Marine indicators are more typical of storm surges than terrestrial indicators are. A salt marsh near the Coastwide Reference Monitoring System (CRMS) 0224 station in the Barataria Basin was chosen as our study site. Three cores were taken at 1 m (core ID: M1), 5 m (M5), and 30 m (M30) from the marsh edge. Each core was 4 meters long and taken in 50 cm increments using a Russian peat Borer with twenty four 50 cm cores in total. Back in the laboratory, X-Ray Fluorescent Spectroscopy (XRF) was used to measure elemental composition of all cores in 1 cm increments. The XRF data projected elemental concentration changes with depth in each core. Potential storm layers and fluvial flooding correlated across all three cores. Each core showed 2 or 3 storm surges in recent history and a transition zone with fluvial flooding leading to several more storm surges. To further identify storm surge events, the cores were sliced into 5 cm or 10 cm layers and analyzed for water content, bulk density, loss on ignition, grain size, as well as carbon and nitrogen content. The continued research will focus on groundwater exchange along with soil characteristics in relation to weather dynamics.

Isabel Proger

PA - Susquehanna University

Discipline: Biology

Authors:

#1 Pavithra Vivekanand

#2 Swarna Basu

Abstract Name: Investigating Anti-Inflammatory Properties of Pomegranate Gold Nanoparticles and Punicalagin

The investigation of polyphenols as a potential therapeutic strategy to reduce chronic systemic inflammation has become an area of interest. Many plant-derived polyphenols induce anti-inflammatory responses in different cell lines. Previous research suggests that punicalagin, a polyphenol found in pomegranates, exhibits anti-inflammatory effects in murine cell lines. This study examines the potential anti-inflammatory effects of pomegranate gold nanoparticles (POM AuNPs) as well as pure punicalagin on the THP-1 human monocytic cell line. POM AuNPs were synthesized using gold chloride and pomegranate juice. THP-1 monocytes were differentiated into macrophages and treated with lipopolysaccharide (LPS) to simulate an infection in the absence or presence of increasing concentrations of POM AuNPs or punicalagin. Cell viability (XTT) assays showed no decrease in cell viability as a result of either treatment. Preliminary data obtained through enzyme-linked immunosorbent assays (ELISAs) suggests that punicalagin may reduce the production of pro-inflammatory cytokines in THP-1 derived macrophages.

Rebecca Flow Prophete

NY - CUNY Brooklyn College

Discipline: Education

Authors:

#1 Rebecca Flow Prophete

Abstract Name: An Examination of Parental Knowledge and Beliefs about Dual Language Development and its Impact on Dual Language Learners

Whether a child will grow up to be bilingual or not is largely determined by their parents. This study reviews current literature to examine major paradigms of parental knowledge and beliefs about dual language development. Two major belief structures are explored: (1) the belief that dual language development is harmful because learning two languages simultaneously may cause language delays or hinder English acquisition, and (2) the belief that bilingualism provides opportunities for success as well as maintenance and appreciation for cultural heritage. The literature also reveals that these belief structures vary across cultural groups and often reflect the collective struggles of that particular cultural group. As society progresses toward becoming multilingual, and the cognitive and educational benefits of bilingualism are more broadly understood, these findings indicate that it is crucial to educate parents on this topic in a culturally responsive manner. Future studies should further examine how socio-economic class influences parental ideologies about dual language development. Such insights could provide a more comprehensive understanding of the factors affecting bilingualism in children and guide more effective educational strategies for parents across different socio-economic backgrounds.

Georgia-Maria Prountzos

NY - Fordham University

Discipline: Business

Authors:

Abstract Name: Does stock popularity on social media impact short-term equity performance?

This study attempts to determine if small retail investor interest on social media can have an impact on short-term equity performance. For each stock in a given portfolio, investor interest is determined by the frequency of mentions and other data measures, including upvotes. Related literature exists primarily between 2020 and 2022, the so-called “meme stock” era. Similar research is performed on Reddit but using a smaller portfolio and a longer data period, as well as on Twitter, Discord, and Stocktwits to correlate social media sentiments with return. This study builds upon said previous work by observing more recent 2024 data within the context of rampant growth of overall social media usage. This study utilizes the Reddit forum r/wallstreetbets, one of the most active social media sources of investor activity. To perform this research, a custom Python program was created to search the forum’s comments and aggregate the frequencies of tickers mentioned. For each stock, an analysis is run of its mentions against its short term performance over the next few days, controlling for market capitalization, book-to-market ratio, and past 12-month returns. I expect to find a measurable relationship between social media interest and subsequent performance which can depend on the stock, firm industry, market cap, etc. Understanding which stocks are most sensitive to retail investor popularity can inform future investment strategies, predict the next emergence of potential viral meme stocks, and provide insights into social media investor attitudes and sentiment.

Nicolas Provenzo

PA - Duquesne University

Discipline: Business

Authors:

#1 Nicolas Provenzo

#2 Saskya Hector

#3 Wenqi Zhou

Saskya Hector

Abstract Name: Integrating Generative AI in Data Warehousing: Bridging the Educational Gap for Future Graduates

Data warehousing is a system that stores and manages large volumes of structured data from various sources for analysis, reporting, and decision-making, often using solutions like SAP BW. The increased growth of Generative AI in recent years has led to advancements in data warehousing. An example includes integrating machine learning algorithms in Extract, Transform, and Load (ETL) processes for improved data quality. Nevertheless, the radical innovation of Generative AI also brings in a gap between undergraduate curriculum in Business School in the States and the latest state of warehousing methods. The goal of our research is to examine the status quo and suggest ways in which higher education can integrate GenAI use cases into data warehousing curriculum, aiming to provide timely skills to recent graduates. With an increased adoption of GenAI solutions in the workforce, it is imperative to prepare students with these skills. To accomplish this, we study the role of GenAI in data warehousing throughout the past and the present at both higher education and professional levels using two approaches. First, we examined the course offerings in the undergraduate business education by referring to the recommended curriculum framework from the related professional associations and university accreditation, supplemented with information collected from university websites. Second, we surveyed professionals about their working experiences of data warehousing and thoughts on the future of GenAI in this field. This research contributes to the heated discussion of GenAI in industry through the angle of student preparedness in higher education. The findings identified the missing pieces in current offerings and recommends topics, tools, and approaches to prepare this generation of students for the future workforce.

Evelyn Pugh

TX - Texas Woman's University

Discipline: Nursing and Public Health

Authors:

#1 Niki Fogg

Abstract Name: Exploring the Impact of Medical Interpreters in Simulation on Nursing Students' Knowledge and Competence

Purpose: To explore the impact of medical interpreter-mediated communication education on final semester prelicensure student nurses' knowledge, clinical competency, and perceptions of interprofessional simulation-based education (IPSE). Background: Culturally competent care is becoming more critical in nursing practice due to the increasingly diverse population. An essential component of culturally competent care is effective communication between healthcare providers and patients. Language barriers are one of the greatest challenges in providing effective communication in the clinical setting, often requiring the use of medical interpreters. However, existing resources to prepare medical professionals for these competencies, and studies exploring their effectiveness are limited. To address this gap, a learning module and nursing student simulation were implemented utilizing medical interpreter students and a non-English language preference (NELP) patient. Methodology: Retrospective analysis of nursing students' pre/post-evaluation of a student-developed knowledge-based module. Nursing and medical interpreter students completed the Students Perceptions of Interprofessional Clinical Education - Revised 2 (SPICE-R2) Instrument pre/post-simulation. The nursing students' application of competency-based knowledge was evaluated by faculty during the simulation. Expected Results: Data collection is complete, and analysis will be completed January 2025. Preliminary results suggest positive student perceptions of IPSE increased following the simulation experience. The analysis can enhance understanding of IPSE effectiveness and will be utilized for data-driven decision-making regarding the module, and student competency utilizing interpreter-mediated communication to engage with NELP patients in professional practice. Future studies exploring structured IPSE programs across all classifications and levels of nursing programs in nursing education may promote a healthcare environment that more heavily prioritizes cultural competence.

Kayla Pugliese

PA - Duquesne University

Discipline: Chemistry

Authors:

#1 Alayna Funke

#2 Derek Bedillion

#3 Paul Lummis

#4 Thomas Montgomery

#5 Daniel Chase

Abstract Name: Four- Coordinate Lanthanide Azadipyrrromethene Chelates in Near-Infrared Region

Bioimaging is a vital, non-invasive technique that plays a crucial role in the identification and treatment of diseases. Among the techniques available, fluorescence imaging has emerged as a powerful method, using molecules capable of absorbing and emitting light to illuminate cancerous tissues. For clinical usage, these molecules must be water-soluble, cost-effective, and exhibit minimal side effects. To achieve deep tissue tumor imaging, fluorescence dyes must operate within the near-infrared (NIR) region, as NIR wavelengths penetrate tissues effectively while minimizing damage to surrounding organs and structures.

Azadipyrrromethene (aza-DIPY) cores represent an underexplored class of NIR-fluorescent molecules, typically chelated to Group 13 metals. However, their potential when chelated to lanthanide metals, forming a unique four-coordinate system, remains absent in the current literature. In this study, a novel aza-DIPY core was synthesized and chelated to various lanthanide elements to investigate its NIR activity and photophysical properties, paving the way for innovative advancements in fluorescence imaging.

Taylor Pulley

VA - Longwood University

Discipline: Biology

Authors:

#1 Amanda Starr

Abstract Name: Carbon and Nitrogen Influence on Enzyme Production in *Batrachochytrium dendrobatidis*

Batrachochytrium dendrobatidis (Bd) fungus has contributed to global amphibian decline and extinction. Bd infects the skin of amphibians, causing ion imbalances and death. The exact nutrients and carbon to nitrogen (C:N) ratios of amphibian skin is unknown. Amphibian-produced antimicrobial peptides and bacterial-produced metabolites are known to impact the growth of the fungus. The fungus produces a broad range of proteases to help degrade skin components, but the impact of nutrition on their production has not been researched. Altering the C:N conditions for Bd could alter production of virulence traits. The goals for the project are: 1) determine sub-lethal C:N ranges of Bd, 2) analyze gene expression of secreted proteases in sub-lethal C:N ratios, and 3) determine protease activity in each condition. The growth of Bd in different C:N ratios was completed in 96 well plates using a spectrophotometer with a wavelength of 492 nm over 7 days. The sublethal conditions of Bd were C10N1 and C1N5, with C1N1 and C0N1 being optimal conditions. Gene expression was analyzed by extracting RNA from Bd grown in C:N conditions on day 4 of growth by converting RNA to cDNA and using Real Time qPCR with 5.8S rRNA as an internal standard and protease specific primers designed through IDT PrimerQuest. Elastase activity was monitored using a fluorometric dye

on day 4 intracellular and extracellular proteins. Day 4 data suggests protease genes are expressed higher in carbon conditions while protease activity is higher in nitrogen conditions. Future studies will look at gene expression and elastase activity over growth from Day 2 to Day 5. By understanding how nutrients can impact the virulence of the fungus, susceptible amphibians could be identified and treatment plans customized.

Brianna Puorro

PA - Villanova University

Discipline: Biology

Authors:

#1 Matthew Youngman

Abstract Name: Analysis of the ARID-1 complex during aging in *C. elegans*

Cellular identity-the structural and functional features common to particular cell types that distinguish them-is established when cells differentiate as epigenetic mechanisms permit specific constellations of genes to be expressed while silencing others. During aging, changes to chromatin structure disrupt transcriptional regulatory programs that maintain cellular identity. This leads to dysfunction at the tissue level, eroding health later in life, and limiting lifespan. We discovered that in the roundworm *Caenorhabditis elegans* ARID-1, an ortholog of the mammalian ARID4a chromatin organizing protein, is expressed in neurons during adulthood and is required for both innate immunity and longevity. Prior studies showed that, similar to ARID4a, ARID-1 functions as a part of a multisubunit complex in the *C. elegans* germline. However, the composition of this complex in other tissues and in postreproductive animals is unknown. To determine the function of the ARID-1 complex during aging and to identify its constituents, I first used a reverse-genetics strategy to ask whether products of candidate genes cooperate with ARID-1 to confer immunity and thus likely encode ARID-1 complex subunits. In adults, *suds-3* knockdown phenocopies RNAi targeting *arid-1*, causing increased susceptibility to bacterial pathogens. This suggests that SUDS-3 and ARID-1 may be part of the same protein complex in older animals. Further functional analyses of additional candidate genes are underway. In parallel, I pursued a biochemical strategy to isolate the ARID-1 complex by immunoprecipitation. Using growth conditions that I optimized, I have increased the number of animals in our age-synchronized *C. elegans* cohorts by 80-fold. This is expected to generate sufficient starting material to pull-down a FLAG-tagged version of ARID-1 from fractionated *C. elegans* lysates for downstream analysis. We anticipate that our studies will have implications for the importance of maintaining chromatin structure to preserve critical functions during aging in diverse organisms, including humans.

Aleena Purewal

PA - Duquesne University

Discipline: Health and Human Development

Authors:

#1 Melanie Tommer

#2 Melanie Schultz

#3 Katrina Bucher

#4 Caitlyn Brannon

#5 Chloe Warham

#6 Regina Harbourne

#7 Sarah Berger

Abstract Name: How does an infant's sleep impact problem-solving skills during a motor task?

Background: Infant sleep is essential for both cognitive and physical development. Healthy sleep consists of appropriate timing and adequate duration with no disturbances. It is recommended by the National Sleep Foundation that infants between 4-11 months sleep between 12-15 hours per day. It is possible that sleep quality plays a unique role at differing times during infant development, but research results have been mixed. For example, 6-month olds sleep quality was positively associated with a cognitive task the next day (Konrad, 2016), but 12-month olds sleep was not associated in the same study. Further evidence is needed to understand if an infant's sleep quality is linked to learning and cognitive performance particularly under conditions of an early motor milestone, sitting independently. Purpose: The goal of this project is to determine if an infant's sleep quality impacts their abilities to solve a reaching task challenging their newly gained sitting balance control. Methods: 6 to 8 month-old infants were recruited for this study via public announcements in Brooklyn NY and Pittsburgh PA. All infants could sit independently but were not crawling and were typically developing. A reaching task was done to quantify movement with the infant reaching for toys in alternating locations through a reaching board. The infant's sleep was tracked with a sleep monitor to measure duration and number of wakings. Factors quantifying problem-solving included reach time, postural control, and look time, which were measured via Datavyu video coding. Conclusions and Expected Results: We predict that infants with better sleep quality will show faster reach time and look times. We also expect there to be a trade-off between posture control and reach time, such that infants with less postural control will take longer to problem-solve and thus have longer reach and look times.

Christina Qi

MI - University of Michigan - Ann Arbor

Discipline: Linguistics and World Languages

Authors:

#1 Lisa Levinson

Abstract Name: Testing a New Tool for Psycholinguistic Experiment Stimuli Development: The A-maze 2.0

The Maze Task is an experimental method used in linguistics to study how people process and understand the meaning of sentences. In the task, participants choose the correct word (out of two options) that continues the sentence in a grammatically correct way. However, because of the difficulty of generating stimuli (the alternatives, or "incorrect" options), the Maze Task had not been widely used until recently. Thus, the development of the A-maze (automatic-maze) software which generates stimuli automatically by Boyce et al. has been greatly beneficial. Building upon the A-maze by Boyce et al., we have built a new A-maze "2.0" to generate stimuli for more languages (previously was just English) and to make the software more accessible to more people. This study aims to analyze the results of the A-maze "2.0" and compare how well it performs to the original A-maze, namely by comparing error rates. To collect data, participants are asked to complete several trials of the improved Maze Task online over an Ibex platform, where sentences are purposely ambiguous in some way. Then, the data and error rates associated with each word are compiled and compared with Boyce et al.'s A-maze. We expect the A-maze "2.0" to perform similarly well, with similar levels of error, although the study is currently ongoing and results will be reported. Ultimately, this new A-maze is crucial to further developments in psycholinguistics, as it expands research into other less studied languages, and the Google Colab interface allows more people with less programming experience to access the software.

Cynthia Qian

PA - Carnegie Mellon University

Discipline: Psychology

Authors:

#1 Cynthia Qian

#2 Kasey Creswell

#3 Catharine Fairbairn

Abstract Name: Enhancing Validity in Alcohol Research: The Case for Multi-Participant Alcohol Administration Studies

Background: Since the 1930s, researchers have studied alcohol's effects on emotions, behavior, and cognition in laboratory settings to understand factors that may contribute to alcohol use disorders (AUD). While most real-world drinking occurs in social settings—whether with friends, family, or strangers—laboratory studies seem to be overwhelmingly focused on solitary drinking. This discrepancy raises concerns about the ecological validity of laboratory alcohol administration studies and may limit our understanding of alcohol's effects in naturalistic social environments. Here, we aimed to quantify how much laboratory alcohol administration studies have incorporated social drinking contexts. **Methods:** A systematic review was conducted of laboratory alcohol administration studies published through 2023, adhering to PRISMA guidelines. Searched in PsycINFO, PubMed, and Web of Science identified 5,690 records, from which 989 studies were included. Studies were coded for whether drinking occurred in solitary or social settings (see pre-registration for additional details <https://osf.io/njvzd>). **Results:** Of 989 studies identified, 90.8% administered alcohol in solitary settings, with less than 10% featuring a social context. Most multi-participant studies were conducted prior to 1990 and were methodologically limited by small sample sizes and inadequate statistical methods to account for interdependent participant interactions. More recent, well-powered multi-participant alcohol administration studies demonstrate alcohol's robust effects on social bonding and tension reduction, mechanisms critical to understanding AUD risk. **Conclusion:** Current laboratory research largely overlooks the social nature of drinking, creating a gap in understanding alcohol's typical effects and AUD risk factors. Well-designed multi-participant alcohol administration studies are urgently needed to address this gap, as they offer the potential to uncover social mechanisms underlying alcohol use and its associated harms. Prioritizing such research will improve ecological validity and may inform public health strategies for mitigating alcohol-related risks.

Julie Qian

CA - University of California - San Diego

Discipline: Biology

Authors:

#1 Sonja Lorean Plasil

#2 Olivier George

Abstract Name: Chemogenetic Activation of Corticotropin Releasing Factor-Expressing Neurons in the Central Nucleus of the Amygdala Influences Cocaine-Related Behaviors in a Sex- and Session- Dependent Manner

Cocaine misuse in the US has steadily risen throughout recent decades, leading to ~28,000 cocaine-related deaths in 2022 alone. Positive feedback loops underlie addiction, where drug taking and associated rewarding effects promote further drug seeking in a self-sustaining cycle. Negative emotions such as stress and anxiety emerge during withdrawal. The Corticotropin releasing factor (CRF) neuropeptide is enriched in the central amygdala (CeA) and is key at modulating affective states and behaviors related to stress, anxiety, fear, and pain. Previous studies show an increase in CRF neuropeptide and neuronal activation during cocaine withdrawal. However, the role of CRF neuronal activation during active cocaine intake is not well-

understood. To investigate this, control AAV or AAV encoding a novel cocaine-activated Cre-dependent chemogenetic Na⁺ channel (termed coca-5HT3) was stereotactically injected into the CeA of CRF-Cre rats bilaterally. Immediate behavioral and physiological response to intraperitoneal (i.p.) cocaine was measured for locomotion, anxiety- and irritability-like behaviors, and mechanical nociception. Cocaine seeking was assessed by short access (ShA) and long access (LgA) intravenous self-administration (IVSA) after jugular-vein catheterization. We hypothesized that activation of CeA CRF neurons by cocaine during IVSA could either induce withdrawal-like symptoms and subsequently increase intake in an attempt to arrest the symptoms, or decrease cocaine intake by learned association between aversive effects of CRF neuronal activation and cocaine. Here, we show that coca-5HT3 resulted in various effects dependent on sex and IVSA session length. Coca-5HT3 promotes an increased heart rate upon i.p. cocaine injection and higher weight gain overtime. Following ShA IVSA, Coca-5HT3 suppressed active lever presses in females during footshock (FS). Moreover, Coca-5HT3 during LgA IVSA facilitated an earlier escalation of active lever presses without affecting the number of cocaine infusions. These results suggest that CeA CRF neuronal activation during cocaine exposure impacts cocaine-related behavioral responses dependent on the time-course of IVSA.

Jessica Qualich

WI - University of Wisconsin-Stout

Discipline: Engineering

Authors:

#1 Jessica Qualich

Abstract Name: Experimental Design for Optimizing Plant Growth Using a Programmable Farming Robot

The goal of this research was to create an experimental design that can be applied more broadly to research how to optimize the growth of any plant species by systematically adjusting relevant variables and measuring their effects. A programmable farming robot, FarmBot, was used in collaboration with Chippewa Valley Bean to grow dark red kidney beans in a controlled greenhouse environment. The FarmBot platform provides several attachments that enable the monitoring or manipulation of various agricultural variables. In this case, we used its watering nozzle and camera. Plant growth was monitored for two months by regularly photographing each individual plant. The photographs were then downloaded and organized into folders specific to each plant. The variable chosen to investigate for its impact on plant growth was the volume of water applied. Each section of the farm bed received a different water volume, ranging from 30 ml to 60 ml, and the experiment was conducted in a greenhouse to eliminate the influence of weather variability. The plants were spaced in a way that allowed for individual plant monitoring, using canopy cover as a proxy for growth. This experimental approach can be used to efficiently test various factors that may affect plant growth, enabling researchers to develop better agricultural models and ultimately improve crop yields in the field. Our experimental design can be expanded to explore other variables, such as soil type, to investigate their influence on plant growth. Additionally, the collected photographs could be processed to identify early signs of diseases, pests, and other potential threats to the plants.

Hannah Queener

IL - Eastern Illinois University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

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#1 Hannah Queener

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Abstract Name: A Retrospective Exploration of the Relationship Between Executive Functions and Social Skills Among College Students with Autism

The diagnostic criterion for autism spectrum disorder (ASD) identifies social communication deficits as a persistent characteristic of the condition. Additionally, executive dysfunction has been identified as a concomitant feature of autism. Executive functions are defined as those cognitive and meta cognitive skills that provide for the capacity to regulate, adapt, and control our behaviors, responses, and actions for present demands and act as a foundation for future-oriented goals. Research indicates that executive functions are significantly associated with social impairments in children with ASD. Additionally, research suggests that both social deficits and executive dysfunction in individuals with autism persist into adulthood, but there is no research exploring the relationship between executive functions and social impairment in adults with autism. The aim of the current study is to determine the relationship between executive functioning and social skills in college students with autism based on self- and parent-evaluations on the Behavior Rating Inventory of Executive Function® - Adult Version (BRIEF-A) and the Social Responsiveness Scale, Second Edition (SRS-2). The current study will utilize retrospective data in a correlational research design. Data will be analyzed using the Pearson correlation coefficient (r) to determine the direction and strength of the relationship between BRIEF-A and SRS-2 scores. Results will provide insight into the relationship between executive functioning and social skills in college students with autism.

Hadley Quigg

GA - Georgia College and State University

Discipline: Psychology

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#1 Hadley Quigg

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Ella Swartz

Lauren Gibson

Abstract Name: Echoes of Service: Veteran Identity Explored Through Photovoice and Lyric Analysis

Our study utilized photovoice and lyric analysis, both qualitative community-based participatory action research (CbPAR) techniques, to explore how Veterans define their post-service identities. Many Veterans experience “reverse culture shock” after leaving the military, impacting relationships and leading to isolation. Photovoice empowers Veterans to tell their stories through photographs, while lyric analysis allows reflection on songs resonating with their experiences. Veterans responded to the prompt “What does being a Veteran mean to you?” by taking photos and identifying songs that reflected their identities. They participated in semi-structured interviews discussing these images and lyrics. Transcripts, song lyrics, and other artifacts were analyzed using a phenomenological approach to uncover themes related to Veteran identity. Member-checking was used to establish external validity. Preliminary results reveal common identity themes such as honor, integrity, pride, isolation/loneliness, duty, sacrifice, humanity, identity conflict, and loyalty. Despite common themes, Veteran identity is not a monolith; each participant processed their experiences uniquely. These methods foster trust between historically exploited and excluded groups in science (HEEGS) and researchers, amplifying marginalized voices. As a final showcase, we hosted an interactive gallery of Veterans’ photos and songs, including live performances and displays of highlighted lyrics and photos. Qualitative, CbPAR methodologies, such as photovoice and lyric analysis, not only facilitate more ethical and empowering research with Veterans, but also help rebuild trust with HEEGS.

Alison Quigley

VA - University of Virginia

Discipline: Nursing and Public Health

Authors:

#1 Paula Sherwood

Abstract Name: Healthcare Utilization in Neuro-Oncology

Neuro-oncology has the highest total care costs for any cancer, yet the sources of healthcare utilization (HCU) are not well identified. The purpose of this study was to identify the most common neuro-oncology HCU following diagnosis. A cross-sectional descriptive survey was administered via patient support groups. Patients (N=41) identified use of healthcare resources and potential barriers to HCU using a modified version of the Health Care Access and Utilization survey. Descriptive analyses were completed using SPSSv29.0.1. The majority of respondents were female (83%, N=34), diagnosed with either a glioma (39%, N=16) or meningioma (24%, N=10), and were between 41-60 years of age (58%, N=24). The most commonly used

resources included the neurosurgery team (56.4%, N=22), neuro-oncologist (63%, N=22), and support groups (53%, N=17). Resources patients reported using the least were social work (24%, N=5), occupational (18%, N=7) or physical (42%, N=17) therapy, palliative care (9%, N=4), and neuro-psychology (12%, N=5). For the least used resources, the reason for not making use of these services was that they were either not needed or not suggested. Patients who are diagnosed with brain tumors may limit HCU to the most necessary and time sensitive providers, who also represent a group of high-cost providers. Data also reveal a lack of use of supportive care resources, which is surprising given the high mortality and morbidity rates within this population. More targeted questionnaires to a larger sample would provide insight into not only sources of healthcare costs, but also to the accessibility and acceptability of support care providers.

Leah Quill

NC - High Point University

Discipline: Communications

Authors:

#1 Leah Quill

Abstract Name: Climate Anxiety and Contempt Among Gen-Z: Relationships with Efficacy and Policy Support

This study examined feelings of climate anxiety and climate contempt among 758 Gen-Z residents of North Carolina. Data was collected in May 2024 through polling company Dynata. Within this survey study, participants were measured on their levels of contempt and anxiety about climate change using five-point scales. Using t-tests and correlations, analyses tested whether males or females tended to have more or less climate contempt or anxiety and whether contempt and anxiety varied with political ideology or extent of science knowledge. Analyses also examined levels of collective efficacy and pro-environmental policy support, and how they varied with climate anxiety and contempt. Results showed that those with more climate contempt were more likely to be politically conservative and male, less likely to support environmental policies, and had less science knowledge. Conversely, those with greater climate anxiety were more likely to be politically liberal, more likely to support environmental policies, felt more collective efficacy about helping the climate, and had more science knowledge. Analyzing these findings allow a greater understanding of how key demographic groups perceive climate change and what they are willing to do about it. Implications may include ways to more effectively communicate about climate change and promote pro-climate policies to partisans. Reducing climate contempt is a significant goal as it correlates with lower collective efficacy and lack of support for pro-environmental policy. Intervention could begin early with better science education which could reduce climate change contempt. Although climate anxiety directly correlates with collective efficacy and support for pro-environmental policies, future research should explore ways to promote a sense of urgency about the climate crisis among Gen-Z without triggering anxiety.

William Rabon

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

#1 William Rabon

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Abstract Name: Enhancing Precision: The Application of Exoscope Technology in Spine Surgery

Minimally invasive surgeries (MIS) are becoming increasingly popular techniques for spinal decompression as they reduce postoperative complications such as recovery time, blood loss, pain, scarring, and hospital stay. Unlike conventional microscopes used in neurological surgery, which can lead to surgeon fatigue and poor ergonomics, the exoscope offers surgeons and their teams a highly detailed view of the surgical field in neutral or upright position. This improves precision, fosters stronger collaboration, and enhances patient outcomes. In this case series, we present the successful use of an exoscope in three posterior decompression surgeries to alleviate pain from lumbar radiculopathy, and one thoracic myelopathy case. A robotic exoscope was used by the surgical team for four patients undergoing spinal decompression surgeries. The team analyzed clinical and surgical data to evaluate the exoscope's utility in spinal surgeries. Three patients (75%) had lumbar radiculopathy while one patient (25%) presented with thoracic myelopathy and progressive pain. Three patients underwent a posterior decompression, with the exoscope enhancing visualization during the procedure and microdissection, whereas one patient underwent a lateral thoracic retropleural MIS discectomy. In all patients, the exoscope enabled adequate decompression of the required anatomical areas, namely the lateral recess, traversing nerve roots, and central thecal sac. It enhanced visualization, depth perception, collaboration, and overall surgical convenience. There were no surgical complications or intraoperative neuromonitoring issues, and at two-week follow-up, all patients reported reduced preoperative symptoms. Three-dimensional robotic exoscopes were proven to be extremely beneficial in high-precision procedures like microdissection and decompression. The exoscope enhanced visualization for the surgical team, leading to greater precision and unremarkable postoperative outcomes.

Colin Raddant

NC - University of North Carolina at Charlotte

Discipline: Biochemistry

Authors:
#1 Eva Ge

Abstract Name: Investigation of Post Translational Modifications on Copper Chaperone for Superoxide Dismutase

Copper is an essential metal for biological systems and plays critical roles in numerous intracellular pathways. Dysregulated copper homeostasis can lead to the development of various diseases, highlighting the importance of maintaining its intracellular balance. Copper chaperone for superoxide dismutase (CCS) is a key metallochaperone protein and delivers copper to the redox protein superoxide dismutase (SOD1). CCS has three domains, with copper-binding sites in domains 1 and 3. Domain 3 is intrinsically disordered and contains a serine residue between the two copper-binding cysteine residues. This serine can be phosphorylated, which we hypothesize may influence copper binding and CCS function. To investigate the role of this post-translational modification (PTM), we synthesized WT and phosphorylated peptides encompassing domain 3 of CCS using Fmoc-based Solid Phase Peptide Synthesis (SPPS). These synthetic peptides will be used to study copper-induced structural changes using Circular Dichroism (CD) spectroscopy. This will help to elucidate the functional impact of serine phosphorylation within domain 3 of CCS.

Haridhra Radhakrishnan

Discipline: Communications

Authors:

#1 Anjana Mudambi

Abstract Name: In/visibility of Caste: An Analysis of Second-Generation Indian Americans' Caste Discourses

While caste serves as a fundamental organizational principle across much of South Asian society, its implications often appear less readily visible to members of the South Asian diaspora born and raised outside the region, especially in comparison to their more salient identity as a racially and ethnically nondominant group (see Chandrashekar, 2024). This study explores second-generation Indian Americans' discourses to better understand how they communicatively construct caste in relation to their identities. Using critical thematic analysis (Lawless & Chen, 2019), we examined comments across 26 threads related to caste on the subreddit ABCDesis (American Born Confused Desis) that were posted between 2022 and 2024 and identified four themes. First, they echo frames of colorblindness (Bonilla-Silva, 2018), including minimization, naturalization, and abstract liberalism, to construct a "casteblind" narrative that rationalizes caste/ism and, for many, maintains their caste privilege. Second, they rely on a disconnected power analysis (Jayakumar & Adamanian, 2017) to distance themselves from caste/ism, instead blaming it on first-generation immigrants, British colonization, and/or on a backwards Indian culture. Third, they create a sense of victimhood to contest endeavors to combat casteism in the United States, alleging Hinduphobia and/or reverse discrimination against Brahmins or by prioritizing racism faced by the community over casteism. Lastly, some discourses demonstrated critical reflexivity (Mudambi et al., 2023) to challenge casteism by recognizing their own caste privileges within the larger sociohistorical context of South Asian immigration. This research highlights the importance of caste as an analytic framework to better understand dis/privilege within the South Asian diaspora. Keywords: Caste, Casteism, South Asian diaspora, Hinduphobia, Critical Reflexivity

Lavin Radiro

TN - Lipscomb University

Discipline: Biology

Authors:

#1 Amanda Williams

Abstract Name: Elucidating the Role of HD5 in Colonic Wound Healing

Introduction Crohn's colitis (CC), a type of inflammatory bowel disease (IBD), causes chronic inflammation in the large intestine, resulting in malnutrition, diarrhea, and severe pain. Early and accurate diagnosis of CC is essential, as misdiagnosis with ulcerative colitis can lead to inappropriate treatment and worsened outcomes. Innate immune peptide, human alpha-defensin 5 (HD5), is upregulated in CC, but not UC, and may play a role in disease pathogenesis. Preliminary data in our lab indicates that HD5 impairs wound healing in colonic epithelial cells. **Hypothesis** We hypothesize that HD5 increases RNA and protein levels of COL4A3, EGF, and MMP1 while decreasing ACTB expression, thereby affecting colonic wound healing in CC. **Methods** Wound healing assays will measure the effect of HD5 on epithelial cell migration and closure. RNA and protein extractions will be performed on HD5-treated NCM460 cells, followed by qPCR and Western blot analyses to assess gene and protein expression levels of COL4A3, EGF, MMP1, and ACTB. **Expected Results** We anticipate that HD5 treatment will reveal altered expression of genes and proteins critical to wound healing. These findings will help elucidate HD5's role in CC pathogenesis and identify potential molecular targets for therapeutic intervention. This study aims to advance understanding of

HD5's influence on epithelial repair and its contribution to CC, ultimately informing more effective treatment strategies.

Kennedy Ragin

GA - University of West Georgia

Discipline: Political Science

Authors:

Abstract Name: Off the Cliff: Case study of drug overdose deaths in Georgia

From 2019-2022 drug overdose deaths in Georgia increased by 76%, but in 2023, there was a small decrease of 6%. However, government statistics, epidemiological research and descriptive research, show that black people are dying at a higher rate in Georgia compared to their white counterparts. The figures for other ethnic groups show slight increases but not as large as those for blacks and whites. For example, the nominal number of black overdose deaths in 2023 continued to rise especially in urban populations from 791 deaths in 2022 to 818 deaths. I am researching drug overdose deaths in Georgia because I want to know why certain populations are being disproportionately affected compared to others. The objective of this research is to present policy recommendations to reform drug intervention policy in Georgia with the aim to help reduce the overdose deaths in all communities, but especially those affected more disproportionately. This is a case study of Georgia to use as a base line as a comparison across all states who have a similar problem.

Khondokar Rahman

PA - Duquesne University

Discipline: Computer Science

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#1 Khondokar Araf Rahman

Abstract Name: Faking Reality - Ethical and Legal Concerns

This study looks at the ethical and legal problems surrounding deepfake pornography, focusing on issues of consent, privacy, and the societal impact of this technology. Deepfakes make it easy to manipulate someone's image into explicit content without their permission. This not only invades their privacy but also puts them at risk of public humiliation and mental health challenges, especially for women, who are the primary targets. We explore how this growing technology harms individuals and society while existing laws fail to provide enough protection. For example, outdated legal frameworks leave many victims with no way to hold perpetrators accountable. The study also examines efforts to address these issues, such as stricter laws in states like California and Virginia, and the need for better detection tools. The findings highlight the urgent need for stronger federal laws, faster detection methods, and accountability for platforms that allow this content. By addressing these gaps, we can work toward reducing the harm caused by deepfakes and protecting people's rights in the digital age.

hasina rai

MD - Towson University

Discipline: Exercise Science and Nutrition

Authors:

#1 Devon Dobrosielski

Brita Onomake

Abstract Name: The effects of obstructive sleep apnea on muscle tissue oxygenation during exercise

Obstructive sleep apnea (OSA) is characterized by recurrent arousals and episodic oxyhemoglobin desaturations during sleep. Patients who suffer from OSA have reduced exercise performance, although the mechanisms for this reduction are not clear. Purpose: To examine the tissue oxygen saturation (StO₂) of the tibialis anterior (TA) muscle in adults with OSA during a graded exercise test. Methods: Near-infrared spectroscopy (NIRS) was used to measure StO₂. All participants walked at 2.5 mph on a treadmill for six stages of progressively steeper grades (0%, 3%, 6%, 9%, 12%, 15%) or until volitional fatigue. Each stage lasted three minutes and StO₂ was averaged over the last minute of each stage. The severity of OSA was determined using an at home sleep testing system and characterized by the apnea-hypopnea index (AHI) and time during sleep spent under 90% oxygen saturation (T90). Body composition was measured using dual energy X-ray absorptiometry. Results: Nineteen adults (men:10; women:9; age=43+9 years, BMI=34.4+8.1 kg•m⁻²) enrolled in the study. Thirteen subjects completed the exercise protocol, whereas six subjects stopped after completing Stage 4 (2.5 mph @ 9%). Trunk fat was lower (45+21 kg vs. 68+18 kg, p=0.028) and T90 was less (3.9+4.0 min vs. 0.8+2.4 min, p=0.048) in those who completed the protocol compared to the non-completers. No difference between groups in AHI (p=0.486) or StO₂ at Stage 4 (p=0.633) were observed. Among the non-completers, those with the lowest StO₂ at Stage 4 had greater T90 compared to those with the highest StO₂ at Stage 4 (7.3+2.5 min vs. 0.5+0.4 min, p=0.039). However, no differences in AHI (p=0.513), or trunk fat (p=0.211) were observed. Discussion: These data suggest greater hypoxia during sleep, rather than the total number of apneic events, limits exercise performance and suggests that treating OSA could enhance exercise tolerance in OSA patients.

Danica Raich

DC - American University

Discipline: Political Science

Authors:

Abstract Name: The Role of the Military Industrial Complex in Nuclear Modernization Programs

The question central to this research is: What institutional mechanisms explain the persistence of nuclear modernization programs? This research employs within-case analysis and process-tracing to investigate the role of the actors of the military-industrial complex (MIC) in sustaining U.S. nuclear modernization programs, with a focus on the Sentinel Program, formerly the Ground Based Strategic Deterrent (GBSD). These findings present the possibility of a causal chain linking the persistence of nuclear modernization programs in the U.S. to the alignment of economic, political, and strategic interests among defense contractors, Congressional stakeholders, and military leadership. The dependent variable is the persistence of nuclear modernization efforts like the Sentinel Program, while the independent variable includes the institutional mechanisms guided by economic interests of defense contractors, political priorities of Congressional stakeholders, and strategic imperatives articulated by military leadership. Primary literature, such as the annual assessment process of the U.S. Nuclear Weapons Stockpile serves as the basis for content analysis of decision-making processes, linking institutional evaluations to policy outcomes. Secondary literature, including Mayer's *The Political Economy of Defense Contracting*, McNaugher's *New Weapons, Old Politics*, and Fox's *Arming America: How the US Buys Weapons*, frames the analysis within the broader political and economic dynamics of defense contracting and policy inertia. The findings show a new way of

examining if nuclear deterrence is successful, which often focuses solely on the absence of nuclear conflict since 1945.

Tanvir Raihan

NY - Rockefeller University

Discipline: Biology

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#6 Wei Zhou

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Abstract Name: Optics-free Spatial Genomics for Mapping Mouse Brain Aging

Spatial transcriptomics has drastically transformed our understanding of cellular dynamics in aging and disease by allowing for detailed mapping of molecular and cellular organization across anatomical regions. However, despite these advances, current spatial transcriptomics technologies have limitations in throughput and cost that hinder their application in comprehensive studies. To overcome these limitations, we present IRISeq (Imaging Reconstruction using Indexed Sequencing), a novel and optics-free spatial transcriptomics that removes the requirement of predefined capture arrays or extensive imaging, allowing for rapid and cost-effective processing of several tissue sections simultaneously. IRISeq reconstructs spatial images through the sequencing of local DNA interactions, enabling tissue profiling without constraints on size and at varying resolutions. These local DNA interactions are captured through barcoded receiver beads that capture cellular mRNA and barcoded sender beads with photocleavable linkers. IRISeq was utilized to investigate gene expression and cellular dynamics across thirty brain regions of adult and aged mice in order to elucidate region-specific changes in gene expression associated with aging. Additionally, cell type-focused analysis was conducted to identify age-related cell subtypes and complex changes in cell interactions that are specific to spatial niches in order to elucidate unique region-specific aging processes. These investigations highlight the varied and diverse effects of aging across the brain spatially. The cost-effectiveness, scalability, and simplicity of IRISeq give it the potential to be a versatile tool in mapping region-specific gene expression and cellular interactions across biological systems.

Claire Rainey

NC - Elon University

Discipline: Nursing and Public Health

Authors:

Abstract Name: Factors Associated with a Type 1 Diabetes Diagnosis

Type 1 diabetes (T1D) is caused by an autoimmune reaction in which a person's body mistakenly attacks their insulin-producing beta cells in the pancreas. Scientists are unsure what exactly causes this reaction, but it is hypothesized to be a combination of genetic and environmental factors, like exposure to certain viruses (e.g., COVID-19). Interestingly, T1D incidence has been on the rise over the past few decades, and the exact reason

for this increase is not fully understood. Research on T1D is crucial to understanding potential causes and improving treatments. Although we cannot determine causality, our research is a cross-sectional study that aims to explore factors associated with a T1D diagnosis. We are using data from the 2021 National Health Interview Survey from the Centers for Disease Control. We are analyzing data for both children, with almost 8,000 observations and 30 T1D cases, and adults, with 25,000 observations and 235 T1D cases. Each data set contains data for numerous other factors that are potential causes or correlates with T1D. The binary variable T1D will be our response variable, and we will use logistic regressions to estimate odds ratios along with 95% confidence intervals. Preliminary results suggest that for both children and adults, general health status is highly associated with having been diagnosed with T1D. Children with a perceived poor or fair health status are 11.2 (95% CI 3.4 to 36.4) times more likely to have a previous T1D diagnosis than those with a perceived excellent health status. Adults with a perceived poor or fair health status are 10 (95% CI 5.7 to 17.6) times more likely to have a previous T1D diagnosis than those with a perceived excellent health status. Moving forward, we will fit models that assess multiple factors simultaneously.

Amala Rajagopal

CA - Chapman University

Discipline: History

Authors:

Abstract Name: "Is it America first or is it not?": The Daughters of the American Revolution and U.S. Nationalism during World War I

The National Society of the Daughters of the American Revolution, known as the DAR, is a lineage-based service organization for women who are descended from individuals who contributed to the American Revolution. Established in 1890, the organization works to promote education, patriotism, and historic preservation. With the outbreak of war in Europe in 1914 and America's initial but contested neutrality, rising anxieties began surrounding the query of where its citizens would place their allegiance became necessary for the American government. The state became active in promoting patriotism and intolerance of other political viewpoints. The DAR endorsed this effort and sought to preserve patriotism and combat dissenting ideologies throughout the war, incorporating the growing antiradical and Americanization movement of the late 1910s into their mission. This research seeks to explore the role of the DAR in promoting the war, the relationship between the Revolutionary War and World War I, and the usage of the relationship in promoting the war effort amongst Americans. This project establishes how the Daughters of the American Revolution endorsed patriotic and nationalist rhetoric during World War I, serving as a point of reference to understand the changing political climate during World War I and the role of a female patriotic organization in promoting nationalist and nativist values. Examining the climate of the DAR's patriotism alongside American neutrality and growing nationalism during the Great War showcases how the Daughters of the American Revolution contributed to the creation of a distinct war culture during World War I. This research establishes an additional understanding of the effects of American patriotic groups and their promotion of "America First" in their mission during World War I, providing historical context to the rise of U.S. nationalism and the way in which patriotism can be used to develop the ideology.

Moneesh Rajaram

GA - Kennesaw State University

Discipline: Engineering

Authors:

#1 Bao Nguyen
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Abstract Name: Automated Bruise Detection in Fruits Using AI-Driven Instance Segmentation for Enhanced Quality Control

Effective quality control is essential in agriculture to reduce fruit loss, with bruise detection being critical to ensure product integrity from farm to market. This research introduces an advanced AI-driven system that leverages convolutional neural networks (CNNs) to automate bruise detection in fruits. By utilizing Detectron2's instance segmentation and object detection capabilities with a ResNest-50 backbone, our system accurately identifies bruised areas on fruit surfaces, addressing a key need in post-harvest processes. Bruising in fruits often arises from increased metabolic and physiological changes as they ripen, making them susceptible to damage even from minor external forces. Detecting bruising early can significantly reduce post-harvest losses. Our method relies on a dataset of 100 annotated high-resolution images, developed with the help of RoboFlow and tailored to capture bruising variations across fruit types like apples and pears. The dataset was divided into training, validation, and testing sets, with 70 images used for training, 20 for validation, and 10 for testing. The model was trained using augmented images to enhance generalization and evaluated on the validation set to tune its parameters. Final testing on a separate test set demonstrated the model's high recall and precision, effectively detecting and segmenting bruised regions. This automated approach reduces dependency on manual inspection, minimizes human error, and is scalable for large-scale operations, making it suitable for integration into commercial sorting systems. In addition to enhancing operational efficiency, this solution reduces labor costs, minimizes waste associated with undetected bruises, and promotes sustainable practices by extending produce shelf life. The proposed solution reflects a forward step in precision agriculture, marking a significant advancement toward data-driven, modernized quality control in the fruit industry.

Snekha Rajasekaran

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:

#1 Paul Benson

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Abstract Name: Incidental Finding of Zoonotic Larval Cestodes During Autopsy

Introduction: Larval cestodes (tapeworms) adapted to other hosts are occasionally found in human tissues. Spirometra species are endemic worldwide and can cause sparganosis in humans, characterized by larval migration into superficial or visceral tissues including the pleural cavity, vitreous fluid, pericardium, abdominal cavity, and central nervous system. A few thousand cases have been reported worldwide, mostly in Asia, in association with the ingestion of infected copepods, consumption of raw meat from amphibians and snakes, as well as application of medicinal poultices prepared from infected animals to open wounds. Case: A 44-year-old female presented to the hospital with a pertinent medical history of schizophrenia, bipolar disorder, sepsis, rhabdomyolysis, chronic and acute kidney disease, and hypertension. She presented to the ER with ventricular fibrillation and underwent aortic valve replacement and repair of an aortic root abscess. The operation was complicated by arrhythmia and unstable hemodynamics, and she passed after failed attempts to wean her from cardiopulmonary bypass. In autopsy, incidental findings of hepatic multifocal subcapsular nodules (1-3 mm), with histologic characteristics of a zoonotic larval cestode, prompted microbiology consultation. Discussion: Histologic findings showed a focal granuloma of the liver with a central necrotic core containing foreign material. PAS, GMS, and AFB stains were negative for fungal and acid-fast organisms. The slides were reviewed by microbiology, who identified it as a zoonotic larval cestode

based on pathognomonic calcareous corpuscles as well as a myxoid matrix with loose smooth muscle fibers surrounded by an eosinophilic acellular tegument. Due to post-mortem diagnosis, a thorough history of travel, animal exposure, dietary intake, or poultice utilization was not available. Molecular confirmation was not performed but sparganosis was highest on the differential.

Sneha Rajendran

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:

Abstract Name: The Relationship Between p21 Expression and PKD1 Cyst Formation

Polycystic kidney disease (PKD) is a genetic disorder caused by mutations in the PKD1 and PKD2 genes. My project focuses on Pkd2, the gene responsible for 15% of PKD cases. Mutations disrupting PKD2 result in uncontrolled cyst development and a decline in kidney function over time. Recent research in my lab has indicated that a protein, p21 a cyclin-dependent kinase inhibitor, may regulate cyst initiation and expansion in PKD2 models. The goal of my research is to determine how p21 contributes to cyst formation. I am using mouse models to study when p21 expression is upregulated relative to cyst initiation and whether the number of p21-expressing cells correlates with the cystic burden. My research findings show that there is an increase in p21 levels before cyst expansion, suggesting an initiation role. My immunofluorescence analysis shows that cells expressing p21 are in and near cystic epithelium during a time course of cyst expansion, further supporting the initiating role. I am still analyzing whether the percentage of p21-expressing cells is linked to the rate of cyst formation and whether the p21-expressing cells directly contribute to the cysts. These outcomes support an important role for p21-expressing cells in cystogenesis. Correlating spatial information regarding cyst-initiating patterns and the location of p21-expressing cells, I want to explore how p21 expression contributes to cyst initiation and expansion in polycystic kidney disease. This research can provide a foundation to determine if regulating p21 expression could be used to prevent or delay cyst initiation or disease progression.

Anton Rajko

FL - Florida Atlantic University

Discipline: Computer Science

Authors:

#1 Jinwoo Jang

Abstract Name: LiDAR-based Streetscape Awareness for the Dynamic Interactions between Vehicles and Pedestrians in a Microscopic Digital Twin Simulation

This project harnesses LiDAR technology and 3D virtual simulation to construct a digital twin of West Palm Beach, Florida. The primary focus is to enhance understanding of the dynamic interplay between vehicles and pedestrians. The simulation provides an immersive and highly detailed 3D representation of the city, offering an interactive platform to visualize and analyze urban infrastructure and traffic dynamics at a street level. By integrating data from LiDAR sensors, the system precisely tracks the movements of both vehicles and pedestrians, mirroring their actions within the simulation. The system operates frame by frame, processing LiDAR data to determine the precise positions of vehicles and pedestrians. This data is then used to dynamically place 3D models in the appropriate locations within the Unity simulation, creating a realistic and

continuously updated virtual environment. This approach ensures a high level of accuracy and responsiveness, making the simulation suitable for a wide range of applications, from traffic flow analysis to pedestrian safety studies. One of the key objectives of the project is to demonstrate how the integration of LiDAR and digital twin technologies can revolutionize urban planning and traffic management. By modeling both vehicles and pedestrians, the simulation enables stakeholders to assess interactions between different road users, identify potential congestion points, and explore the impact of proposed infrastructure changes in a virtual setting. This detailed modeling also provides insights into pedestrian behaviors, allowing for safer and more efficient urban designs. Beyond traffic and mobility applications, this project highlights the broader potential of digital twins in smart city development. By combining precise sensor data with an interactive, visually rich 3D environment, the system offers a powerful tool for policymakers, city planners, and engineers. It supports data-driven decision-making, reduces reliance on costly real-world testing, and fosters innovation in designing sustainable, efficient, and responsive urban systems.

Arkadzi Rakach

PA - Carnegie Mellon University

Discipline: Political Science

Authors:

#1 John Chin

Abstract Name: Ruling from the Shadows: Why Regime Leaders Install and Remove Nominal Executives

This research investigates why some autocratic regime leaders employ “nominal executives” — heads of state or government who hold formal titles but lack actual governing power — and how these appointments impact regime stability and leader duration. Through coding and analyzing a newly compiled cross-national dataset of nominal executives in authoritarian regimes since 1946, this project offers the first systematic data on this phenomenon. It enables scholars of authoritarianism to identify dictators (regime leaders) who "rule from the shadows" by installing and removing one or more presidents or prime ministers who rule in name only. This first-of-its-kind data and accompanying case study narratives of the (mis)use of nominal executives may help political scientists explain patterns of leader duration, regime (in)stability, and (lack of) democratization. A key question this research seeks to answer is: why do dictators appoint nominal executives instead of concentrating power in their own hands? Indeed, we observe that factors such as term limits, appeasing opposition and international backers, and the incentive to shift blame for regime failures onto others may all contribute to the use of nominal executives. For instance, term limits facilitated nominal executives in a well-known example occurred in 2008 Vladimir Putin stepped down as president due to Russia's constitutional two-term limit and installed Dmitry Medvedev as a nominal president. While taking on the less powerful role of Prime Minister, Putin retained effective control, bypassing constitutional restrictions without relinquishing real authority. With over 1500 total cases, our dataset also tracks how the nominal executives entered and exited office, their roles, and who was the actual leader in charge during their tenure. Furthermore, we analyze how many different times each nominal executive was in office, and if and when they flipped from head of government to head of state.

Allison Raley

KY - University of Kentucky

Discipline: Engineering

Authors:

#1 Claire Rowlands

#2 Pranto Paul

#3 Nikita Gupta
#4 Zach Hilt
#5 Brittany Givens Rassoolkhani

Abstract Name: Modifying Poly(beta-amino ester) Hydrogel Formulations to Achieve Sustained Release of Bupivacaine Anesthetic

The current standard of care for treating post-operative pain is opioids. Opioids are powerful pain blockers but are highly addictive substances responsible for many overdose deaths. Nerve blocks can reduce opioid use but typically last no more than 4 hours with an anesthetic, Bupivacaine, injection. Another option is the sustained-release nerve block, Exparel®, which provides pain management for 72 hours. The challenge with Exparel® is that facial surgery requires at least 7 days of post-operation pain relief, meaning the highly addictive opioids are still prescribed. This work aims to improve upon the current sustained release of nerve-blocking anesthetics to reach the needs of more patients. In this research, a variety of formulations and structures of Poly(beta-amino ester) (PBAE), a biodegradable hydrogel, have been tested to achieve a more sustained release of Bupivacaine, which is an anesthetic with a long half-life. The PBAE used was formed from diethylene glycol diacrylate (DEGDA) or Poly(ethylene glycol) diacrylate (PEGDA) and isobutylamine (IBA). All formulations kept a molar ratio of 1.2:1 diacrylate to amine, but the molar ratios of the diacrylates were differentiated: molar ratio 3:1 DEGDA to PEGDA and a homopolymer of DEGDA. The purpose of having a formulation with just DEGDA as the diacrylate is to increase crosslinking, due to its shorter chain length within the PBAE, to have a more sustained release over time. The structures of each formula were tested in a particle format and various disc thicknesses. Release studies showed that utilizing the homopolymer formulation had a more sustained release of bupivacaine over 7 days than the copolymer formulation. However, this release profile was only seen in disc form and did not extend to microparticles. Overall, this suggests future developments will need to keep the integrity of the hydrogel structure to achieve a sustained release with this formulation.

Arjun Ram

AL - University of Alabama at Birmingham

Discipline: Chemistry

Authors:

#1 Di Bai

#2 Pengfei Wang

Abstract Name: The Isolation of Acetylated Triterpene Saponin from *Agrostemma gigatho* L. for Medicinal Chemistry Studies

Saponins are widely distributed across more than 100 families of dicotyledonous and monocotyledonous plants and found in various plant parts such as the stems, roots, flowers, bark, leaves, and fruits, representing a rich source of natural products with high potential for pharmaceutical applications. Exhibiting excellent biological activities, saponins have been investigated for their potential as immunomodulatory, anti-cancer, wound healing, analgesic, and various other types of pharmaceutical agents. Notably, saponins have garnered attention for their ability to treat a variety of cancers, by inducing cell death through apoptotic, necrotic, and autophagic cell death pathways. Additionally, their modulation of cell signaling pathways, such as ROS generation, activity on organelles, and permeabilization of the outer mitochondrial membrane, offers advantages as new chemotherapeutic agents. Another application of saponins lies in their potential as Endosomal Escape Enhancers (EEEs) to augment the efficacy of anticancer protein/peptide drugs. Research shows that most protein drugs internalized into cells via receptor-mediated endocytosis tend to become sequestered within endosomes, with only about 10% escaping into the cytosol to exert their bioactivity. Despite the potential of saponins as chemotherapeutics or EEEs, their capabilities in these areas are underexplored. The lack of systematic studies on SAR, particularly concerning the application of saponins as

EEEs, can be attributed to the lack of structurally diverse and well-defined pure saponins. This study details our efforts to isolate an acetylated triterpene saponin from *Agrostemma githago* L. The isolated natural product will undergo comprehensive SAR studies to develop new, improved leads for chemotherapeutic and EEE applications.

DARLINA RAMDHANIE

NY - York College

Discipline: Biology

Authors:

#1 Virginia Garcia-Marin

Abstract Name: The Synaptic Composition of layer 4B and layer 6 of Primary Visual Cortex in Macaque monkeys.

The primary visual cortex (V1) plays a vital role in visual processing by receiving input from the retina and transmitting information to higher-order visual areas. This study investigates the structural and functional organization of layers 4B and 6 in V1 of macaque monkeys, focusing on their distinct roles in visual processing and feedback modulation. Layer 4B, responsible for rapid signal integration, is hypothesized to contain densely packed excitatory neurons specialized in processing raw visual data, while layer 6, which houses pyramidal neurons, is involved in feedback regulation to fine-tune this information. Using advanced imaging techniques, specifically focused ion beam scanning electron microscopy (FIB-SEM), we conducted high-resolution, three-dimensional reconstructions of the neuropil in layers 4B and 6 of the primary visual cortex. Our aim was to investigate whether the neuropil in each layer exhibits unique structural characteristics that correlate with their distinct physiological properties. Data collected from over 200 axonal boutons revealed that larger axons in layer 4B exhibited more complex PSD morphologies, indicating stronger synaptic connections in this layer. Over 50% of PSDs in layer 4B displayed macular morphology, consistent with its specialization in integrating visual signals. In contrast, layer 6 displayed a diverse synaptic composition with smaller boutons and less complex PSD morphologies, reflecting its role in feedback modulation. Preliminary three-dimensional reconstructions revealed that layer 4B neuropil contains densely packed excitatory neurons with large mitochondria, supporting rapid signal processing, while layer 6 exhibits more variable synaptic structures with smaller mitochondria, consistent with its regulatory function. These findings enhance our understanding of the structural and functional differences between layers 4B and 6 in the macaque V1, highlighting their distinct contributions to visual processing and feedback mechanisms.

Iniya Ramesh

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

#1 Xinfeng Guo

#2 Qingde Wang

Abstract Name: The Adar D1113H mutation in the ADAR1 catalytic domain results in early-onset and MDA5-dependent encephalopathy with IFN pathway activation in the mouse brain.

Aicardi-Goutières syndrome is a severe progressive genetic disorder in young children presenting with symptoms such as encephalopathy, developmental delays, loss of intellectual abilities, and motor control

impairments. Symptoms of AGS typically present themselves within the first year of life, with early-onset beginning at birth and later-onset developing within the first few weeks to months of life. AGS has been linked to mutations in seven different protein-coding genes that are involved in DNA/RNA metabolism and sensing. However, the molecular mechanism by which these mutations impact the neuropathogenesis of AGS remains unclear. As a result, there are no effective treatment measures to stop the progression of AGS. To study the mechanism behind these mutations, we created a mouse model by introducing a mutation at the ADAR1 coding gene, one of the identified protein-coding genes, through the use of CRISPR/Cas-9 technology into the mouse genome. Through breeding, a double gene mutation, ADAR1 and MDA-5, mouse model was developed. RNA sequencing analysis was used to measure the levels of RNA editing in brain mRNA substrates of ADAR1. Additionally, phenotype, gene expression, innate immune pathway activation, and pathologic studies (such as RNA in situ hybridization and immunohistochemistry) were used to identify potential disease mechanisms in the mouse model. Through the mouse model, we established the underlying mechanism of the ADAR1 mutation in AGS. This mutated mouse model exhibited changes in RNA editing of neural transcripts, resulting in heightened IFN-stimulated gene expression. The in situ hybridization showed increased expression of ISG in specific cell-types. Mutant mice presented with early-onset astrogliosis and microgliosis and late-stage calcification in deep white matter. ISG activation and neuroglial reaction are blocked due to the removal of the cytosolic RNA receptor MDA-5. The ADAR-1 mutation results in early-onset encephalopathy leading to IFN pathway activation in mice, which is MDA5 dependent.

Anna Ramesh

PA - Drexel University

Discipline: Biochemistry

Authors:

#1 Riley Young

#2 Mauricio Reginato

Abstract Name: Acetate Protects from Ferroptosis in Breast Cancer Brain Metastatic Cells

Breast cancer kills approximately 40,000 U.S women annually, primarily from widespread metastasis to major organs such as the brain. Investigating the unique metabolic needs of brain metastatic tumors offers a compelling therapeutic opportunity to disrupt their energy supply and effectively "starve" them to death. Healthy brain tissue relies almost exclusively on glucose for energy, consuming approximately sixty percent of the body's total glucose at rest. Thus, while most tumors rely on glucose as an energy source, brain metastatic tumors must turn to alternative energy sources. The brain region harbors the second-highest level of acetate — another potent energy source — in the body. Acetate can be converted to acetyl-CoA by the enzyme acetyl CoA synthetase 2 (ACSS2). Previous research by our group has shown that breast cancer brain metastatic (BCBM) tumors rely on ACSS2 to protect from cell death via inhibition of ferroptosis. To explore acetate's role in BCBM cell survival, we examined breast cancer brain tropic cells in an acetate-rich medium, using both in vitro and ex vivo models. Preliminary experiments with RSL3 reveal that acetate pre-treatment significantly reduces RSL3-mediated BCBM cell death, as observed through crystal violet staining and flow cytometry. We are currently testing whether increasing levels of acetate can protect from other ferroptotic inducers (Erastin, Sulfasalazine, and Sorafenib) and chemotherapeutics used to treat BCBM patients (Cisplatin, Olaparib, and Capecitabine). Our study aims to uncover the range of BCBM cellular processes supported by acetate, including resistance to ferroptosis and chemoresistance. Understanding acetate's role in breast cancer brain metastases could significantly influence the development or refinement of future therapeutics targeting brain metastatic tumors.

Mickala Ramezani

OK - University of Central Oklahoma

Discipline: Nursing and Public Health

Authors:

Abstract Name: Nonpharmacological & Pharmacological Interventions for Anxiety & Stress

Introduction: The adult population often experiences symptoms of anxiety and stress, requiring interventions to prevent dysfunction during activities of daily living. Research has addressed the sustainability and effectiveness of pharmacological methods to manage symptoms of anxiety and stress while acknowledging the adverse effects associated with medication treatment. Other research has highlighted various nonpharmacological methods to manage symptoms of anxiety and stress through holistic interventions that pose minimal to no risks. Sustainability and effectiveness of nonpharmacological interventions are being explored as alternative treatment and in conjunction with pharmacological interventions.

Nonpharmacological interventions as alternatives to pharmacological interventions are safer for those unable to maintain medication treatment related to adverse effects and physiological functioning, but also allows reduced dosing for those requiring medication treatment. Nonpharmacological alternatives are also beneficial for those who struggle to maintain medication compliance. **Purpose:** To discover if nonpharmacological methods are more sustainable and/or effective than pharmacological methods for treating symptoms of anxiety and stress in the adult population. **Methods:** This study uses a descriptive, quantitative design by utilizing surveys with questionnaires to obtain data from individuals that experience symptoms of anxiety and stress. The data retrieved will be based on each participant's perception of their symptoms and how their symptoms respond to nonpharmacological and/or pharmacological interventions used. **Conclusion:** Pharmacological methods are effective with questionable sustainability related to tolerance, dependence, compliance, and adverse effects. Nonpharmacological methods are effective and sustainable when used. More research is required to comprehensively compare sustainability and effectiveness of nonpharmacological methods with pharmacological methods. **Keywords:** nonpharmacological interventions, pharmacological interventions, anxiolytic tolerance, adult anxiety, adult stress

danna Ramirez

UT - Weber State University

Discipline: Exercise Science and Nutrition

Authors:

#1 Danna Ramirez-Quintero

#2 Margarita Lopez

#3 David Aguilar-Alvarez

Margarita Lopez

Abstract Name: Effects of Marathon Running on Inflammatory Cytokine Levels: Acute Increases and 48-Hour Resolution

Purpose/Hypothesis: Marathon running requires multiple hours of exertion that can result in significant changes in inflammatory markers even days after the competition. We investigated how running a marathon affects inflammatory cytokines before, immediately after, and 48 hours post-race. We hypothesize that inflammatory cytokines will increase post-race and return to baseline after 48 hours. **Methodology:** Blood samples were collected from 24 Ogden Marathon runners at three time points: pre, post, and 48 hours after the race. Plasma levels of TNF- α , IFN- γ , IL-4, IL-10, IL-6, and IL-1 β were measured using Luminex® MAGPIX® multiplex assays, with differences analyzed using repeated measures ANOVA. **Results:** IL-6 levels increased significantly from pre to post (3.1 ± 1.2 vs 70.8 ± 18.1 , $p = .002$) but returned to baseline after 48 hours (3.1 ± 1.2 vs 2.4 ± 0.1 , $p = .22$). IL-10 levels also rose post-race (21.5 ± 7.1 vs 98.8 ± 21.4 , $p = .001$) but fell below baseline at 48 hours (21.5 ± 7.1 vs 14.1 ± 4.8 , $p = .035$). No significant change was observed in

TNF α pre to post (25.8 ± 4.9 vs 27.6 ± 4.6 , $p = .74$), but a significant decrease was noted at 48 hours (27.6 ± 4.6 vs 17 ± 3 , $p = .046$). Discussion/Conclusion: Muscle contraction results in the secretion of cytokines IL-10, IL-6, and TNF α which were expected to increase after running a marathon. IL-10 has potent anti-inflammatory and pro-resolving properties; the return to below baseline levels observed after 48 hours is likely due to finalizing the resolution process of inflammation. IL-6 induces the secretion of anti-inflammatory cytokines, induces glucose production, and triggers fatty acid oxidation, which is a process favored during long-distance running.

Jimena Ramirez

OK - East Central University

Discipline: Biochemistry

Authors:

#1 Courtney Karner

#2 Yilin Yu

Abstract Name: Investigating the role of GOT2 in kidney development

Proliferation of nephron progenitor cells (NPC) is essential to maintain and expand the progenitor pool during kidney development. Proliferation depends on mitochondrial aspartate biosynthesis to fuel nucleotide synthesis. Glutamic-Oxaloacetic Transaminase 2 (GOT2) is a mitochondrial enzyme that catalyzes the transamination of glutamate and oxaloacetate to form aspartate and α -ketoglutarate. While GOT2 is essential for nucleotide synthesis and proliferation in cancer cells, the role of GOT2 during kidney development is unknown. Using publicly available scRNAseq datasets and immunofluorescence (IF) staining, we show Got2 is broadly expressed during kidney development. To determine the necessity of GOT2 we took a genetic approach to knockout a conditional (floxed – fl) Got2 allele in NPC using Six2Cre. Western blot and qPCR analyses of newborn mice confirmed efficient ablation of Got2 using this approach. Histology and gross analyses found that Six2Cre;Got2^{fl/fl} mice have smaller kidneys at birth. IF staining using both anti-Six2 and anti-Pax2 found a reduction in the size of the NPC population in Six2Cre;Got2^{fl/fl} mice compared to Six2Cre;Got2^{fl/+} littermate controls. Our findings suggest that GOT2 is essential to maintain and/or expand the NPC population. In light of these findings, future studies evaluating the effects of Got2 ablation on proliferation and apoptosis are warranted.

Rachel Ramirez

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: +55 Active Adult Residential Community Design Promoting Health, Wellness and Longevity Based on The Blue Zone Project.

With the aging U.S. population, particularly baby boomers transitioning into retirement, there is a growing demand for lifestyle-oriented housing that supports independence and wellness. This project aimed to design a +55 active adult residential community, The Grove, promoting longevity and adaptability by integrating Blue Zone Project values. The Blue Zone Project promotes creating healthier environments to naturally nudge people towards healthier choices. The research on longevity and wellness coincides with the 9 traits based on the Blue Zone project research: move naturally, right outlook with purpose and downshift, eat wisely with the

80% rule, plant slant, wine at 5, and connect, positive pack, loved ones first and belonging. Drawing inspiration from Sardinia, Italy—a recognized Blue Zone region—The Grove incorporates Mediterranean design elements such as vibrant citrus-inspired colors, terracotta tiles, and lush communal gardens. These elements blend with modern architectural practices to enhance quality of life. Additionally, this project focused on creating an inclusive and age-friendly environment that fosters social engagement, security, and health for residents aged 55 and older. The methodology combined a literature review, case studies of similar active adult communities, and interviews with target participants to define essential design features, including walkability, social integration, and adaptable layouts. Expected outcomes include a mixed-use building offering diverse apartment units, resort-style amenities, and communal spaces that encourage interaction while maintaining privacy. Key design features include ADA-compliant designs, natural lighting, and health-focused spaces to support residents' evolving needs and well-being. By addressing the stigmas associated with senior living, this project redefines perceptions of active adult communities, distinguishing them as vibrant hubs for active aging. This design will work as a precedent for sustainable, community-oriented housing solutions, enhancing well-being and fostering longevity among older adults.

Emilia Ramirez

CA - Citrus College

Discipline: Engineering

Authors:

#1 Pablo Benalcazar

Abstract Name: The Human Factor: What Energy Systems Engineers Have Been Missing

Amidst a rapidly changing environment due to climate change and pollution, along with a global rise in energy demand, creating relevant and accurate energy systems models has become imperative to not only meet the rising energy demand, but also do so while mitigating carbon emissions. Moreover, those who are in most need of access to energy and who are most vulnerable to climate change, pollution, and the disastrous effects that come along with them, are rural communities. A potential solution that is versatile enough to meet rural energy demand while decreasing carbon emissions and dependence on fossil fuels is the use of hybrid renewable energy systems (HRES) in rural electrification (RE) projects. There exist numerous techniques for optimizing HRES models, and in many cases, these systems have been shown to be economically feasible for various rural communities. However, once implemented in the real world, the majority of these systems and RE projects tend to fail, end prematurely, or even cause negative after-effects in the community. For too long, energy systems models have prioritized cost-effectiveness and profits while omitting crucial externalities that significantly affect their success, and most importantly, the people in the affected rural communities. This research explores social and ecological factors, as well as effects of RE projects in rural communities often overlooked by energy systems engineers and how incorporating these factors in all stages of modeling, design, and implementation can help increase chances of long-term success while allowing rural communities to maximize the potential benefits of electrification. Through a human-centered, multidisciplinary approach, an HRES will be optimized in GAMS (General Algebraic Modeling System program) for a typical rural community in Ghana considering the unique meteorological, ecological, techno- and socio-economic constraints of the region with linear programming as the main optimization method.

Levi Ramirez Garcia

CA - Chapman University

Discipline: Political Science

Authors:

Abstract Name: Factors in Decision Making of Political Candidates

What factors impact the decision to run as non-partisan over one of the major US parties? It is essential to analyze this phenomenon to determine the real motivations of candidates and the party they represent because they impact society as a whole. The candidates' ideologies and how the candidates feel representing the parties' ideologies are the main reasons for choosing non-partisan over one of the major US parties. This occurs because humans tend to work where they feel comfortable and in places with the same values and ideologies as them. It is the same in the case of candidates; they look to represent a party with whom they share ideologies. The dataset is taken from the Campaign Finance in Local Elections: An Eleven City Study, 1989-2007, which provides essential data on local politics. Specifically, data shows that the likelihood of candidates running non-partisan might decrease based on the type of political office.

Jennifer Ramos

TX - The University of Texas - Permian Basin

Discipline:

Authors:

#1 Seyed Ghiaasiaan

Emilio Ibarra

Adrian Sandoval

Abstract Name: Violin Shoulder Rest

The violin shoulder rest is an optimal tool used by musicians to help alleviate some unwanted stress and weight during a performance. The shoulder rest focuses on three major components that include comfort, stability, and durability. The three components are taken into consideration in the design process and when considering materials, in today's market it seems that some of these traits are not completely included leaving out one or the other. Some common issues seen in shoulder rest today stem from the two-legged design that many companies incorporate, with the shoulder rest not being tightly secured onto the instrument causing slipping and coming out of place even during performance. Another main issue with the two-legged design can be seen in beginners as they lack the knowledge of the correct positioning of their shoulder rest to maximize comfort resulting in a painful playing experience. The materials used when constructing the shoulder rest seemed to be cheap and saw a lot of wear and tear over time, not compensating for the large price tag they come with. Our goal is to create a modular design that implements comfort, stability, and durability while focusing on lowering the overall price to allow all skill levels to have access to our product. With that being said, we also want to focus on the customizable aspect of our design making it versatile to all types of players by making the legs adjustable to fit any sized instrument from violas to violins, to include customizable padding to fit all types of shoulder rest to enhance longevity.

Melinda Ramovic

PA - Lafayette College

Discipline: Biology

Authors:

#1 Ezra Lencer

Abstract Name: The Role of pou4f4 in Neurogenesis: Testing for Compensation and Sufficiency

The goal of this project is to determine the role of the POU Class IV family of transcription factors in neurogenesis. Data shows that the paralog pou4f4 is expressed in neuronal progenitor cells such as Rohon-Beard neurons and cranial ganglia. Rohon-Beard neurons are a transient population of cells that function as the early peripheral nervous system during larval stages in amphibians and fish. However, when pou4f4 is knocked out in zebrafish, there is no observed change in phenotype after 24 hours post-fertilization. A possible mechanism responsible for this may be through upregulation of a similar gene within the POU class IV transcription factors. I previously conducted qPCR to test for compensation in the absence of pou4f4. My data shows that the paralog pou4f1 is upregulated in pou4f4 mutants, suggesting that pou4f1 may compensate for pou4f4. This project will use zebrafish that will undergo CRISPR/Cas9 mediated mutations to create a pou4f4 and pou4f1 mutant background to test if compensation occurs when a nonsense mutation is introduced. If compensation occurs, I expect to see an altered phenotype, such as decreased cell numbers in the cranial ganglia of embryos after 24 hours post fertilization, and decreased numbers of Rohon-Beard cells in the trunk of the embryo. This project will also address the role of pou4f4 in cell differentiation. To test this, zebrafish embryos will be injected with pou4f4 mRNA to overexpress the gene, and imaged through immunofluorescence. If pou4f4 has a critical role in determining cell fate, we should expect to see higher numbers of axons, and higher cell counts of the cranial ganglia and Rohon-Beard cells.

Tristyn Rampersad

FL - Stetson University

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

#1 Joshua Rust

Abstract Name: Analyzing Racial Disorientation Through Predictive Processing

In *Disorientation: Being Black in the World*, Ian Williams explores the feelings of uneasiness and uncertainty that he experiences after racial encounters. He terms this feeling racial disorientation, “the effect of racial encounters on racialized people, the whiplash of race that occurs while minding one’s own business.” In *The Experience Machine*, Andy Clark provides a new model for human perception and cognition. He explains that rather than experiencing the world directly through our senses and constructing a picture of the world from what we see and hear, the brain functions much more like a prediction machine. Humans already form predictions about their experiences prior to any sensory input. Our brains then subtract that predictive model from sensory data, leaving behind residual errors: the discrepancy between expectation and reality. In this paper, I will argue that racial disorientation is caused by a residual error in one’s racially inflected encounters with another by way of the brain’s comparison of its predictive model to actual sensory data. This error arises from the stark contrast of a person’s predictive model for everyday social encounters and the reality of unexpected racial interactions. Through this lens, the paper aims to explore the cognitive underpinnings of racial disorientation.

Hannah Ramsperger

CA - California Institute of Technology

Discipline: Engineering

Authors:

Abstract Name: Ignition of Aviation Fuels and Surrogates in Hot Air Atmospheres – Parametric Analysis on the ASTM Injection System

The ignition properties of aviation fuels and surrogates are assessed in the ASTM-E659 standardized test apparatus. A small volume, 0.1-0.5 mL, of liquid fuel is injected with a syringe into hot air within a flask contained in a temperature-controlled furnace. Given that the test results strongly depend on injection characteristics, we use an automatic injection system to control the height, speed, and duration of the syringe's needle inside the hot atmosphere. We investigated how injection parameters influence ignition behavior using the temperature signals inside the flask. After conducting one hundred tests, we found that different injection parameters significantly affect the initial temperature condition and fuel volume in the flask. If the needle stays inside the flask for more than 10 seconds, approximately 150% of the initial fuel volume vaporizes. We also found that vaporization influences the temperature decrease more than the needle itself. To prove this, we visualized the injection jet with a high-speed camera in a transparent rectangular cell heated by a hot plate. This test showed that vaporized fuel enters the container even without injection, validating our hypothesis. This finding suggests that the injection in the standardized ASTM-E659 test should last less than 10 seconds to have accurate results.

Alaina Ramundo

KY - University of Kentucky

Discipline: Exercise Science and Nutrition

Authors:

#1 Lara Amaral

#2 Oyenmwun Abu

#3 Kevin Pearson

Abstract Name: Can Exercise Protect against Forever Chemicals in Female Mice?

This project aims to determine whether exercise can affect overall tissue distribution and excretion of long-lasting forever chemicals. Per- and poly-fluoroalkyl substances (PFAS), a family of synthetic chemicals characterized by strong carbon-fluorine bonds, are of concern given their ubiquity and persistence (forever chemicals). Prenatally, PFAS are known to contribute to growth restriction and influence the risk of chronic diseases later in life. The research community must identify lifestyle interventions to diminish PFAS-associated children's health impacts. Therefore, we set up a mouse model to test the hypothesis that voluntary wheel running will decrease PFAS levels in mouse serum and tissues compared to sedentary mice. To test our hypothesis, 30 8-week-old female C57BL/6J mice were singly housed and fed either a low- (10 kcal% fat) or high-fat diet (60 kcal% fat) with access to unlocked (exercise) or locked (sedentary) running wheels (n = 5 per exercise and diet group). After 5 weeks of exercise, mice were fasted for 3 hours and exposed to a PFAS mixture (0.4 mg of PFAS per 1 kg of body weight) via oral gavage. Urine and feces were collected after 24 hours. The mice were then treated with a 2nd dose of PFAS after one additional week, and mice were euthanized after 24 hours. Serum and tissues were collected, flash-frozen, and prepped for PFAS quantification. We expect PFAS levels in exercising mice to be lower than those in sedentary mice in the serum and tissues. However, the PFAS levels in the feces will be higher in the exercising mice because of lower uptake or higher excretion. If exercise positively influences PFAS body burden, future studies will determine whether exercise during pregnancy can protect offspring from developmental exposures to PFAS. These studies may generate new avenues for interventions to mitigate the impacts of PFAS exposures on future generations.

Aleila Rankin

VA - Norfolk State University

Discipline: Social Work and Human Services

Authors:

#1 Aleila Rankin

#2 Sharon Alston

Abstract Name: The Implications of Public Housing on Resident's Mental Health

Public housing offers affordable housing options for residents with low-income. However, the current conditions of public housing developments have significant implications for the overall well-being of residents. Without the proper resources to support their physical, mental, or social needs, public housing residents will be at further risk for more problems. This poster will discuss the impact public housing has on mental health on the socially vulnerable and what can be done to alleviate their struggles. This study employed a cross-sectional research design with a convenient sample of 211 African Americans residing in public housing. Participants were recruited through posting of fliers within the housing developments where they resided and through a snowball sampling technique. Of the 211 participants, 70% were female, and 33% identified as head of household with 75% having an associate degree or less. Data was collected using the Qualtrics online platform. The questionnaire included demographic variables and self-administered standardized scales including the CESD depression scale, Anxiety Sensitivity Index, Subjective Neighborhood and the Self-efficacy scales. Preliminary data analysis revealed that 50% of the sample is both clinically depressed and anxious with a mean score of 17.9 and a standard deviation of 11.5 and mean score of 21 with a standard deviation of 5.77 respectively. This research identifies the psychological impact of residing in public housing on public housing residents. The preliminary results suggest that the current conditions of public housing continue to be a stressor for residents. The result for this study has implications for those who work directly in housing, where they can reevaluate how to meet the specific needs of public housing residents. In correlation with public policy, this study provides valuable data that can be used to push for more policies that recognize the importance of proper mental health in critical housing conditions.

Anshu Rao

GA - Kennesaw State University

Discipline: Health and Human Development

Authors:

#1 Lei Shi

Abstract Name: Creating a Digital Twin of the Human Heart Using Machine Learning

Personalized simulations of the left atrium enable professionals to create patient-specific models that replicate the unique electrophysiological and biomechanical behavior of the atrium. Segmentation of patient-specific CT/MRI data is used to create finite element analysis (FEA) meshes, which enable precise modeling. However, manual segmentation is time-consuming and prone to errors. Additionally, existing neural network-based tools fail to capture detailed anatomical features limiting their use for FEA simulations and personalized treatment planning. The aim of this research is to develop an automated neural network-based tool to accurately segment the left atrium and create a ready-to-use FEA mesh for left atrium simulations. Our approach addresses these challenges by focusing on the intricate anatomy of the left atrium, including the appendage and trabeculations, to improve both segmentation accuracy and simulation quality. To achieve this, we will train a neural network using 120 3D CT/MRI images from public datasets and 100 CT images from Emory University collaborators. The images are then manually segmentate to render a replica of the left atrium through the SimVascular workflow. The segmentation is then smoothed using the software tool

Meshmixer to create high-quality training datasets. Data augmentation will enhance the dataset. We will implement a HeartDeformNet-derived neural network for segmentation, using 150 images for training, 20 for validation, and 50 for testing. The predicted meshes will be compared with manually segmented ones using the DICE score and other quality metrics. The predicted FEA mesh will be integrated with a 0D lumped-parameter model to simulate full-cycle left atrium function based on patient-specific inputs such as ECG signals and pressure measurements. We expect this tool to reduce segmentation time and effort while improving simulation accuracy, contributing to better pre-surgical planning and personalized cardiovascular treatments.

Samarth Rao

TX - The University of Texas at Austin

Discipline: Chemistry

Authors:

#1 Diana Zamora-Olivares

Abstract Name: Use of Untargeted Mass Spectrometry-based Metabolomics to Profile Texas Wines

Vitis vinifera is economically one of the most important plant species. Worldwide, the U.S.A. is the fourth highest wine producing country, where 87% of grapes harvested from *Vitis vinifera* are used for wine production. Comprehensive characterization of metabolites and biomarkers to uncover signatures specific to the producing regions has been accomplished by leading producing countries. Texas is one of the oldest and major wine producing states in the U.S.A. Wines contain a complex-versatile metabolome signature, including flavonoids, organic acids, sugars, and other phenolic compounds. Wine metabolites can be affected by factors such as grape varietal, ripening stage, regional environment, and the winemaking process. Central Texas endures harsh environmental conditions such as heatwaves and drought during the growing season. Interestingly, wine produced in this region is considered of singular high quality, showing a major increase of wine production in the last decade. Thus, it is imperative to identify wine biomarkers specific to the region. To our knowledge, there is no research precedent on metabolite profiling of wines produced in Central Texas. Herein, the goal is to characterize for the first time, the metabolomic profile of 8 wines produced from 4 vineyards located in Central Texas using mass-spectrometry based metabolomics. The second aim is to analyze the produced multivariate data to obtain information about correlations, similarities and differences between measured metabolites and grapevine varietal using Compound Discoverer and MetaboAnalyst. The following metabolomic workflow stages have been accomplished: 1) collection of wine samples, 2) extraction of metabolites using a liquid-liquid extraction method 3) experimental analysis using high-resolution mass-spectrometry for untargeted metabolomic profiling and 4) identification of over 300 metabolites. Principal Component Analysis, Partial Least Squares Discriminant Analysis, and Heatmaps were utilized to elucidate important patterns and relationships between varietals and their metabolites.

Tanmayi Rao

PA - Drexel University

Discipline: Psychology

Authors:

#1 Tanmayi Rao

Abstract Name: Adolescent Depression Among Chinese Immigrants and American Youth: A Comparative Study Before and After the COVID-19 Pandemic

Adolescents are susceptible to depression during a critical developmental period, negatively impacting their social relationships. Depression impacts various cultures, including Americans and Chinese immigrant adolescents. A literature review that examined depressive symptoms from before and after the COVID-19 pandemic reveals that during the pandemic the prevalence of depression in both American and Chinese adolescents significantly increased. Notably, research indicates higher increase in prevalence of depressive symptoms among Chinese adolescents in immigrant families, in comparison with American adolescents, primarily due to acculturation being an added stress. A crucial factor for adolescent mental health is their relationships with their peers. Academic pressure and reduced opportunities for in-person interactions related to the COVID-19 lockdown likely intensified symptoms of depression in adolescents. In contrast, a positive and uplifting environment amongst peers provides support for someone who may be depressed. Future research should focus on developing better social skills and tracking rates of depressive symptoms in adolescents, focusing on acculturation with Chinese immigrant adolescents.

Abigail Raper

MN - Minnesota State University - Mankato

Discipline: Interdisciplinary

Authors:

#1 Jess Schomberg

Abstract Name: U Stressed? Do Library Employees Experience More Technology Eustress Or Distress?

This research project has developed in response to ongoing conversations regarding library technology usage and its impact on work-related stress. We inquire whether library employees experience more technology eustress or distress on the job. This was inspired by Tarafdar's (2017) "The Technostress Trifecta." Our study explores a facet of her theoretical framework, specifically the relationship between motivating (eustress) and discouraging (distress) technology stress. The research project uses a mixed method of survey and follow-up interview. Study participants receive a recruitment email through a Minitex newsletter—read by people who work in public, private, and tribal libraries in Minnesota—to complete a scaled questionnaire. They are then invited to an optional, semi-structured interview to collect qualitative responses about their workplace and techno-stress. We hypothesize employees feel more techno-eustress than distress. The discussion of techno-stress includes factors such as uncertainty, overload, and training. This study provides a frame of reference to identify areas of growth for programs and more nuanced discussions about technology in libraries.

Megha Rastogi

DC - American University

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: Khaana Khazana: Food Labor in Cosmopolitan India

This work aims to understand the relationship between food workers, gender norms, and class dynamics within economically and culturally diverse Indian cities. While food workers, specifically chefs and food makers, inhabit a central role in urban food consumption and cultural systems, their labor and positionality transcend the spatial confines of a restaurant. However, present research focuses on food workers as products of their occupation, rather than considering their positionality within larger sociopolitical dynamics and how

they shape these processes. This gap has manifested in both the subjugation of food workers to the boundaries of the restaurant and a dearth of insight into their perspective regarding ideological principles and values that govern their work, based on class hierarchies and gender roles/norms. Restaurants reinforce class divisions, only intensifying since the end of the COVID-19 pandemic; the space thus provides ethnographic glimpses of ethnic food spaces, while the food laborers reveal wider implications about social values from their position in local and global political economies. The research bridges these gaps through the triangulation of participant observations, interviews, and menu analysis of four eateries in Mumbai, with the data collected over a week. Using open coding to analyze the data, the study finds that the experiences of food workers, however varying, display characteristics of broader sociopolitical frameworks; the differing roles of gender within the workspace and within the household was represented throughout the data. The occupational limitations and systemic inequity faced by chefs in urban Indian eateries also contributed to their views; Western ideals and influence in the Mumbai's restaurant scene shaped how some food workers approached their work, while fiscal necessity motivated others. This research suggests important findings regarding the interplay between political economy and sociopolitical factors, like class, gender, and Westernization, for food workers in major cities of the Global South.

Cloe Ratliff

WV - West Virginia University

Discipline: Biochemistry

Authors:

#1 Jianhai Du

Abstract Name: Absolute Quantification of Amino Acids in Female and Male Ocular Tissues

Purpose: The eye is one of the most metabolically active organs within the human body; the metabolites it uses are affected by gene expression, diet, and exposure. Metabolic dysregulation can lead to diseases such as diabetic retinopathy and age-related macular degeneration (AMD), the number one cause for blindness for the elderly. It is known that women are more susceptible to AMD, cataract, and glaucoma, but the biochemical basis for these sex differences is unknown. This study aims to both quantify and contrast the metabolic pathways of certain amino acids within ocular tissues in relation to time of day and sex. Methods: We collected four different tissues, including retina, retinal pigment epithelium (RPE), cornea, and lens of 8-week old wild type (WT) C57BL/6J mice; male (6) and female (6), at either 10 am or 2 pm. We were able to differentiate the metabolic usages between sex and different times of the day. These samples were run through a Shimadzu LC, paired with a Qtrap 5500 mass spectrometer using a metabolomics assay. Results: Multivariate analysis helped identify key metabolic changes that are sex and tissue specific. There was no difference in male retina or RPE based on time. The female displayed differences in isoleucine, leucine, and lysine in the retina, as well as metabolites in the TCA and glycolysis cycles in RPE. In cornea there is downregulation of taurine in both sexes at 2 pm. Females show a decrease in 21 metabolites whereas males display only 4. Remarkably, metabolites associated with nucleotide and glutathione pathways are upregulated in male lens tissue only. Conclusion: These results suggest time of day has a greater impact on amino acid abundance in females in comparison to males in their retina, RPE, and cornea; the opposite is true for the lens.

Will Ravetto

IL - Governors State University Honors College

Discipline: Psychology

Authors:

#1 Jade Groble
#2 Hayley Stewart
Hayley Stewart

Abstract Name: From Grace to Guilt: How Spirituality Affects Regret

Problem or Major purpose: Current regret literature suggests a psychological difference in how people cognitively evaluate their own role in suboptimal outcomes, in terms of actions taken. Initial studies report a robust action effect (Kahneman, 1982); however. Subsequent studies have challenged these findings and suggest that it is the inactions that elicit greater regret (e.g., Gilovich & Medvec, 1995). When facing the consequences of our most impactful decisions, spirituality may significantly impact the decision-making process, in turn the amount of regret experienced. It will explore the role of spirituality with regards to experience of regret. It is expected that spirituality will affect regret, and the directionality of the effect is contingent on the presence of a negative or positive spiritual styles. Procedure: This study will examine the interactive effect of decision type (action vs. inaction) and level of spirituality (low vs. high) on the intensity of regret using a scenario paradigm. Participants will be asked to complete the Religious Coping Scale (RCOPE) (Kenneth, Bockrath & Donna, 2011), after which they will be instructed to imagine themselves either changing or sustaining a regretful decision. Participants will then rate the amount of regret they would experience upon a negative outcome. Results: Approximately 60 participants. will be recruited. We expect to find a main effect of decision type—individuals will report experiencing more regret following a (failed) action. Additionally, a significant interaction between the level of spirituality and decision type is expected. D. Conclusions: This study is expected to shed light on spirituality as a contributing factor to experience of regret following (failed) action/inactions based on the religious coping styles. Positive religious coping styles are expected to produce less feelings of regret from their failed actions whereas negative religious coping methods should experience greater difficulty in absolving personal guilt following a change in decision (action).

Sanjaykrishnan Ravikumar

GA - Kennesaw State University

Discipline: Computer Science

Authors:

#1 Sanjaykrishnan Ravikumar
Ravi Kumar Rogannagari

Abstract Name: The Impact of Adversarial Attacks on Remote Sensing Applications

This research investigates the vulnerability of remote sensing systems to adversarial attacks, focusing on datasets used for object classification. Remote sensing technologies are vital for automated surveillance, environmental monitoring, and disaster management. However, these systems are susceptible to adversarial attacks, where subtle, deliberate modifications to input data can mislead machine learning models, compromising their performance in detecting and classifying objects. In this study, we demonstrate the impact of adversarial perturbations using the Fast Gradient Sign Method (FGSM). Using the UC Merced dataset, we first train a model that achieves 87% accuracy. After applying FGSM attacks, the accuracy plummets to 32%, underscoring the vulnerability of remote sensing systems to such attacks. This significant drop highlights the importance of developing robust defense mechanisms. To counteract these attacks, we implement two defense strategies: ensemble learning and Projected Gradient Descent (PGD). Ensemble learning combines the outputs of three models, averaging their scores to boost accuracy to 55%, demonstrating moderate resilience against FGSM attacks. PGD, a more robust defense technique, effectively mitigates the effects of FGSM by training with adversarial examples, restoring the model's accuracy to 84%, nearly matching the original performance. This demonstrates that PGD is significantly better at mitigating the effects of adversarial perturbations and ensuring system reliability. The findings emphasize the critical need for secure remote

sensing systems and provide actionable strategies to improve their robustness. Remote sensing systems are integral to both public and private sectors, and securing them against adversarial attacks is essential for maintaining their effectiveness in real-world applications. This research contributes to the development of more secure machine learning systems for remote sensing, ensuring their reliability in crucial applications such as surveillance and environmental monitoring. The results underscore the importance of advanced defense mechanisms in safeguarding the accuracy and integrity of remote sensing technologies.

Tanisha Ravindran

IA - Iowa State University

Discipline: Computer Science

Authors:

#1 Tanisha Ravindran

#2 Anna Fedie

#3 Betsy Hahn

#4 Dara Darling

#5 Michelle Loo

Michelle Loo

Abstract Name: What are the Capabilities and Pitfalls of LLMs on Integral Calculus Problems with Zero-Shot Reasoning?

This paper investigates the challenges faced by Large Language Models (LLMs) in accurately solving complex calculus problems. LLMs are increasingly applied to diverse tasks, offering solutions across a broad range of topics. Our research examines the limitations of LLMs, focusing specifically on their performance in solving geometric calculus problems, such as calculating areas of cross-sections, areas between curves, volumes of solids of revolution, surface areas of revolution, and triple integrals in rectangular coordinates. We assess the accuracy of ChatGPT-4.0 mini and Microsoft CoPilot by analyzing both their successes and inconsistencies in the integration steps required for these multi-step calculus problems. A grading rubric is employed to evaluate each model's reasoning accuracy, with particular emphasis on their geometric capabilities. After identifying patterns in their performance, we assess the significance of these patterns to address specific types of calculus challenges. We will report our findings. Ultimately, our findings highlight critical areas for improvement in LLM-driven calculus computation, providing insights that can potentially inform future model development.

Kanika Rawat

CA - Aspiring Scholars Directed Research Program

Discipline: Interdisciplinary

Authors:

#1 Richa Prasanna

#2 Nicki Yazdi

#3 Anoushka Vijay

Nicholas Ke

Abstract Name: Genome Variation Analysis between Different American Populations to Improve Precision Medicine

Precision medicine, which focuses on how mutations affect human drug response and susceptibility to diseases, needs more genetic diversity. Our purpose is to address this issue, making healthcare more equitable. Native Americans are among one of many American populations facing underrepresentation in genomic studies, facing lower life expectancies compared to other populations according to the Office of Minority Health. Our central research question considers whether a personalized medical approach is needed among different American populations due to genetic variation. Our objectives include discovering novel variants, analyzing their relationship to drug-response, and connecting these results to prevalent diseases in American subpopulations, especially those facing health inequities. We hypothesize that our analysis will yield notable clinical recommendations thereby reducing health inequity. Our research methodology includes epidemiology research to identify major disease trends based on literature from the National Institute of Health and other sources, variant calling using Genome Analysis Toolkit 4, and identifying significant pharmacogenetic recommendations through the Pharmacogenomics Clinical Annotation Tool (PharmCat) and the PharmGKB database. The results of our PharmCat analysis of variants from the Alaskan Native sample yielded 54 strong clinical recommendations, across 33 drugs and 9 clinically-relevant genes. Out of these 54 recommendations, there were 10 recommendations for alternatives to 4 drugs: citalopram, clopidogrel, escitalopram, and simvastatin. In the 52 Paleo-Eskimo samples, we identified 15 clinically significant variants among 11 genes affecting response to drugs for depression, addiction, HIV, cancers, and other diseases. In conclusion, we have found clinically significant variants and genotypes identified in our samples, which we hope can lead to better health outcomes for modern Indigenous populations in the Canadian Arctic, Alaska, the Aleutian Islands, Chukotka, and East Siberia. Overall, our research advances the field of precision medicine, using clinically significant recommendations to improve healthcare outcomes, especially for underrepresented groups across the nation.

Zakary Raymond

CA - University of the Pacific

Discipline: Health and Human Development

Authors:

#1 Zakary Raymond

Abstract Name: Optimization of Adipogenic Differentiation Potential of Lipedema-Origin Adipose-Derived Stem Cells (ADSCs)

Lipedema, a chronic disorder characterized by metabolic and inflammatory abnormalities, as well as, disproportionate subcutaneous fat accumulation affects 11% of women worldwide. Despite its prevalence the disease remains underdiagnosed, poorly understood, and lacks effective treatments which highlights the need for deeper exploration. Adipose-derived stem cells (ASCs), with their accessibility and ability to differentiate into adipocytes, present a valuable tool for modeling adipose tissue disorders. This study aims to create a reliable in vitro model that replicates the diseased state, enabling further exploration of Lipedema-specific metabolic dysfunctions and fostering advancements in diagnostic and therapeutic strategies. Furthermore this study tailors adipogenic differentiation for Lipedema-ASCs, offering insights into disease-specific behavior and metabolic resistance that are distinct from lean and obese controls. ASCs were isolated from SAT samples of lean, obese, and Lipedema donors. Cells underwent adipogenic differentiation using various treatments, including full (14 day) and half (7 day) durations of Rosiglitazone, a Ppar γ agonist, and Adipoqual, a commercially designed differentiation protocol. Differentiation success was evaluated by quantifying lipid accumulation through Oil Red O staining and analyzing key adipogenic markers (e.g., Ppar γ , Fas, and SCD-1) through qPCR and chemiluminescent western blotting. Comparing results across sample groups assessed the distinct responses of Lipedema-ASCs under optimized conditions. Preliminary findings suggest that Rosiglitazone treatment yields the highest adipogenic differentiation, with Lipedema-ASCs demonstrating unique metabolic characteristics compared to lean and obese counterparts. These results provide a foundation for future studies to investigate the metabolic resistance and thermogenic deficiencies associated with Lipedema. By bridging the gap in understanding Lipedema's pathophysiology, this study provides important foundational information for improved diagnosis and treatment of this debilitating condition.

Laurel Raymond

MN - Hamline University

Discipline: Exercise Science and Nutrition

Authors:

#1 Laurel Raymond

#2 Olivia Tobin

#3 Divya Bhaskaran

Abstract Name: Determining The Effects of Ankle Fatigue on Division III Gymnasts vs Non Gymnasts With Varying Levels of CAI

Introduction: Gymnasts use their ankles in diverse ranges of motion and have high proprioceptive abilities. Despite this, their ankles are the most commonly injured joints. Gymnasts have reported high rates of chronic ankle instability (CAI) which is related to muscle fatigue. This study aims to compare the effects of muscle fatigue in gymnasts and non-gymnasts with varying levels of CAI. The clinical significance of this study will be to provide a better understanding of the muscles of a gymnast to design ankle rehabilitation protocols specific to this population. Methods: The study recruited 10 female gymnasts and gender matched non-gymnasts. Participants self-reported their levels of CAI. The muscle activity of the medial Gastrocnemius (MG), peroneal longus(PL), and tibialis anterior(TA) was measured using a Noraxon Electromyography system. Multiple rounds of a strenuous activity protocol, which involved hopping, shuffling and running, was performed by participants until they reported a level 9 or 10 on the BORG scale. The ankle stability tests such as the Y-Balance, single leg stance (SLS), and single leg hops (SLH) were performed before and after the strenuous activity protocol. Results: Significant differences between the two groups were observed. MG post strenuous activity was significantly higher in the gymnasts compared to non-gymnasts when performing single leg hops on the right leg. During the Y balance test, post strenuous activity: the gymnasts demonstrated almost no change, while the non-gymnasts reached significantly lesser distance. Conclusion: The study observed different behaviors between the gymnasts and non-gymnasts, but not sufficient differences to prove significance. This could be due to the small sample size. In summary, there were some instances where gymnasts out-performed non-gymnasts after the strenuous protocol. However further research needs to be conducted to confirm our hypothesis.

Leticia Raymundi Pinheiro

AL - Auburn University

Discipline: Nursing and Public Health

Authors:

#1 Amy Pridemore

#2 Claire Thompson

Abstract Name: Enhancing Preconception Care Awareness to Improve Maternal Health Outcomes in Marginalized Communities: A Focus on Reducing Health Disparities in Alabama

Maternal mortality rates in the United States have been rising despite global declines, with Alabama experiencing particularly high rates at 36.4 deaths per 100,000 live births in 2020. This trend persists despite improvements in in-hospital delivery and prenatal care, highlighting underlying systemic issues. Marginalized communities, especially women of color and those in rural areas, face significant barriers to healthcare,

including limited access to prenatal care, provider shortages, socioeconomic disparities, and systemic racism. These factors exacerbate maternal health disparities, particularly as more women experience chronic conditions like obesity, hypertension, and diabetes at younger ages. Poorly managed chronic conditions increase the risk of pregnancy complications, including maternal and neonatal death. Consequently, there is a critical need for healthcare interventions that prioritize women's health before conception, during the inter-conception period, and throughout their reproductive years. This project seeks to improve awareness and knowledge of preconception care among women of childbearing age in marginalized communities in Alabama. Data collection will take place at three community health centers: Chambers County Community Health and Wellness Center, AU Health and Education Clinic, and Opelika's Neighborhood Mobile Wellness Clinic. Participants will complete surveys assessing their knowledge of chronic conditions, physical activity, nutrition, substance use, and medication habits. Based on identified knowledge gaps, individualized group teaching sessions and one-on-one consultations will be implemented. Post-intervention surveys will measure changes in knowledge, health behaviors, and motivation to adopt healthier practices. The objective is to empower women to understand the impact of their health behaviors on future pregnancy outcomes, improve their self-efficacy, and motivate them to take an active role in their health. This intervention aims to promote healthier behaviors among reproductive-aged women, ultimately improving maternal and infant health outcomes in Alabama and similar communities.

Ayaan Raza

CA - Bellarmine College Preparatory

Discipline: Engineering

Authors:

Ayush Guha

Venkat Prasanna Kumar

Abstract Name: Comparative Analysis of Experimental and Modeling of a High-Power LED Panel Performance using ANSYS Modeling

High-energy LED panels find diverse applications, such as indoor or space agriculture. However, LED panels generate excessive heat, reducing their efficiency and posing a risk of permanent damage. In this study, an effort is made to combine two passive cooling techniques by designing a heat sink with embedded thermosyphons operating at a low pressure. Refrigerant within the thermosyphons evaporates, which then condenses at the condenser end, efficiently releasing heat to the environment. 144 rectangular pin-fins, each with a 3mm embedded hole, were attached to a vapor chamber filled with R134a refrigerant at a low pressure. The fluid activates the thermosyphon process at elevated temperatures, effectively transferring heat away from the LED panel. The lower vapor chamber is sealed, and the LED panel is affixed beneath it. Thermal paste is applied to enhance heat conduction and minimize air pockets between surfaces. The temperature data is collected using k-type thermocouples attached to the top and bottom of 8 different pins around the heat sink. The LED panel is turned on, and the temperature readings are recorded through a multiplexer PCB connected to a Raspberry Pi. The experimental results were compiled and completed, and we noted that without any cooling devices, the LED panel reached nearly 120 degrees C. With cooling fans, the panel's temperature peaked at roughly 40 degrees C. The LED surface temperature with thermosyphons measured around 42 degrees C, closely aligning with the target temperature achieved with the cooling fans. Our new work focuses on theoretical measurements and simulations using Solidworks, and Ansys. We aim to prove that the thermosyphons are in effect and model the temperature gradient along the fins to gain an in-depth view of the system. We will present the completed theoretical work and simulations at the upcoming conference alongside a brief overview of our experimental results.

Abigail Read

CO - Metropolitan State University of Denver

Discipline: Engineering

Authors:

#1 Abigail Read

#2 Kyle Mathiesen

#3 Alfredo Cervantes

#4 Sabina Arroyo

#5 Oscar Hammond

Kyle Mathiesen

Alfredo Cervantes

Abstract Name: Development and Evaluation of Advanced Machine Motion Table for Kinematic and Dynamic Motions

The objective of this project is to develop an advanced machine motion table capable of demonstrating and testing various mechanical, kinematic and dynamic motions, specifically focusing on linkages and gears that transmit rotational forces. This is intended for use in educational settings to enhance students' understanding of different mechanical systems and motion. The kinematics, dynamics, and mechanical design of the system are described. The new design will incorporate increased power and linkage capabilities, allowing for experimental validation of theoretical concepts and providing a more hands-on approach to engineering technology education. To achieve this, SolidWorks and other prototyping methods are utilized to simulate multiple design iterations, significantly aiding the design process. Finite Element Analysis (FEA) using ANSYS was conducted on the tabletop and table base. Additional FEA analysis was done on the linkage accessories and motor carrier using SolidWorks Simulation. This ensures all components met the safety, strength, and validity of requirements. The electric motor for the table must have a power output between 0.1-0.5 horsepower. The new table will be large in size to accommodate an increase in power and linkages but must still fit through a standard doorway. The integration of SolidWorks for design simulation and ANSYS for component analysis will ensure the table's safety and performance, contributing to a robust educational tool for mechanical engineering studies.

Frances Readshaw

OH - The College of Wooster

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: Campus Collections: Status Building in Higher Education

In an academic world where higher education has become increasingly competitive, colleges and universities must build their reputation and prestige in order to maintain relevance and attract a community. Studies show that reputation and status are essential for the success of higher education institutions by focusing on parameters such as acceptance rates, qualifications of faculty, difficulty and diversity of courses, and post-graduation placement rates. My research takes a different approach by focusing on the role of museum and archival collections in creating and maintaining reputation, prestige, and status for colleges and universities. Using three collections at the College of Wooster as a case study, I aim to identify if and how higher education institutions build and maintain status through collections. Incorporating ethnographic interviews with relevant faculty and staff alongside content analysis of collection and institutional documents, this

research explores archival collections, statuary and public art, and archaeological collections as status building tools. At the College of Wooster, Special Collections provide privileged access to rare materials and preserve the history and traditions of the College. Campus statues embody economic connections to donors, as well as the values and identities of the campus community. The Pella at Wooster archeological collection symbolizes shifts in institutional goals and educational missions. Overall, these collections represent the complex history and identity of the College, stand testimony to its economic and social ties, and, consequently, affect issues of belonging, representation, and involvement. Collections are essential for holistically understanding how colleges and universities produce reputation, status, and prestige.

Sofya Recupero

PA - Allegheny College

Discipline: Biology

Authors:

#1 Tricia Humphreys

Abstract Name: The Effect on Lifespan and Oviposition of *Callosobruchus maculatus* with Four Different Legumes

Bean beetles (*Callosobruchus maculatus*) are invasive granivores that choose specific beans for ovipositing, or egg laying, and have shown various outcomes among different bean types. There is little information known about the relationship between *C. maculatus* oviposition and bean type, as well as the correlation between bean type and *C. maculatus* lifespan. To test both biological relationships, *C. maculatus* were raised on black-eyed pea, chickpea, yard-long, and mung beans. Two male and two female adults were separated into 4 containers with 7 grams of each bean type, and the resulting offspring were counted and separated into their own containers, dispersed by sex. 1 gram of the same bean type was added to the female offspring, and the lifespan of both female and male beetles were measured. The *C. maculatus* females produced the highest oviposition on the yard-long beans ($\mu = 30$), compared to the black-eyed pea ($\mu = 23$), chickpea ($\mu = 23$), and mung bean ($\mu = 19$), on average. Interestingly, despite similar averages of oviposition for chickpeas and black-eye peas, yard-long ($\Sigma = 66$) and mung ($\Sigma = 61$) beans produced more offspring, meaning that they may be the more favorable host for *C. maculatus*. In contrast, the chickpeas produced the lowest offspring production ($\Sigma = 27$), likely due to their hardshell being less suitable for reproduction. Black-eyed peas were in the middle for offspring production ($\Sigma = 47$). Additionally, the longer average lifespan of *C. maculatus* on yard-long beans ($\mu = 12.74$) suggests these beans may offer better nutritional or developmental support compared to mung ($\mu = 11.41$), chickpea beans ($\mu = 10.56$), or black-eyed peas ($\mu = 6.95$), respectively. Therefore, the high oviposition rates, offspring production, and longer average lifespan on yard-long beans infers their suitability as a host, due to optimal nutritional content that support the development and survival of *C. maculatus*.

Natalie Redding

TX - The University of Texas at San Antonio

Discipline: Biology

Authors:

#1 Amber Ng

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#4 Lindsey Macpherson

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Abstract Name: Investigation of epigenetic landscape of taste receptor cells

Chromatin is the nucleoprotein polymer that regulates propagation and interpretation of genetic information in eukaryotes. Four histones – H2A, H2B, H3, and H4 – form the protein core of the nucleosome. Combinatorial post-translational modification of histone residues by “writer” enzymes, and their interpretation by “reader” effectors, provide the platform for epigenetic regulation of gene regulation, and are integral to development and differentiation. Polycomb system consists of two factors, Polycomb Repressive Complex 1 and 2 (PRC1/2). Defects in PRC1/2 are frequent in malignancy and developmental disorders, driving precocious differentiation, or, conversely, de-differentiation of tumor cells. Mechanistically, PRC1 is a ubiquitin ligase of histone H2A lysine 119, while PRC2 is a methyltransferase of histone H3 lysine 27. Yet how individual cell types establish and maintain Polycomb domains in chromatin, and the consequences of PRC1/2 loss in specific tissues and cell types, are critical yet poorly understood questions in cell biology. We utilize a taste receptor cell (TRC) model, to delineate the contribution of Polycomb to the differentiation of a terminal, post-mitotic cell lineage. TRCs are specialized epithelial cells, providing multiple sensory inputs to the central nervous system. TRCs are thus uniquely suited to explore the mechanism of cell specialization in development. Immunofluorescence analyses of chromatin landscape revealed remarkable differential accumulation of Polycomb subunits and associated chromatin modifications specifically in TRCs, but not in surrounding epithelial cells or underlying tissues. We documented high levels of PRC2 subunits EZH2, EED and SUZ12, as well as H2AK119 ubiquitylation and H3 K27 di- and trimethylation, unique to terminally differentiated TRCs, identified by accumulation of Cytokeratin-8. Curiously, all tested TRC subtypes, identified by the subunits TRPM5 and Car4, accumulate Polycomb proteins and associated histone modifications, suggesting this as a universal feature of terminally differentiated TRCs, and Polycomb activity may be required for their differentiation.

Pratheek Reddy

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Grayson Gimblet

#2 Jason Whitt

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#4 Herbert Chen

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Abstract Name: PET Imaging of Urokinase-Type Plasminogen Activator Receptor (uPAR) in Aggressive Thyroid Cancer

Background: Aggressive thyroid cancers, including poorly differentiated thyroid cancer (PDTC) and anaplastic thyroid cancer (ATC), represent more than half of annual mortality despite accounting for less than 5% of annual cases of thyroid cancer. The purpose of this study was to assess urokinase-type plasminogen activator receptor (uPAR) as a target for aggressive thyroid cancers. uPAR is a cell membrane receptor which facilitates cell invasion and migration during wound healing and embryogenesis, but becomes overexpressed in many cancers including breast, prostate, ovarian, and colorectal. Methods: Cancer specimens originating from twenty-one patients with PDTC and eighteen patients with ATC were immunostained for uPAR. Western blot and immunohistochemistry were used to identify cell lines with membranous uPAR expression. uPAR-targeted peptide, AE105, was radiolabeled with PET radioisotope ^{68}Ga ($t_{1/2}=68$ min) in order to create a uPAR PET-imaging agent. uPAR-positive cell lines were used to conduct in vitro cell uptake studies and in vivo PET imaging in a subcutaneous xenograft model with the uPAR-targeted radiopharmaceutical

[68Ga]Ga-NOTA-AE105. Results: Immunohistochemical analysis revealed 19% of PDTC patients (4 primary) and 28% of ATC patients (3 primary and 2 metastatic) were uPAR-positive. Western blot identified one PDTC and two ATC cell lines with strong endogenous uPAR expression: THJ529T (PDTC), THJ560 (ATC), and JEM493 (ATC). In vitro uptake of 1 nM [68Ga]Ga-AE105 was $7.4 \pm 2.9\%$ bound/mg in uPAR-positive THJ529T cells. Uptake was significantly reduced ($p < 0.001$) to $1.2 \pm 0.7\%$ bound/mg by addition of excess AE105. PET imaging 20-minutes postinjection showed that the mean standardized uptake value (SUV_{mean}) in THJ529T (PDTC) xenografts was 1.3 ± 0.1 , 2-fold higher than background organs, and 1.2 ± 0.3 in JEM493 (ATC) xenografts, 3-fold higher than background organs. Conclusions: In vitro uptake and in vivo PET imaging suggest uPAR is promising target for diagnosis and therapy in aggressive thyroid cancers that are uPAR-positive

Grace Reed

MN - University of Minnesota - Duluth

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Jolene Hyppa-Martin

Abstract Name: Central Auditory Processing Disorders: A National Survey of Assessment Practices

The etiology of auditory processing disorder (APD) remains unclear but does not exclude neurological disorders, lesions in the auditory pathway, aging, and genetics. Symptoms of APD include problems localizing auditory input, hearing in acoustically challenging environments, and poor auditory processing amid competing acoustic stimuli. The presence of APD can make it difficult to converse in a busy environment and to understand multi-step directions. At present there is no “gold standard” test battery for APD assessments. The American Speech-Language-Hearing Association suggests criteria of at least 2 standard deviations below the mean on two or more APD test batteries, but does not specify the use of one or both ears. The American Academy of Audiology requires 2 SD or more below the mean for at least one ear on two test batteries. The British Society of Audiology has no specific criteria for APD diagnosis but recommends using indirect and direct standardized tests. Other recommendations are that an APD test battery include temporal resolution and a dichotic listening test. Before performing an APD test battery, a hearing screening should rule out a potential audiologic issue that can be resolved with amplification. Whether an individual is diagnosed by a speech-language pathologist or audiologist can change the assessment outcome. A struggle with phonemic identification evaluated by an audiologist may conclude an APD diagnosis, one by an SLP may lead to a phonemic discrimination issue. Currently, only 45% of audiologists report offering APD assessment. Testing for APD is different than a diagnostic hearing evaluation; APD is not well predicted in decontextualized situations in sound-controlled environments. A nationwide survey adapted from Chermak et al. (1998) was distributed. Responses were analyzed to identify the audiology programs that currently offer APD testing and, among those that offer APD testing, to identify the test batteries and protocols used in assessments.

Carter Reed

GA - University of West Georgia

Discipline: Physics and Astronomy

Authors:

#1 Carter Reed

#2 Wyatt Ackerman

#3 Dr. J.E. Hasbun
#4 Dr. L. Ajith DeSilva

Abstract Name: Unified Study of the Classical Hall Effect

We conduct experiments on different types of germanium samples; some are doped with acceptors (p-type) and some with donors (n-type). Our experiments reveal carrier concentrations of $6.73 \times 10^{20} \text{ m}^{-3}$ for the n-type sample and $1.16 \times 10^{21} \text{ m}^{-3}$ for the p-type sample. These experiments were conducted for the standard Hall effect (Hall voltage versus magnetic(B) field) as well as conductivity and Hall voltage versus temperature for different B-fields. The zero-field results allow us to obtain band gaps (E_g). For the n-type we found that $E_g = 0.663 \text{ eV}$, while for the p-type sample $E_g = 0.618 \text{ eV}$. While it is commonly known that the Hall voltage is linear with B-fields, not so common is the behavior of the Hall voltage with temperature, especially for both n-type and p-type samples. Thus, we derived a general Hall voltage theory for semiconductors that unifies the understanding of both n-type and p-type carriers. Our experimental results are analyzed with the unified theory using MATLAB.

Sasha Reeder

PA - University of Pittsburgh

Discipline: Geography/Geology

Authors:

#1 Ian Flynn

Abstract Name: Effusive and Explosive Properties of a Volcanic Vent East of Olympus Mons, Mars

The surface of Mars is covered in numerous small volcanic vents. Specifically, the Tharsis volcanic province has ~1,100 identified volcanic vents. Previous studies have assumed the primary construction process for many of these vents is effusive volcanism. Meaning they are constructed by overlapping layers of multiple lava flows. However, with the increase of high spatial resolution visible and topographic datasets on Mars, this assumption is beginning to be questioned. We present a morphologic analysis of a volcanic vent east of Olympus Mons to identify evidence of explosive and effusive features. Analysis of the vent utilized high resolution visible and topographic data from the High Resolution Imaging Science Experiment (HiRISE) instrument on Mars Reconnaissance Orbiter. The vent has a similar morphology to terrestrial fissure vents but covers an area of ~4.2 km². This is ~2 orders of magnitude larger than the equivalent terrestrial fissure vent. Using the high resolution visible and topographic datasets, we identify evidence of effusive (e.g., multiple lava flow channels and overlapping sheet flows) and explosive (e.g., constructed spatter ramparts) volcanism. Initial results from this research indicate that explosive volcanic activity was more present in the Amazonian (~3 Ga to present) than previously thought. Identification of explosive volcanism during the Amazonian would lead to a greater understanding of the volcanic processes and environmental conditions when the vent was emplaced.

Joseph Reeder

PA - Duquesne University

Discipline: Environmental Science and Sustainability

Authors:

#1 Emma McConnell

#2 Philip Reeder

Abstract Name: Using Ground Penetrating Radar (GPR), Archival Data, and Survivor Testimony to Locate Holocaust Mass Burials in the Livas Cemetery in Liepaja, Latvia

The Jewish section of the Livas Cemetery in Liepaja, Latvia, shares a history with many other European cemeteries in that it was used as a burial ground by local Jewish communities, in some cases for centuries. During World War II, Nazi Germany and local collaborators sometimes used these cemeteries for mass burial of Jews murdered as part of the Holocaust. The main objective of this research was to use technology, archival data, and Holocaust survivor testimony to determine if previously unknown mass grave(s) are present in Livas Cemetery. Specifically, ground-penetrating radar (GPR), which uses high-frequency pulsed radio waves emitted from a transmitter antenna and collected by a receiver in the GPR system, was used to image the subsurface. Interpreting GPR data collected within the cemetery can indicate subsurface anomalies (disturbances). Archival sources and Holocaust survivor testimony suggest that in June 1941, Jews were killed and buried in three shallow mass graves at Rainis Park in Liepaja. After several weeks, because of the smell emitted from the decaying bodies, they were exhumed and moved to a mass grave(s) in Livas Cemetery, approximately three kilometers away. In 2023, GPR data collection focused on an area where two distinct surface mounds exist in an area of the cemetery devoid of gravestones. In 2024, we collected GPR data in the vicinity of monuments created to memorialize the atrocities associated with the murder of Jews in Liepaja during the Holocaust. These preliminary investigations indicated a sizable subsurface anomaly near the two surface mounds and no apparent anomalies were present in the memorialized area. Future research includes expanding the search area to include another area devoid of gravestones, additional archival and testimony studies, and incorporating other geophysical techniques to determine if a mass grave(s) exists in the cemetery.

Natalie Rees

PA - Duquesne University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Abigail Delehanty

Fiora Marchionda

Abstract Name: How do Toddlers on the Autism Spectrum Explore and Use Objects During Toy Play in the Home Environment?

Children on the autism spectrum have been observed to explore and play with objects differently than children with typical development. For example, they may focus intently on objects, gather them, or use objects in a repetitive manner by sorting or organizing them into lines. Children with autism are also less likely to show joint engagement with others during play, and they may show delays in symbolic and imaginary play with their peers. For these reasons, speech and language interventions for children on the autism spectrum often include teaching of functional, symbolic, social, and pretend play. However, very little research has examined play development in young autistic children. In this study, two trained student researchers coded actions with objects during toy play from naturalistic, video-recorded home observations in a sample of 50 autistic toddlers at a mean age of 20 months. Videos were coded using Noldus Pro Observer XT software for a variety of exploratory, functional, constructive, symbolic, and imaginative play actions. Twenty percent of videos were double coded to ensure adequate inter-rater reliability. The aim of this research study was to identify and describe patterns of object exploration and use in this sample. Findings from this study will deepen understanding of the development of play in very young children on the autism spectrum. It is important to increase our understanding of early play skills in this population so that speech-language pathologists can build on children's strengths, help them make meaningful connections with other people, and take a neurodiversity-affirming approach to teaching social interaction and play.

Cassandra Reese

PA - PennWest Edinboro

Discipline:

Authors:

#1 Cassandra Reese

Abstract Name: Bridging Academia and Industry: The Beehive Design Practicum

This presentation highlights a graphic design practicum course within the NWPA Beehive Program, a collaborative hub for community innovation. Students engage in professional projects for local clients, emphasizing creative problem-solving, client management, and teamwork. By refining their skills, assuming leadership roles, and collaborating on projects, students build confidence, adaptability, and professional portfolios. Through examples of student work and classroom dynamics, this talk demonstrates how the practicum bridges academic learning with real-world practice. Attendees will gain strategies for guiding students through ideation, managing client relationships, and fostering collaborative, growth-oriented environments.

Naira Rehman

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Xisheng Liu

#2 Zhangli Su

Abstract Name: Novel RNA-Binding Proteins Interacting With tRNA Fragments in Glioblastoma

Introduction: Glioblastoma (GBM) is a very aggressive and fast-growing brain tumor with a poor patient prognosis. We aimed to identify potential targets for GBM therapies by discovering novel RNA-binding proteins (RBPs) that interact with glioma-prognostic tRNA fragments (tRFs) in GBM cells. tRFs often work by interacting with RBPs and regulate protein translation, gene silencing, and cancer cell proliferation. These small non-coding RNAs are formed from mature or precursor tRNA cleavage and often play a regulatory role in cancer. We identified and focused on three tRF-3s prognostic for poor survival in low-grade glioma (LGG) in The Cancer Genome Atlas (TCGA) database: tRF-3009a (Leu), tRF-3021a (Ala), and tRF-3030a (Tyr). **Methods:** The RBPs binding with the glioma-prognostic tRFs were identified using an RBP microarray in vitro, including NOVA1, NOVA2, EIF4B, PTBP3, and PCBP4. For each RBP, I investigated the function, upregulation in gene expression, correlation with patient survival in TCGA, and role as an oncogene or tumor suppressor. RNA Bind-n-Seq data from ENCODE was used to determine if the tRF-3 sequences had enriched motifs for the RBPs, and AlphaFold 3 formed potential predictions for these interactions. **Results:** Bind-n-Seq data showed that PCBP4 preferentially binds to a sequence motif in tRF-3009a, but no other matches could be validated due to limitations in available datasets. AlphaFold 3 predictions demonstrated that NOVA1 and NOVA2 binding tRF-3009a and PCBP4 binding tRF-3009a, tRF-3021a, and tRF-3030a are likely (iPTM>0.6, low PAE). **Significance:** Identifying novel RBPs that interact with glioma-prognostic tRFs may highlight further areas of study in the direction of new treatments for GBM. For example, targeting RBPs or tRFs associated with poor patient survival could prove to be a promising strategy for enhancing GBM patient outcomes.

Andrew Reidenbaugh

FL - The University of Tampa

Discipline: Biology

Authors:

#1 Kimberly Dobrinski

#2 Sofia Cuello

Abstract Name: Identifying Mechanisms of Capsaicin Treatment in Breast Cancer Cell Lines

Breast cancer will kill approximately 1 in 40 women, making it the second leading cause of death in women. Roughly 50% of HER2 cancers develop drug resistance; this study hopes to fight those statistics. Capsaicin has shown an ability to kill MCF-7 and MDA-MB-231 breast cancer cell lines, but the mechanism of cellular death that it enforces is still unknown. Three different assays were utilized to analyze the possibility of the Warburg Effect playing a role; lipid peroxidase, CyQuant, and oxygen plate analysis. The lipid peroxidase assay showed little change in oxidative stress from the DMSO control and the capsaicin treated cells. The CyQuant assay showed minimal differences in cellular death rates with varying concentrations of capsaicin. The oxygen plate analysis showed that different concentrations of capsaicin had only small changes in oxygen consumption. This data indicates that capsaicin kills cells through an alternate mechanism to the Warburg Effect. Moving forward, data collection will assess the possibility of an alternate pathway in the endoplasmic reticulum: Unfolded Protein Response (UPR), more specifically the activation of IRE1 α protein coupled with GRP78 protein, and the activation of CHOP protein ultimately triggering a caspase cascade that forces cell death.

Charles Reigle

MD - Salisbury University

Discipline: History

Authors:

#1 Kristen Walton

Abstract Name: Fear of the People: The Undemocratic Origins of the U.S. Constitution

The origin of the U.S. Constitution is one shrouded in mystery due to the closed-door meetings and invite-only admittance to participate in the Constitutional Convention proceedings. Thanks to the meticulous notes taken by some of the framers, like James Madison, and the efforts of the Federal Government to preserve those records, historians have been able to glimpse what was happening behind those closed doors. In 1913, historian Charles Beard published his interpretation of the origins of the U.S. Constitution titled *An Economic Interpretation of the Constitution of the United States*, making it one of the first publications to analyze the economic and financial interests at play during the drafting of the U.S. Constitution. This opened up avenues for people like Woody Holton, author of *Unruly Americans and the Origins of the Constitution*, to further research the class conflict that resulted in today's Constitution. Through analysis of Woody Holton's work, along with primary sources from Max Farrand's volumes of *The Records of the Federal Convention of 1787*, I have been able to research my own interpretation of the origins of the Constitution. By breaking down the framers' intentions to that of economic superiority, political superiority, and social superiority, I have concluded that the U.S. Constitution that resulted from the Constitutional Convention of 1787 sought to restrict the peoples' access to democracy and establish a baseline for who the political elite should be.

Florian Reihl

PA - University of Pittsburgh

Discipline: Computer Science

Authors:

#1 Rishi Basdeo

#2 Shovan Bhatia

#3 Michael Kann

#4 Regan Shanahan

#5 Jacob Biehl

#6 Edward Andrews

Abstract Name: Surgical Precision during Haptic Virtual Reality

Over the last several years, Haptic Feedback in Virtual Reality (VR) has seen significant developments allowing users to feel virtual objects. Haptics offers the possibility of tasks, like surgeries, to be performed remotely across the world and in the classroom. A question posed is how precise the actions of surgeons are when performing teleoperated surgical tasks. This study uses a "Hoop Wire Game" within a VR environment to quantify the differences in fine motor skills between novices and skilled surgeons. The game requires participants to guide a virtual wire loop along a winding path without touching the edges, simulating the delicate movements required in surgery. By tracking movement and measuring the size of errors (contacts with the "hoop"), smoothness of movement, and number of finger adjustments in the game, we aim to establish objective metrics for evaluating performance. The task will be performed using commercially available haptic gloves that provide touch sensations through pressurized air. Based on these metrics, we will evaluate the comfort levels and learning curves associated with VR training in different media. The same precision task will be performed within the simulated virtual environment, teleoperated using a physical robot that mirrors the surgeon's VR movements, and in a non-virtual environment. These comparisons address the crucial question of whether proficiency in VR translates directly to improved skills in traditional settings, particularly for experienced surgeons who may have less familiarity with VR technology. The expected result is for there to be no significant differences between the conditions. Lessons learned in this study can help to inform the way that tele-surgical and surgical training interactions are designed.

Garrett Reihner

PA - Washington & Jefferson College

Discipline: Biology

Authors:

Olivia Olsen

Libby Kinsey

Abstract Name: Improving Exercise Performance by Modifying External Environment

This study examined the effect of environmental stimuli on resistance exercise performance in college aged athletes using leg extensions. We utilized biofeedback and proprioception to analyze muscle activation and its correlation with perceived effort to determine whether knowledge of the weight being lifted affected physiological responses in resistance training. Previous studies had initial results that indicated that squat 1-repetition maximums increased with weight covered. In our study, we explored stamina using 60% of a 5-

repetition maximum on a leg extension machine. Participants first reported and performed their 5-repetition maximum. Then, participants performed repetitions until failure with the weight stack covered (perception of effort set). After completing this set, participants filled out a modified POMS survey, took a three-minute break, and repeated the assay after being told the weight they would be lifting, which was the same as in the first set. While we found that visual awareness of the mass to be lifted did not affect higher quadricep activation, the speed of the repetition was found to be different. We observed that the control set (2.65 ± 0.50 s) compared to the perception of effort set (3.18 ± 0.64 s), with a significant difference ($p = 5.38E-15$). Additionally, the first repetition of the perception of effort set showed a significantly lower difference in muscle activity, shown by an increased bicep femoris activation, compared to subsequent repetitions ($p = 0.02$) and the first repetition of the control set ($p = 0.008$). These findings suggest that while the perception of weight has some effect, it does not increase muscle activation as initially hypothesized. This research contributes to our understanding of how psychological factors like perception of effort and proprioception can impact performance in resistance training.

Cali Reinhart

MS - University of Southern Mississippi

Discipline: Education

Authors:

#1 Cali Reinhart

Abstract Name: Implementing Storytelling into the Elementary School Classroom: A Best Practice Guide with Adaptable Lessons

Incorporating storytelling projects and activities in the elementary classroom helps students become more engaged and interested in what they are being taught. Often, there is not enough time in the day to cover all the material, let alone teach students these concepts in fun and engaging ways that every student deserves. Therefore, teachers should be given the resources to help their students learn the material in a fun and appealing way, such as through storytelling. Previous research has shown that storytelling is a multisensory project that reinforces literacy and language skills, increases students' retention of the information presented, and increases their active engagement (Stanley & Dillingham, 2009). Storytelling is a research-proven and effective method of instruction that can be used to further teach children the six language arts (NCTE, 1996), story comprehension (Campbell & Hluske, 2015), and the parts of a story while encouraging critical thinking, problem-solving, and collaboration (Lisenbee & Ford, 2018). I have collected data from various research articles and scholarly books that have detailed explanations of three types of storytelling (traditional storytelling, digital storytelling, and performance literacy storytelling). This data will be analyzed in a narrative and informational format style. All relevant data is compiled into an informational guide that will give teachers the information they need to easily and effectively implement storytelling into their elementary school classrooms with sample lesson plans for various elementary grade levels and subject areas.

Aaron Reising

OH - Capital University

Discipline: Music

Authors:

Abstract Name: Glocal Identity of Contemporary Estonian Music Culture

Despite political and cultural impositions dating back to the 12th century, Estonia, a small Baltic country bordering with Russia, has maintained a unique musical identity through preservation and celebration of traditional vernacular music and ongoing singing festivals, coupled with the effective absorption of outside influences. The “Estonian Composer” of any time has never been a clear-cut image, and the leading contemporary classical (or “art music”) composers of the nation have become exceptionally diverse in their styles of writing, including electronic, sacred, spectral, and jazz music. And, while music of Estonian composer Arvo Pärt has become a subject of most textbooks on Western Music History, his “spiritual minimalism” or “new simplicity” style does not necessarily represent Estonian art music at-large. In fact, the majority of the works written by the composer’s contemporaries are stylistically dissimilar to Pärt’s music, embracing a vast range of influences, but also commonly containing unique elements or references to Estonian language, traditions, and sensibilities. Often used in social sciences, the term “glocalization,” according to Roudometof & Dessi (2022), is “understood as a hybridization requiring the interplay of both ‘global’ and ‘local’ factors” (3). This study recontextualizes the term to form a better understanding of the identity of Estonian contemporary music culture. After briefly outlining a turbulent geo-political history of Estonia and touching upon the country’s main cultural markers, I utilize selected works by Lepo Sumera and Helena Tulse to argue that the Estonian model of cultural identity is glocal in its essence, embracing the nation’s cultural past and promoting enriching and productive creative encounters while resisting the limitations of traditional nationalistic constructions.

Ethan Reisler

PA - Messiah University

Discipline: English and Literature

Authors:

Abstract Name: The Literary Analysis of Video Games as Texts: Psychoanalysis and Postcolonialism in Disco Elysium

How can literary theories of psychoanalysis and postcolonialism uncover new dimensions of narrative/gameplay in video games like Disco Elysium? This project draws upon psychoanalytic and postcolonial literary theories to analyze the video game, Disco Elysium, exploring how critical literary theories unravel the non-traditional medium of video game storytelling, and how players' interactive role enhances narrative elements. Previous research has investigated role-playing opportunities in interactive storytelling and the general application of literary theory in critical analysis. This project addresses the gap in existing research by exploring how literary analysis reveals gameplay mechanics as being narrative elements that reinforce role-playing choices and complement the literary storytelling in video games. Using psychoanalytic and postcolonial literary criticisms, the research explores the 24 personality-based skills used in gameplay, the narrative arc of the protagonist produced through role-playing decisions, and how dialogue choices intersect with narrative elements. In Disco Elysium players control an amnesiac detective who lost all epistemological knowledge while solving a lynching. Players inhabit the protagonist's shattered identity and navigate a postcolonial setting, discovering a conspiracy beyond the lynching. Psychoanalytic findings indicate that in-game psychosomatic skills are recontextualized as building blocks of the subconscious rising to the conscious, emphasizing the protagonist's lack of a cemented personality; players thus impose their personalities through gameplay. Postcolonial findings indicate players also become vulnerable to mimicry — the protagonist's ungrounded sense of self inhibits resisting radicalization when adopting preexisting ideologies during gameplay. Utilizing a close reading and interviews, gameplay reflects the Estonian developers' experiences witnessing conflicting ideologies fighting over national identity after the USSR's collapse, providing insight into the critical landscape of Disco Elysium. These conclusions contribute to ongoing applications of literary theory in the critical analysis of video games, and how non-traditional storytelling mediums provide opportunities for expanding narrative into spaces of audience interaction.

Sophia Reister

MD - Salisbury University

Discipline: Mathematics

Authors:

#1 Sophia Reister

Abstract Name: Human and Artificial Intelligence Communication: Strengths and Weaknesses of Conversing with AI for Coding Mathematical Models

This project examines the efficacy and limitations of artificial intelligence in generating Mathematica code for calculus applications. Mathematica is a computational software used for complex mathematical, scientific, and engineering problems that also includes a “chat-enabled notebook,” allowing users to interact with an AI assistant embedded within the notebook environment. By exploring five models representative of core calculus topics, this study compares code responses from OpenAI’s ChatGPT and the chat-enabled notebook within Mathematica, also provided by OpenAI software. This study also analyzes how each artificial intelligence platform reacts to different styles of queries during the code creation and debugging process. My comparison revealed that ChatGPT generally provides reliable, functional rudimentary code, whereas Mathematica’s chat notebook demonstrates a greater capacity for complex and realistic model creation, however, often with more bugs. Additionally, both platforms produced better results when queries were phrased as questions rather than direct commands. This analysis highlights the differing strengths of AI tools in computational code generation for mathematical applications and helpful methods for successful human to AI interaction.

Natalya Reister

IN - Valparaiso University

Discipline: Interdisciplinary

Authors:

Abstract Name: Golf, God, and The Hunger Games: The Usage and Social Implications of the ‘Magical Negro’ Trope in Film

Films over the last 25 years such as The Legend of Bagger Vance and The Hunger Games have paired black characters along with the movie’s white lead in an effort to promote better representation of African Americans in cinema. While these films make small strides toward more positive representation, their use of a black character to advance the white protagonist’s growth classifies them as ‘Magical Negro’ (MN) films. The MN trope within cinema is problematic because it testifies to society’s perception of unbalanced power between black and white Americans. This paper aims to critique the tolerance of semi-positive and seemingly harmless portrayals of African Americans in film through an analysis of the MN trope. After investigating the common elements and patterns within MN films, most notably the patterns of economic deficiency and temporary presence, the paper argues that these stereotypes negatively impact the audience. The paper concludes with an examination of how modern audiences should interact with MN films. These films’ potential negative impact warrants intentional education so that an audience can still appreciate the valuable aspects of the film without internalizing the negative stereotypes they perpetuate. The relationship between harmful characterizations and real-world impact as demonstrated with MN films warrants attention because cinema is an influential tool for enforcing racial attitudes that should be held accountable.

Taylor Reitz

PA - Duquesne University

Discipline: Biology

Authors:

#1 Ebony Saccento

#2 Michael Kardos

#3 Sarah Woodley

Abstract Name: Exploring Biofluorescence in Desmognathine Salamanders: Sex Differences and Glandular Sources

Biofluorescence occurs when organisms absorb light at one wavelength and emit it at another. Biofluorescence is widespread in animals and has recently been discovered in salamanders. Salamander skin is a mosaic of different skin glands, a source of biofluorescence. In Red-back salamanders, males exhibit a higher density of biofluorescent speckling on their ventral tail than females, suggesting a function in social interactions related to reproduction. This study investigates biofluorescence patterns in Desmognathine salamanders and the gland source of biofluorescence in *Desmognathus ochrophaeus*. First, we hypothesized that male-biased sex differences in biofluorescence are widespread among salamanders. To test this, we characterized biofluorescent patterns in males and females of three species of salamanders in the *Desmognathus* genus. Salamanders were anesthetized and biofluorescence was observed under a fluorescent microscope that was exciting the salamander skin at a wavelength of 480 nm and emitting light at 535 nm. The density of biofluorescent glands was measured using Image J. Contrary to expectation, females in all 3 species had a significantly greater density of biofluorescent glands compared to males throughout the body, including the ventral and dorsal tail, and the ventral head. In the second experiment, we hypothesized that biofluorescent glands and modified granular glands are synonymous in *D. ochrophaeus*. We took fluorescent images as described previously and then compared the density of biofluorescent glands to the density of modified granular glands in cryosectioned and tri-stained skin samples. Overall, we conclude, that there is an established pattern of greater biofluorescence in females than in males in the *Desmognathus* genus. Also, we conclude that modified granular glands are not the glandular source of biofluorescence in *D. ochrophaeus*. These findings will inform future research that will seek to determine the function and source of the biofluorescent glands.

Polly Ren

IL - University of Chicago

Discipline: Geography/Geology

Authors:

Abstract Name: Going the Extra Mile: investigating the relationship between bikeshare and public transit

Bikesharing has emerged as a popular response to the growing need for sustainable, flexible transportation options in urban areas. With the ability to bridge the gaps in traditional transit networks, bikesharing offers a potential solution to the first-mile/last-mile problem, making it easier for commuters to connect to and from public transit options. Despite its rapid adoption, little is known about how bikesharing trips interact with public transit usage on the aggregate. This research studies the complex interplay between bikesharing and public transit in three major U.S. cities: Chicago, New York City and Los Angeles. We use bikesharing trip data along with historical general transit feed specification data to investigate the extent to which bikesharing trips integrate with or substitute against public transit in these geographically and demographically distinct cities, as well as how various spatial, temporal and socioeconomic factors may influence these dynamics. Our

findings reveal that modal integration is associated with higher service frequency of public transit, while modal substitution tends to be more common in dense urban cores. The interaction between bikesharing and public transit is also shaped by individual and neighbourhood-level social factors. Younger commuters, particularly in college towns, and individuals from socioeconomically disadvantaged neighbourhoods are more likely to integrate bikesharing with public transit. Built environment differences between the three cities also influence how bikesharing is used in relation to public transit. These findings support the critical need to account for built environment and socioeconomic factors when planning for effective integration between bikesharing and public transit systems and, ultimately, sustainable and equitable urban transportation systems.

Karl Rennick-Zuefle

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

#1 Kayla Conaty

#2 Joshua Yeoum

#3 Erin McCarty

#4 Daniel Buysse

#5 Henry Lehrer

Abstract Name: Multidimensional Sleep Health in Retired Day Shift Workers and Retired Night Shift Workers

Introduction: Night shift work is associated with poor sleep quality and sleep disorders during employment and retirement. Most studies surrounding sleep and shift work draw from self-reports, clinical diagnoses, or laboratory observation, but few examine sleep patterns from a multidimensional perspective in retirees exposed to shift work. This study compared sleep health in retired day workers (RDW) and retired night shift workers (RNSW). Methods: 76 RDW and 61 RNSW provided an average of 6.88 days of sleep diary and actigraphy data. Multidimensional sleep health was quantified using wrist actigraphy measures of sleep efficiency, timing, duration, and regularity, a diary measure of sleep satisfaction, and the Epworth Sleepiness Scale to measure daytime alertness. Components were dichotomized and summed as a composite score (0-6); higher values indicated better sleep health. Linear regression tested associations of shift work exposure group, years of night shift work, and recency of shift work with multidimensional sleep health and its individual components, adjusting for age, sex, race, educational attainment, physical health (RAND-12), and depressive symptoms (CES-D). Results: RNSW exhibit marginally worse multidimensional sleep health compared to RDW ($\beta=-0.174$, $p=0.060$) and poorer sleep satisfaction ($\beta=-0.178$, $p=0.045$). Other individual components were not associated with shift work exposure. Neither the duration nor recency of night shift work was associated with multidimensional sleep health. Conclusion: Retired night shift workers exhibit worse overall sleep health and sleep satisfaction compared to retired day workers. Importantly, duration and recency of night shift exposure do not mitigate these effects. These results further link night shift work and poor sleep, which may lead to worse health outcomes in old age. Future research could assess changes in shift workers' sleep health longitudinally. Research into the physiological consequences of night shift work could rule out the possibility that individuals with poor sleep health self-select into night shift work.

Jerry Rennwald

CA - University of California - Los Angeles

Discipline: Psychology

Authors:

Abstract Name: The Weight of Beauty: How Body Size Affects Gender Perception of Attractiveness

The current cultural issues surrounding body shaming and fatphobia in the United States has led to the need for the present study to examine whether perceived attractiveness depends on body type, gender, or if body type has an effect on perceived attractiveness depending on gender. The present study was conducted as a 2 x 2 between-subject experimental design. The data was collected through an online survey and the survey link was distributed by student researchers via text or email. Surveys were administered electronically through the Google Forms application. The data was submitted to SPSS 25 for analysis, using a Two Way ANOVA, with an alpha level of .05. The present study consisted of 74 participants ranging in ages 18 to 76 (M = 27). The results revealed thin body types were perceived as significantly more attractive than thick body types. However, no significant interaction was found between body type and gender on attractiveness ratings. The study's findings align with previous research that suggests a cultural preference for thin body types and a gender difference in attractiveness perception. However, limitations such as the use of animated images and a relatively small sample size may have affected the results. Furthermore, a manipulation check failure occurred with one of the images, suggesting the need for improved stimuli in future research. The study underscores the persistent influence of societal norms on body image and attractiveness, despite movements toward body positivity. Future studies should consider using real-life images of models and increasing the sample size to enhance validity. Additionally, the influence of factors such as hunger on attractiveness perception should be explored further to understand the nuances of body size preferences across different contexts.

Karen Resendes

PA - Westminster College

Discipline:

Authors:

#1 Karen Resendes

#2 Thomas Lavelle

Thomas Lavelle

Abstract Name: Leveraging High School/College Partnerships to build Research Interest and Experience

The Seneca Valley High School Center for Biotechnology began with the creative ideas of a faculty member, the support of an administrator and a parent with biology expertise. The Center was developed and is funded through a combination of school district money, grants and charitable donations from philanthropic organizations. This presentation describes the development, implementation, growth and impacts of a dedicated STEM research space and training program for high school students. Initiated as an opportunity for gifted students, the center began as a partnership with a faculty member at Westminster College who identified equipment needs and offered technique training sessions for students. Over the past 8 years the space and program have grown, now working with partners from Westminster College, University of Pittsburgh School of Medicine, Duquesne University, Penn State University, United States Geological Survey, United States Fish and Wildlife Service, and the Pittsburgh Zoo. The center has reached 72 students, through various research scenarios, including investigations into conservation genetics, biofilm producing bacteria, synthetic biology, fluorescent microscope mitochondria detection, environmental detection of microbes and genetic edits in produce. Due to the terrific growth in student involvement, the laboratory matched demand with an increase in faculty staffing. Most of the students contribute projects to local and regional science fairs and some earn research internships with local institutions. As the early participants have gone off to college, we have begun to see the lasting benefits of this experience in their transition into undergraduate research. Notably, the alumni communicate that their experience in the lab opened opportunities for earning research positions early in their post-secondary education. These students have also returned to speak at the Center's

Open House, a student-initiated event to share stories of success and confidence as they approach potential research mentors and integrate themselves into college level laboratory experiences.

Haylee Ressa

VA - University of Virginia

Discipline: Psychology

Authors:

#1 Benjamin Newman

#2 John Darrell Van Horn

#3 Kevin A. Pelphrey

Abstract Name: Investigating the Relationship Between Brain Microstructure and Behavioral Heterogeneity in Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by deficits in social communication and repetitive behaviors, with significant variability in presentation. Current diagnostic methods rely on behavioral assessments, but no biomarkers reliably connect these measures to underlying neurobiology. Previous findings from our lab identified that g-ratio, a measure of axon to myelin diameter, and conduction velocity, which is associated with speed of a neuronal signal, may be associated with ASD, correlating these microstructural differences with behavioral and cognitive performance. Using data from the NIH Autism Centers of Excellence (ACE) network, I observed associations between brain microstructure and behavioral subscales, revealing distinct neuronal profiles that may be masked by composite test scores. Machine learning analyses further highlighted age as a critical factor, identifying ASD subtypes characterized by restrictive behaviors versus sensory sensitivity and language performance. Building on this foundation, my ongoing research investigates how g-ratio and conduction velocity evolve as participants transition into early adulthood. Utilizing diffusion magnetic resonance imaging (dMRI), I aim to determine whether microstructural differences persist across development and to explore potential sex-based differences following puberty. Anticipated results include sustained microstructural abnormalities and emerging sex differences, providing insights into how developmental trajectories influence ASD heterogeneity. This research seeks to bridge the gap between behavioral assessments and neurobiology, advancing the potential for neuroimaging biomarkers to improve early diagnosis and personalized interventions in ASD.

Blake Restivo

TX - Lone Star College

Discipline: Biochemistry

Authors:

#1 Blake Restivo

#2 Julie Harless

#3 Anitha Iyer

#4 Michael Sundermann

Abstract Name: Isolating and Analyzing Fungi for Purposes of Bioremediation

The use of microorganisms to chemically degrade crude-oil derivatives, which often take the form of inert aliphatic and/or aromatic compounds and polymers, has been proposed as a potential means to reduce pollutant levels in global ecosystems and to recycle material into biologically active forms. Fungi have a

unique array of enzymes and structural characteristics which allow for efficient and highly-specific organocatalysis of substrates inaccessible through most metabolic processes. . The aim of our research has been to isolate suitable strains of local, fungal species in different environments with varying levels of exposure to petrochemicals in the form of motor oil, and to perform extractions and tests for secondary metabolite analysis. Research in this area has shown promising results which demonstrate the efficacy of specific fungi, changes to chemical composition of polluted samples, and have shown trends correlating to specific enzymes. An inadequacy found in much of the literature published, however, is the reliance upon wild soil substrates for sample collection which excludes important fungal groupings such as sapotrophs. Lignin peroxidase and laccases, abundant in wood-degrading funguses, have been used for the benign treatment of wastewater due to their ability to break-down hazardous phenolic compounds. In this project, specimen are collected from several environments using open agar plates which are coated in motor oil. Prevalent organisms are then further cultured under similar conditions with varying substrates including emulsified, liquid broth and polluted wood pellets of differing types. Metabolite extractions are performed using standard solvent-based techniques, as well as column chromatography, and HPLC. Products are analyzed using gas chromatography and IR-Spectroscopy. DNA-extractions are performed on each species and indexed via barcoding.

Abby Retz

IN - Butler University

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: In the Middle of Migrant Medicine: Perceptions of Appalachian Folk Healing

This qualitative study explores folk healing practices among Appalachian migrants, focusing on how intergenerational knowledge and regional stigma influence folk healing practices and beliefs. Central to this project rest questions like: how do Appalachian migrants perceive, practice, and perpetuate folk healing? How is this influenced by stereotypes often associated with Appalachian identity? These questions are addressed by delving into the role of Appalachian identity in folk healing practices, paying particular attention to how participants identify with and carry forward these traditions in new environments while balancing potential complexities related to self-identification with an ethnic group. Existing literature posits Appalachian migrants as possessing unique ethnic and cultural identities, understanding the Appalachian Diaspora related to migrant relationships and Appalachian identity (Trent 2006). Specific care has been taken to understand how stereotypes impact self-identification with Appalachian ethnicity (Krok-Schoen et. al 2015). Findings suggest that migrants of later generations tend to identify less with the Appalachian ethnic group, suggesting a turning away from Appalachian identity (Ludke et. al 2012). This project proposes that stereotypes that impact self-identification with Appalachian ethnicity have a potential impact on migrants' self-identification with cultural practices such as folk healing. However, literature examining this intersection is scarce. To address this lapse, this study emphasizes the emic understanding of folk healing amongst Appalachian migrants while critically examining and engaging with existing etic reports. Through personal narratives, approximately 12 participants reflect on remedies they utilized to treat illnesses and injuries, examining the continuity and adaptation of practices across generations. Emphasizing practical and spiritual dimensions, the study considers how regional ethnic identity influences participants' engagement with and perception of healing practices, contributing to a broader understanding of Appalachian folk medicine and identity in contemporary contexts related to migrants.

Bailey Reutinger

NC - Elon University

Discipline: Biology

Authors:

#1 Bailey Reutinger

Abstract Name: Increasing the Accuracy of Tree-Ring Data Processing to Improve Models for Reconstructing Climate

Tree-ring data is used to reconstruct past climate and to predict future climate trends. In each year of a tree's lifespan, a distinct ring is added to the tree's width, and the widths of individual rings vary depending on the climate that year. To process tree-ring data, two cores from each tree are typically extracted, and then all cores are combined before analysis. We aim to improve the modeling of future climate scenarios using tree rings by assessing the accuracy of tree-ring data collection. Our investigation of data from the International Tree-Ring Data Bank found that cores sampled from the same tree do not necessarily have the same ring widths, and trees with low correlation may have a worse correlation with local climate data. These findings imply that only trees with moderate or better internal correlation should be used for climate modeling. To more directly target differences among tree-ring data processing methods, we collected 47 tree cores from Virginia pines (*Pinus virginiana*) in Elon University Forest. With this data, we combined and correlated the widths of the rings on each core with local climate data. We compared the existing standard method of combining cores for processing with a new method. The standard method treats each core in the stand independently despite each belonging to a pair or triplet of a single tree. We proposed a new method that processes measurements on the tree level instead of a core level. We compared each method to recommend the approach that produces better fits with local climate data. The proposed method produces a higher correlation for annual average temperature ($r = 0.20$) and precipitation ($r = 0.12$) data than the standard method ($r = 0.13$, $r = -0.01$, respectively).

Maria Reyes

TX - Laredo College

Discipline: Biology

Authors:

#1 Maria Reyes

#2 Elizabeth Enriquez-Atwell

#3 Qingguo Meng

Abstract Name: Identifying Zoonotic Bacteria in Indoors and Outdoors Mouth of Dogs

This research highlights the critical role of oral care and nutrition in mitigating the risk of zoonotic bacteria transmission from dogs to humans. The study was conducted in two parts. First, a systematic review of existing literature examined bacteria commonly found in dogs' mouths, their potential health effects, and best practices for oral care. The second part utilized microbiological techniques, such as streaking for isolation and Gram staining, to identify and differentiate bacterial species. *Pasteurella multocida*, *Mycobacterium* spp., and *Salmonella* spp. are the most common bacteria found in dogs' mouths. These bacteria can cause symptoms in dogs such as tremors, swollen gums, and painful urination. Additional pathogens, such as *Serratia marcescens* (a red-pigmented Gram-negative bacterium) and *Pseudomonas aeruginosa* (a highly resistant aerobic bacterium), were also identified as zoonotic risks capable of causing infections in both humans and animals. For the mixed unknown culture, the bacteria isolated were identified as *Serratia marcescens* and *Pseudomonas aeruginosa*. Preventive measures to reduce zoonotic bacteria in dogs include maintaining good oral hygiene, feeding properly cooked meat, practicing food safety, ensuring proper nutrition, and scheduling regular dental checkups. These measures aim to improve overall dog health and minimize zoonotic risks.

Jacqueline Reyes

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: "A Home Designed to Enhance the Daily Living Experience" – Housing Design for Individuals with Diabetic Retinopathy

Many commercial and residential spaces are not designed with inclusivity in mind for individuals with visual impairments. This lack of extensive design can limit the functionality of these spaces, and can cause discomfort and prevent individuals from completing daily tasks. Research conducted through a knowledgeable speaker in home design for the visually impaired, and a case study of a space designed for those who are legally blind showed that incorporating specific design elements can enhance the quality of life for people with visual impairments. These elements include features such as materials that create sound, high-contrast materials, wayfinding solutions, and textured surfaces. While these designs are beneficial to everyone, they are especially transformative for individuals with visual impairments. The purpose of this project is to analyze the effects of diabetic retinopathy and to propose a residential design to cater to the needs of individuals living with this condition. Diabetic retinopathy is a complication of diabetes caused by high blood sugar levels, which damage the back of the eye. Advanced symptoms of diabetic retinopathy can include increased eye floaters, distorted vision, poor night vision, and loss of vision. Specific design elements were implemented within the space to meet the needs of the client. These include high contrast in color to help distinguish objects and surfaces, textured fabrics for sensory engagement, wayfinding solutions using painted wall guides to help the user to navigate through the home, and lighting layers and proper illumination to accommodate for eye sensitivity and poor night vision. Additionally, the home design meets the International Residential Codes and ADA Standards to ensure accessibility, safety, and inclusivity. In conclusion, this design creates a functional and supportive living environment that meets the needs of individuals with diabetic retinopathy, ultimately improving their daily living experience within their home.

Janeth Reyna

OK - Southern Nazarene University

Discipline: Computer Science

Authors:

Abstract Name: Chapel Attendance Patterns

We studied the chapel attendance data at a private Christian university in the south central United States. Because the university considers chapel to be an essential community experience, students are required to attend a minimum of 25 chapels per semester. We discovered that students attend chapel differently depending on their personal characteristics. For instance, we discovered that there are more male students that attend chapel than female students. We also discovered that student athletes are more likely to attend daytime chapel services than evening chapel services when compared to non-student athletes.

Somer Rhodes

OK - University of Central Oklahoma

Discipline: Art History

Authors:

Abstract Name: Message in a Bottle: Train Graffiti in the US and Spain in the 1970s

Throughout history, graffiti has been an integral part of urban, social, and political culture. In the 1970s United States, graffiti was produced inordinately by youth in retaliation to the marginalization of people of colour in specifically New York high poverty, urban ghettos. Similarly, graffiti in Spain developed into a highly political and social means of protest primarily in the years following the fall of Spanish military dictator, Francisco Franco Bahamonde, in 1973. In both societies, graffiti on trains was a significant part of the graffiti culture. I argue that graffiti on trains can be understood like the message in a bottle, as a system of taking thoughts, expressions, and protests beyond their original geographical and cultural confines. This paper examines how graffiti on American and Spanish trains works as public communication aimed at large and diverse audiences in the 1970s. In both societies, I demonstrate, this traveling “message in a bottle” helps marginalized groups assert their presence and challenge systemic inequalities. Keywords: Graffiti, Train, United States, Spain, Political Protest

Mark Rhoge

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Zongqi Xia

Abstract Name: Dynamometer Testing as a Predictor for MS-Related Disability Burden in MS Patients

Multiple Sclerosis (MS) is a chronic neurodegenerative disorder of the central nervous system characterized by inflammatory demyelination and progressive neurological disability. Current clinical assessments of MS-related disability are often impractical due to their complexity and time-intensive requirement. Grip strength, as measured using a dynamometer, is a quick, simple, and sensitive measure of muscle weakness, a common symptom in MS. However, few studies have examined its clinical utility. This single-center cross-sectional study examines the extent to which grip strength correlates with standard objective and patient-reported measures of MS disability, and tests whether greater discrepancies between dominant and non-dominant hand grip strength are associated with greater MS disability burden. 516 MS patients completed grip strength testing of dominant and non-dominant hands and standard MS disability measures, including objective measures [eg, Expanded Disability Status Scale (EDSS), Age-Related MS Severity (ARMSS), Timed 25-Foot Walk (T25W), 9-Hole Peg Test (9-HPT), Symbol Digit Modality Test (SDMT)] and patient-reported outcomes [eg, Patient-Determined Disease Steps (PDDS), Multiple Sclerosis-Related Scale-Revised (MSRS-R)]. Multivariate regression models assessed grip strength and inter-hand discrepancies in relation to standard MS disability measures, adjusting for demographic and clinical confounders such as age, gender, race/ethnicity, MS subtype, disease duration and disease-modifying therapy. Dominant and non-dominant grip strength significantly correlated with 9-HPT, T25W, EDSS, and MSRS-R, while differences between dominant and non-dominant grip strength significantly correlated with PDDS, EDSS, and MSRS-R. Notably, reduced dominant grip strength (estimate = -0.021, $p < 0.05$, 95% CI = [-0.040, -0.003]) and greater inter-hand discrepancies (estimate = 0.0458, $p < 0.001$, 95% CI = [0.021, 0.072]) significantly correlated with patient-reported MS disability severity (as measured by PDDS). These findings highlight grip strength testing as a practical measure of MS disability progression, with potential for broader clinical application. Further validation is warranted to confirm its clinical utility.

Lucas Ribaudó

PA - University of Pittsburgh

Discipline: Physics and Astronomy

Authors:

#1 Lucas Ribaudó

Abstract Name: A general mechanism for sizer size control in yeast

Size is a key physiological variable for cell growth. Subjected to noise, cells must employ active size control. However, the mechanistic origins of size control remain elusive. One possibility is that cells have molecular thresholds for key molecules that must be reached for division to commence. Eukaryotic cells (e.g., fission yeast) are believed to follow a concentration-based molecular threshold for size control. Additionally, it has been found that yeast cells follow a “sizer” control mechanism, targeting a specific size before division. The mechanistic origins of sizer control in yeast remain unclear. Here, we introduce a generic model that relies on multiple concentration checkpoints for different cell proteins. Our results show that if at least one checkpoint relies on a molecule whose concentration is proportional to volume, then sizer control dominates over cell size control. We show that this model is consistent with experimental data, and suggests that size control is separate from division control in yeast.

Mckensi Rice

VA - Norfolk State University

Discipline: Sociology

Authors:

Abstract Name: Bridging the Gap: Challenges in Housing Accessibility for Black Residents in Hampton Roads After COVID-19

The COVID-19 pandemic profoundly disrupted global social and economic stability, creating challenges for securing basic necessities, particularly housing. This research focuses on the pandemic’s impact on housing accessibility for Black residents in Hampton Roads, Virginia. Historically, Black individuals have faced systemic barriers to homeownership due to discriminatory policies and practices. This study investigates whether the pandemic further exacerbated these challenges and explores potential solutions to address them. Using a mixed-methods approach, the research incorporates quantitative data analysis of local real estate trends, census information, and lending policies, alongside qualitative insights from interviews with real estate professionals, community activists, and affected residents. Findings reveal how stricter lending standards, surging home prices, and income-based disparities in loan approval rates have disproportionately affected Black homebuyers in Hampton Roads. These obstacles, compounded by the pandemic, highlight the systemic inequities Black residents continue to face in accessing housing. To address these issues, the study proposes solutions ranging from immediate actions to long-term strategies, including increasing housing supply, diversifying Virginia’s housing stock, implementing targeted financial assistance initiatives, and raising awareness through education. These solutions aim to foster a more equitable real estate landscape in Hampton Roads and beyond. This research serves as a call to action for policymakers, financial institutions, and community stakeholders. By addressing housing disparities worsened by the pandemic, it charts a path toward systemic change and a fairer future in housing accessibility for Black communities.

Emily Rice

WV - West Virginia University

Discipline: Biology

Authors:

#1 Christopher Arnold

#2 Katelyn Halliwell

#3 Elizabeth Letrent

Abstract Name: Resolution of a Hox Gene-Mediated Size Control Mechanism in the planarian *Schmidtea mediterranea*

Animals grow to a body size that is characteristic to their specific species. However, the intrinsic mechanisms establishing final body size are poorly understood. The planaria *Schmidtea mediterranea* is a regenerative flatworm with the ability to asexually reproduce to generate unlimited clonal copies of themselves. Planaria, therefore, have the potential to grow that extends beyond the size of an individual body, but they still exist at a limited size. This model provides an opportunity to uncover mechanisms by which body size is established via the restriction of growth potential. We identified a Hox gene, *post2b*, that restricts body size in planaria. Our research question asks what the downstream genes of *post2b* are and how they regulate body size. RNA sequencing analysis was performed to identify the downstream mediators, followed by RNA interference (RNAi) screening to identify functional effectors. The number and size of the RNAi worms were quantified using FIJI software. We identified two categories of genes that altered body size: asexual reproduction-dependent genes and inhibitory body growth genes. Further literature research and sequence analysis was conducted to identify and determine the potential mechanisms of the genes. The genes varied in putative functions, including metabolism, hormonal signaling, cell proliferation, cell differentiation, and more. This study contributes to planarian research and can be applied to other areas of research as well. For instance, understanding these mechanisms that typically restrain the growth of tissues has the potential to be applied to research studying uncontrolled growth, such as cancer.

Sarah Rice

PA - Moravian University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Michael Steimling

Abstract Name: An Investigation into Body-Weight Supported Treadmill Running on Ground Reaction Forces Utilizing A Single Subject Design

Body-weight support (BWS) treadmills offload part of the user's body weight, allowing them to exercise with less strain on the body. The Lever Movement System (LMS) is a type of BWS system that utilizes elastic bands to suspend the user from an aluminum frame attached to the treadmill. The biomechanical effects of the LMS have not been well studied, so this study aims to investigate how offloading changes a runner's vertical ground reaction forces (VGRF). Four collegiate distance runners participated in a cross-over randomized control trial that compared two 30-minute treadmill runs at 100% and 80% body weight with the LMS. VGRF was collected with the Loadsol, an instrumented insole worn within the shoe. VGRF data was compressed into 100-point time series curves for each footstep at each time interval. Statistical parametric mapping (SPM) was used to compare the time series force curve of two running conditions. SPM calculates a 't' statistic for each time point of the time series curve and allows for statistical analysis between conditions within a single subject, alpha .05. VGRF was significantly reduced for most of the stance phase during the bodyweight support conditions for all four subjects. VGRF was most different between 40-60% of the stance

phase. The 0-15% of the stance phase was the least different between the two conditions, with 2/4 subjects demonstrating a non-significant difference during this portion of stance phase. All participants saw reduced VGRF when running on a treadmill equipped with the LMS. The greatest reduction was during the mid-stance portion of the running gait cycle when VGRF is greatest. The smallest reduction was during the load acceptance portion of the stance phase. This is meaningful because tissues that are loaded during different times within the stance phase may experience differences in load reduction when using the LMS.

Janis Richards

TX - San Jacinto College

Discipline: Economics

Authors:

Abstract Name: Creation of the Greenback as U.S. Money by President Abraham Lincoln

Janis Richards, richards.j896865@stu.sanjac.edu, U.S./Texas – San Jacinto College, North Campus, Honors Program, Paralegal Studies Student Why was President Abraham Lincoln's creation of the Greenback Dollar important when he did it, and how would recreation of the Greenback experience impact the United States today? Since U.S. money is currently being created and circulated by the private sector, under the auspices of the Federal Reserve, this process is in violation of the Constitution. The Federal Reserve is not a government organization. It is a private cartel of 10 powerful private banks, each of which has the sole responsibility of earning a profit for its investors. The function of earning a profit interferes with the function of working on behalf of the public. Consequently, the U.S. is currently experiencing a pricing structure that harkens runaway inflation. There are no elected officials on the Federal Reserve who are responsible to the American public. The methodology of the Federal Reserve is opaque. It was originally created under questionable circumstances in 1913. Historical precedent described from scholarly research verifies the unconstitutionality of private creation of U.S. money. Research methodology will consist of proof from numerous case studies which confirms the thesis. The conclusions will show that U.S. money can only be created and circulated by the Congressional branch of the U.S. Government. These conclusions will be discussed in the context of historical experience with current evidence of the danger of this private system of money creation to the American public and the world, as was evidenced in 2008.

Gabrielle Richardson

GA - Georgia State University

Discipline: Anthropology and Archaeology

Authors:

#1 Jeffrey Glover

Abstract Name: Prescriptions of the Past: Archaeological Correlates of Illness in Early 20th century Atlanta

The medicines people choose can reveal not just the illnesses they face but cultural values about how to treat them. Archaeological materials can serve as a proxy for illnesses that were experienced by different communities in Jim Crow-era Atlanta. My research project explores how cultural perceptions of illness manifest in materials that were collected from archaeological excavations conducted when the Metropolitan Atlanta Railroad Transit Authority (MARTA) rail lines were installed in the late 1970s. To do so, I aim to analyze the economic value of discarded medical bottles, with a focus on the medical implications they present. I will specifically focus on materials from the site "9FU91" as my control group, a site which served

as the city's dumping ground from the late 1800's until the early 1920's. Paired with similar archaeological data from excavations conducted on the west side of Atlanta, my comparison seeks to investigate how the upper-middle class families in North / central areas of Atlanta and the lower-class families in Western parts of Atlanta defined and treated illness, as well as attempting to find and compare this data with health trends from the time. Countless individuals in Atlanta during this period had their lives intertwined with consumerism and pharmaceuticals. While the geographic location of the site is known, the populations by which these sites were utilized are unknown. I plan to demonstrate the value of depositional medicinal materials as indicators of socioeconomic factors, and to possibly show racial and class disparities in health care.

Natalie Rickert

PA - California University of Pennsylvania

Discipline: Education

Authors:

Abstract Name: Developing "Lucy and Star's New Neighborhood Adventure": Story Crafting and Readability

This project explores the creation of a children's book designed for second and third-grade readers by a PreK-4 teacher candidate, focusing on both the creative writing process and the integration of educational themes. The story follows a girl and her dog who become lost in their new neighborhood, emphasizing themes of staying calm, problem-solving, and finding help when needed. These themes align with key social-emotional learning competencies in the Collaborative for Academic, Social, and Emotional Learning Framework. The process began with research into effective children's literature, including appropriate word count, sentence complexity, and the structure of picture books. Brainstorming and a plot diagram helped shape the initial draft. Multiple revisions followed, with particular attention paid to simplifying language, improving readability, and aligning the story with the developmental needs of the target audience. Readability tools were used to refine the text, ensuring it met the desired grade level. Feedback was also incorporated to strengthen the narrative and make it more engaging for young readers. This project demonstrates the interplay between creativity, research, and revision when developing a story that is both entertaining and educational. The result is a thoughtfully crafted children's book that supports young readers' literacy and social-emotional growth.

Jade Riddle

VA - Longwood University

Discipline: Biology

Authors:

#1 Dale Beach

Abstract Name: Exploring the Impact of Seasonal Variation on Microbial Community Composition and Diversity in Rainwater Harvesting Systems Across Central Virginia

Increasing global water scarcity has sparked interest in more sustainable water sources such as rainwater harvesting (RWH). Because these systems utilize roof-runoff for collection, they can easily be contaminated with environmental bacteria from animal feces and leaf litter on the roof surface, potentially degrading water quality. Thus, questions remain about the safety of harvested rainwater for human use due to our current limited understanding of the microbial communities contained within it. To our knowledge, there is little to no published research on the microbiome of rainwater harvesting systems (RWHS) within the continental

U.S. This study aims to characterize the bacterial diversity and community composition of RWHS across Central Virginia. Water samples were collected from 10 systems in four cities, spanning rural farmland, small towns, and urban areas. Rainwater samples were filtered through 0.22 μm membranes to capture resident bacteria which were then analyzed using Nanopore sequencing of the 16S rRNA gene to determine the microbial composition. A total of 50 samples have been analyzed, including one from each system in summer 2023 ($n = 10$) and in winter 2023 ($n = 10$), and three from each system in summer 2024 ($n = 30$). All samples contain highly diverse bacterial communities. Preliminary results indicate differential composition of microbes between summer and winter of 2023 and summer of 2024. Shifts in the relative abundance of genera at the same site were observed with increased community evenness in the winter. Current work is focused on completing a two-year cycle of seasonal sampling by sequencing samples from the winter of 2024 ($n = 30$) to determine if there is annual variation in the composition of microbial communities in RWHS.

Emily Riley

PA - Millersville University

Discipline: Computer Science

Authors:

#1 Jingnan Xie

Abstract Name: On Productiveness and Complexity in Real Function Analysis through Hilbert's 10th Problem

In David Hilbert's 1900 address, he introduced 23 problems, with the 10th problem questioning whether an algorithm exists to determine if a Diophantine equation has integer solutions—a challenge we now refer to as Hilbert's 10th Problem (HTP). A Diophantine equation is a polynomial with integer coefficients that can involve any number of unknowns. Extensive research, primarily done by Matiyasevich, has shown that it is undecidable to determine whether an arbitrary Diophantine equation has an integer solution. He established that every recursively enumerable (RE) set has a Diophantine representation. Building on this foundation, Daniel Richardson proved the undecidability of the "equivalence to the identically 0 function" problem for a set of elementary functions using many-one reductions from HTP. In this work, we introduce the concept of productiveness, a stronger form of non-recursive enumerability. A productive set, S , is not recursively enumerable; moreover, for any effective axiomatic system F , there is an effective procedure to construct an element in S that is not provable in F . We extend the undecidability results of HTP and the "equivalence to the identically 0 function" problem to the context of productiveness, demonstrating that both problems are not only undecidable but also unprovable. The productiveness of the "equivalence to the identically 0 function" problem over different domains is also investigated. Furthermore, our findings indicate that many predicates within the theory of real functions, such as those determining the continuity or differentiability of an arbitrary function, are as hard as the "equivalence to the identically 0 function" problem through highly efficient many-one reductions. Intuitively, these efficient reductions preserve almost any level of complexity, allowing us to prove undecidability and complexity results simultaneously.

Shayla Riley

GA - Georgia State University

Discipline: Political Science

Authors:

#1 Shayla Riley

#2 Kimberly Zagorski

Abstract Name: Drinking Water: Household Source and Awareness of Dunn County Water Quality

This study investigates the relationship between a household's water source and their awareness of local water quality in Dunn County, Wisconsin. Using surveys conducted with county residents, the research aimed to measure levels of awareness regarding water quality issues, particularly local nitrate problems. Quantitative analysis revealed no statistically significant relationship between water source and overall awareness. However, correlations were found between awareness and demographic factors such as age, gender, education, income, and housing status (renting vs. owning). Additionally, machine learning techniques were employed to predict awareness levels concerning local nitrate issues among renters and homeowners. Renters were found to be less aware of the nitrate issue while homeowners who watch the news are more aware of the nitrate issue. These findings provide valuable insights for local government officials and community leaders, highlighting the importance of targeted educational initiatives to enhance community awareness of water quality and its implications.

John Riley

IN - Purdue University Main Campus

Discipline: Interdisciplinary

Authors:

Hannah McCallister

Ethan Lyon

Abstract Name: From Trauma to Trails: A Nature-Based Processing Method for Greater Lafayette Youth

When prompted by Purdue University undergraduate researchers, the mayor of Lafayette, Indiana responded that the greatest problem in the Lafayette community is youth trauma. He has seen this reality manifest generationally, one bad life decision to the next, diminishing quality of life. With over 47,000 individuals under the age of 18 in the Greater Lafayette area, our community faces the critical issue of a large youth population with few constructive outlets for trauma processing. Partnering with the city of Lafayette, multiple participating high schools and grade schools, and a group of dedicated Purdue student engagement researchers, our team is working to address this local city-expressed problem. Research suggests that for youth populations, intentional engagement with nature and nature-based therapies can improve mental health. This intentional engagement has formed the basis for our approach to combatting this established problem. We have chosen the Wabash Heritage Trail, an expansive 18-mile nature trail, as our ideal and accessible medium for building intentional engagement with nature. Having newly launched the project, our process includes: 1) brainstorming ideas by drawing on our own experiences with nature, 2) conducting a review of published research and existing engagement tools, and 3) hiking the Wabash Heritage Trail, collecting our own data from notes, pictures, and experiences. Finally, by synthesizing these approaches, we are producing a nature guidebook. This guidebook is a tool to help youth directly engage with nature and informally help them process trauma. We will then distribute these guidebooks, teaching Heritage Trail facilitation methods to pre-established local high school service learning teams. In this manner, distributing our guidebook to even 40 students in one such leadership club at only one of many high schools has the potential to impact thousands of local youth and help them process their trauma in a nature-directed manner.

John Riley

IN - Purdue University Main Campus

Discipline: Education

Authors:

Abstract Name: Freeing Emotions Through Jazz: A Video-Based Analysis of Performance

My University's Honors College Jazz course, sparked my interest in jazz research and helped me develop a conceptual framework of jazz. Writing projective verse, aurally analyzing jazz genres, and writing/performing unique jazz-inspired pieces are the scaffolds of my framework. Focusing on these jazz-inspired pieces, my research demonstrates that musicians and non-musicians alike visibly express their emotions in a performance setting. Students in my Honors college must plan and complete a knowledge-generating research project. To fulfill this, I developed a method to qualitatively analyze the class' jazz performances and apply this work to the aforementioned Jazz class for community engagement. My project will help future jazz students think more critically about their own performances, provide a potential educational model for performance-based classes, and consider the implications of jazz for student authenticity and vulnerability. The question then: For a group made up of different levels of musicianship, does having weekly jazz performances allow for those same students to free themselves from emotions, both positive and negative, seen through visible expressions? To collect data I rewatched the recorded performances from Jazz class and observed five individuals', at different levels of musicianship, visible expressions. Visible expressions were split into three categories: facial expressions, body language, and audible expressions; each with their own subcategories. Results have shown that the students who had the least musical experience show more expressions as they perform more, indicating that they are more freely expressing their emotions through jazz. I have also constructed a thematic map using the software application Gephi to illustrate the connectedness of the various expressions.

Jin Christian Rimando

CA - Medanos College

Discipline: Mathematics

Authors:

Abstract Name: Predictive Modelling of Wildfire Dynamics: Analyzing the Park and Borel Fires through Satellite Imagery to Enhance Fire Management in California

California had two of the largest fires in state history in 2024: the Park Fire and Borel Fire. According to the California Air Resources Board, of the twenty largest fires in California history, eight have occurred since 2017. The purpose of this project is to use data from the NASA Earth Observatory satellite images to create function models for the perimeter and burn area estimates for these two fires. Can the average rates of change be used to predict future wildfires? The focus of this research project is unique because these two recent wildfires are significant to residents of California. Calculating Riemann Sums for satellite images, this project estimates the burn area of wildfires day-by-day, and it can be used to predict the burn area and the fire perimeter of future wildfires and to stop wildfires from spreading further. From the NASA satellite images, I gathered aerial images from regular occurrences from the two fires. The fire perimeter distances at various times during the fire growth are being calculated. Using regression, I have thus far found functions modeling the rate of change of the burn area and fire perimeter of the two wildfires. I am hoping that my research can be used to help deter climate change in California and to prevent future wildfires from spreading further, impacting California residents.

Jeila Rios

TX - St. Edward's University

Discipline: Psychology

Authors:

Abstract Name: The Likelihood of Collectivist Cultures Exhibiting Protective Factors Towards Male Perpetrators of Sexual Violence

After the rise of the #MeToo movement, support for survivors has entered mainstream media setting the tone that Sexual Violence (SV) will not be tolerated. Even so, the ways in which SV is handled in individualistic versus collectivist cultures vary greatly. This study investigates the likelihood that collectivist cultures will express protectiveness over male perpetrators of SV. Participants, including St. Edwards University students and the general public, completed a survey that measured protective factors towards male perpetrators in four hypothetical scenarios. This study used a mixed methods research methodology. Qualitative measurements were utilized to explore whether participants were exhibiting protectiveness over perpetrators. Then, quantitative measurements of demographics were collected in order to examine whether or not there was a correlation between collectivist cultures and exhibiting protectiveness over male perpetrators. The duration of this study was eight-weeks, and we collected data from a total of 86 participants. The results indicate that there was no significant difference when measuring for race/ethnicity. However, a significant difference was found when measuring gender, with non-binary/third-gender individuals being more likely to show protective tendencies towards male perpetrators of sexual violence compared to both male and female individuals. Together, this study is contributing to our understanding of the ways in which social norms as well as the oppression of marginalized groups contribute to the prioritization of protecting group image over protecting the survivors of sexual violence.

Natalie Rippy

OK - University of Central Oklahoma

Discipline: Art History

Authors:

Abstract Name: Comparative Analysis between a French and African Female Statue: Different Aesthetics but Similar Social Significance

This study examines the statues of women of the French and Bamana people and their social meaning within their respective cultures. The French statue, Standing Woman, is from the 16th century and the Statue of a female Ancestor is from the 19th century. This comparative examination focuses on the aesthetic and the cultural meaning of the artworks Standing Woman and Statue of a Female Ancestor to decipher their similarities and differences. The comparative assessment of both artworks demonstrates both societies created images of women with different aesthetics, but both shared cultural idealization and sexualization of women with the pure purpose of sexual arousal and childbearing. I will use a formal examination of the artworks and academic gender studies and social context studies to support my argument. This study is important considering limited comparative art historical research, in favor of emphasis on cultural differences based on aesthetic values, or national and geographical art historical studies.

Hannah Ritter

DC - The George Washington University

Discipline: Political Science

Authors:

Abstract Name: The Integration of Colombians, Argentinians, and Ecuadorians in Madrid and Barcelona: Discrimination, Trust in Institutions, and Sense of Belonging

Spain is often characterized as a "new" immigration destination. Between 1998 and 2022, the country's population increased from 40 million to 47.5 million, driven mainly by international immigration. By 2022, Latin American immigrants constituted 43 percent of Spain's foreign-born population. In light of this recent surge in immigration, there has been growing debate among citizens, policymakers, and scholars regarding the extent to which Latin American immigrants successfully integrate into Spanish society. A common misconception is that these immigrants integrate easily due to their shared language, cultural similarities, and historical ties with Spain. Therefore, this study examines the integration of first-generation Colombian, Argentinian, and Ecuadorian immigrants in Madrid and Barcelona from 1998 to 2024. More specifically, if these nationality groups perceive discrimination, trust in public institutions, and feel a sense of belonging in their respective cities. Focusing on the same nationality group across different contexts in different cities, this case study explores how integration experiences may vary between nationality groups and across autonomous communities in Spain. This paper analyzes fourteen semi-structured interviews conducted in June and July of 2024; I found that Latino-on-Latino discrimination, citizenship status, use of social networks, and time in Spain became prominent themes that impacted the integration of these nationality groups. Additionally, I identified the role of Catalan language acquisition as a crucial dimension of the integration process in Catalonia. This study has broad implications for future integration policy in Spain across autonomous communities, as well as implications for the European Union in creating an updated standard integration framework for EU countries to follow.

Charlie Ritter

VA - George Mason University

Discipline: Political Science

Authors:

#1 Charlie Ritter

Abstract Name: Party Minority Impact on In-Party Financial Contribution

In the United States Congress, are parties in the minority more likely to be cohesive? With member-to-member financial contributions, I examine party cohesion networks in the United States Congress. This question is important as it examines what parties in the minority will do in order to get out of the minority. Parties have an easier time getting things done when they have a majority. Therefore, parties are motivated to get out of the minority. Data that I examine is financial contributions between members in multiple Congresses including the 103rd, 109th, 111th, and the 115th. Running a modularity test in Gephi on the data from each Congress, I find clustering of Congress members in order to determine if there is financial cohesion in minority parties. After I have applied the results from the modularity tests that I run on each Congress, I am able to find that there is a link between parties being in the congressional minority and intra-party financial contribution cohesion.

Miguel Rivera

TX - The University of Texas at San Antonio

Discipline: Engineering

Authors:

#1 Vikram Kapoor

#2 Ahmed Hussein

#3 Miguel Rivera

Abstract Name: Interaction of Metal Oxide Nanoparticles with Nitrifying Bacteria in Soil

Zinc oxide (ZnO) nanoparticles (NPs) are widely used in consumer products such as agrochemicals, paints, and antimicrobial agents. While beneficial in various applications, ZnO NPs pose risks to soil ecosystems due to their antimicrobial activity, particularly impacting the nitrogen (N) cycle by inhibiting nitrifying bacteria. These bacteria play a vital role in converting ammonia to nitrate, a process essential for soil fertility and plant growth. Disruption of this cycle by ZnO NPs can reduce microbial diversity, enzyme activity, and overall soil health, ultimately affecting agricultural productivity. This study investigates the impact of ZnO NPs on soil nitrifying bacteria through physiological, transcriptional, and metabolic analyses. Soil microcosms were prepared with ZnO NP concentrations of 10, 100, and 500 mg/kg, alongside controls. Samples were collected over 20 to 100 days, and enzyme activities of ammonia monooxygenase (AMO), nitrite oxidoreductase (NXR), nitrite reductase (NIR), and nitrate reductase (NAR) were measured. To assess AMO activity, soil samples were incubated with phosphate-buffered saline containing ammonium sulfate and potassium chlorate, followed by potassium chloride extraction. The methodology ensured precise conditions to evaluate enzymatic responses to ZnO NP exposure. Preliminary findings suggest that higher ZnO NP concentrations significantly inhibit enzyme activities, supporting the hypothesis that ZnO NPs adversely affect nitrifying bacteria and nitrogen cycling. The nitrogen cycle is crucial for ecosystem stability, plant photosynthesis, and agricultural sustainability. Disruption by ZnO NPs threatens food security and ecological health. This research underscores the need for alternative, less toxic materials or mitigation strategies to reduce environmental impacts. By understanding ZnO NP interactions with soil microorganisms, this study aims to inform the development of sustainable nanoparticles that preserve soil health and agricultural productivity amidst increasing nanoparticle usage.

Jose L. Rivera

TX - The University of Texas at El Paso

Discipline: Health and Human Development

Authors:

#1 Carolina Valencia

#2 Alejandra Ochoa Alverado

#3 Manuel E. Morales

#4 Pablo Quiros

Samuel A. Womack

Madeline A. Mendoza

Abstract Name: Association Between Psychosocial Factors and Pain Perception in Elderly Individuals in the U.S.–Mexico Border Region.

Evidence shows that the elderly population are more likely to experience chronic pain than younger individuals. Chronic pain perception in elderly individuals is influenced by a dynamic interaction of psychosocial and physiological factors, especially in the U.S.-Mexico border region. However, evidence is

still not clear on the influence of psychosocial factors on pain perception. The purpose of this study is to explore how psychosocial factors such as resilience, acculturation and pain catastrophizing influence pain perception in elderly populations. The preliminary analysis included 38 participants (60.5% females), 22 Hispanic, (Mean age=67.21 years, SD=5.92). After signing informed consent, validated questionnaires such as the Brief Resiliency Scale (BRS), Short Acculturation Scale for Hispanics (SASH), and Pain Catastrophizing Scale (PCS) were provided. Participants underwent quantitative sensory testing, including thermal pain threshold and tolerance, Temporal Summation (TS), and Conditioned Pain Modulation (CPM). Correlational analyses were performed to assess associations between psychosocial factors and pain perception. Analyses revealed a negative correlation between resilience and conditioned pain modulation ($r = -.370$, $p = .024$), as well as a negative correlation between acculturation and conditioned pain modulation ($r = -.536$, $p = .001$). Additionally, findings revealed a significant negative correlation between pain catastrophizing and pain tolerance ($r = -.357$, $p = .033$). Findings highlight the importance of psychosocial factors in shaping pain perception among elderly individuals in the U.S-Mexico border region. Lower resilience and higher pain catastrophizing were associated with diminished inhibitory capacity and tolerance respectively. The study highlights the importance of accounting for psychosocial factors, in pain management particularly in aging populations. Future studies should explore this with a larger sample size to assess the true role of resilience, acculturation, and pain catastrophizing in pain perception.

Jacqueline Rivera

MI - Hope College

Discipline: Interdisciplinary

Authors:

Abstract Name: Tap, Music, and Dance History: Shifting Tap Pedagogy by honoring Oral Traditions

This research study aims to preserve and honor the foundational elements of tap dance through archival investigation and the study of oral pedagogical traditions. Tap dance by nature is interdisciplinary, both music and dance, and is a blend of African rhythmic footwork and European dance influences. It reflects a vital form of African American cultural expression, rooted in jazz performance. Reflecting oral traditions, tap has been passed down through generations, belly to belly through experience. However, modern tap dance education often emphasizes memorization, disconnecting students from tap's musical and historical context. Without efforts to preserve the historical knowledge and pedagogical methods, tap dance faces the risk of losing its cultural significance. Professor Cornell studied under influential tap practitioners such as Eddie Brown, Steve Condos, Cookie Cook, Harriet Browne, and Buster Brown, and is among the last generation of tap dancers to have worked directly with these pioneers. Her extensive archives, including rare footage of these tap masters—largely unavailable to the public—were invaluable to this study. Through archival digitization, interviews, and direct analysis of their pedagogical methods, this research preserves the techniques of these tap pioneers and ensures the continuation of their oral teaching traditions. This study highlights the importance of oral transmission in tap dance—a living art form at risk of losing its authentic voice and human connection. The resulting pedagogical framework serves as both a tribute to the art form and a call to action for preserving the legacy of oral teaching methods in tap dance education. Although this project will be ongoing for a significant period of time, the goal is to initiate a fluid transmission of content throughout its life. I've chosen to create a mini documentary for my contribution to this research.

Jacob Rivera

GA - University of West Georgia

Discipline: English and Literature

Authors:

Abstract Name: One Piece: Commentary on Society and politics, and the human condition

The story of One Piece, Created by Eiichero Oda, is a story that is acclaimed by many as one of the greatest manga works of all time. This statement is said because of its characters, Worldbuilding, and story. One question that comes to mind is, Why? One piece talks about ideas about political corruption, generation trauma, and the idea of human dreams. These ideas all blend into the ideas of the human condition. Oda weaves these ideas throughout the story to tell a grand narrative about piracy and freedom and how Oda uses human history and mythology to tell his story through a fantasy lens. How does the story illustrate these ideas through its characters and story? With not only its setting but with how the fictional world operates. From the main characters to the many story arcs our characters find themselves in. We will talk about some characters' backstories and how they illustrate this idea, and we will go into how Oda builds the world of one piece—talking about the story overall, from the most recent chapters to the story's start! This abstract presentation will discuss these things, using the evidence throughout the story to illustrate them and show why one piece is a transcendent work of art. And how Eiichero Oda uses all these ideas to talk about political corruption through systemic oppression, racism, and segregation with generation trauma to show how dreams are formed. How Oda creates a high fantasy setting and uses it to talk about the politics of history and both worlds at large.

Mariya Rizvi

VA - James Madison University

Discipline: Art History

Authors:

#1 Mariya Rizvi

Abstract Name: Forgotten Soviet Nationalism: Viktor Djorbenadze's Wedding Palace

Soviet architecture is often viewed in the west as entirely monolithic in style. This is not always true. In the later years of the Soviet Union, national identities and cultural revival of member states were fostered and encouraged through both public sentiment and under Brezhnev's policy of "Developed Socialism". Many architectural projects utilized national iconography to work towards this goal. Viktor Djorbenadze's Wedding Palace (1984) in Tbilisi is an underappreciated embodiment of this cultural period. The ways in which the Wedding Palace stands out will be explored through comparative formal analysis of similar cultural projects of the time, Djorbenadze's own architectural and social influences, as well as an examination of its unique historical and political context. By contradicting typical Soviet architectural styles through its use of Georgian cultural symbols, but maintaining a distinctive aesthetic through modernist forms, Djorbenadze's Wedding Palace is able to defy categorization as singularly "Soviet" or "Georgian". Built as a symbol of growing cultural pride, but imbued with certain Soviet functionality, the Wedding Palace is representative of its particular circumstances in history, including the particular support from Georgia's head of state, Eduard Shevardnadze. While Viktor Djorbenadze managed to gain approval for his eccentric projects during this time, his works were largely forgotten and shunned after Georgian independence in 1991. Djorbenadze's Wedding Palace is individual in its integration of Soviet functions, religious and cultural symbols, and modernist forms. Djorbenadze's Wedding Palace serves as a prime example of innovative and timeless design of Soviet projects that defy western expectations.

Megan Roach

OK - Oklahoma State University

Discipline: Biology

Authors:

#1 Benjamin Nelson

#2 Savannah Beakley

#3 Karen Wozniak

Abstract Name: Antifungal Mechanisms of Action by Dendritic Cell Lysosome Proteins

Cryptococcus neoformans is an opportunistic fungal pathogen that primarily affects immunocompromised individuals and can cause cryptococcal meningitis. Approximately 152,000 cases of cryptococcal meningitis occur annually in HIV/AIDS patients, leading to 112,000 yearly deaths. Very few antifungal drugs are available to treat cryptococcal infection, and those are ineffective or toxic. In addition, fungal pathogens such as *C. neoformans* have become resistant to many types of treatment. Previous studies in our lab showed that proteins from the dendritic cell (DC) lysosome have antifungal activity against *C. neoformans*, including NOSTRIN, human neutrophil elastase (HNE), matrix metalloproteinase 25 (MMP25), myeloperoxidase (MPO), and coronin. In this study, we tested the antifungal activity of the compound NOSTRIN against the *C. neoformans* strain H99 using different concentrations of the drug. First we calculated the minimum inhibitory concentration (MIC). Then, fluorescence microscopy was used to examine structural changes in *C. neoformans* post-treatment, and mutant libraries were utilized to find genes that exhibited resistance or susceptibility to NOSTRIN. Results showed that NOSTRIN had a similar MIC to the antifungal drug Amphotericin B, with NOSTRIN around 0.25 ug/ml and Amphotericin B around 2 ug/ml. Fluorescence microscopy showed that fungal cells treated with NOSTRIN are releasing intracellular contents following incubation, indicating damage to the fungal cell wall or membrane. Mutant library analysis showed that the deletion of genes such as INM101 increased the percent of surviving mutant cells, while the deletion of NDX6 decreases the percent of surviving mutants. In future studies, we will continue to examine NOSTRIN and other antifungal DC lysosome proteins utilizing microscopy and cryptococcal mutant libraries in order to identify their mechanism(s) of antifungal activity. By researching the presented topics, we hope to gain a better understanding of the effects that these proteins have on *C. neoformans*, which could potentially lead to more effective therapies for cryptococcosis.

Alyssa Roadcap

PA - Shippensburg University

Discipline: Biology

Authors:

#1 Alison Fedrow

#2 Marcie Lehman

#3 Richard Stewart

Larissa Cooper

Abstract Name: Determination of Ehrlichia and Anaplasma (multiple species) prevalence in Amblyomma americanum ticks collected in central Pennsylvania

Amblyomma americanum, also known as the Lone Star tick, has historically been found in the southeast and midwestern United States; however, according to the U.S. Centers for Disease Control, current species distribution extends up the eastern coast into Maine. It is suspected that the movement of Lone Star ticks into northern climates is due to recent, milder winter conditions that allow for over-wintering; additionally, the expansion of white-tail deer populations is also hypothesized to be a contributing factor. Due to its aggressive host-seeking behavior and its role as a vector of a variety of biological agents, including the causative agents

of ehrlichiosis and anaplasmosis, the Lone Star tick has become epidemiologically significant. Our research analyzed *A. americanum* ticks (individual adult ticks, pooled larvae, and nymphs) collected at Letterkenny Army Depot and Fort Indiantown Gap from 2019-2024 for the presence of *Ehrlichia* and *Anaplasma* species, including *E. ewingii*, *E. chaffeensis*, *E. canis*, *E. ruminantium*, and *E. muris euclairensis*, as well as *A. ovis*, *A. Marginale*, *A. centrale*, *A. platys*, *A. bovis*, and *A. phagocytophilum*. These species act as serious nuisance pathogens to both humans and animals (domestic and peridomestic), enhancing the need for additional knowledge regarding the threat they pose to Pennsylvania and its inhabitants.

Alexandria Robbins

IN - Indiana University Purdue University Indianapolis

Discipline: Biology

Authors:

#1 Elysabeth Otte

#2 Randall Roper

#3 Charles Goodlett

Abstract Name: Dosage-dependent effects of mbk-1 Down syndrome orthologous gene in *Caenorhabditis elegans*

Down syndrome (DS), also known as Trisomy 21, is a genetic condition characterized by the presence of three copies of human chromosome 21 (Hsa21). Abnormal expression of a gene of interest, dual specificity tyrosine-phosphorylation-regulated kinase-1A (DYRK1A), contributes to phenotypes such as delayed development of motor and cognitive skills. Identification of functional contributions of DYRK1A to behavioral phenotypes can be facilitated in genetically modified organisms in which the gene of interest is functionally deleted (full knockout), but mammalian models are not capable of modeling a full knockout of DYRK1A from conception as it is embryonic lethal. *C. elegans* possess an orthologous gene to DYRK1A, minibrain kinase 1 (mbk-1). Knockout (EK228) and overexpression models in *C. elegans* may be helpful in understanding effects of DYRK1A dosage in development. We hypothesize that mbk-1 knockout and overexpression models of *C. elegans* will display altered mobility and impaired learning when compared to the wild-type N2 strain. Motility is assessed by measuring the distance traveled over a 24-hour period. Testing revealed motility deficits in knockout strains. Future testing of mobility (body bends assay) will further analyze possible movement deficits of overexpressing strains compared to knockout strain. Learning in *C. elegans* is assessed using classical conditioning of associations between neutral chemosensory cues (conditioned stimuli, CS) NaCH₃COOH and NH₄Cl with the manipulated presence or absence of a food source (*E. coli*) (unconditioned stimuli, US). Ongoing studies of classical conditioning have resulted in inconclusive preference for the conditioned stimulus requiring future adjustments. These studies will allow for the analysis of potential roles of mbk-1 in learning and neurodevelopment in *C. elegans* and will provide a model to help identify the role of DYRK1A in the behavioral patterns and neurological function in DS.

Paige Robbins

KY - Thomas More University

Discipline: Chemistry

Authors:

Abstract Name: Synthesis and Characterization of Platinum(II) and Palladium(II) Complexes with 2,2'-biquinoline (bqu)

Platinum and palladium diimine complexes function as catalysts in a variety of important chemical processes. This study investigates metal complexes with the novel ligand 2,2'-biquinoline (bqu) and related analogs. The products were confirmed and characterized using UV/Visible spectroscopy and ¹H NMR spectrometry. Future work will focus on refining synthetic parameters and using the products as precursors to additional metal complexes.

Anna Robbins

IN - University of Evansville

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: Study of a Private Lithics Collection from Southeast Missouri

This project involves the cleaning, labeling, cataloging, photographing, and identification of Native American lithics. The collection includes arrowheads, spearpoints, knives, an atlatl weight, and a hand axe. These artifacts, which were found in Bollinger County Missouri, are part of a private family collection. The collection includes hundreds of specimens. This project focuses on the best-preserved artifacts in the collection, about 150 pieces. As this is a private collection, the artifacts have been removed from their original context, meaning that they do not have provenance. The lack of information based upon where the artifacts were found makes them difficult to study. Despite the abundance of private collections like this, there have been few studies of their contents. However, to gain as much information as possible from these private collections they must be studied. As there has been little archaeological work in the area, due to it primarily consisting of private farmland, this study provides meaningful information pertaining to native populations of the area which would otherwise be unknown. The collection was originally displayed in picture frames. Because of this, the artifacts had to be removed from these frames and glue residue removed in order to be properly persevered. Then, each artifact was assigned a catalog number based on which family member originally owned the artifact. This was done to work with the needs of the owners while still being an effective study. Each lithic was then photographed before each identifiable artifact could be dated. By completing this study, I hope to not only share my work but also share this family collection. As an archaeology student, I have learned the importance of sharing history. It is crucial that this vast collection of lithics, as well as other private collections, are not only studied but made available to others for further research.

Gracee Roberson

TX - West Texas A&M University

Discipline: Biology

Authors:

#1 Emilie Baker

Abstract Name: The Relationship between Telomere Length, Age, Disease, and Performance in Livestock Animals

The purpose of this study is to identify any gaps within previous literature discussing the correlation between telomere length (TL), age, disease, and performance in various livestock species such as cattle, horses, sheep, goats, pigs, and chickens. In this extended literature review, a two-stage screening process was implemented

to ensure systematic and efficient selection of relevant articles. Within the first stage, the titles and abstracts of all identified articles were reviewed using predetermined inclusion and exclusion criteria. Each article that passed the initial screening went on to an in-depth review which focused primarily on the methods and results sections to ensure relevance and quality. A total of 245 articles were screened with only 31 being included in this review. The general trend across species correlated TL with age, determining that as age increased, TL decreased. Within all other measurements, there were mixed results regarding any correlation whether positive or negative. Across all livestock species, it is evident that more research is needed to determine TL's effects on disease susceptibility and immunity. With continued research focused on those health factors and performance traits, this could lead to improved breeding strategies and enhanced animal health.

Rachel Roberson

VA - Virginia Military Institute

Discipline: Psychology

Authors:

Abstract Name: Examining Implications of Diagnostic and Therapeutic Ambiguity in Medical Scenarios

It is common to see ambiguity in the medical fields specifically surrounding how severe the course of a disease might be or how effective a particular treatment is (Han et al., 2011; 2019). Generally, patients are hesitant to make decisions when given ambiguous information, and ambiguity aversion is a well-documented phenomenon in the medical domain (Han, 2016). However, few researchers have directly compared whether patients react differently to different types of ambiguity. In the present research, we compared diagnostic ambiguity (operationalized as uncertainty surrounding the severity of the disease) to therapeutic ambiguity (operationalized as uncertainty surrounding how well a vaccine works). 351 participants were presented with one of 3 hypothetical medical scenarios – one with only diagnostic ambiguity, one with only therapeutic ambiguity, or a control condition with no ambiguity. Despite theoretical reasons to expect different reactions, there was no significant difference in willingness to receive the vaccine between conditions, suggesting that patients do not distinguish between different types of ambiguity. Implications of these findings and avenues for future research are discussed.

Mary Roberts

OK - University of Central Oklahoma

Discipline: Education

Authors:

#1 Mary LeBoeuf

#2 Mary Roberts

#3 Hania Rehman

Mary Roberts

Hania Rehman

Abstract Name: Teaching Art Criticism in K-12 Art Classrooms

This lesson introduces an innovative approach to teaching art criticism through interactive methods like Think, Pair, Share and See, Think, Wonder, using Gabrielle M nter's painting Snow and Sun as the focal point. The lesson is built around the key principles of "Investigation, Exploration, and Imagination," which serve as a framework for guiding students through the stages of art analysis and critique. These principles

encourage students to observe, reflect, and share their insights with peers, fostering an environment of inquiry and creativity. By employing these interactive teaching methods, the lesson promotes active participation in both group discussions and individual artistic expression. The aim is to enhance students' understanding of art not only by encouraging them to explore different perspectives but also by helping them articulate their viewpoints. This approach also strengthens their critical thinking skills, as students are prompted to engage deeply with the artwork rather than passively observing it. Research data for this lesson was gathered through the observation of student interactions at various stages of the lesson. Special attention was given to how critical thinking was integrated into each phase of the process, from initial investigation to final discussion. The findings indicate that this structured and interactive approach significantly improves students' ability to engage with and analyze artwork meaningfully. By encouraging them to explore, imagine, and critically assess the art, the lesson helps develop their analytical abilities and enhances their capacity for creative self-expression. Through planned exercises, this Art Criticism Game seeks to support students' growth in visual literacy, improve their capacity to express their reactions to art, and boost their self-assurance in their analytical abilities.

Elliot Roberts

UT - Utah State University

Discipline: Biology

Authors:

#1 Claudia Nischwitz

Abstract Name: Survey for Insect Pests of Cut Flowers in Utah

Cut flower production is a relatively new industry in the state of Utah and little research concerning management of the plants has been conducted. One issue producers face are insects that harm the plants in ways such as feeding damage and transmission of diseases. Currently it is unknown which insects target different species of cut flowers in Utah. Morphological identification of genera and species is often difficult or impossible because of the small size of many of the insects and minute differences between species. This project uses PCR and DNA sequencing to identify the genus and species of insects that were captured while residing on cut flowers in Utah. The resulting sequences were compared to other known sequences using the NCBI BLAST search. To date 21 species have been identified on 14 species of cut flowers grown on 12 cut flower farms across Utah. This information allows producers to proactively take measures against specific species of insects.

Joey Roberts

MN - Hamline University

Discipline: Biology

Authors:

#1 Leif Hembre

Abstract Name: Daphnia in the Water Column: Migration Strategies, Coping with Predators, and Hypoxic Dead Zones

Water columns of lakes and oceans are heterogeneous environments in which factors like temperature, dissolved oxygen (DO), food availability, and predation risk often vary with depth. Organisms will select for particular depths and times that maximize their ability to survive and reproduce. Animals possessing traits

that improve survival under hypoxic conditions commonly found in deep water would likely have a competitive advantage, being favored by natural selection. Hemoglobin (Hb) production by *Daphnia*, a common freshwater zooplankton, is a trait that can increase survival in hypoxic environments. However, a trade-off exists: *Daphnia* with higher Hb concentrations are brightly colored, making them more vulnerable to visual predators. *Daphnia pulex* were collected at different depths from the water column of Mary Lake (northwestern Minnesota) during the daytime and at night. Individuals were assayed for Hb level and genotype at the Glucose 6-Phosphate-Isomerase (GPI) allozyme marker. We hypothesized that 1) *Daphnia* collected from low oxygen depths would have higher Hb content, 2) *Daphnia* with higher Hb levels wouldn't be found in daytime surface waters (due to vulnerability from visual predators), and 3) *Daphnia* of different GPI genotype would differ in their vertical migration behavior and/or Hb content. We found that average Hb content of *Daphnia* differed significantly among depths and between day and night. We also found positive correlations between Hb concentrations and *Daphnia* density at given depths. This indicates a possible connection between migration patterns and Hb levels. However, we also found lower than expected densities of *Daphnia* in nighttime surface waters, possibly due to predation risk from *Chaoborus* (phantom midges), non-visual predators that were abundant at those depths. Understanding factors that affect vertical migration patterns could enable ecologists to predict population response to increasing effects from climate change, which cause increased thermal stratification and worsening hypoxia ('dead zones') in deep water.

Jude Roberts

VA - Virginia Military Institute

Discipline: Computer Science

Authors:

#1 Sherif Abdelhamid

Abstract Name: Large Language Models for Hiring Automation: Evaluating GPT-4 for Robust, Consistent, and Accurate Resume Screening

This research investigates the potential of large language models (LLMs), specifically GPT-4, in hiring automation and resume selection. A comprehensive literature review and a bibliometric analysis were conducted to understand the current research landscape, key themes and topics, and influential researchers and institutions. The study also examines the robustness of LLMs against challenges such as keyword manipulation and content overload. We aim to address these research questions: How accurate, consistent, efficient, and precise are LLMs for automating the task of resume screening? Also, what are the advantages and limitations of LLMs in this domain? These questions will contribute to a more broad concept of their overall reliability. The research, currently in progress, follows a mixed-method approach and involves both quantitative evaluation of accuracy and time efficiency, as well as qualitative assessments of consistency and precision in repeated candidate selection. Preliminary observations indicate that while LLMs show promise in accuracy and efficiency, they may struggle with precision and consistency, particularly when faced with malicious or overly complex inputs. This work aims to reveal the advantages and limitations of LLMs in task automation, offering insights into their application in hiring workflows and emphasizing the importance of careful oversight to mitigate potential risks.

Murray Robertson

OH - Capital University

Discipline: Music

Authors:

Abstract Name: FilterINg the Noise: A Digital Method in Composing with Filters and Recorded Sounds

Subtractive synthesis has been a primary method in musicians' use of analog synthesizers since their popularization in the 1950s-1960s. The process involves playing pitches made of basic waveforms with their sound softened through audio filters. I propose a new way of passing audio through filters to synthesize pitches from sound sources such as field recordings or white noise. Using digital tools, a bandpass filter is given a small bandwidth (approx. 4Hz to >1 Hz) and when applied over a harmonically rich sound source, the resulting sound is perceived with a sinusoidal tone. Then, virtual instruments can be programmed to synthesize tones using multiple filters. This application of filtered sound can be further extended with the manipulation of the source audio, such as changing field recording or noise generation techniques. This project explores the utilization of sound source and the filtered tones both independently and in combination with one another to create a multi-functional virtual instrument. Introducing granular synthesis concepts have also been investigated as a way to create a "brighter" and more dynamic tone. Building on principles of subtractive synthesis, this method allows the artist to control a musical instrument which produces sounds mirroring the inflections of the original audio.

Cally Robertson

WI - University of Wisconsin-Eau Claire

Discipline: Biochemistry

Authors:

#1 Sanchita Hati

#2 Laurel McEllistrem

Kassandra Bargender

Abstract Name: Use of Raman Spectroscopy as a Noninvasive Tool for Cancer Detection in Human Saliva

Cancer now tops heart disease as the number one cause of death in the United States, and it is the second leading cause of death globally. Cancer symptoms are often not specific, and, in many cases, they are either absent or minimal until the tumors have already metastasized. Early cancer detection is the hallmark of successful treatment. In an attempt to develop a rapid, reliable, and noninvasive method for cancer detection and screening, Raman spectroscopy, a powerful analytical technique, has been employed to conduct a comparative analysis of the saliva samples of healthy individuals and breast and lung cancer patients. This vibrational spectroscopic technique identifies unique fingerprints of molecules present in a sample based on the inelastic scattering of monochromatic light. Herein, the preliminary results of our comparative study will be presented.

Taylor Robinson

OK - Southern Nazarene University

Discipline: English and Literature

Authors:

Abstract Name: Island of Truth and Fiction: Robinson Crusoe, Verisimilitude, and Contemporary Films Within

Robinson Crusoe is considered a 'classic' and canon within the field of literature, leading to an expansive collection of scholarly articles, journals, dissertations, and film adaptations. The novel has garnered attention from scholars and general audiences alike. This research will analyze the novel Robinson Crusoe (RC) by Daniel Defoe, the castaway motif, and the techniques of verisimilitude. I will provide an example of the influence of Robinson Crusoe on the motif, adaptations of the motif in film and how the castaway motif adapts to its audience. To show how the castaway motif adapts to its audience, the movies "The Martian" (science fiction film, 2015) and "Cast Away" (drama film, 2000) have been selected. The castaway motif and verisimilitude play an important role in the popularity of RC as well as the adaptations for the current generations. This research allows for a broader view of the castaway motif and it explores how media can evolve for its audiences.

Mikela Robinson

NC - William Peace University

Discipline: History

Authors:

#1 Mikela Robinosn

Abstract Name: The Role of The Black Church during Jim Crow

During the Jim Crow era, the black church served as a safe haven and a "symbol of community" for African Americans. In 2024 I conducted an oral history interview with my devout and church-going grandmother, Priscilla Turner, who grew up in Alabama during the mid-twentieth century. My grandmother's stories gave me insights about what it was like to experience racism and the crucial role of the black church in a time when miniscule state or federal protection was provided. It piqued my interest to learn more, so I consulted a variety of additional sources including newspaper articles, academic books, and oral history interviews conducted by the Southern Oral History Program at UNC-Chapel Hill. This personal and academic dive into the personal and communal trials of and resistance to Jim Crow, provided me with two understandings which are examined at depth in my paper. First, the horrid events of Jim Crow happened over decades and we are not drastically removed from them in our current time. They remain very real memories for members of America's older generation and the impact of these experiences continue to this day. Second, marginalized communities have always created a space for themselves where they can be safe within their expression. For many twentieth-century black Southerners, one of those important spaces was the church.

Lafayette Robinson III

VA - Norfolk State University

Discipline: Education

Authors:

#1 Ronald White

Abstract Name: A Critical Review of Crabill's 2023 "Great of Their Behalf" using Memoing.

In his seminal text Levine (1993), suggests policy is the tool that society uses to manage scare resources efficiently and effectively to achieve its goals. In many school systems, boards are community representatives that depend on such tools. Therefore, this presentation is a critical review of Crabill's 2023 text, "Great on Their Behalf: Why School Boards Fail, How Yours Can Become Effective (Effective School Boards)." Using

memoing to triangulate video analyses and interview data, recommendations are made regarding its relevance for aspiring trustees.

Mario Robledo

AL - Troy University

Discipline: Biology

Authors:

#1 Ja'Dazia Posey

#2 Samantha Ruwuya

Abstract Name: FOXI3 Regulation of Prostate Cancer Cell Behavior in the Bone Microenvironment

Introduction: Prostate cancer (PCa) is a leading cause of cancer-related deaths in men, with bone metastasis significantly contributing to morbidity and mortality. The bone microenvironment is a fertile "soil" for metastatic "seeds." Understanding the molecular mechanisms governing PCa bone metastasis is crucial for developing effective therapies. This study investigates the role of FOXI3, a member of the Forkhead-box (FOX) family of transcription factors, in PCa bone metastasis. While the functions of some FOX proteins in cancer are well-established, the specific role of FOXI3 in PCa remains largely unexplored. Recent studies suggest FOXI3 is involved in bone development and homeostasis. **Methods:** An indirect co-culture experiment using a transwell plate will be used to examine the interaction between PCa cells and bone marrow stromal cells. PCa cell lines will be seeded in the bottom chambers of 6-well plates (100,000 cells/well, 2mL media). Bone marrow stromal cells will be cultured in upper chambers (100,000 cells/1mL media). After a 24 and 48-hour co-culturing, gene expression will be assessed using RT-PCR and qRT-PCR for FOXI3. Protein analysis will be measured using Western blot. Additionally, we will repeat co-culturing and investigate the effects of bone-derived factors (FGF8 and TGF- β) on FOXI3 expression and PCa cell behavior. **Results:** As this is a research proposal, results are pending. We anticipate exposure to bone marrow stromal cell-conditioned media will increase FOXI3 expression and other pro-tumorigenic factors in PCa cells. We expect that FOXI3 removal will reduce prostate cells' invasive and metastatic potential in the simulated bone microenvironment. **Conclusion:** This research aims to elucidate the interplay between FOXI3 and the bone microenvironment, potentially uncovering new therapeutic targets for PCa bone metastasis. Understanding these mechanisms could lead to improved treatment strategies and better outcomes for patients with advanced prostate cancer.

Emili Robles

WI - University of Wisconsin-Madison

Discipline: Computer Science

Authors:

#1 Emili Robles

#2 Tallal Ahmad

#3 Corey Jackson

Abstract Name: AI Fairness and Its Relationship to Cultural Contexts

The rapid growth of artificial intelligence (AI) technologies has amplified concerns regarding cultural biases, perpetuated social inequalities and the disproportionate effects on marginalized communities. A significant factor preventing more responsible AI is that many tools are deployed that do not account for local context in

which they operate, fail to consider the diverse needs and lived experiences of the affected populations, or the values of those who are governed by such technologies. To address these challenges, our research focuses on developing a framework that incorporates context and values to produce culturally sensitive AI systems. Our current efforts involve crowdsourcing pre-audits where laypeople (with local knowledge) evaluate AI projects. These audits capture how cultural contexts influence perceptions of AI systems and their potential biases. Vital components of this research include teaching laypersons about AI, crowdsourcing evaluations, developing machine learning algorithms to automate the evaluation of the audits, and designing auditing reports to communicate community insights. By analyzing these findings, we aim to classify recurring patterns and highlight focal points for designing equitable AI systems that respect cultural diversity. While this research is ongoing, the implications of this work extend to fostering more inclusive AI technologies that reduce cultural harm and promote justice in global applications.

Lauren Rocheford

MN - Gustavus Adolphus College

Discipline: Nursing and Public Health

Authors:

Abstract Name: Evaluation of Sexual Function in Spinal Cord Injury Patients in the Epidural Stimulation After Neurological Damage (ESTAND) Study

Sexual dysfunction can have a significant impact on quality of life, leading to other health problems. The ESTAND trial, which stands for Epidural Stimulation After Neurological Damage, is ongoing and aims to optimize the use of epidural spinal cord stimulation (eSCS) to restore functions that enhance patient quality of life. In this study, sexual function was assessed using the Orgasm Rating Scale (ORS). The ORS is a list of adjectives describing orgasm experiences that was created based on the experiences of able bodied college students. The effectiveness of this scale within the SCI population prior to this study was unknown. The adjectives were categorized into physical sensations (PS), emotions (E), and interpersonal relations (IR). Patients underwent surgical implantation of the eSCS and attended 13 follow-up visits where they underwent a series of motor and autonomic assessments and completed surveys evaluating bladder, bowel, and sexual function, as well as overall quality of life. Average female and male ratings for each category of the ORS were calculated for the first visit and final visit and a paired t-test ($p < .05$) was conducted. The data we obtained from the ORS did not indicate any difference in sexual function in females or males over time. Previous studies done on the effects of eSCS on female sexual function using two alternative scales have demonstrated improvement over time with each patient visit, however this data does not reflect similar trends. It is plausible that the ORS did not accurately capture the sexual experiences of individuals with a spinal cord injury (SCI). Future research might aim to use different tools to gain additional insights from our ESTAND participants on how eSCS has impacted their quality of life and sexual function.

Samantha Rock

PA - Duquesne University

Discipline: Biochemistry

Authors:

#1 Michael Cascio

Abstract Name: Mapping the Serotonin Transporter Using Crosslinking-Mass Spectrometry

Neurological dysfunction is responsible for disorders such as anxiety and depression. Selective serotonin reuptake inhibitors are used to treat these neurological disorders by targeting the serotonin transporter (SERT). However, they often have negative side effects and are only successful in 40-60% of patients. To learn more about its structure, a mutated form of SERT containing a single reactive cysteine (Cys) at position 310 was overexpressed in Sf9 insect cells. After purification and reconstitution into lipid vesicles, SERT will be crosslinked with MTS-benzophenone (MTS-bzp). V310C SERT may then be isolated on a gel. Proteolyzed and extracted peptides will be analyzed in bottom-up mass spectrometry to provide information on the structure of SERT by identifying crosslinking sites near the mutated region of SERT. This information will give a better understanding of the structure and function of SERT to help design medications that are more specific and effective at treating anxiety and depression.

Megan Rodak

VA - George Mason University

Discipline: Interdisciplinary

Authors:

Abstract Name: Rights of Nature in an Extractive Economy: Corruption and Corporate Influence in Ecuadorian Environmental Governance

In 2008, Ecuador became a global pioneer in environmental governance by enshrining the Rights of Nature in its Constitution, granting ecosystems the legal right to exist, regenerate, and be restored. However, despite this progressive framework, Ecuador's economy remains deeply reliant on extractive industries, creating a complex dynamic between environmental protections, corporate interests, and governance. This research explores how corruption and corporate influence shape environmental governance in Ecuador, focusing on the intersection of constitutional protections and the nation's economic dependency on resource extraction. Using a mixed-methods approach, the study analyzes public discourse, judicial rulings, and policy implementation to answer three key questions: (1) How do government and corporate entities frame environmental issues when addressing the public? (2) What role does corruption play in the Constitutional Court's interpretation of Rights of Nature cases? (3) To what extent do corporate interests influence executive decision-making and environmental policy outcomes? The research employs content and discourse analysis to investigate public communications, media framing, and judicial language, revealing patterns of narrative manipulation and policy capture. Findings will contribute to understanding how corporate actors coopt environmentalist rhetoric to deflect responsibility and advance extractive agendas, often at the expense of indigenous communities and ecological integrity. By illuminating the systemic corruption and structural challenges undermining Ecuador's environmental protections, this study aims to inform global discussions on sustainable governance and the practical enforcement of environmental rights.

Vanessa Rodgers

MI - University of Michigan - Ann Arbor

Discipline: Biology

Authors:

- #1 Changyang Linghu
- #2 Bobae An
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#11 Steve Ramirez
#12 Edward Boyden

Abstract Name: Recording of cellular physiological histories along optically readable self-assembling protein chains

The ability to view cellular activity and processes is important for understanding both normal and diseased processes. In this project, protein-based systems—expression recording islands (XRIs)—are designed to record cellular physiological events over a period of time. The XRIs include multiple components that allow them to store cellular information, such as epitope tags—which allow for the use of fluorescence to visualize when a stimulus asserted a response in the cell. To transport XRIs into the cell, viral vectors are used. The delivered XRIs will then start to grow and indicate a cellular response by activating the epitope tags, which can be visualized with conventional optical microscopy. Key findings of this study include successful applications of this scaffold in cultured neurons: an unbroken XRI that displays the appropriate fluorescence. Despite these successes, the system has limitations, including the need for standardization and the inability to track events in dividing cells. Future research will focus on improving the replicability of this model and extending the time the XRI can record. This study implies a new cellular recording technique that offers a non-invasive method to monitor cellular events in real time. Due to its non-invasive implications and ability to record events in real time, this technology may become transformative for researching gene regulation and disease progression.

Kara Rodgers

TX - Midwestern State University

Discipline: Biochemistry

Authors:

Abstract Name: Membrane Protein Chaperone Influences Tau Aggregation Kinetics and Morphology: A Therapeutic Approach for Alzheimer's disease

The most common type of dementia, Alzheimer's disease (AD), is a progressive neurodegenerative disease that initially consists of mild memory loss, but could eventually lead to loss of ability to communicate or react to their environment. A microtubule-associated protein, Tau, aggregates causing neurotoxicity and inevitably neuronal cell death, which is hypothesized as one of the leading causes of the pathogenesis of AD. Abnormal hyper-phosphorylated Tau proteins clump together (aggregate) to form neurofibrillary tangles, which are toxic to neurons and force cell death. The amyloid hypothesis suggests that protein aggregate accumulation in the brain is the primary culprit driving AD pathogenesis. Consequently, inhibiting or reversing this protein aggregation has potential for future therapeutic treatments. Chloroplast signal recognition particle 43, cpSRP43, is a membrane protein chaperone that has shown to efficiently reverse protein aggregation through chaperone and aggregation-prone substrate interactions. This process does not require the use of ATP because cpSRP43 selectively binds to hydrophobic amino acid residues, stabilizing these interactions and preventing the client proteins from ever aggregating. Through the use of Thioflavin T dye, we obtain the aggregation kinetics of Tau aggregation and determine that cpSRP43 prevents Tau aggregation in a concentration-dependent manner. In addition, the electron microscopy shows that the morphological contrast of Tau aggregate in the presence of cpSRP43, indicating that cpSRP43 can inhibit the Tau aggregation. Our results open the opportunity to prevent the Tau aggregation by utilizing unique anti-folding and disaggregation properties of cpSRP43 and emphasize the special role of the membrane protein chaperone in the treatment of protein aggregation-prone disease.

natalie rodrigues

NY - Pace University

Discipline: Chemistry

Authors:

#1 Natalie Rodrigues

#2 Elmer Mojica

Abstract Name: Multivariate Analysis of the IR of Honey Samples

This study explores the chemical composition and authenticity of various honey types, including wildflower, clover, pure, and organic unfiltered honey, utilizing Attenuated Total Reflectance Fourier Transform Infrared (ATR-FTIR) spectroscopy coupled with multivariate statistical analyses. The ATR-FTIR spectra revealed key vibrational bands that indicate the presence of hydroxyl groups, aliphatic hydrocarbons, and carbonyl functionalities, highlighting significant moisture content and sugar composition common to all samples. Principal Component Analysis (PCA) demonstrated that the spectral data variances primarily reflected differences in floral sources, with wildflower and clover honeys clustering closely due to their analogous chemical profiles. Conversely, pure honey distinguished itself with a more standardized chemical constitution, while organic unfiltered honey exhibited unique characteristics linked to its less processed nature. Hierarchical Cluster Analysis (HCA) reinforced these findings by visually representing the relationships among honey types, confirming that floral sources and processing methods critically influence chemical diversity and authenticity. This research underscores the potential of PCA and HCA as effective tools for evaluating honey quality, supporting industry efforts to ensure product integrity and consumer confidence.

Tatiana Rodriguez

CA - Chapman University

Discipline: Psychology

Authors:

#1 Tatiana C. Rodriguez

#2 Emily C. Sweiss

#3 Laura M. Glynn

Abstract Name: Postpartum PTSD is Linked to Maternal Exposure to Unpredictability During Childhood

Background: Approximately 20% of mothers experience the onset of a mental health disorder, including post-traumatic stress disorder (PTSD), after childbirth. Maternal psychopathology is known to negatively impact the health, well-being, and development of both the child and the mother. One risk factor for PTSD in other populations, such as combat veterans, is exposure to unpredictable environments in childhood. In this study, we aim to assess the role of exposure to childhood unpredictability in risk for maternal PTSD after a traumatic versus non-traumatic birth. Methods: Participants included 137 mothers (Mage = 32 years, SD = 5; 56% Latina). We used the Questionnaire of Unpredictability in Childhood (QUIC; total possible range = 0-38; M = 8.8, SD = 7.3) to measure exposure to unpredictability and the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (PCL-5; total possible range = 0-80; M = 6.9 SD = 9.1) to measure childbirth-related PTSD symptoms. Two researchers independently coded birthing narratives as non-traumatic (n = 88), possibly traumatic (n = 27), and traumatic (n = 20) and discussed discrepancies to

reach consensus. We will employ multiple linear regression to test moderation effects of childhood unpredictability on the association between traumatic birth and PTSD symptoms. Expected Results: We expect maternal exposure to childhood unpredictability to increase likelihood of more severe PTSD symptoms after experiencing a traumatic childbirth. Conclusions: These expected results are consistent with previous research on exposure to unpredictability and psychopathology. Findings from this investigation can be implemented to identify mothers at greater risk of postpartum PTSD symptoms due to their childhood experiences of unpredictability and mobilize targeted support.

Sofia Rodriguez

NY - New York University

Discipline: History

Authors:

Abstract Name: Sacred Syncretism: Native American Influences on Catholic Rituals in Colonial New Spain and Mexican Folk Catholicism

In my study, I examine the influence of Native American spiritual practices on Catholic rituals in colonial New Spain, analyzing how these practices shaped Mexican folk Catholicism through processes of religious syncretism. Following the Spanish conquest, indigenous spiritual beliefs—such as animism, ancestor veneration, and ritual festivals—intersected with Catholicism, creating a rich fusion of religious expressions. By focusing on specific instances of syncretism, including the reimagining of indigenous deities as Catholic saints, the alignment of indigenous festivals with Catholic holy days, and the incorporation of sacred natural elements into Catholic rituals, I explore the adaptive strategies indigenous communities employed to preserve their cultural identity within imposed religious frameworks. My analysis includes emblematic figures and practices that embody this blending of spiritual traditions, such as the Virgin of Guadalupe, whose veneration integrates aspects of the Aztec goddess Tonantzin, and the celebration of Día de los Muertos, which synthesizes indigenous ancestral veneration with Catholic observances of All Saints' and All Souls' Days. These case studies highlight the resilience and agency of Native American communities under colonial rule, who, rather than abandoning their spiritual customs, transformed them within a Catholic context. This project contributes to a deeper understanding of how colonized communities navigate and retain cultural identity through religious adaptation. By illuminating the dynamics of Mexican folk Catholicism as a distinctive cultural identity rooted in syncretic practices, offering insights into the broader themes of cultural resilience and adaptation in the face of colonial domination.

Adrianna Rodriguez

WI - University of Wisconsin-Parkside

Discipline: Biology

Authors:

- #1 Snigdha Reddy
- #2 Stefinie Washington
- #3 Lauren Prochniak
- #4 Brittany Dobrowski
- #5 Illirian Dhimitruka
- #6 Robert Barber

Abstract Name: Exploration of active site dynamics and substrate specificity among short chain fatty acid

(SCFA) kinases

Numerous studies reveal the importance of gut microbiome-derived short chain fatty acids (SCFA), such as acetate, propionate and butyrate, in signaling, metabolic, and health outcomes for animal hosts. Colonic microbiomes in Western human populations are generally dominated by species belonging to two bacterial phyla, Firmicutes and Bacteroidetes, which engage in a complex metabolic network that adjusts SCFA levels within an individual. Bacteroidetes includes well-recognized commensal and mutualistic species that serve to break down complex polysaccharides in the gut and generate products such as carbohydrates, propionate, and acetate that can serve as nutrients for the host and other microbial community members. In turn, Firmicutes utilize available resources (carbohydrates, acetate, etc.) to produce metabolites including an array of SCFA through fermentation. One SCFA metabolic pathway recognized within these species involves two distinct enzymes: 1) a SCFA kinase and 2) an acyltransferase. Together, these enzymes can reversibly interconvert SCFA with their acyl-CoA derivatives. Among the SCFA kinase protein family, several variant enzymes exhibiting amino acid substitutions predicted to influence substrate preferences compared to previously characterized SCFA kinases can be identified among key gut microflora species, including *Bacteroides mediterraneensis* (BM), *Bacteroides thetaiotaomicron* (BT), *Phocaeicola vulgatus* (PV), and *Roseburia intestinalis* (RI). Heterologous expression of histidine-tagged variants of the BM, BT, PV, and RI enzymes in *E. coli* has allowed characterization of biochemical properties regarding these variants. Novel, commercially-unavailable substrates have been synthesized and utilized in this study to enhance characterization of these enzymes. Results from these experiments provide insights regarding potential physiological roles for these enzymes in short chain, branched-chain, and medium chain fatty acid metabolism that may influence gut community dynamics and human health.

Roberto Rodriguez

TX - Lone Star College

Discipline: Economics

Authors:

#1 Aurora Lugo

#2 Ghazal Bayanpourtehrani

Abstract Name: Analyzing Nintendo's Demand Forecasting to Optimize Production and Minimize Market Risk

With an aim to identify how Nintendo can use demand forecasts to optimize production schedules and minimize risks of overproduction and stockouts, this research examines sales data and market trends from 1998 to 2024. As a leading game developer and console manufacturer, Nintendo has faced challenges in managing production and maintaining supply chain efficiency, particularly during periods of fluctuating consumer demand and market volatility, such as the COVID-19 pandemic. This study employs a quantitative time-series analysis using unit sales data from 1998 to 2024. A study by Felix Richter (2024) was used to investigate hardware sales trends and their implications for production strategies. Additionally, findings from Shankar et al. (2003) were utilized to assess the impact of network effects on console sales and market competition. The findings indicate that while Nintendo's sales conform to expected product lifecycle trends, the sustained success of the Nintendo Switch reflects changing consumer preferences and evolving market dynamics. As a result, Nintendo combines current market data with traditional forecasting methods, proving essential for aligning production with real demand and improving supply chain management precision. Future research should investigate how digital platforms like eShop and subscription models could further enhance Nintendo's ability to synchronize production with demand forecasts.

Sophia Rodriguez

Discipline: Biology

Authors:

#1 Sophia Rodriguez

#2 Michael F. Miles

#3 Jennifer T. Wolstenholme

Abstract Name: Investigation of Nucks1 Gene Expression Following Chronic Ethanol Consumption:

Nucks1, nuclear casein kinase and cyclin-dependent kinase substrate 1, is highly expressed in the mouse cortex and hippocampus, and was recently associated with progressive increases in ethanol intake in mice and with number of drinks per week in a human genetic association study (GWAS). We recently found that overexpression of Nucks1 in the mouse prefrontal cortex decreased ethanol intake during chronic ethanol access and we suspect may be involved in escalating intake and ethanol dependence. Nucks1 modulates chromatin structure and regulates replication, transcription, and chromatin condensation. Nucks1 expression is high in stem cells and the brain and is expressed in neurons and glial cells. Nucks1 has also been identified as a potential susceptibility gene for Parkinson's disease and bipolar disorder. In the present study, we interrogated Nucks1 mRNA expression following chronic ethanol consumption to test whether ethanol drinking regulates Nucks1 expression. Twenty C57BL6/J male mice were exposed to voluntary ethanol or water consumption and the PFC was collected after nine weeks of ethanol intake. Four primer sets were designed to target all regions of the Nucks1 gene. Primers were tested, and gel electrophoresis was run to determine the most efficient primer set. Complementary DNA was then synthesized from each of the samples and quantitative rtPCR was run to examine levels of Nucks1 expression across both treatment groups. Following a t-test, no significant differences in Nucks1 expression were found between the samples exposed to chronic ethanol and the control group, but certain exons showed trends to be higher expressed in ethanol drinking mice, suggesting potential differential splicing of the Nucks1 gene. Surprisingly, Nucks1 expression was not correlated to ethanol intake in this study. Future analyses will use deep RNA sequencing to investigate if voluntary ethanol drinking alters differential exon usage or transcript variants of the Nucks1 gene.

Elianis Rodriguez Arzola

FL - Miami Dade College

Discipline: Biology

Authors:

Hilary Ramirez Payamps

Abstract Name: The Last of Us: The Quest for Uninfected Monarch Butterflies in South Florida

The monarch butterfly (*Danaus plexippus*) is an iconic species that has long been a flagship for insect conservation, habitat restoration, and the promotion of butterfly gardens. In efforts to support monarch populations, enthusiasts and educators often plant milkweed in gardens and schools. However, in South Florida, the nonnative tropical milkweed (*Asclepias curassavica*) has become dominant in these gardens. Monarchs that preferentially select tropical milkweed are often exposed to higher levels of *Ophryocystis elektroscirrha* (OE), an obligate parasite known to negatively impact monarch growth, flight, and survivorship. To explore the prevalence of this parasite, we captured and tested monarchs for OE spores at three distinct sites: 1) residential butterfly gardens, 2) school butterfly gardens, and 3) natural fields in the Everglades. Our results show that monarchs from residential and school gardens were predominantly heavily infected, whereas monarchs from the Everglades exhibited significantly lower levels of infection. These findings suggest that, despite the prevalence of OE in garden environments, the Everglades may provide a

natural refuge that helps mitigate the effects of parasitic infection, potentially offering healthier individuals that could support broader conservation efforts. Future studies should further investigate milkweed availability and parasitic loads in Everglades habitats to better understand how these factors influence monarch health and conservation.

Daniela Rodriguez Suarez

FL - Florida Gulf Coast University

Discipline: Psychology

Authors:

#1 Starlette Sinclair

Abstract Name: Neurodivergence in the Brain

Neurodivergence is the term used to describe significant divergence of neurocognitive functioning from the social norm. Those who function within the norm are what are referred to as “neurotypical”, while those who function outside of that norm are referred to as “neurodivergent” (Walker, 2014). What defines neurodivergence is not entirely well-specified – some believe neurodivergent disorders are a few neurodevelopmental disorders, while others include disorders you can develop over your lifetime. Perspective in recent years has shifted towards viewing neurodivergency as a natural form of cognitive diversity and away from the idea that there is a “correct” cognitive structure (referred to as the social and cultural models of disability, and in part the Neurodiversity Paradigm [Sarrett, 2016; Walker 2014]). The neurodivergent disorders considered in this review include autism spectrum disorder (ASD), attention deficit/hyperactivity disorder (ADHD), Tourette’s syndrome, dyslexia, dyspraxia, and dyscalculia. Approximately 185 pieces of literature were reviewed – with 13 of them highlighted. This literature detailed the structural brain differences (that deviate from the norm) within these disorders. Structural differences were noted throughout the entire brain, more specifically the amygdala, corpus callosum, throughout the cortex, temporal lobe, frontal lobe, basal ganglia, cerebellum, and parietal lobe. Other structures also noted abnormality. These findings may imply structural roots for various symptomology in the associated disorder and further study could lead to research into alleviating more debilitating symptoms associated with certain neurodivergent disorders. This review has already been conducted and data appropriately assembled.

Willa Rogers

WI - University of Wisconsin-Eau Claire

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 David Jones

Abstract Name: Brewing Identity: Starbucks' Cultural Transformation and the Evolution of Japanese Café Culture

Japanese café culture has undergone a remarkable transformation, evolving from traditional kissaten to modern, pop culture-themed establishments, mirroring the nation's changing social dynamics. This evolution offers a unique lens through which to examine Japan's shifting consumer behaviors, cultural identity, and its complex relationship with global brands. The Japanese café scene, once dominated by local establishments, now features a blend of traditional aesthetics and contemporary trends, creating a distinctive landscape where global coffee chains like Starbucks coexist uniquely with Japanese café concepts. The integration of

international coffee brands into Japan's café culture presents a fascinating case study of cultural adaptation and localization strategies. Starbucks, for instance, has successfully navigated this cultural transition, blending elements of traditional Japanese hospitality with modern pop culture to create a brand identity that resonates with local consumers. This success stands in stark contrast to the brief entry and exit of other international chains like Caribou Coffee, highlighting the intricate balance required to thrive in Japan's competitive café market. This research highlights how Starbucks adapts its brand to align with Japan's distinctive café culture, investigating the localization strategies employed and their resonance with Japanese consumers. By exploring the history of café culture in Japan and its connection to Japanese pop culture, this study uncovers how Starbucks has successfully integrated its services and products into Japanese society while maintaining its core brand identity. Additionally, it investigates the factors that led to Caribou Coffee's withdrawal from the Japanese market, providing a comparative perspective on the challenges of adapting to Japan's unique café landscape.

Lauren Rogers

LA - Louisiana State University, Baton Rouge

Discipline: Biology

Authors:

#1 Naohiro Kato

#2 Alexis Strain

#3 Fan Zhang

#4 Victoria Rodriguez

Abstract Name: The Symbiotic Nature of Plant Microbiomes for Plastic Degradation

Bioplastics, such as polylactic acid (PLA), are designed to reduce environmental impact but degrade slowly in natural soils, with only about 10% of PLA mass decomposing in a month under unconditioned soils. Bacteria like *Bacillus* spp., known for their bioplastic-degrading abilities, thrive in the rhizosphere, where root exudates promote their colonization. We hypothesized that bioplastic degradation rates would increase in the rhizosphere due to enhanced microbial activity. To test this, we examined the degradation of three bioplastics—PLA, polyhydroxyalkanoate (PHA), and a PLA/PHA blend—over three months. Synthetic plastic acrylonitrile butadiene styrene (ABS) served as a control. Degradation was assessed by weight loss every 30 days, and microbial community dynamics in the rhizosphere were analyzed using next-generation sequencing. This study highlights variations in degradation rates and microbial diversity across different plant species and plastic types, offering insights into leveraging plant-microbe interactions to enhance bioplastic breakdown in soil environments.

Jazmine Rogers

OH - The Ohio State University

Discipline: Health and Human Development

Authors:

#1 Xin Feng

Abstract Name: The Influence of Maternal Depression and Parenting Styles on Children's Emotional Expression under Stressful Conditions

Maternal mental health and parenting practices are fundamental to children's emotional and psychological

development. Maternal depression, a prevalent mental health challenge, is linked to less adaptive caregiving practices, potentially compromising children's emotional regulation under stress. This research investigates how maternal depressive symptoms and parenting behaviors influence children's emotional expressions during stress-inducing tasks, addressing gaps in understanding these interconnected dynamics. Mothers completed the Parenting Behaviors and Dimensions Questionnaire (PBDQ), a validated tool assessing emotional warmth, punitive discipline, autonomy support, permissive discipline, and anxious intrusiveness. Simultaneously, children participated in a stress-inducing matching task, with their facial expressions, vocal tones, and behaviors coded for emotional response patterns. Data from the PBDQ and emotion-coding assessments were integrated to explore relationships between maternal depressive symptoms, parenting behaviors, and children's stress-related emotional responses. Findings revealed significant correlations between maternal depressive symptoms and punitive discipline ($r = .29$, $p = .001$), highlighting the impact of maternal mental health on parenting behaviors. Adaptive parenting practices, such as emotional warmth and autonomy support, were linked to positive emotional responses, including problem-solving and persistence. In contrast, punitive discipline and anxious intrusiveness were associated with emotional dysregulation, such as frustration and withdrawal. Children from supportive households demonstrated superior stress management, whereas those exposed to punitive or permissive parenting exhibited heightened stress sensitivity. This study underscores the critical role of maternal mental health and adaptive caregiving in fostering children's emotional resilience under stress. The findings inform interventions aimed at enhancing maternal well-being and caregiving practices, promoting environments conducive to healthy emotional development. By identifying protective and risk factors in maternal mental health and parenting, the research contributes to advancing clinical, policy, and educational strategies to support families and mitigate the intergenerational impacts of maternal depression.

Nico Rogers

PA - Westmoreland County Community College

Discipline: Social Work and Human Services

Authors:

#1 Susan McClure

Abstract Name: The Invisible Wounds Encompassing PTSD in Veterans

Post-Traumatic Stress Disorder (PTSD) is a mental health condition that is a silent detrimental issue effecting many military veterans today. Since 2001, one third of U.S. military veterans who served in the Afghanistan and Iraq wars have been diagnosed with PTSD. The economic, physical, and psychological burdens such as hyperarousal, social avoidance, re-occurring traumatic incidents, and emotional numbness can leave an overwhelming collision in the mind of a veteran. This halts them from completing a proper transition back into civilian life and greatly impacting their professional, social, and educational welfare. Unfortunately, the numbers surrounding this issue are much greater than what is reported. This is due to the underreporting from veterans, often because of the stigmatization they receive for wanting to seek mental health treatment while in the military and the culture of the military. This has led to multiple mental health issues such as depression, anxiety, night terrors, panic disorder, and in severe cases, suicide amongst those veterans. There needs to be a more concise psychological strategy built around these issues and statistics to better serve the veterans that have served our nation. There is also a great need for collaboration of efforts amongst the social service and psychology professionals for a more cost-effective way of delivering psychotherapy treatments. To conclude, if one were to combine the quantitative data from all the epidemiological studies obtained, while using the qualitative perspectives of the veterans that are directly affected, researchers could institute a well-versed investigation into the effects of the invisible wounds encompassing veterans. This would lead to larger success rates which would ultimately provide the proper assistance in supporting the veterans, and get them back on track, and minimize the effects that PTSD has on them.

Sarah Rogers

VA - Liberty University

Discipline: History

Authors:

Abstract Name: Lessons from Yalta: Perpetuating Geopolitical Tensions in Asia into the Modern Age

This study seeks to determine the long-term impacts of the policy agreements between the United States and Soviet Union in East Asia following the Yalta Conference in February 1945 and continuing into the 21st century. The Yalta Conference, in trilateral agreements, primarily focused on the relationship between the Allied Powers and the coming end of Nazi Germany. However, the concessions made at Yalta concerning East Asia, particularly Japan, Korea, and China, have led to long-term impacts on geopolitics and the balance of power dynamic. The USSR and US' involvement in the region set the stage for an extensive cold war and several proxy wars following World War II. Yet, the framework of the relationship built within the Yalta agreement and the vacuum created after the fall of the Soviet Union at the end of the 20th century has caused a new struggle for the title of regional hegemon. The conducted research will be analyzed qualitatively into three periods: the conference itself through the start of the Vietnam War, the Vietnam War through the fall of the Soviet Union, and finally the 1990s through the election of Xi Jinping as the leader of the People's Republic of China. Primary research will be conducted through perusing primary and secondary sources including press releases, first hand accounts from the world leaders present at the conference, and geopolitical analysis of critical events in East Asia in the decades following the conclusion of the conference. This examination refutes the belief that Yalta was only Eurocentric, and instead proposes the notion that Yalta had more severe consequences, for better or for worse, in East Asia than previously thought.

Nicholas Rojas

NC - North Carolina State University

Discipline: Biology

Authors:

#1 Ian Williamson

Abstract Name: Using GCMS to trace conversion of fructose to short-chain fatty acids in the Western diet.

The Western diet of high fructose and high fat has led to a rise in metabolic diseases such as obesity and diabetes due to its effect on metabolism and nutrient availability throughout the body. Short-chain fatty acids (SCFAs), such as butyric, acetic, and propionic acids, are made by microbiota in the gut from ingested nutrients. SCFAs have a role in promoting healthy immune and gut function, as well as maintaining overall intestinal homeostasis. Enterocytes that line the gut lumen use SCFAs as an important energy source, as well as converting fructose into glucose. However, a high fructose intake may overwhelm the process, causing unconverted fructose to reach the colon where the microbiota converts the fructose into SCFA's, feeding liver lipogenesis. Due to the low concentration of SCFAs throughout the body and their volatile nature, these SCFAs may be difficult to measure. Gas Chromatography and Mass Spectrometry (GCMS) have been the preferred methods for analyzing SCFAs for its high sensitivity. By studying biological samples from mice fed a diet of high fructose and fats, we hope to measure changes in the metabolic production of SCFAs from C13-enriched fructose through isotope tracing. Measuring labeled and unlabeled fatty acids within the biological samples of mice fed with controlled diets shows that a high-fat diet alters SCFA production by the microbiota, leading to the negative effects of consuming a Western diet.

Allem Rojas

NC - Western Carolina University

Discipline: Linguistics and World Languages

Authors:

#1 Michael Martinez

Abstract Name: The Accent of your Class: How Language Adapts and Changes Through The Movie Nueba Yol To Represent The Caribbean migrant Experience.

This presentation takes a critical linguistic approach to analyze the 1995 film Nueba Yol by director Ángel Muñiz. The film is about Balbuena, a Dominican man who travels to the United States in search of the American Dream. On the surface, it is a lighthearted comedy about the antics of a stereotypical Dominican man and his quest for a better life in the United States. While the comedic elements clearly define the film's tone, the film also interestingly uses language codes, register changes, and dialectical intonation unique to the Dominican dialect to explore more serious social issues such as immigration and the lived experiences of marginalized classes. Indeed, the colorful cast of characters deploys different language forms based on the social circumstances they find themselves in, demonstrating not only a tactical ability to negotiate cultural differences but also reflecting how the 'American experience' changes them. Most notably, the protagonist Balbuena adapts to American culture in the big city by partaking in capitalist habits, climbing the social ladder, and shifting to an individualistic mindset, and these shifts in his identity are linguistically reflected in his pronunciation, morphosyntax, and vocabulary choice. An examination of linguistic differences will therefore not only shed critical light on the Caribbean migrant's modern experience but also on the pivotal role that language plays in the formation of Hispano-American identities.

Angela Victoria Rojas Rivera

VA - George Mason University

Discipline: Biology

Authors:

#1 Angela Rojas Rivera

#2 Marissa Howard

#3 Purva Gade

Abstract Name: Secretory mitophagy is a novel pro-survival and pro-growth mechanism for Neurofibromatosis Type 2 cancers.

Neurofibromatosis Type 2 (NF2) is a hereditary cancer caused by a chromosomal mutation which induces loss-of-function of the tumor suppressor protein Merlin. The physical effects of the mutation-induced tumors include hearing loss, tinnitus and a loss in balance. Currently, most therapies available are palliative and involve treatments to minimize pain and neurologic dysfunction, rather than destroying the cancer. There is a need to study new mechanisms of tumor growth. A hallmark of cancer is metabolic reprogramming. Under oxidative stress, mitochondria undergo changes (fission or fusion) to support the metabolic needs of the cancer. Autophagy, or self-eating, is a process to recycle damaged or unwanted proteins within a cell to the lysosome to survive. Mitophagy is the removal of damaged mitochondria regulated by mitochondrial fission molecules (FIS1 and PINK). Our team discovered an alternative pathway known as secretory mitophagy, which is the export of damaged mitochondria into extracellular vesicles. We observed Merlin, FIS1, and PINK1 within these vesicles. We hypothesize that secretory mitophagy is a cell survival and pro-growth mechanism used by cancer cells to withstand oxidative stress and export tumor suppressor molecules. Chemically induced oxidative stress and lysosomal blockade of meningioma cancer cells lead to increased

cell survival and greater levels of secretory mitophagy. Merlin co-located via immunoprecipitation of PINK1+ EVs. A siRNA knock-down of FIS1 with oxidative stress reduced secretory mitophagy and cell survival. Overall, secretory mitophagy is an adaptive pathway used by cancer to endure greater levels of toxicity and export tumor suppressor molecules for unchecked growth.

Thomas Rojas Tavera

COL - EAFIT University

Discipline: Law and Legal Studies

Authors:

#1 David Alejandro Velásquez Sánchez

#2 Carolina Penagos Restrepo

#3 Mauricio Sánchez Morales

#4 Susana Estrada Pérez

#5 Juan José Marín Burgos

#6 Reinela Salazar García

#7 José David Posada Botero

#8 José Luis González Jaramillo

#9 Luis Felipe Villa García

Abstract Name: Advantages, Risks and Challenges of the Implementation of Artificial Intelligence (AI) in the jurisdictional process with emphasis on the Colombian Executive Process through the Exactis tool

The purpose of this research project is to explore the use of Artificial Intelligence (AI) in judicial processes, examining its advantages, risks, and challenges. The study investigates potential cognitive biases in AI tools, their impact on procedural activities, and their implications for judicial oversight. The project focuses specifically on executive proceedings in Colombia, as these are the legal mechanisms employed to access justice in relation to claims based on enforceable legal instruments. According to statistical data, executive proceedings account for the majority of cases handled by civil judges in Colombia. Thus, integrating AI assistance into these processes could significantly improve the country's judicial performance indicators. The methodology applied follows the framework of socio-legal research, involving an extensive analysis of the current influence of technology, particularly AI and its underlying algorithms, to assess their potential impact on judicial processes. The research led to the development of a prototype named "Ex Actis" which was created using the chat GPT 4.0 platform. Among its identified benefits are ensuring reasonable timelines, providing technical support to judges, and contributing to the unification of case law. These advantages are evident in the prototype's functionalities, which focus on expediting the reading of promissory notes and drafting judicial orders to initiate payment proceedings. The tool demonstrates significant potential to enhance judicial efficiency while being subject to human oversight to ensure impartiality, effectiveness, and adherence to ethical considerations, as required by legal doctrine and Colombia's Constitutional Court. The findings and the prototype have been and will continue to be shared in academic forums and with judicial operators to foster understanding and adoption. This is the link for the Ex Actis tool: <https://chatgpt.com/g/g-jL76UaJsA-exactis-2-0-asistente-de-procesos-ejecutivos>

Michaela Rolecki

PA - Susquehanna University

Discipline: Biology

Authors:

#1 Alissa Packer

Abstract Name: Unraveling the Tritrophic Interactions Between a Seed Predator (*Gibbobruchus mimus*) and Parasitoid Wasps Among Eastern Redbud (*C. canadensis*) Cultivars

Eastern Redbud (*Cercis canadensis*) is a horticulturally important pod-bearing tree in the legume family (Fabaceae), which is host to complex tritrophic interactions consisting of Redbud seeds, their bruchid beetle predator, *Gibbobruchus mimus*, and multiple species of wasp parasitoids of the bruchid beetle larvae. Along with native *C. canadensis* species, many cultivars are commercially available. Previous research on other legumes has found seed beetle predation varying among cultivars. Here, we test the hypothesis that seed predation by *G. mimus* may be higher in Eastern Redbud cultivars due to reduced genetic diversity when compared to the native population. To investigate this, Eastern Redbud pods were collected from 10 cultivars (60 pods per tree; 3 or 4 trees per cultivar) at the National Arboretum in Washington, DC. Seeds were classified as either intact, beetle exit hole, wasp exit hole, aborted seed, or irregular seed. We predict that phenotypic differences among cultivars will influence rates of predation and parasitoidism. We are also interested in whether seed predation by the beetle always leads to death of the plant embryo, as the label “predator” implies. Our initial findings show viable embryos can be found in seeds following the emergence of the beetle, suggesting the designation “seed predator” may not be accurate. To determine if seed predation by *G. mimus* causes embryo death, we will stain seeds sorted into the forementioned categories with tetrazolium chloride, which changes color if cellular respiration is present. Additionally, we will cold stratify and germinate seeds to determine if they could produce viable offspring, even after damage. If seed damage leaves an intact embryo and improves water imbibement, we expect to see an increase in germination rates for seeds that have bruchid beetle or wasp exit holes compared to intact seeds. Such findings could lead to a reclassification of these tritrophic interactions.

Jaeden Roman

OH - Baldwin Wallace University

Discipline: Engineering

Authors:

#1 Helen Muga

Michael Rodak

Andrew Palos

Abstract Name: Analysis of Permeable Concrete Compositions and Mechanical Properties

This study investigates the permeability of concrete mixes composed of varying ratios of cement, gravel, and sand. The objective was to find the most permeable mixture while maintaining AASHTO specifications by testing different combinations of these materials. In this experiment, three different ratios were tested and compared to various pervious and standard concrete composites. Each of the tested ratios had a volume of 432 cubic inches. The ratios that were tested were formed by a volume percentage as follows: 50:50 cement to gravel, 50:45:5 cement to gravel to sand, and 50:35:15 cement to gravel to sand. For each mixture, the time was recorded for a gallon of water to fully pass through the slabs. The weight of each slab was measured before and after to see how much water was trapped by the concrete after the timer was stopped. The permeability of each sample was calculated using Darcy’s law. In addition, a tensile test for each of the samples was run using a dog bone mold, poured separate from the original slabs. The results were converted from tensile to compressive strengths for trials 1-3 as follows: 4067 PSI, 11963 PSI, and 6961 PSI respectively. The results of the test showed that the most permeable sample was the 50:50 ratio with an average permeability constant of , compared to the 50:45:5 which was and 50:35:15 which was . The results show that a more permeable concrete contains less sand, as the sand fills the gaps between the concrete and gravel thus absorbing more water. The findings of this study provide valuable insights between material proportions and concrete permeability, offering guidance for future concrete mix designs focused on preventing storm water flooding on roadways.

Rebecca Roman

FL - Florida Gulf Coast University

Discipline: Chemistry

Authors:

#1 Rebecca Roman

#2 Danielle Moura

#3 Daniel Lambrecht

Abstract Name: Molecular Docking to Identify Possible Drug Candidates for Neglected Tropical Diseases

Neglected tropical diseases remain a greatly under-researched topic, despite the global impact they have. This project studied potential drug candidates for a selected tropical disease with the goal to identify viable alternatives for a known inhibitor for the chosen tropical disease, ideally with higher specificity and lower side effects. To make candidates easily accessible and affordable, the candidate pool was selected from known drugs already approved to treat other diseases (drug repurposing), such as those contained in the Pandemic Response Box. Cheminformatics tools such as ChemMine were employed to identify candidates similar to known inhibitors as a starting point. In the next phase of the study, candidates with high similarity to known inhibitors were selected for further investigation. These candidates were then subjected to molecular docking studies which investigated the binding to target proteins to assess their potential use as inhibitors. The target protein structures were obtained from published X-ray crystallography studies, if available, or from machine learning approaches for protein structure prediction, such as AlphaFold2. The binding pockets of selected candidates were investigated to better understand the intermolecular forces between the protein and the ligands. Several candidates were identified to have binding energies comparable to known ligands, thus making these interesting targets for further studies.

Samantha Romero

PA - Misericordia University

Discipline: Psychology

Authors:

#1 Marnie Hiester

Linda Hidalgo

Erynn Barancho

Abstract Name: Interpreting Ambiguous Communications and Ghosting in Online Dating: The Role of Rejection Sensitivity and Dating Experience

Research indicates that emerging adults increasingly use online dating apps (i.e., Hinge and Tinder) to seek out romantic relationships. Although this use of technology can be helpful in connecting to potential romantic partners, it could also be detrimental to one's mental health, particularly for those who are more sensitive to rejection. Studies have indicated that those who are "rejection sensitive" are more likely to experience rejection, even when the intent to reject is ambiguous, and are more likely to be distressed by perceived rejection. This is relevant to online dating because when you communicate with only words and no facial expressions or tone of voice, rejection sensitive individuals may interpret ambiguous text messages (SMS) as rejection and be more distressed by them. This may be particularly true at the beginning of an online dating relationship when you are getting to know someone based only on messages exchanged. This quantitative study examines how emerging adults respond to hypothetical ambiguous and ghosting online dating scenarios based on their rejection sensitivity and prior dating experiences. Participants will be approximately 200 college students between the ages of 18 and 25 who are attending a small university. They will complete an anonymous online survey consisting of the following measures: Rejection Sensitivity Questionnaire (RSQ), Inventory of Dating Stress (IDS), and Responses to Ambiguous Dating Communications Questionnaire. Data will be analyzed using correlation and regression analyses. We predict that individuals higher in rejection sensitivity and who report more negative dating experiences will be more likely to interpret ambiguous online dating scenarios as rejection and respond with more distress. We also expect that "ghosting" communications will be experienced as more distressing by those higher in rejection sensitivity.

Hannah Romoff

PA - Carnegie Mellon University

Discipline: Law and Legal Studies

Authors:

Abstract Name: The Intersection Between Intellectual Disability and Capital Punishment from a Constitutional Lens

In 2002, the Supreme Court ruled in *Atkins v Virginia* that those with intellectual disabilities cannot constitutionally be sentenced to execution. In an effort to explore the relationship between intellectual disability and capital punishment, this paper analyzes four buckets of research. It begins by discussing the differences in the history of death penalty law in specific states: those that maintain legalization of the death penalty and actively use it. The paper then reviews Supreme Court jurisprudence on the 8th amendment to gain a well-rounded understanding of how both the definition of "cruel and unusual" as well as the utilization of specific applications of the death penalty have changed over time, smoothly transitioning into a deep dive on *Atkins* specifically. The chapter regarding *Atkins* functions to discuss the ethical dilemma of the death penalty and the philosophy of punishment in addition to the questions that the Court leaves unanswered on

intellectual disability. The focus moves to revisit the previously discussed states to determine how they have attempted to answer these questions themselves, including what constitutes an intellectual disability, how inclusive this definition should be, and what burden of proof should be required to prove intellectual disability. This project concludes by summarizing commonalities and differences found between the states. It also calls for legislative and/or Supreme Court action to provide further guidance to decrease variation between states since the lack of legal imposition of the death penalty toward those with intellectual disabilities was ruled a constitutional protection in Atkins.

David Roque

GA - Kennesaw State University

Discipline: Interdisciplinary

Authors:

#1 Cassidy Moreau

#2 Hoseon Lee

#3 Junia Nguyen

#4 Adi Turlapati

#5 Peter Hesketh

Abstract Name: Controlled Radiation Capsule Device with High-Density I-125 for Enhanced Dose Rate in Precision Cancer Therapy

Radiation therapy plays a crucial role in cancer treatment, with approximately 50% of patients undergoing it at some point, contributing to 40% of curative cases. Brachytherapy, a form of radiotherapy, offers two main options: High-Dose Radiation (HDR), which is effective in shorter sessions but poses higher risks to healthy tissues, and Low-Dose Radiation (LDR), which is safer for surrounding tissue but requires prolonged treatment times. This study proposes a novel implantable device that combines the advantages of HDR and LDR by controlling radiation release directly toward the tumor while minimizing exposure to healthy cells. Our design features an implantable capsule with a magnetic-actuated window that opens only when directed at the tumor site. The device combines a permanent magnet and an electromagnet to control the release of radiation, allowing for high precision and reduced collateral damage to adjacent tissue. Monte Carlo Damage Simulation was conducted where it simulates the damage made in the cell by radiation. In Montecarlo Damage Simulation, the capsule delivers a high-dose rate of 10Gy/min of I-125 which shows a lot of damage to cancer cells making significant double strands breaks every minute. The capsule optimizes both dose rate and beamwidth for targeted treatment. We conducted feasibility testing with TOPAS, a specialized simulation tool in medical physics, comparing conventional LDR treatment (1 Gy/day) to our capsule's proposed rate of 10 Gy/min. Simulation results confirmed that the capsule effectively blocked radiation except through the designated window, achieving controlled, targeted treatment. This innovative device potentially enables high-dose LDR brachytherapy, optimizing safety and reducing treatment duration. Applications for this capsule include intracavitary cancer treatments, such as for esophageal and cervical cancers, offering a promising approach for more efficient, precise, and safe radiation therapy in cancer care.

Valeria Rosales

TX - The University of Texas at San Antonio

Discipline: Biochemistry

Authors:

#1 Thomas Kunkel

#2 Sarah Marks

Abstract Name: Repair of insertion/deletion errors generated by Pol α as a marker for Pol δ extrinsic proofreading

DNA replication involves sophisticated tag-team polymerase activity. The primary lagging strand polymerases α and δ are involved in Okazaki fragment synthesis, with a handover occurring after the pol α -primase complex synthesizes about 10-30 nucleotides of RNA/DNA primer. Surprisingly, while the pol α -primase complex only synthesizes about 1.5% of the genome, it is more error prone than the other major polymerases because it lacks proofreading ability. Previous studies indicate that pol δ may be able to extrinsically proofread errors made by pol α during the handover using its exonuclease. A double mutant of pol1-L868M pol3-5DV in *Saccharomyces cerevisiae*, containing a mutator form of pol α and an exonuclease deficient form of pol δ , exhibits high rates of indels in long homopolymer runs. Here, we aim to determine if repair of indels by pol δ could serve as a marker for extrinsic proofreading. By transforming select yeast with construct DNA containing mNeonGreen, a drug resistance gene, and an A homopolymer run, indel mutations within the homopolymer run should result in a fluorescent signal. Currently, we've been able to construct DNA containing the target genes and homopolymer track of A's. Remaining steps include successful transformation into wild-type, pol1-L868M single mutant, pol3-5DV single mutant, and double mutant yeast. Following successful development of the assay, we plan to screen mutant libraries of pol δ for other mutations that may impact extrinsic proofreading.

Bryan Rosario

PA - Swarthmore College

Discipline: Engineering

Authors:

#1 Fiona O'Donnell

Ethan Pang

Abstract Name: Facilitating Reuse of Wood and Engineered Wood Products

Wood's ability to store carbon dioxide and lower carbon emissions in its manufacturing process make mass timber a sustainable alternative building material. However, tearing down timber structures before the end of their service life limits these benefits and generates significant wood waste. Salvaging and reusing this timber in new construction would maximize the material value and potentially reduce the overall construction cost. The mechanical properties and performance of cross-laminated timber and used light timber frames were characterized through a literature review. The review aimed to define degradation and durability, identify the biological, environmental, and physical factors that impact them, and determine timber's residual properties. This was achieved by creating multiple sets of relevant search terms, such as "timber" and "degradation", and performing searches on Google Scholar of each combination of terms across sets. Relevant papers were compiled and analyzed. Much of the literature focused on environmental and biological factors, including weathering, fungal decay, insect damage, and especially moisture content. These factors often provide visual cues that indicate whether timber can be reused, repaired, or not used. Physical factors, such as duration of load, had inconsistent effects on the mechanical properties of timber. When it came to short-term strength tests, salvaged timber at first had a similar probability of failure before rapidly increasing. Other mechanical properties varied greatly, making it difficult to make conclusive estimates. Attempts to model the cumulative damage of salvaged timber have been made, with some coming close to matching experimental results, but further data is needed for reliable modeling.

Nicholas Rose

Discipline: Engineering

Authors:

#1 Kaitlyn Crawford

#2 Kareem Abdelrahman

#3 Aditya Maan

Abstract Name: Algorithms for Characterizing Motion-Based Energy Harvesting Reproducibility

With energy demands estimated to double by 2050 and climate change creating pressure to reduce emissions, there's a need to develop alternative energy sources (US Department of Energy). To adapt to new energy requirements, scalable triboelectric devices--capable of converting motion into electrical output--are promising power supplies that have harvested energy from rotating tires to beating hearts. However, triboelectric generators (TEGs) struggle with reproducibility and variable power output. Further, characterizing inconsistencies can be challenging due to instrument limitations. This project addresses characterization challenges by developing algorithms to enhance existing equipment and track device reproducibility. The first algorithm enhances a widely used material science instrument by expanding its frequency capabilities and offering precise control over frequency, force, and distance variables. Triboelectric power output depends on these variables, so keeping them constant during each test is critical for measuring device reproducibility. The second algorithm measures voltage and current output consistency by automatically scanning the TEG's electrical output data. Current metrics focus on maximum current and voltage peaks. Alternatively, this program provides the average relative maximum and minimum peaks. We used this information to evaluate output consistency between three TEGs made with manufactured cellulose and Kapton tape, with a 99% confidence interval. While confidence intervals are the gold standard for comparing results in various fields, they are not commonly incorporated into TEG research. Applying this algorithm to past and future studies offers a quantitative look into how device modifications and manufacturing practices influence power generation, bringing us closer to producing reliable alternative energy harvests.

Isabella Rose

TX - Texas Woman's University

Discipline: Education

Authors:

Katherine Rose

Abstract Name: Parental Decision-Making About After School Programs for their School Aged Children

The purpose of this research project is to examine parental preferences of characteristics of after-school care for their children. According to Sacks et al.'s (2024) study of the potential need for "out-of-school time" (p. 1) care for school-aged children using data from the 2012 and 2019 waves of the National Survey of Early Care and Education, approximately 25% of school-aged children in the US experienced non-parental care outside of school hours in 2019 (about the same as in 2012). Children from lower income groups and certain ethnic groups experienced a decrease in participation in 2019 from 2012. Understanding why these trends occur is crucial for making sure that children are well cared for in their school aged years when not in school, how parents decide which after school programs to use, as well as whether they choose to use them over available alternatives. Increased knowledge about the influence of different characteristics of care may help educational professionals better design after school programming that is attractive to parents, while still being developmentally appropriate. While research exists on parental preferences in these child care arrangements, less research exists on which characteristics are most influential to their decision-making. This quantitative

research study will examine this via conjoint analysis by asking parents of school-aged children to indicate their likelihood of choosing various hypothetical after school program scenarios. These hypothetical choices will include 5 characteristics of care, varying at 3 levels, to determine which characteristics of care are most influential to their ultimate decision. Therefore, we will recruit 156 parents of school-aged children (ages 5-12 years of age) to complete an anonymous, online survey, allowing us to examine which characteristics of care are most influential to parental choice, as well as what trade-offs they may make when choosing this care for their children.

Katherine Rose

TX - Texas Woman's University

Discipline:

Authors:

#1 Jennifer Stockemer

#2 Destiny Jones

Rhonda Buckley

Abstract Name: Creating and Implementing a Program to Promote Undergraduate Research: Pioneering Discovery: An Undergraduate/Graduate Mentorship Program

Describes the development and implementation of a program offering undergraduate students a unique opportunity to engage in collaborative research and increase leadership skills; with a primary goal to empower undergraduates to feel confident and comfortable engaging in original research, and presenting their findings to wider audiences. Because our university has a primary focus on educating women, who comprise less than 35% of researchers globally, we are well-situated to address the goal of increasing women in research and leadership roles. Undergraduate students in the program received mentoring from doctoral students, under the guidance of a faculty mentor, and a stipend to support their research endeavors. They also participated in leadership trainings, with pre- and posttest data collected to evaluate program efficacy. We have completed Year 1, and Year 2 is currently underway. Applicants had to identify leadership goals, research interests, agree to attend leadership trainings and cohort meetings, and work with their partnered doctoral and faculty mentors to conceptualize, develop, and implement a research project; as well as analyze the results, submit a proposal of the findings for presentation or publication, and attend a professional conference to either present their findings and/or to participate in the networking and knowledge acquisition available from conference attendance. The conceptualization, funding search, implementation, and initial findings of our program will be explained. We will also describe pitfalls we encountered and possible solutions to surmounting them for those that may want to establish similar programs. We will also describe the structure and topics of the training sessions that we included to help the participants foster their leadership, research, and advocacy skills, as well as resources to assist with providing them.

Olivia Rosenberg

IL - North Central College

Discipline: Communications

Authors:

#1 Amy Buxbaum

#2 Mara Berkland

Abstract Name: Executive/leading women and their relationship to apologies in the workplace

This project explores the relationship between executive/leading women and apologies in order to better understand how these specific communication patterns function in relation to the often-marginalized positions that women hold in the workforce. The way and the frequency in which women employ apologies reveal how women's socialization re(inforces) their historically minimized place in the public sphere. The goal of this project is to produce thoughtful research that engages the voices of the target group, giving them an opportunity to be involved in the conversation about their experiences. According to the World Economic Forum in 2023, only 32.2% of senior leadership roles belong to women (Shine). The number of women in these executive positions are small, which gives more reason for their stories to be recognized. The experiences of these women can not only act as a blueprint to those following in their footsteps, but they can also serve as a window into the oppression they may face in the workplace. The research methodology used will be qualitative, using semi-structured focus groups and/or interviews to collect data. This study is phenomenological in the nature of its methodology and analysis. Based on prior literature review, the anticipated findings will reveal that women perceive more offenses as calling for apologies as well as view apologies as a vehicle to achieve social harmony, explaining the high frequency of women apologizing in the workplace.

Brigette Rosenberg

FL - The University of Tampa

Discipline: Criminology/Criminal Justice

Authors:

#1 Rachel Severson

Abstract Name: Exploring the Relationship Between Pregnancy and Mental Illness Among Incarcerated Women

In the 1980's, the United States experienced substantial growth in correctional populations, so much so the decades since have been labeled the era of mass incarceration. During this time, research has consistently demonstrated an increase in the number of women in the incarcerated population. The number of incarcerated women increased by over 500% between 1980 and 2021, a rate twice that of incarcerated men. Despite these findings, research largely overlooks the role gender plays in prison life. This is problematic for several reasons. One example that is largely unexplored is the experience of pregnancy among incarcerated women. In 2016, the Pregnancy in Prison Statistics study became the first systematic examination of pregnancy while incarcerated, with 1,396 admissions of pregnant people occurring in their sample of federal and state prisons. Simultaneously, the number of persons with mental illness in the prison setting has increased substantially; correctional facilities have become the largest mental health service provider in the United States. However, the experience of mental illness among the incarcerated is not equally distributed in terms of gender; incarcerated women have higher rates of mental illness than incarcerated men. Thus, two unique needs exist among incarcerated women that have not been fully explored in correctional scholarship: pregnancy and mental illness. We seek to answer the following research question: are women who are pregnant in prison more likely to experience mental illness than those who are not pregnant? We will explore the relationship between pregnancy and mental illness using a series of logistic regression models and the Survey of Inmates in State and Federal Correctional Facilities, a large, publicly available and nationally representative sample of incarcerated persons in the United States. We hypothesize that pregnancy and mental illness are directly related and that pregnant women will have an increased chance of experiencing mental illness.

Kaelyn Rosenberg

NC - Elon University

Discipline: Film/Photography Studies

Authors:

Abstract Name: Unholy Desires: The Evolution of Christianity and Sexuality in Vampire Film and Television

This paper examines the chronological evolution, from the 1920s to today, of the vampire in film and television in relation to society's attitudes towards Christianity and sex. The vampire in popular culture has gradually transformed from a creature of moral and sexual depravity into a symbol of sexual freedom and self-expression; these changes reflect Western society's shifting relationship to Christianity. Much scholarly research explores the relationship between Victorian vampire literature and Christianity, as well as Christianity and sexual norms; however, little scholarship examines the influence of Christianity on current vampire media or the intersection of sexuality, Christianity, and vampire cinema. An initial qualitative review of existing literature was conducted regarding cinematic depictions of vampirism, Christian influences in society, and Christian rhetoric in sexuality discourses. Following this review, 20 popular American and British movies and television shows in the vampire genre were watched and thematically analyzed for their depictions of sex and Christianity. Such research found that early vampire movies established the vampire as a villain, driven by perverse and anti-Christian motivations. This idea prevailed until the 1960s sexual revolution and the cultural decentering of Christianity that accompanied it; 1960s vampire movies began utilizing sensationalism to create veiled messages that condemned the culture of repression within Christian society. In the 1980s, as secular viewpoints gained further legitimacy in sexuality discourse, vampires functioned as metaphors for sex as a form of self-discovery. The 1990s to 2010s, in tandem with the evangelical-led purity movement, popularized sympathetic vampires that yearned to be released from their shameful nature. Modern vampire media transforms again, embracing the vampire's appeal to disempowered people and ability to create meaning outside of religion. This research ultimately aims to identify and deconstruct the ability both of Christianity to shape popular culture and also of fiction to investigate Christian standards within society.

Eric Rosenfield

NY - SUNY New Paltz

Discipline: Engineering

Authors:

#1 Eric Rosenfield

#2 Ping-Chuan Wang

#3 Mahdi Farahikia

#4 Matthew Selvaggio

#5 Alexander Gorzula

Abstract Name: Characterization of Additive-manufactured Novel Cold Plates for Efficient Heat Removal

Integrated Circuit (IC) chips are the fundamental building blocks of modern computers. Various fields require the use of high-power IC chips to perform various computationally intensive tasks, and while they are remarkably effective, they must be cooled to maintain chip functionality and reliability. Looking at various thermal management solutions, we focused on cold plate as the starting point for an improved liquid cooling solution. Generally, more intricately designed cold plates with more complex internal structures would yield better thermal management results. With the absence of constraints posed by conventional manufacturing methods, additive manufacturing (AM) processes can be adopted for the design and fabrication of more efficient and effective cold plate structures. In this presentation, we will introduce our research project on characterizing both the cooling efficiency and power consumption of novel cold plate designs fabricated by AM technology. In particular, the design considerations and experimental verification of several cold plate structures to remove local hotspot in IC chips will be presented. Experimental data will also be compared

with simulation results from finite-element modeling to address the potential opportunities of leveraging AM, numerical simulations, and real-time temperature distribution monitoring to tackle the challenges in thermal management of advanced IC technologies.

Kaitlin Ross

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Lyse Norian

#2 Francesca Dempsey

Abstract Name: Exploring the Effects of Chemotherapy-Induced Senescence in the Tumor Microenvironment

Ovarian cancer is one of the most lethal gynecological malignancies with a five-year survival rate of just 25-35%. The current foundational chemotherapy regimen for initial treatment combines Carboplatin (CPT) and Paclitaxel (PCT). This combination is known to induce senescence, a cellular state marked by the loss of proliferation, in ovarian cancer cells. However, the full effects of chemotherapy-induced senescence within the tumor microenvironment (TME) are still unknown. We have demonstrated that CPT and PCT can induce cellular senescence in ovarian cancer cells, as confirmed through cell cycle analysis. To investigate the potential effects of CPT and PCT on leukocytes, which are critical components of the TME, we exposed primary human Peripheral Blood Mononuclear Cells (PBMCs) to this chemotherapy combination in vitro. Cellular senescence was assessed through staining for established senescence markers and analyzing marker expression via flow cytometry. Preliminary analysis of senescence markers indicate that chemotherapy does induce senescence in PBMCs and induces T cell dysfunction that is characterized by reduced effector function. In the future, chemotherapy-treated ovarian cancer cells will be cocultured with untreated PBMCs to determine effects on immune cells. We will investigate the production of inflammatory cytokines by the PBMCs to see if chemotherapy or the ovarian cancer cell-PBMC coculture affects leukocyte effector function. We also plan to assess the effects of senescence on tumor tissues from ovarian cancer patients before and after undergoing CPT + PCT chemotherapy. We hope that by studying senescence induced by CPT and PCT, we will gain newfound understanding to improve patient outcomes for women with ovarian cancer.

Simone Rothstein

PA - Carnegie Mellon University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: 269

American Judaism, Jewish Americanism is not dead. Despite an increasing popular sentiment that Jewish Americans have passed our peak culturally, intellectually, creatively, and religiously we are still here. Seven point five million Jews live in the United States. Depending on who you define as Jewish this is more than the number that resides in the state of Israel. The majority of these people are presumably happy to live in the U.S. as Jews and yet many have given up on the term Diaspora. The Diaspora must be taken seriously, and its future existence defended. Scholars such as Daniel Boyarin, and Shaul Magid critique Zionism from a political and cultural standpoint. This paper begins by analyzing this existing literature on the cultural and religious implications of living in a Jewish state. However, the paper continues beyond a negative defense of

the Jewish Diaspora through a critique of Zionism, to a positive defense of the Diaspora and why it must be protected as a necessary and unique component of Jewish history. Building on the writings of Jewish historian and philosopher Simon Dubnow, this project considers how the Diaspora can be conceptualized without Israel. Zionism can have a place but does not have to be the center of Jewish identity, life, and imagination. The paper concludes by setting a path forward, examining existing Jewish Autonomous projects in the U.S., and proposing ideas for how the Diaspora can be revitalized. Above all else, this author argues the importance of Diasporism for the Jewish people and suggests ways to reignite it as a vital philosophy in the collective consciousness of Jews globally.

Lyddia Rougeux

PA - Westminster College

Discipline: Biology

Authors:

#1 Joshua Corrette-Bennett

Abstract Name: Effect of siRNA knockdown of the *icaA* and *icaD* genes on biofilm formation in *Staphylococcus aureus*.

Staphylococcus aureus is a prominent infectious agent due to its ability to produce a biofilm that protects against the host immune response, enhances attachment to surfaces and aids in antibiotic resistance. Organisms that produce a biofilm possess a biological advantage that often leads to post-surgical infections because they can coagulate on the surfaces of medical devices. One mechanism for biofilm production in *S. aureus* is the production of a polysaccharide intercellular adhesin (PIA) molecule that is encoded by the *ica*-operon. The *ica*-operon encodes 4 genes: *icaA*, *icaD*, *icaB*, and *icaC*. The *icaA* gene encodes for an N-acetylglucosaminyl transferase that is responsible for expressing the PIA molecule. The *icaD* gene produces a protein that is responsible for enhancing the enzymatic activity of *icaA*, and thus production of the PIA molecule. The goal of this study was to determine if siRNA knockdown of the *icaA* and *icaD* genes can decrease biofilm formation in *Staphylococcus aureus*. In this study, *S. aureus* cells were treated with 10µg of *icaA* siHybrids, 10µg of *icaD* siHybrids, or 20 µg *icaA* and *icaD* siHybrids, combined. After treatment, the cells were stained using crystal violet to quantify the amount of biofilm produced. The results from this study indicate that individual suppression of the *icaA* gene and combined suppression of the *icaA* and *icaD* genes using siHybrids leads to a significant decrease in *S. aureus* biofilm formation.

Rebekah Rouse

AL - University of Alabama at Birmingham

Discipline: Psychology

Authors:

#1 Bekah Rouse

#2 Gregory Strauss

#3 Lauren Luther

Abstract Name: Effort Expenditure for Rewards: Differential Associations with Symptoms Based on Risk for a Severe Mental Illness

Background: Humans are constantly using information about reward, probability of reward receipt, and effort to guide their effort expenditure. Research has shown that there are individual differences in effort

expenditure decisions, but little research has examined how these decisions differ in groups at putative high risk for severe mental illnesses. **Methods:** The current study evaluated whether groups at putative elevated risk for a severe mental illness demonstrated reductions in the willingness to expend effort for rewards and whether these impairments were associated with greater symptoms. Participants included 80 participants with elevated risk for a severe mental illness and 74 participants without this risk. All participants completed the Effort Expenditure for Reward Task (EEfRT). **Results:** Groups did not significantly differ on effort expenditure performance and chose to exert similar levels of effort across all trials. However, among those at increased risk for a severe mental illness, greater positive symptoms (e.g., subclinical delusions, hallucinations) and associated distress were associated with increased effort expenditure. On the other hand, in the group with reduced risk, associations were opposite – greater effort expenditure was associated with reduced positive symptoms and associated distress as well as lower negative symptoms (e.g., reduced motivation). **Conclusions:** Findings observed differential relationships between effort expenditure in at-risk participants versus participants at reduced risk for a severe mental illness. Associations suggest that in those at elevated risk, subclinical positive symptoms may interfere with effective decision making.

Alyssa Rousseau

AZ - Northern Arizona University

Discipline: Nursing and Public Health

Authors:

#1 Felicity Sepulveda

Toni DeMarco

Kadence Lloyd-Bisley

Abstract Name: Disability Etiquette and Equity Initiative in Inclusive Recreation

Project Purpose: Our initiative promotes the use of disability etiquette in inclusive recreation. **Background:** In Coconino County, Arizona, 15% of individuals are living with a disability. High Country Adaptive Sports (HCAS) serves those with various disabilities (athletes) by promoting inclusive recreation. HCAS contributes to positive physical and mental health outcomes within this population, having served 5,000+ athletes. In regard to stigmatized topics, like disabilities, trainings create positive change and instill skills and confidence. Trainings address negative attitudes and stigma around a topic in order to reduce prejudice and discrimination. Disability etiquette consists of treating all individuals with disabilities with respect by using appropriate language while communicating and not assuming one's ability. The annual training for the HCAS staff and volunteers had not previously included the topic of disability etiquette. **Methods:** Our intervention included an impact report, panel discussion, and disability etiquette training. We created a visual snapshot of the successes of HCAS in order to encourage donations and volunteerism within the non-profit organization. Lived experiences and insight were collected from individuals with disabilities, parents of those with disabilities, and those who work in the disability field, which were incorporated into our disability etiquette training. This training was created and implemented to equip HCAS staff and volunteers on appropriate disability etiquette strategies to utilize when interacting with HCAS athletes, to promote an inclusive environment. **Conclusions:** Following the disability etiquette training, a post-test was conducted revealing that trainee's confidence increased by 11.4%, 94.4% of trainees identified three correct disability etiquette strategies, and 83.3% of trainees strongly agreed they will utilize the learned disability etiquette strategies in working with HCAS. Looking ahead, HCAS will continue to implement this successful training in their annual training for their staff and volunteers.

Valentina Rovella

WI - University of Wisconsin-Parkside

Discipline: Biology

Authors:

#1 Natalie Meyer

Abstract Name: From CT to 3D: Building Accurate Anatomical Models of Organisms for Teaching and Research

Utilization of tactile or virtual 3D models as teaching aids improves understanding of structural and functional properties of anatomical specimens. However, there are not many available resources for anatomically identified 3D models of various organisms, and model formats are limited. Our project is part of a National Science Foundation (NSF) funded collaboration that aims to create a free repository (MorphoCloud) and novel software tools for generating and sharing 3D models of representative organisms. This is achieved through the use of 3DSlicer, an open-source software for 3D rendering and analysis of visual data. This specific project also employs the SlicerMorph extension, which offers extensible visualization of volumetric and surface scans. Data is imported from high resolution computed tomography (microCT) scans of an organism, and is then converted into a 3D image through a range of tools. The SlicerMorph extension also allows multiple users to modify and export the virtual specimens for a variety of uses, such as 3D printing of didactic models or virtual animations. The work resulting from this project encourages scientific discovery and has potential significant applications in the field of evolutionary biology. This semester, our contribution to the project showcases the modeling of the African Clawed Frog (*Xenopus laevis*), with a focus on how 3DSlicer and SlicerMorph applications were used to generate the end result. Ultimately, this software provides opportunities for researchers, students, and even the public to collaboratively build accurate models of various organisms. This work includes applications for teaching and research, as well as encourages the use of 3D models for hands-on education and public outreach.

Onyx Royal

NC - North Carolina State University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Queer Self-Expression, Community, and Resource Availability: A Comparative Analysis of NCSU with Japanese Universities

University can be a difficult period for young adults to navigate, balancing school, social life, and other responsibilities for the first time. For those in the LGBTQ+ community, these issues may be exacerbated by discrimination and feelings of isolation. This study aims to highlight these issues related to being LGBTQ+ based on a survey conducted both at various universities in Japan as well as NCSU. LGBTQ+ rights and community in a transnational context have been studied extensively both in Japanese and English, but few studies have looked at the lives of college students specifically. Survey questions included things related to social situations, discrimination, personal safety/comfortability, and the responsibility of social institutions (universities, government) in mitigating these issues. By conducting this comparative analysis, the hope is to outline both the issues currently being faced by each group, as well as already existing solutions and their efficacy. Preliminary analysis shows that although both groups indicated discrimination in some capacity, those from NCSU tended to fear harassment and physical harm, while Japanese students tended to worry about ostracization, bullying, and social discrimination. By understanding the socio-cultural contexts that invoke these differences, policies can be adopted, adapted, and applied to properly address the needs of LGBTQ+ students, hopefully leading to general solutions regarding LGBTQ+ rights globally.

Ayona Roychowdhury

AL - University of Alabama at Birmingham

Discipline: Psychology

Authors:

#1 Robert Sorge

#2 Demario Overstreet

#3 Andrea Thomas

Abstract Name: Childhood Adversity, Inflammation, and Race in Chronic Low Back Pain

Chronic low back pain is the second leading cause of disability in the world, but for 90% of people, it cannot be traced to a pathoanatomic cause. Recently, the biopsychosocial model has been utilized to understand the condition as a result of interacting physiological, emotional, and external factors. This study utilized measures such as adverse childhood experiences (ACEs), racial demographics, and C-reactive protein (CRP) concentration via blood draw from Non-Hispanic Black (NHB; $n = 116$) and White (NHW; $n = 61$) participants with non-specific chronic low back pain. A positive correlation of $r = 0.152$ was found between the number of ACEs and CRP concentration, and there was a significant difference ($p = < 0.001$) in the average CRP concentration for NHB vs. NHW participants. However, the difference in ACEs experienced between NHB and NHW was insignificant, with a p -value of 0.54. These results suggest a regional similarity in childhood adversity experienced by NHB and NHW participants, but a significantly higher rate of systemic inflammation as represented through [CRP] in mg/dl in NHB than NHW. On average for both groups, the incidence of ACEs and [CRP] in mg/dl trends upwards, suggesting a correlational relationship supported by previous research. Future mechanistic studies are needed to investigate the mechanisms of how chronic stress becomes systemic inflammation, and future correlational studies are needed to better understand how region and socioeconomic status play into the experience of race in healthcare outcomes.

Amarilis Rubido Gonzalez

FL - Miami Dade College

Discipline: Engineering

Authors:

#1 Jyrko Correa-Morris

Luis Cruz

Abstract Name: Advancing Electric Network Frequency Detection through Deep Neural Networks

In this paper, we present advancements in Electric Network Frequency (ENF) detection using deep neural networks. ENF is a critical tool for verifying recording timestamps, determining recording locations, detecting tampering, synchronizing multimedia, identifying deep fakes, and authenticating videos. We analyze the choice of the ENF-WHU dataset with an 8000 Hz sampling rate, evaluating its advantages and limitations compared to higher rates like 44.1 kHz, particularly in terms of frequency resolution and the detection of subtle ENF variations. Additionally, we investigate the impact of recording bit depth by comparing 16-bit and 32-bit recordings to assess whether increased bit depth enhances ENF signal detection. Furthermore, we revisit the traditional ENF attenuation formula, which is inversely proportional to the square of the distance between the microphone and the nearest power source, incorporating factors such as electromagnetic power fluctuations and environmental influences that may affect the recorded signal. This research aims to refine ENF detection methodologies, improving accuracy and reliability for diverse forensic and authentication applications.

Afeni Rubio

OK - Southern Nazarene University

Discipline: Exercise Science and Nutrition

Authors:

Abstract Name: Global Positioning System Metrics and Injury Prevalences in DII Collegiate Female Athletes

In the athletic realm, preventing injuries is a top priority among coaches and players as statistics have revealed that among NCAA athletes, injuries are exorbitant and severe as many result in critical care and terminate an athlete's athletic career. However, research has disproportionately focused on male athletes. The lack of research specific to female collegiate athletes and injuries led to this project's focus. The goal of this study was to determine the correlations among various Global Positioning System (GPS) metrics associated with injury prevalence in DII collegiate female soccer players. This project hypothesized that GPS metrics could predict injuries in collegiate female soccer athletes and that injury prevalence would correlate with poor nutritional choices and/or sleep hygiene. Anonymous GPS data was obtained through the TITAN Sensors website and statistically analyzed through Jamovi. The results revealed no predictive correlations between GPS metrics and injuries in this specific population and concluded that the variables used to analyze were not prognostic. This matters because the analyses did not predict injuries and suggest that these variables may not be effective along with utilizing a different approach and/or metrics to predict injuries. The results of this study warrant further research within this field and population to improve the methods and metrics used in the statistical analyses. Although predictions were not discovered, this research project captured the ineffectual metrics and opened the door for further studies to support the success of female student-athletes.

Brianna Rucker

VA - Norfolk State University

Discipline: Psychology

Authors:

#1 Brianna Rucker

#2 Susan Ha

Abstract Name: The Psychological Impact of Media: Developing Effective Communication Skills For Adolescents

The forms of communication have advanced, creating new avenues to interact with others online and in-person; including text messaging, calling, video chatting, and socializing online. These new platforms, along with the traditional avenues of communication, have become the foundation to strengthen interpersonal relationships and social skills. This new way of communication has transitioned into the primary method to interact due to in-person conversations becoming less and less frequent. Acquiring adequate communication skills and understanding Emotional Intelligence are essential to adolescents' transition into adulthood; such as regulating their mental health, changing in behavior, and overcoming social trauma. I propose to demonstrate how online communication platforms influence interpersonal relationships, including how it has become a complex psychological system. This lecture presents how developing effective communication skills for adolescents impacts their Emotional Intelligence, trauma resilience, and interpersonal relationships through various forms of online media.

Aileen Rueda

MN - Minnesota State University - Mankato

Discipline: Education

Authors:

#1 Aileen Rueda

#2 Matthew Coons

Matthew Coons

Abstract Name: The Children's House: Review of Prekindergarten Education in a Laboratory Setting on a University Campus 1972 – 2022

The education and care of young children has occupied humankind since the beginning of human life. Immigrants brought concepts of organized 'kindergarten' programs to the United States in the middle 1800s. In the United States in the early 1900s, education and care of young children began to be professionalized, with the expansion of nursery schools, day nurseries, and other forms of programming. In 1972, in a rural southern Minnesota city, early childhood professionals conceived a new program: The Children's House. This program had several purposes: early childhood education and care, teacher education, demonstration, special projects and events, such as professional development and continuing education opportunities. The purpose of this investigation was to trace the development of The Children's House at Minnesota State University from its establishment in 1972 to the close of the 2022 school year. The researchers reviewed archival data which included documents, theses, photographs, artifacts, contributions from past staff members and oral histories. Information was collected about program philosophy, design and curriculum, funding, staffing, facilities. Potential outcomes of this research project include: (1) documentation of historical development; (2) insight into evolving education practices; (3) reflections on funding and resource allocations; and (4) recommendations for policies and programs. This comprehensive analysis has the potential to contribute valuable insights to both the history and future of early childhood education, emphasizing the importance of adaptable and reflective program design in response to evolving educational needs and trends. This is a multi-year project. Presentations in 2025 will discuss methodology and initial findings.

Campbell Ruffhead

MD - Salisbury University

Discipline: Health and Human Development

Authors:

#1 Nicholas Rolnick

#2 Victor De Queiros

#3 Tim Werner

Abstract Name: Effects of Blood Flow Restriction Cuff Chamber Design on Acute Cardiovascular Responses

This study aimed to investigate the impact of the blood flow restriction bladder type (single- [SC-BFR] vs. multi-chambered [MC-BFR]) on cardiovascular responses with exercise sessions incorporating multiple sets to volitional failure in a randomized, crossover experimental design. Twenty-seven healthy, physically active participants (11 females; age: 22.6±5.7; BMI: 25.0±4.1 kg/m²; ~93% reported regular resistance training within 6 months) randomly performed wall squats to failure (4 x sets to failure, 20% 1RM, 60% limb occlusion pressure, 1 min rest between sets) in each of three conditions: SC-BFR (using the Delfi

Personalized Tourniquet Device), MC-BFR (using the BStrong Cuffs), and N-BFR (no BFR control). Hemodynamic assessments and indices of arterial stiffness were monitored immediately before and after each exercise session. SC-BFR blunted post-exercise increases in carotid-femoral pulse wave velocity ($p = 0.328$) whereas the other conditions showed elevations ($p < 0.05$). The bladder design of a BFR cuff impacts the acute responses to exercise, as SC-BFR mitigates post-exercise arterial stiffness responses compared to MC-BFR and N-BFR.

Nicholas Rugbart

NC - Elon University

Discipline: Interdisciplinary

Authors:

#1 Jason Kirk

Abstract Name: Cinematic Crossroads: Recent Trends in the Cultural, Political, and Industrial Decoupling of US-China Film Relations

In the context of the Chinese government's persistent pursuit of a Zero-COVID policy during the pandemic, the year 2021 marked a turning point for domestic film companies and the Chinese Communist Party (CCP). Notably, Chinese theaters achieved a historic milestone, surpassing global competition by collectively grossing the highest box office share for worldwide box office revenue. With approximately 1.7 billion movie tickets sold and \$7.3 billion USD in earnings, this achievement raises questions about China's evolving position in the global film industry. The absence of international films in the top 20 highest-grossing films of 2021 underscores China's potential for self-reliance, as Hollywood productions took a backseat. Only 12% of that year's total box office sales came from US-imported movies, while eight of the top ten highest-grossing films were domestic productions. In 2023, China's domestic film market continued to thrive, with 83.77% of the total box office revenue (over \$7.75 billion) generated by local productions. Notably, all top 10 films were domestic, led by the historical thrillers and sci-fi genres. Although 88 foreign films were imported in 2023 (the most since 2019), Hollywood's share of China's box office remains limited. For example, Disney and Marvel films returned after a hiatus but did not make significant box office gains. This shift prompts inquiries into the motivations and strategies behind China's move toward self-sufficiency in its film industry and what this means for film distribution as a soft power tool. This paper seeks to analyze “decoupling” through interdisciplinary methods such as qualitative analysis by examining causal relationships and testing hypotheses using evidence from journalism, established political science research, and government documents. The report comprises multiple case studies and delves into how the US and Chinese film markets respond to changing bilateral relations and how Hollywood producers navigate an increasingly polarized environment.

Elise Ruggiero

DE - University of Delaware

Discipline: Interdisciplinary

Authors:

#1 Daniel Stevens

Abstract Name: Music for Young Listeners with Autism: A Student's Perspective on Music Theory, Interdisciplinary, and Community-Engaged Research

How might community-engaged learning create opportunities for music students to engage in applied, interdisciplinary research while learning fundamental course content? Problem-based learning (PBL) is a pedagogical approach where students develop and apply newly acquired knowledge in order to solve a problem (Duch, Groh, and Allen, 2001). PBL promotes problem solving through team learning, critical thinking, and creativity; it also increases students' learning retention (Albanese and Mitchell, 1993). This paper explains how a music-theory centered, community-engaged, PBL project developed into a multi-year, interdisciplinary, and grant-supported research agenda that defined the author's undergraduate experience and helped her establish a path toward graduate study. Music for Young Listeners with Autism Spectrum Disorder (ASD) launched from a first-year honors music theory course, where students addressed a societal problem through collaborative partnerships and knowledge synthesis. This project, inspired by the author's experience as a musician with a sibling with ASD and auditory-sensory sensitivities, led the author on a journey of discovering how to make sensory-friendly music for individuals with ASD who are overstimulated by certain sounds. This included learning how to establish partnerships with community organizations, develop interdisciplinary teams to build complex solutions, submit IRB proposals, write grant applications, and conduct human-subjects research over an extended timescale. This paper dives into the research's key outputs, such as the song template used to create modular music, examples of the modular music, and details about the device that makes the magic happen, uCue. The development and testing of uCue's sound library through four IRB-approved studies is described, as well as the preliminary results found from them. The ultimate goal of this research is to collect user-interaction data sets large enough to identify preference patterns for both individuals and groups of people with ASD so future sensory-friendly music can be created for music therapy and education settings.

Jose Ruiz

KY - Thomas More University

Discipline: Chemistry

Authors:

#1 Daniel Esterline

Abstract Name: Cubane: A Stable Molecule with Unstable Bonds – Advances in Synthesis and Characterization

Cubane is a molecule that has caught the attention of chemists due to its paradoxical nature, namely a high stability even though it contains multiple 90° bond angles. Typically, a ring system with a bond angle below 109.5° becomes unstable the lower the angle is, but cubane remains highly stable in spite of these structural features. These bond angles do contribute to cubane being extremely energetic where a large amount of energy is released when the bonds are broken. The molecule was first theorized to be possible by William Weltner Jr. in 1953, it was originally named tricyclooctane. Eaton and Cole synthesized this 11 years later, however the overall yield was abysmally low (around 12%) due to the long synthesis pathway used. Over time this was improved, and the current yields of cubane are around 47%. Yields remain low due to the photochemical step required to create the cube, where a α -halo ketone undergoes nucleophilic substitution (Favorskii rearrangement) which is typically used to convert cyclohexane rings into cyclopentane rings. For this rearrangement to occur UV-B light is needed, however, such lamps are costly. Cheaper commercial UV sources can be used, but doing so reduces the speed of the reaction and makes it prone to side reactions contaminating the product. For this reason, new methods are being developed to enable this reaction to occur in UV-A light that is safer and less expensive. In this work, the synthesis of cubane methyl ester was performed, the photochemical step was modified to see any improvements could be made, and products of this synthesis were all characterized by NMR.

Alisa Ruiz Rios

Discipline: Nursing and Public Health

Authors:

#1 Alisa Ruiz Rios

Abstract Name: 'It's a Slap in the Face': Exploring Sense of Belonging and Challenges Among Undocumented Students in Higher Education

Sense of belonging (SB) is a basic human need that describes the extent to which people feel personally accepted, respected, and involved in their respective communities. Research has consistently demonstrated the positive implications of a heightened SB, including improved academic performance, engagement, motivation, and mental and emotional well-being. Although its importance is well established, many underrepresented students suffer from lowered SB compared to their White peers. SB is consistently shown to be lower for women, minorities, and underrepresented populations. Therefore, the aim of this study was to describe the factors that influenced undocumented students' SB at the University of California. Twenty semi-structured interviews were conducted to explore this research question. Results demonstrated that these students face additional barriers, compared to their documented peers, due to their legal status. They are frequently unable to participate in internships or research opportunities that require citizenship. Additionally, undocumented students face increased financial challenges because they are unable to obtain on-campus employment. This lack of experiential learning opportunities led to feelings of invalidation, isolation, and a decreased sense of belonging. From these results, we aim to produce an actionable set of recommendations to enhance SB among undocumented students.

Ana Rumbaut

FL - Florida International University

Discipline: Biology

Authors:

#1 Harry Brown

Abstract Name: COX-2 upregulation in hippocampal astrocytes of a parkinsonian mice model: implications for blood-brain barrier damage

Parkinson's Disease (PD) is the second most common neurodegenerative disease in the world. However, many aspects of its pathogenesis and development remain an enigma. Blood-brain barrier (BBB) damage in PD because of chronic neuroinflammation is a relatively unexplored area of research, but literature suggests that these factors contribute to neurodegeneration. Due to astrocytes' primal function of supporting the BBB, these cells pose an ideal subject to study changes in BBB integrity. On the other side, cyclooxygenase-2 (COX-2) synthesizes prostaglandin E2 (PGE2) under inflammatory conditions, which is a potent vasodilator, and in excess could have a detrimental impact on BBB stability. In our study, we use immunofluorescence to detect COX-2 overexpression (through SP21 monoclonal antibody) by GFAP-positive astrocytes in hippocampal tissue of saline treated (control) vs. paraquat-treated mice, which is known to emulate parkinsonian conditions in rodents. The tissue samples were further observed under confocal microscopy and quantitative analysis of the images demonstrated changes in astrocyte morphology corresponding with PD-characteristic reactivity, such as irregular shape and thickened processes, along with spatial co-existence of COX-2 in astrocytes processes and cell body, and a significant increase in signal intensity of SP21, not seen in control samples. These findings suggest not also the instrumentality of COX-2 in the chronic inflammatory cascade propagated by astrocytes and its potential effect in the stability of the BBB, but also novel contributions to a field in which vascular morphology of Parkinson's has been widely understudied, broadening the horizons for therapeutic development and new paradigms.

Jacob Rundle

MA - Bridgewater State University

Discipline: History

Authors:

Abstract Name: Constitutional Absolutism? Feudal Kingship in Late Restoration Royalism, 1679-1688

Following the Glorious Revolution of 1688, the “absolutist” kingship of the deposed Stuart kings was condemned by the victorious Whig party as an illegal subversion of the limited monarchy established by England’s “ancient constitution.” While modern scholarship on medieval England has found powerful kings who ruled the kingdom as their private property or patrimony, a historiographical consensus remained that Stuart absolutism was ahistorical and unconstitutional. This study aimed to challenge the still-widespread belief in the historicity of Whig limited monarchism and thereby vindicate the Stuart absolutist interpretation of English kingship as constitutional. To do so, the polemics written by royalists in the late Restoration period—wherein medieval feudalism was cited as the source of the absolute power of the Stuart kings—together with the praxis of this royalist theory by the said monarchs, were reexamined and substantiated according to an emphasis placed on royal patrimonialism. It was determined that an English kingship that was patrimonial and feudal must also be autocratic, and therefore England was historically an absolute, not a limited, monarchy. Not only does this conclusion exonerate Stuart absolutism from the charge of unconstitutionality, but it also busts the myth that limited kingship was the historical form of the English monarchy.

Isabella Runion

WV - West Virginia University

Discipline: Dance

Authors:

#1 Yoav Kaddar

Abstract Name: Fool For You

This piece intends to showcase through dance the longing associated with wanting to be involved with something greater than oneself, or to simply be connected to others. It explores the emotions of desperation and the willingness to struggle to reach a goal or dream. I choreographed this piece to Linger by the Cranberries, drawing inspiration from the song’s almost ethereal composition and how it contrasts with its distressed lyrics. Because of its intriguing composition, I created choreography using both the music’s lyrics and beats. The music itself, Linger, was what originally sparked my desire to create. The methodology utilized throughout the construction of Fool For You always started with determining what kind of movement quality I intended to use for each specific section. From there, I was able to formulate choreography and intricate movement. Using what I had created, I would then place the movement on my dancers and play with facings, pace, and directional changes. Being able to see my work fully performed by a cast always further influenced how I proceeded with the next segment of the work. Designing Fool For You and translating ideas I originally had to a stage taught me how I can correlate movements to a contrasting musical composition. Although Linger has sound quality more often associated with styles such as ballet, I chose a combination of lyrical and contemporary movements. I felt that this approach better represented the yearning I intended to portray. Through this number, I hope to show audiences how concepts such as longing or desperation can be

painful, but are also beautiful signs of feeling. Wanting to be connected with others, part of a larger story, or even pining for love are all parts of the magnificent human experience.

Lila Rupp

UT - Westminster University

Discipline: Psychology

Authors:

#1 Christopher Davids

Abstract Name: Attachment, Emotional Invalidation, Cognition, and Complex Posttraumatic Stress Disorder

Abstract: Complex posttraumatic stress disorder (CPTSD) affects 3.4% to 7.7% of the population and involves emotional dysregulation, interpersonal difficulties, and a negative self-concept (Cloitre et al., 2019; Hyland et al., 2020). Relational trauma—a specified form of interpersonal trauma—is defined as persistent rejection and abandonment from a close other (e.g., a parent or romantic partner; Gómez et al., 2016) and is a significant predictor of CPTSD, often disrupting attachment systems and impairing cognitive and emotional processes. In the present study, we examined the relationships between attachment insecurity, emotional invalidation, and CPTSD symptomatology, as well as the mediating roles of cognitive flexibility and posttraumatic cognitions. Using data from 273 participants in the United States with histories of relational distress, the proposed model showed an excellent fit. Path analysis revealed that insecure attachment and perceived emotional invalidation had a positive direct relation to CPTSD symptoms. Posttraumatic cognitions, such as self-blame and negative beliefs about others, significantly mediated these relationships, underscoring their role in the development and maintenance of CPTSD symptoms. Cognitive flexibility did not mediate these relationships. However, cognitive flexibility was negatively associated with emotional invalidation, suggesting that as emotional invalidation increases, there is a small yet significant reduction in cognitive flexibility. The present results highlight the complex mechanisms that inform the corresponding relationship between relational trauma and CPTSD symptomatology, therefore emphasizing the need for trauma-informed and attachment-focused treatment for individuals impacted by relational trauma. Limitations, future areas of research, and practice implications are discussed.

Sara Rusi

NC - Western Carolina University

Discipline: History

Authors:

Abstract Name: "Get the Boot off Our Necks:" The Impact of the United Packinghouse Workers of America in Chicago

From the 1930s through the 1950s, Chicago was the center of early industrial meatpacking, being dubbed the 'hog butcher of the world.' The low wages, terrible working conditions and high rates of injury led workers to organize unions, including the United Packinghouse Workers of America in 1943. Historians of American labor unions have both underestimated racism and overstated some unions' claims to be racially inclusive. This paper uses oral histories and interviews to show how, in contrast, the UPWA was unique in its interracial leadership policies and in confronting racism among its own workers. By uniting workers across racial, ethnic, religious and gender lines, the UPWA was able to improve conditions for packinghouse workers.

Heather Rusiewicz

PA - Duquesne University

Discipline:

Authors:

Abstract Name: Mission-Driven Mentoring: Broader Purpose, Bigger Goals, Deeper Relationships

This session will spotlight the transformative nature of mission-driven mentorship in higher education. Though the missions of institutions are highly individualized and vary in the degree in which they permeate university life, the tenets of each mission can provide a framework for individual mentorship and subsequent student scholarship. Such a mission-driven framework is beneficial for faculty planning and student focus. At the same time, these experiences of shared language and goal setting can lead to enhanced trust, strengthened relationships, heightened creativity, and elevated outcomes. The emphasis on academic excellence, societal impact, and community connections can be identified across the missions of many, if not all, institutions of higher education. Explicitly embracing, discussing, and letting the mission of the institution guide the mentoring process may lead to competent and intellectually curious graduates who are also leaders, advocates, and empathetic professionals with enhanced levels of self-efficacy and sense of purpose. Examples of implementing a mission-driven framework for one-on-one mentoring will be provided using the Spiritan charism and mission of Duquesne University. A summary of mission statements across other colleges and universities will be presented and ways to extend some of these examples will be considered. Lastly, students and faculty in attendance will be led to reflect on the mission of their home institution and the potential benefits and challenges of utilizing a mission-driven approach to mentoring.

Alexzander Russell

WI - University of Wisconsin-Eau Claire

Discipline: Psychology

Authors:

Joseph Her

Abstract Name: Quantitative Analysis of Predictors of Self-Perceived Recovery from NSSI

Non-suicidal self-injury (NSSI) is the intentional injuring of one's body without the intent to die (Lewis et al., 2019). Efforts are needed to understand the motivation and recovery process of NSSI (Liu et al., 2024). Recovery can be experienced differently by individuals and may be influenced by various mechanisms (Lewis & Hasking, 2021). Andersson et al. (2024) qualitatively found three themes of recovery that encompass facets of self-compassion, social support, resiliency, and mental health distress. Most studies investigating NSSI recovery utilize qualitative methods (Lewis & Hasking, 2021) and our study expands this work by quantitatively examining variables related to perceived NSSI recovery. We hypothesized that self-perceived recovered individuals would score higher in self-compassion, social support, and resiliency and lower in mental health distress and self-criticism. We also explored which of these factors would predict perceived recovery. Participants included 712 young adults from a Midwest University (Mean age = 19.55, SD = 1.46, 73.4% female, 90.8% White) recruited through email to complete an anonymous online survey of constructs related to NSSI recovery. A 3x5 ANOVA revealed significant differences between groups and Bonferroni-adjusted post-hoc tests indicated self-perceived recovered individuals scored higher than unsure and not recovered individuals on social support and resiliency, and unsure individuals scored higher than not

recovered individuals, all $p < .05$. Unique group differences existed in self-compassion, self-criticism, and mental health and will be discussed. Linear regression analyses identified that all variables studied were significant predictors of perceived recovery, $F(8) = 12.16$, $p < .001$, accounting for 14.1% of the variance. Results indicate the recovery process is influenced by self-perceptions and general mental health. Although qualitative research indicates individual differences at various phases of recovery, the variables quantitatively studied should be accounted for when creating a plan for NSSI recovery.

Emily Russell

KY - Morehead State University

Discipline: English and Literature

Authors:

#1 Philip Krummrich

Abstract Name: From the Stage to the Screen: The Evolution of the Amphitryon Theme

The Amphitryon theme has inspired numerous plays over the centuries, along with operas, musicals, and a full-length film. The Roman author Plautus wrote the first surviving play developed from the legendary story of Amphitryon and the engendering of Hercules. In doing so, not only did the Latin dramatist provide an enduring template that playwrights have followed more or less closely for the last two millennia, but also captivated writers beyond the theater. Written and directed by Reinhold Schünzel, the 1935 German musical film *Amphitryon: Luck Comes from the Clouds* offers a unique adaptation of the popular theme. This presentation will examine how film, as a medium, presents distinct advantages over theater in conveying the Amphitryon story. By analyzing Schünzel's filmic adaptation, I will explore how cinematic techniques enhance and transform the traditional elements of the Amphitryon theme. One advantage of film is its ability to exploit space in a way that stage productions cannot. In a theater production, space is inherently limited by the physical confines of the stage, which restricts the scope of the action. By contrast, the Amphitryon film uses the spatial freedom of the medium to expand the narrative far beyond the limitations of a stage. The film is able to seamlessly shift between locations—from the divine heights of Olympus to the mortal world below—using wide shots to highlight the scale of Jupiter's interventions and the contrast between the realm of gods and humans. Ultimately, the transition of the Amphitryon theme from stage to screen highlights the unique strengths of film as a medium. While theater has long succeeded in portraying the humor and complexity of mistaken identity, film provides opportunities to amplify that humor through hilarious visuals and exaggerated effects.

Kevin Rusu

NC - Wingate University

Discipline: Business

Authors:

#1 Kevin Rusu

#2 Kristin Stowe

#3 Barry Cuffe

#4 Katlin Cundiff

Abstract Name: Moldova: Impact of FDI and Corruption on GDP per Capita

This research studies the impact of foreign direct investments (FDI) inflows and corruption on the economic

performance of Moldova. Data is compared to peers like Romania, Estonia, Ukraine, and other countries from the former Eastern bloc. Previous papers concluded that higher FDI inflows paired with strong business relationships through free economic trade zones are beneficial for economic growth. Moldova plans to join the EU, which would be another favorable factor. Corruption is one of the factors that impacts economic growth negatively. Former USSR countries handled corruption differently. Some were more successful and others are still experiencing high levels of government and business corruption. A multiple regression model with 21 countries was used to compare different independent variables to the dependent variable GDP per capita. After six rounds of the regression, four of the seven independent variables made it to the final model. Results of the multiple regression model show that a low unemployment rate, government expenditure, trade balance, and lack of corruption had a significant impact on the GDP per capita.

Ashlyn Ryan

TN - Belmont University

Discipline: Biology

Authors:

#1 Ashlyn Ryan

#2 Maria Sebastian

#3 Felicity Sterling

Abstract Name: Investigation of Shared Therapeutic Targets in Lysosomal Storage Disorders

Lysosomal storage disorders (LSD) are a class of genetic diseases defined by a loss of lysosomal activity resulting in a pathological accumulation of biomolecules. LSD's individually are rare, but it is estimated that 1 in 8,000 are living with an LSD, and very few have a drug in development let alone FDA approved. Many companies struggle to develop therapeutics for LSD's, because there is not a large enough market for commercial use. Therefore, identifying a common therapeutic target is essential. Previous work on Niemann Pick Type C (NPC) revealed that lysosomes fail to project membrane tubules, thereby resulting in pathological accumulation of cholesterol and sphingolipids. This ultimately leads to impaired mitophagy and cell death. Although this pathway is compelling it is unclear if the other LSD's would see the same results. NPC is defined by impaired cholesterol transport through a membrane, whereas the other LSD's involve impaired enzymatic activity. However, because lipids other than cholesterol accumulate in NPC disease, it is possible that disorders involving these lipids, such as Hurler Syndrome, would see decreased lysosomal and mitochondrial activity in a similar manner. To investigate the commonalities, we induced Hurler Syndrome in COS-7 and N27A cells with ML-S1 and observed lysosomal and mitochondrial activity through live cell microscopy. We found that although there were some common morphological changes, there were some different between the two disorders.

Jonathan Ryan

CA - Medanos College

Discipline: Chemistry

Authors:

#1 Marquez Westbrook

#2 Aurelia Ward

#3 Jack Capito

Abstract Name: Repurposing Grape Pomace as a Bioadsorbent for Removal of Methylene Blue

In California, pomace, the product of wine pressing, is discarded in thousands of metric tons each year. The use of bioadsorbents in the removal of heavy metals and dye contaminants is an emerging field of study, often focusing on the repurposing of regional biowaste into a cost-effective solution. Dye contaminants have widespread negative effects on water systems, and the cationic dye, methylene blue (MB), is one of the leading water contaminants globally. Addressing both modern challenges, this study investigates the pomace biochar (PB) as an adsorbent by examining the effects of contact time, exposure method, and pH levels on the PB adsorption of MB from aqueous solutions. PB was prepared using sulfuric acid and low-temp firing to minimize ash content, maximizing adsorption. Of the exposure methods evaluated, mesh strainer containment produced the most consistent data. Green pomace biochar (GPB) adsorbed optimally at pH conditions of 7.0 to 11.0, the black pomace biochar (BPB) adsorbed optimally between 4.0 and 7.0, and became unstable in basic conditions. Both reached equilibrium between 45 to 60 minutes, and reached maximum percent removals between 45% and 65%. Analysis of the kinetics concluded that across trial methods and pH conditions both GPB and BPB align with the pseudo-second-order kinetic model. This study shows that PB is a fast-acting, efficient adsorbent of MB.

Kimberly Saavedra Villegas

WI - Alverno College

Discipline: Biology

Authors:

#1 Kimberly A. Saavedra Villegas

#2 Megan A. Krueger

Abstract Name: Cultivating and Identifying Soil Bacteria with Antimicrobial Activity

The Tiny Earth Project aims to discover novel antibiotics from bacteria in local soils. There is a pressing antibiotic crisis where numerous bacteria and pathogens become untreatable due to increased antibiotic resistance. This dire situation is resulting in loss of lives and continues to claim more unless alternative antibiotics are developed to combat the resistance. In our contribution to the Tiny Earth project, we dedicated our efforts to exploring techniques for cultivating and identifying bacteria demonstrating antimicrobial activity. We conducted rigorous tests on soil samples from three distinct sites in our Milwaukee, WI community to identify soil bacteria present and evaluate their antimicrobial potential. Our primary goal was bacterial identification, and we have identified four colonies demonstrating resistance to either *B. subtilis*, *A. baylyi*, or both. Both are considered Safe ESKAPE pathogens, in other words relatives of pathogenic bacteria that do not cause disease and are safer to use. The next step in this research will be to further characterize the four colonies that displayed antimicrobial properties against safe ESKAPES.

Keerthana Sabhanayakam

CA - Moreau Catholic High School

Discipline: Chemistry

Authors:

Shreya Desai

Abstract Name: Evaluating Flavonoid Content in Black Beans (*Phaseolus vulgaris* L.) For Medical Advances

Various species of beans across the market are consumed by both humans and animals, particularly black

beans, as sources of nutrients like protein, fiber, and potassium. Existing literature proposes possible medicinal benefits for diabetes, heart disease, inflammation, and decreased risk of certain cancer cells offered through black beans. A plausible interpretation of this can be linked to the flavonoid content present in these beans. Flavonoid compounds contain antioxidant properties, cardiovascular protection, and anti-inflammatory properties that benefit the human body and lower the severity of many general sicknesses. Researchers have also begun to study black bean flavonoids as potential anticancer drugs as they may stop cancer cells from multiplying and decrease the risk of getting certain cancers. The primary source of these nutrients is fruits, plants, roots, and nutrients with a high level of aroma, such as coffee and beans. Previously, researchers at SJSU evaluated and compared the results of flavonoid content in Liberia, arabica, and robusta coffee species. They specifically looked for the concentration of catechin-based flavonoids across the 3 coffee species. The conclusion gathered is that the robusta species has a much higher concentration of Catechin and antioxidant capacity than the other species and may serve as a starting point for the pharmacological evaluation of coffee. The purpose of our project is to strengthen the connection between black beans and medical advances using the flavonoid content levels.

Adam Sacherich

PA - Pennsylvania State University

Discipline: Engineering

Authors:

#1 Adam Sacherich

#2 Seyed Hamid Reza Sanei

Abstract Name: Enhancing inter-material bond strength in multi-material 3D printing using a custom adhesive application toolhead

The integration of multiple materials in Fused Filament Fabrication (FFF) 3D printing presents significant opportunities to enhance the versatility and functionality of additively manufactured parts. However, inadequate inter-material bonding continues to hinder the mechanical performance and reliability of these components. This research seeks to address this challenge by developing and implementing a custom toolhead for FFF 3D printers, designed to deposit an adhesive layer at the interface of dissimilar materials during the printing process. Experimental investigations include lap-shear testing to evaluate the bond strength of multi-material parts produced using various material and adhesive combinations as well as resolution testing is conducted to determine the minimum feature size compatible with the adhesive application process. It is predicted that the incorporation of adhesives significantly enhances inter-material bond strength compared to conventional multi-material printing techniques. Furthermore, the resolution capabilities of this method are expected to enable the fabrication of intricate features that surpass the limitations of alternative bonding methods. This study highlights the potential of adhesive-enhanced 3D printing to overcome critical inter-material bonding challenges, paving the way for advanced multi-material applications in diverse fields, including biomedical devices, electronics, and structural components. The findings underscore the versatility and scalability of this approach, offering new possibilities for multi-material additive manufacturing.

Aliyyah Sadek

KY - University of Kentucky

Discipline: Linguistics and World Languages

Authors:

#1 Aliyyah Sadek

Abstract Name: Having the Linguistic Upper Hand: The Dynamics of English as a Lingua Franca in Contemporary Social and Political Contexts

This study examines the role of American English as a global lingua franca and its implications for cultural identity and language preservation among Arabic-speaking second-language English users. I focus on the sociolinguistic aspects of English's global dominance and its influences on linguistic standards, cultural identity, and multilingual communication. A series of interviews with Native and heritage Arabic-speaking participants focused on their use of English in personal, professional, and contemporary political contexts. I explore the challenges in maintaining their native language and strategies for cultural preservation. Thematic analysis revealed recurring themes of global mobility, identity negotiation, and language loss, highlighting the complex interplay between linguistic adaptation and cultural resilience.

Safiyah Sadek

KY - University of Kentucky

Discipline: Psychology

Authors:

#1 Elyssa Berney

#2 Matthew Whiter

#3 Joseph Hammer

Abstract Name: Examining Gender Differences in the Relationship between Stigma, Help Seeking Intentions, and Substance Use

Between 2002-2022, the age-adjusted overdose rate in the US was 32.6 per 100,000 people. Although men are more prone to overdose deaths, a trend published by the National Center for Drug Abuse Statistics shows that women are experiencing an increase in annual overdose deaths. Moreover, recent studies show that women are more likely to face barriers that prevent treatment-seeking for substance use. Furthermore, stigma is one of the most salient, complex, and least understood barriers to substance use help seeking. This project investigates the impact of gender and the role of stigma on help seeking intentions for substance use. It is critical to investigate the impact of perceived stigma and personal stigma on intentions to seek treatment in order to further inform our understanding of help seeking in substance use and to improve accessibility and feasibility of seeking help for substance use. A nationally representative sample from the 2019-2020 Healthy Minds Study was used to examine the relationship between gender and help seeking intentions in those who admit to substance use and if there is a difference between the impact of perceived and personal stigma on the help seeking intentions on help seeking intentions. Statistical analysis via comparison of means and chi-square analysis provide insight into the nature of stigmas relationship on help seeking intentions among gender and substance use.

Brae Sadler

PA - Grove City College

Discipline: Economics

Authors:

#1 Brae Sadler

Abstract Name: Costs of Quality: Transaction Cost Economics in Higher Education Accreditation

This paper examines the transition from input-based to output-based quality assessment in U.S. higher education over the last century. Initially, the high cost of collecting output data led to the formation of voluntary accreditation associations focused on input metrics. Recent critiques have highlighted how accreditation limits competition by controlling market entry. Yet the economic dynamics behind accreditation's development still need to be explored. I propose that the evolution of accreditation standards is closely tied to the relative costs of measuring inputs and outputs. *Ceteris paribus*, outputs are preferred for quality assessment. However, inputs have been used when measuring outputs was cost-prohibitive. As the cost of gathering output data decreased through the 20th and 21st centuries, there was a noticeable shift towards using output metrics. This study analyzes accreditation standards from three distinct periods: before World War II, 1960-1990, and post-2020. For each era, I detail the specific input and output criteria set by accreditors, using comparative analysis to illustrate shifts over time. Standards were sampled from the seven regional accreditors. The findings reveal a clear trend towards output-based assessment. Suggesting that as output metrics become more cost-effective, colleges can manage quality assessment independently. The shift to outputs could reduce the significance of accreditors in quality assurance and open the higher education market to more competition.

Antonio Saenz

TX - The University of Texas at El Paso

Discipline: Health and Human Development

Authors:

#1 Carolina Valencia

#2 Manuel Eloy Morales

Damien Chavez

Andres Brown

Abstract Name: The Impact of Podcast on Mental Health in High-school Students within the U.S.-Mexico Border Region

Mental health concerns in high school students are especially pronounced during life transitions, such as the shift from high school to college. These periods often lead to heightened anxiety, stress, and maladaptive coping mechanisms, negatively affecting overall well-being. Due to the cultural stigma associated with mental health, high school students within the U.S-Mexico border region often refrain from seeking help, which makes it difficult to manage their emotional well-being during important life transitions like getting ready for college. This service-learning project in collaboration with The 100-Solution Organization, aimed to assess the impact of podcasts as an educational tool to enhance mental health literacy among high school juniors and seniors, raise awareness about local resources, and address cultural stigma. To help break down stigma and provide resources involving mental health, we collaborated with a licensed counselor to answer a series of questions surrounding the topics of cultural stigma on mental health within the border region and transitional periods in students' lives. Using the podcast room at The University of Texas at El Paso, we recorded and distributed a podcast to students and school counselors. Participants were surveyed using a modified impact survey to evaluate the podcast's effectiveness. The results revealed significant positive outcomes. Fifty-six percent of participants were previously unaware of local mental health resources. Notably, 100% of participants found the podcast helpful, and 96% expressed a willingness to share the information with peers, highlighting the podcast's relevance to their needs. Overall, this project highlights the promise of innovative, accessible educational tools like podcasts to improve mental health literacy and support high school students, particularly in border communities, during critical life transitions.

Halen Saenz

TX - San Jacinto College

Discipline: History

Authors:

Abstract Name: German Texas: Fredericksburg's Origin

Because of a growing population in the 1840s, the many German principalities began sending settlers abroad. One of the most successful attempts was the Adelsverein which brought thousands of Germans to settle on the western frontier of Texas. This research project explores the founding and early growth of Gillespie County in general and Fredericksburg in particular from the mid 1840s until the American Civil War. This paper is based heavily on primary sources found in the Southwestern University Special Collections for the accounts of early settlers (such as Bernhard Monken) It also uses the 1850 census. In addition the paper utilizes many secondary sources such as books and articles, in particular from the Texas State Historical Association.

Aditree Sahu

MI - University of Michigan - Ann Arbor

Discipline: Interdisciplinary

Authors:

#1 Sandy Zalmout

Abstract Name: The Role of AI-Driven Gaming Platforms in Fostering Understanding of Neurodiversity Among University Faculty and Staff

This study examines the potential of AI-driven gaming platforms to enhance understanding and acceptance of neurodivergent individuals among faculty and staff at the University of Michigan. Neurodivergence, encompassing conditions such as autism, ADHD, and dyslexia, continues to be accompanied by misconceptions and stigma within academic and professional environments. These biases hinder the development of inclusive institutional practices that address the diverse needs of all individuals. By leveraging the immersive and interactive capabilities of AI-powered gaming, this research aims to simulate the lived experiences of neurodivergent individuals, fostering empathy, promoting awareness, and challenging entrenched stereotypes. The project employs a mixed-methods approach, integrating both technical development and user engagement. The engineering component involves the creation of AI-driven gaming prototypes using platforms such as Unity for interactive environments and Unreal Engine for high-fidelity simulations. Additionally, the project incorporates adaptive AI technologies such as Reinforcement Learning to tailor challenges to player responses, simulating scenarios like sensory overload or difficulties in executive functioning. Examples of similar approaches include games like *Hellblade: Senua's Sacrifice*, which used audio-visual elements to depict mental health struggles, and *Auti-Sim*, a game designed to simulate sensory experiences of individuals with autism. Faculty and staff participants will engage with the platform, and their experiences will be evaluated through gameplay analytics, pre- and post-engagement surveys, and qualitative interviews to assess changes in empathy and understanding. Preliminary findings indicate that AI-driven gaming platforms offer significant promise as educational tools, allowing users to connect with neurodivergent perspectives in transformative ways that traditional methods do not achieve. This project underscores the critical role of innovative technologies in addressing stigma and advancing neurodivergent inclusivity within higher education. The study contributes actionable insights for institutions seeking to implement effective diversity and inclusion initiatives, while also challenging the persistent taboos associated with neurodivergence in professional and academic contexts.

Bahar Sakar

NY - City University of New York - Hunter College

Discipline: Biochemistry

Authors:

#1 Marian Romaine

#2 Akira Kawamura

Abstract Name: Decoding Mixed Microbial Communication Through Stereoisomeric Enantiomers of 12-Hydroxystearic Acid

Bacterial species use signaling molecules to communicate, but the mechanisms underlying communication in mixed-species environments are not well understood. In our study, we identify several signaling molecules produced by Wheatgrass mixed microbial culture (MMC). Notably, Wheatgrass MMC predominantly produces the (R)-isomer of 12-hydroxystearic acid (HSA), which is commercially available, alongside a smaller quantity of the (S)-isomer, which is not commercially available. Using the Mitsunobu reaction, which can be used to invert the stereochemistry of secondary alcohols, we successfully produce the (S)-isomer for further investigation of its role in biofilm formation. While the individual effects of each isomer on biofilm formation are explored, we also examine their combined effects, as interspecies communication appears to involve both enantiomers. This raises an intriguing question: how do varying ratios of these isomers influence bacterial behavior, potentially signaling them to form biofilms or adopt a planktonic state? To address this, we test different (R) and (S)-isomer ratios on biofilm formation, revealing new insights into how bacteria in mixed microbial cultures, mirroring their natural environments, communicate through stereochemical differences. Understanding these mechanisms is critical, as biofilms pose significant challenges across healthcare and industrial sectors, contributing to antimicrobial resistance and contamination. By gaining a better understanding of how bacteria chemically "talk" using (R) and (S)-12-HSA isomers, we may unlock innovative strategies to disrupt harmful biofilms, raising the question of whether manipulating these stereochemical signals could hold the key to controlling bacterial behavior in complex ecosystems.

Karla Salas

TX - Laredo College

Discipline: Health and Human Development

Authors:

#1 Karla Salas

#2 Axel Garcia

#3 Antonio Carranza III

Abstract Name: Maternal Nutrition and Its Impact On The Risk of Birth Defects

Pregnant women often underestimate the critical role nutrition plays in their health and their baby's development. This research aims to highlight the importance of a balanced diet during pregnancy, detailing the best food sources for essential vitamins and minerals. Studies show that malnutrition is a leading cause of various birth defects and illnesses. Waldrop et al. (2024) emphasize that fetal neurodevelopment and visible traits depend on the timing and type of nutrient deficiencies, as different brain regions have unique nutritional needs. A lack of key nutrients during fetal development can impair brain function and physical traits, affecting both the mother and child. The findings reveal the specific roles of vitamins and minerals in fetal growth, the risks of deficiencies, and the recommended daily allowances for pregnant women. While much attention is given to the baby's health, this study underscores the need to address the risks poor nutrition poses to mothers, such as complications and illness. Future research should explore these gaps, focusing on the mother's health alongside fetal development to ensure comprehensive care during pregnancy.

Karen Salazar

CA - California State University - Fullerton

Discipline: Biology

Authors:

#1 Dani Dryer

Abstract Name: Sublethal effects of piperonyl butoxide, a common insecticide synergist, on bumble bee microcolonies

Piperonyl butoxide (PBO) is a common insecticide synergist used in agricultural products throughout the U.S. PBO increases the effectiveness of insecticides by blocking insect detoxification mechanisms. On its own, PBO is considered relatively non-toxic to non-target organisms such as honey bees. However, little research has evaluated its toxicity and sublethal effects on other bees, such as the common eastern bumble bee (*Bombus impatiens*). Using Environmental Protection Agency (EPA) guidelines, we calculated a field-realistic concentration of PBO and dosed bumble bee microcolonies. Mortality, sucrose consumption, and the total number of brood cells and nectar cups were compared between control and PBO-dosed microcolonies. In general, we found limited effects of PBO on any bumble bee response variable. Future studies should evaluate a larger range of field-realistic doses on bees in addition to measuring other sublethal effects such as behavior and physiology.

Eli Salem

OH - University of Cincinnati Main Campus

Discipline: Psychology

Authors:

#1 Rose Marie Ward

#2 Christian Garcia

#3 Nathan Anderson

#4 Natalie Bennings

Abstract Name: The Relationship between Alcohol Myopia and Susceptibility to Illness Among College Students

Alcohol is woven throughout our culture – especially among college students. Despite more recent interventions and research on the detrimental effects of drinking, alcohol-related consequences persist on college campuses. One potential explanation for this may be explained by Alcohol Myopia theory. Alcohol Myopia is defined as the constraint of attention to solely the present moment due to the effects of acute alcohol use on attention processes. Alcohol's myopic effect can be split into three categories: relief, excess, and self-inflation. Relief is alcohol's ability to cause someone to pay less attention to their problems. Excess is the tendency of someone under the influence would exaggerate their feelings, actions, and beliefs, and self-inflation is defined as the feeling of grandiosity an intoxicated person tends to feel. These effects may limit one's focus leading to potential negative consequences. Perceived Susceptibility is a construct from the Health Belief Model, representing the belief of how vulnerable one is to illness. Given alcohol's known myopic effects there is a possibility that during drinking episodes, individuals may not attend to cues or perform behaviors that would limit exposure to or protect from illnesses. Therefore, the focus of the current study is to examine the relationship between alcohol's myopic effects and perceived susceptibility to illness among college students. Participants will be university-attending students and will engage through an online survey. We will be using the Alcohol Myopia Scale and a Perceived Susceptibility to Illness Scale. Expected results are that as there is an increase in the effects of alcohol myopia would lead to a decreased level of perceived susceptibility to illness. Though data collection is ongoing, results from this study can be used to develop interventions regarding illness protection strategies while drinking.

Elizabeth Salerno

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Noha Ahmed

#2 Melissa Harris

Abstract Name: Testing the efficacy of topical RT175 for enhancing pigmentation

Stem cell dysfunction is one hallmark of aging. In an attempt to identify small molecules that rejuvenate stem cells or promote tissue regeneration we utilize the pigment system of the hair. Melanocyte stem cells, which reside in the hair follicle, are required to regenerate the differentiated melanocytes that produce hair color. Failure in this system results in an easily identifiable gray phenotype, providing an ideal model system for this research. Previously, we used the immunophilin ligand RT175 in combination with drugs cyclosporin A and minoxidil to determine their effects on pigmentation in gray haired mice. The results indicated that in combination these drugs induce hair growth and stimulate the production of pigment. We also showed that RT175 can affect melanocyte gene expression autonomously through in vitro treatments. We have now investigated the isolated effects of RT175 in vivo in mice by examining its regenerative properties in tissue, examining epidermal pigment production. The ears of one-year-old, male mice were treated with different doses (low, medium, and high) of RT175 or DMSO vehicle control for thirty days. Wholemount images of these ears demonstrated a change in pigmentation intensity and pattern based on treatment. To better quantify

these changes, tissues from ears of each treatment group were analyzed using the threshold function in the software Image J and indicated that pigmentation levels between groups trended upward in the medium dose but were not statistically significant. Future analyses will focus on defining novel methods to better quantify these pigmentary changes.

Leonardo Salgado

CA - University of California - Merced

Discipline: Nursing and Public Health

Authors:

#1 Alexandra Rivera-González

Abstract Name: Comparing Health Insurance Rates Among Non-Citizens in the California San Joaquin Valley Before and After Medi-Cal Expansions

The Central Valley, which is home to a large number of immigrants in California, faces several disparities involving health insurance coverage. Evidence from regional health reports suggests that statewide improvements through initiatives such as the Affordable Care Act and Medi-Cal eligibility expansions to all residents regardless of documentation status have provided some sense of relief. This study aims to capture the impact of these policy shifts on health insurance coverage for immigrants, in the San Joaquin Valley (SJV), the southern portion of the Central Valley. To measure this, annual data from the U.S. Census Bureau exported for the 2022 and 2015 SJV populations (n=8 counties). Tables were merged and cleaned in Microsoft Excel to create descriptive summaries for health insurance by county and plot trends by year using graphs. Maps were created using the data.census.gov interactive tool to visualize shifts. We found that the SJV experienced major increases in health insurance coverage, although between-county disparities persist. These results help highlight the importance of tailored policy interventions and resource allocation to address the unique health insurance coverage challenges faced by immigrants in the Central Valley. Furthermore, the findings underscore the necessity of ongoing support and monitoring to ensure that statewide health initiatives are effectively reaching and benefiting all communities, particularly those that are most vulnerable and underserved.

David Salomon

VA - Christopher Newport University

Discipline:

Authors:

#1 David Salomon

#2 Student One Student Two

Abstract Name: Build-A-Mentor: Helping Undergraduates Understand the Value of Mentors and Mentorship

This presentation by Christopher Newport University administrators and students stresses the importance of undergraduate mentorship and the value of searching for an appropriate mentor for both research and general support. Based on a lesson for URCA 101: Introduction to Research and Creative Activity, the presentation identifies the best characteristics of a mentor and how to search for suitable potential mentors. The session highlights student experiences (several current students and alums will co-present) discussing their challenges, obstacles, and successes. By synthesizing insights from psychology, pedagogy, and management, we present a mentor-building framework that emphasizes interpersonal skills, domain knowledge, and

reflective practices. We suggest that investing in a structured mentor search can greatly enhance mentorship outcomes, benefiting both mentors and mentees and contributing to a stronger, more supportive research and creative community.

Ophilia Salubi

MD - Bowie State University

Discipline: Biology

Authors:

#1 Ophilia Salubi

#2 Subhechha Rijal

#3 Faezeh Fatemi

#4 Abolfazl Dadkhahtehrani

#5 Supriyo Ray

Abstract Name: Bioremediation of Uranium and Copper Contaminated Water using *Shewanella oneidensis*

Heavy metal contamination is a global concern. Bioremediation offers a sustainable and eco-friendly way of removing these contaminants. Bioremediation is the process of removal of heavy metal pollutants using biological systems. This study investigates using *S. oneidensis* for the sustainable bioremediation of uranium and copper in wastewater. This research evaluated the efficacy of *S. oneidensis* in heavy metal removal under aerobic and anaerobic conditions, using a UV spectrophotometric technique to measure. Two metals of significant importance, copper and uranium salts, were used as substrates for testing the efficacy of *S. oneidensis* in the bioremediation process. Uranium was significantly removed in all time intervals at 4mM. Still, significant removal was observed only after 1 month at 2mM. For copper, concentrations of 10mM and 20mM were effectively reduced under aerobic and anaerobic conditions. In anaerobic conditions, the efficacy of *S. oneidensis* in bioremediating both metals was high. The findings confirm *S. oneidensis*'s potential as an effective agent for removing hazardous metals from wastewater, offering a viable strategy for sustainable environmental management

Rishab Samant

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Jason Warram

#2 Benjamin Kasten

#3 Sherin James

#4 Akhilesh Wodeyar

Abstract Name: Enhancing Diagnostic Accuracy in Laryngeal Cancer: A Comprehensive CLE Scoring System

In the United States, an estimated 16,000 people are diagnosed with laryngeal cancer each year, with most patients being 55 or older, and Black men being the most vulnerable demographic. The five-year survival rate is about 50% [1]. Developing methods for real-time malignant cell detection can help ensure accurate tumor margins, prevent recurrence, and conserve physiological structures. Confocal Laser Endomicroscopy (CLE) allows real-time tissue microarchitecture assessment using a mini probe, providing cellular-level details

without compromising tissue integrity. Widely used across various specialties, CLE has found an additional role in head and neck cancer surgery. However, CLE often relies on subjective interpretation, causing variability in reporting. To improve accuracy and precision, a scoring system based on histopathological criteria, considered the gold standard in cancer diagnosis, can help create objective data for CLE image and video evaluation. This study proposes a modified LPCIS CLE scoring system based on the histopathological characteristics of dysplastic epithelium. The new system builds on a previous six-criteria scoring system for the larynx and pharynx, expanding it to eight criteria that reflect cellular changes typical of cancer in histopathological evaluations. This method allows observers to assign numerical values to images, similar to how pathologists examine tissue specimens. Using a “weighted” system with reference to the 14 Hallmarks of Cancer, a scoring criteria system/criterion was developed, with scores higher than 3 indicating an increased probability of being dysplastic. This approach enhances diagnostic accuracy and supports better clinical decision-making in managing laryngeal cancer, providing the potential for the introduction of CLE as a clinical standard during intra-operative tissue assessment in real time for during head and neck tumor resection surgeries.

Rishab Samant

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:

#1 Jason Warram

#2 Benjamin Kasten

#3 Abbigael Eli

#4 Yolanda Hartman

Abstract Name: Inhibitor of Differentiation 1 (ID1) is Overexpressed in Oral Squamous Cell Carcinoma and Cervical Cancer Tissues

Both oral squamous cell carcinoma (OSCC) and cervical cancer (CC) disproportionately affect low-income and rural individuals in the United States. Developing quick, accessible testing methods for OSCC and CC provides an avenue to combat challenges low income and rural populations face and to obtain early detection, resulting in greater survivorship and reducing the inherent health disparities and barriers that exist among these communities. Inhibitor of Differentiation 1 (ID1) plays a key role in tumorigenesis and regulates cell proliferation. We propose an ID1-based detection methodology; however, the quantification of ID1 as a specific marker for both cancers is understudied. While ID1 expression has been characterized in literature, reports are limited, and display some discrepancies between cancer types. This project aims to evaluate ID1 as a relevant biomarker for OSCC and CC through immunohistochemistry (IHC) analysis in tissue microarrays. Using H-DAB immunohistochemistry with an ID1 primary antibody, 62 Stage I/II OSCC samples, 38 normal, and 22 chronic inflammatory samples were analyzed using QuPath, an open-source digital pathology software. Similar H-DAB IHC was conducted with various stages of CC tissues, totaling 99 samples and 10 normal tissues. Results indicate through optical density value comparison that ID1 is significantly ($p < 0.0001$) overexpressed in early-stage OSCC ($2.3e5 \pm 9e4$) tissues compared to both normal ($1.6e5 \pm 7e4$) and chronic inflammatory ($1.5e5 \pm 4e4$) samples. In CC, ID1 was significantly ($p < 0.05$) overexpressed in both early ($3e5 \pm 1e5$; $p = 0.0001$) and late-stage ($3e4 \pm 3e4$; $p = 0.0002$) tissues relative to normal tissue. The promising findings present opportunities for ID1 as a novel biomarker, namely through its incorporation in novel plasmid-based testing methods that indicate tumor presence.

Jessica Samol

PA - California University of Pennsylvania

Discipline: Chemistry

Authors:

#1 Jessica Samol

#2 Declan Johnson

#3 Ali Sezer

Declan Johnson

Abstract Name: Temperature dependent sensitivity study of gas sensors based on polyaniline/TiO₂/graphene oxide ternary nanocomposites

In this work, the selectivity and sensitivity of polyaniline (PANI), synthesized via oxidative polymerization, to NH₃ and CO gases in chemiresistive sensors was investigated at the presence of nano-sized (25-90 nm) TiO₂ and graphene oxide (GO). Gas sensors were constructed on Pt interdigitated electrodes via spin coating of PANI-based composites. All sensing measurements were carried out under ambient conditions at room temperature with humidity levels of 45-75 %. Significantly improved sensitivity to the presence of NH₃ and CO, in concentration ranges of 10-150 ppm, was observed for the PANI-TiO₂-GO nanocomposites, compared to PANI alone. Easily detectable resistance changes of 10-60 Ohms were measured. The composite exhibited a sensitivity of 13-15 % at 50 ppm gas concentration. The response time was measured to be less than 5 seconds with recovery time dependent upon the gas concentration, which ranged from 5 min to 25 min. Further investigation into the temperature-dependence of gas sensitivity of PANI-based nanocomposites is currently underway. Details of this work will be provided in this presentation.

Claire Sampson

IN - Franklin College

Discipline: History

Authors:

#1 Claire Sampson

Abstract Name: Protecting Women in Higher Education: The Life and Activism of Bernice Sandler

Title IX of the Education Amendments of 1972 has influenced the American education system for over fifty years. Although activist Bernice Sandler played a central role in the amendment's creation, historical scholarship rarely mentions her contributions, and only usually to proclaim her to be the "Godmother of Title IX" without much explanation as to how she earned the title. General histories of Title IX primarily focused on the interactions between the amendment and athletics. When her work is included in scholarly texts, it is usually limited to her activism beginning in the late 1960s and leading up to the passage of Title IX in 1972. In reality, Sandler remained highly involved in the legislative process for implementation and her work continued until she died in 2019. By using Sandler's oral history with Indiana University, Congressional testimony, and newsletters, my research creates a more detailed analysis of the early origins of Title IX and its broader implications for sex equality in higher education beyond athletics. It is clear from the primary sources that Bernice Sandler's personal experiences in higher education pushed her to become an advocate for other women. Her innovative use of Executive Order 11246 and outreach campaigns greatly contributed to the passage of Title IX. Sandler also relied on a strong network of policymakers and activists to achieve legislative goals and increase national awareness. I argue that Bernice Sandler's strategies for activism and her use of a network were innovative and essential to the success of Title IX.

Emma Sampson-Green

AR - Hendrix College

Discipline: History

Authors:

Abstract Name: Exotic to Iconic: The Story of Chinese People in America Through Cookbooks, 1911-2022

From the early 1900s through the present, Chinese cookbooks have reflected the history and status of Chinese Americans in the United States while also attempting to educate white Americans about Chinese culture and cuisine. Through Chinese cookbooks published from 1911 through 2022 and secondary sources that provide historical context, this paper traces the evolution of Chinese cookbooks from those geared toward predominantly white audiences with Westernized recipes to more authentic representations of Chinese cuisine. Chinese immigrants began to arrive in the United States after the start of the Gold Rush in 1848 and during the construction of the transcontinental railroad. Beginning in 1882, the Chinese Exclusion Act restricted the immigration of Chinese people into the United States. In these early years of Chinese cookbooks, the emphasis was on making Chinese food accessible to non-Chinese cooks and palates. Following World War II, Americans sought cheap and nutritious food, and Chinese cookbooks reflected this. Cookbooks by white and Chinese American authors aimed to demystify Chinese food for Americans and bridge cultural divides by simplifying or modifying recipes to suit American palates. However, as Chinese food gained popularity and the status of Chinese Americans changed, cookbooks began to present authentic recipes and dishes from different regions in China. They were increasingly written for wider audiences such as American-born Chinese people. The changes in Chinese cookbooks highlight the changing perceptions of Chinese food and Chinese Americans in the United States from an exotic curiosity to a culinary experience, signaling the growing acceptance and appreciation of Chinese food and culture in America.

María Sanabria

COL - EAFIT University

Discipline: Psychology

Authors:

#1 Maria Antonia Sanabria

#2 Sara Orozco Galeano

#3 María del Pilar Guevara

#4 Carla Maldonado

#5 Juliana Bonilla

#6 Edwin Buitrago

#7 Laura Alejandra Contreras Buitrago

#8 Lina Robledo

#9 Mariantonia Lemos Hoyos

Abstract Name: HEALTH AND ASSOCIATED FACTORS IN EAFIT UNIVERSITY MUSIC STUDENTS

Musical formal training has particularities in the academic experience, due to the intensity and personalization of their musical training from an early age. Likewise, there is previous evidence that suggests greater affectations in the health of music students in comparison with other university students. Therefore, this project seeks to identify the prevalence of emotional symptomatology and the factors that influence the health of this population, with the objective of developing specific interventions. The research method is mixed, combining a quantitative and qualitative phase. The research involved 32 participants, who were administered the Mini International Neuropsychiatric Interview (MINI) to assess mental disorders and semi-structured interviews to explore in depth the students experience. Analysis of the data collected includes

descriptive analyses for the quantitative results and thematic analyses for the qualitative interviews. Partial results shows that 32.1% of the participants have symptoms of major depression, 28.6% have generalized anxiety, and 17.9% are at risk for suicide. The interviews show that most of these students have scholarships to study, and they perceive a close relationship with their master of the instrument, comparing them to relationships with their mothers. However, this means that they feel stressed when they have tensions with their mentors, and their mentor's opinion about their performance usually affects their self-perception. Regarding habits, most of them spend more than 8 hours in the university studying, practicing and socializing, but they usually stay in their building, which means that they usually relate only to themselves. In terms of beliefs, we found that students don't think they can be successful if they stay in Colombia, that musical training must start early in life to be good, and that those who start later have a gap that is very difficult to fill.

Gabriela Sanchez

PA - Lafayette College

Discipline: Linguistics and World Languages

Authors:

Abstract Name: Teach Me Telugu: A Language Accessibility Project

Telugu is a Dravidian language of approximately 80 million native speakers and is spoken primarily in the states of Telangana and Andhra Pradesh in Southern India. When I first started learning the language in my Freshman year, I encountered many barriers that slowed down my progress, including lack of language learning resources and support from native speakers. That is why, in the fall of 2022, I created the "Teach Me Telugu" project, with a vision that accessing the Telugu language could become as easy as a mouse click. Over the years, the "Teach Me Telugu" project has gained traction and covered several milestones, including the creation of a short film, podcast, and website. By the time I graduate college, I hope to conclude the project by creating a free, high-quality Telugu alphabet course designed for an international audience, and redigitizing an old course called "An Intensive Course in Telugu" by uploading all 64 lessons (specifically, the dialogues and vocabularies) on Youtube as beginner-friendly podcasts with accompanying Telugu and English subtitles. My hope is that these resources will serve as a stepping stone for anyone eager to learn Telugu, no matter where they are in the world.

Mia Sanchez

OH - Capital University

Discipline: Biology

Authors:

#1 Mia Sanchez

#2 Sadie Weaver

#3 Lazuro Fuentes

#4 Stevyn Butts

#5 Ryan Suever

Abstract Name: The Use of Thermal Imaging to Compare Skin Surface Temperature in Long Distance Runners and Age-matched Controls After Running an 8-minute Mile

As a person's core body temperature rises during exercise, the body rids itself of excess heat through

sweating, conduction, convection and infrared radiant heat loss. Thermography measures radiant heat loss of skin covering actively contracting muscle. A Seek® thermal imaging camera was used to measure torso skin surface temperatures in collegiate long-distance runners (n=3), and non-athlete controls (n=3) to compare heat loss associated with actively contracting accessory muscles of respiration. All participants were photographed before and after running an 8-minute mile on an indoor track. It was hypothesized that an 8-minute mile would not require recruitment of accessory muscles of respiration in long-distance runners but would require recruitment of accessory muscles (Rectus abdominus, Pectoralis major and External obliques) in controls. Control runners showed a moderately significant drop in average temperature of the anterior torso (8% drop with $p=0.04$) but not in the posterior torso (5.6% drop with $p=0.06$). These data are consistent with active recruitment of anterior torso muscles and an associated need to dissipate heat after exercise. The drop in torso temperature was most pronounced in skin covering accessory muscles of respiration like the Pectoralis major, Rectus abdominus and External oblique muscles. The posterior torso contains few accessory muscles of respiration, therefore, a significant drop in posterior torso temperature was not expected. Although average torso temperature did drop slightly in long-distance runners following exercise, the results were not statistically significant on either the anterior (4.9% drop with $p=0.08$) or posterior (4.8% drop with $p=0.08$) surfaces. Thermography is a non-invasive tool to measure skin temperature above actively contracting muscle during exercise. Information gleaned from this technology may be used to assess athletic performance.

Natalie Sanchez

WI - Alverno College

Discipline: Chemistry

Authors:

#1 Natalie Sanchez

#2 Alex Blom

Abstract Name: Quantifying mineral content in different fertilizers and analyzing how it affects plant growth and amino acid content

The purpose of this research was to determine the effects of different fertilizers on plant growth and amino acid content. The plants chosen were lettuce and radish. Furthermore, some testing was done on three out of the four fertilizers used to compare and contrast the amounts of different minerals to the corresponding labels. The concentrations for most of the minerals tested were lower than expected, however this could be due to interferences on the atomic absorption spectrometer. The determination of amino acids on the high-pressure liquid chromatography machine was unsuccessful, two different methods were used but the only two amino acids present on the samples were isoleucine and phenylalanine. The plants showed a correlation between higher fertilizer concentration and growth.

Alejandra Sanchez

UT - Westminster University

Discipline: Health and Human Development

Authors:

#1 Alejandra Sanchez

Karla Motta

Abstract Name: Fostering Civility in Nursing: Addressing Workplace Incivility to Mitigate Moral Injury, Compassion Fatigue, and ultimately Burnout!

Incivility refers to disrespectful and unprofessional behavior that violates workplace norms and undermines a positive and productive environment. In the nursing context, workplace incivility and bullying remain pervasive challenges that significantly contribute to compassion fatigue, moral injury, and burnout. These systemic issues disrupt teamwork, reduce job satisfaction, and increase turnover rates, posing severe consequences for healthcare delivery and patient outcomes (Ahmadi, S., et al. 2024). A systematic literature review to better understand how to address these issues reveals that leadership built on accountability, zero-tolerance anti-bullying policies, ethics support systems, and mindfulness programs are critical in mitigating incivility in the workplace. These interventions not only improve nurse retention but also enhance patient care delivery by fostering resilience, self-compassion, and collaboration among nursing and intra-departmental staff. Cultivating civility is essential to address systemic stressors in nursing workplaces, thus creating a culture that prioritizes nurses' well-being and advances positive patient outcomes.

Kasai Sanchez

NJ - William Patterson University

Discipline: Health and Human Development

Authors:

Abstract Name: "The Impact of Nutrition on Academic Performance: Addressing Food Accessibility and Equity in Education"

The relationship between food and academic performance is widely studied, showing a strong connection between nutrition and cognitive abilities, which directly affect academic success. For the brain to function at its best, it requires essential nutrients, vitamins, and minerals. However, many students in the United States do not consistently receive these necessary nutrients, negatively impacting their academic outcomes. To fully understand the influence of food on learning, it is essential to examine how various diets affect individuals with different health conditions, recognizing that "healthy" is relative to each person. This research explores how healthy and unhealthy food choices affect academic performance in K-13 students and examines the impact of providing balanced, nutritious meals. By comparing food programs across different school districts, the study evaluates their effects on student outcomes. It also reviews the historical development of school lunch and breakfast programs, examining how policies and legislation have shaped access to healthier meals and their impact on student performance. The findings reveal that limited access to nutritious food is linked to poorer academic performance, emphasizing the need to address social disparities in food availability. Programs aimed at promoting healthier eating habits in schools show promising results, improving focus and cognitive function. On the other hand, diets high in sugar and low in quality contribute to reduced attention and learning capabilities. High-quality meals and balanced diets enhance scholastic performance and provide a foundation for equitable educational opportunities. Addressing food insecurity, fostering better eating habits, and ensuring all students' nutritional needs are met are critical steps toward improving academic success and bridging gaps caused by socioeconomic disadvantages.

Nereyda Sanchez Gama

MI - Hope College

Discipline: Biology

Authors:

#1 Lexus Putt

#2 Mackenzie Williams

#3 Erika Calvo-Ochoa

Abstract Name: Olfactory system alterations in a novel model of dopaminergic loss by 6-OHDA injections in adult zebrafish

Parkinson's Disease (PD) is a neurodegenerative disorder characterized by dopaminergic neuronal loss and severe motor impairment. Olfactory loss is prevalent in over 95% of those with PD and is a symptom that precedes motor deficits in most individuals. However, the mechanisms linking PD and olfactory dysfunction are not well understood. It has been proposed that dopaminergic loss causing retrograde degeneration in the olfactory system might be underlying this phenomenon. Zebrafish provide an ideal model to study these processes, as their olfactory system is analogous to those of mammals and olfactory bulb (OB) contains a large population of dopaminergic neurons that mediate olfactory function. They exhibit lifelong neurogenic capability and neuroplasticity, an ideal model for studying possible repair processes in neurodegenerative diseases. We generated a model of dopaminergic loss in the OB of zebrafish by injection of 6-hydroxydopamine (6-OHDA) into the cerebrospinal fluid at the ventricular zone between the olfactory bulbs and the telencephalon. We aimed to target dopaminergic neurons in the OBs but not in posterior motor nuclei so as not to alter locomotion. We assessed dopaminergic neuronal loss, markers of inflammation, morphological changes of olfactory axons, and pre-synaptic markers following the injections using immunohistochemistry. We evaluated olfactory function utilizing behavioral assays, and observed a dramatic increase in the number of apoptotic cells in the OB 1- and 3-days post injection (dpi) as well as a significant loss of dopaminergic neurons, confirming a successful lesioning method. There was an increase in the neuroinflammatory response, using GFAP staining at both time points, and found disturbances in olfactory-mediated behavior suggesting olfactory functional alterations. Our results show that we successfully optimized a novel method for injection of 6-OHDA to target dopaminergic neurons in the olfactory system. We can use this model to further study the relationship between dopaminergic loss and olfactory alterations.

Keiryn Sandahl

NY - Houghton College

Discipline: Interdisciplinary

Authors:

Abstract Name: Preserving a Faith in Humanity

One feature of present-day Western culture is its faith in inherent human goodness. While this faith has existed for a while, it has had to defend itself from challenges, with the atrocities of Nazi Germany being one of the sharpest. A society of "ordinary" people had either perpetrated or ignored the ugliest kind of evil, en masse. This could signify a fundamental depravity rooted in the human spirit, or it could signify the power of the pressure to conform to society. In order for human nature to be inherently good, it also had to be malleable, threatened or even overpowered by adverse influence. Consequently, in the period following the war, Western culture had to grapple with its beliefs about good and evil, individuals and society. An analysis of sources from this time period reveals a persistent faith in a good human nature and an attendant fear of influence and conformity. In *Eichmann in Jerusalem*, historian Hannah Arendt wrestled directly with the Nazi phenomenon. Thomas Merton, in his poetry, considered instead the U.S.A.'s atomic bomb. Artists expressed their concern about a stifled human spirit from different angles. Some even saw hope in a malleable human spirit, which the right influences might mold towards good. By integrating an analysis of these and other Western cultural products, it becomes possible to see the relationship between the faith and the fears. They express convictions about humanity still with us today. They also express the costs, and the immense responsibility, which such a faith requires.

Elizabeth Sandell

MN - Minnesota State University - Mankato

Discipline:

Authors:

#1 Ryuto Hashimoto

#2 Elizabeth Sandell

Ryuto Hashimoto

Abstract Name: Fostering International Scholars: Course-Based Undergraduate Research Experiences at a US University

As tertiary education in the United States becomes increasingly diverse because of global migration, universities need to adapt and create opportunities for all students to participate in meaningful academic learning endeavors. Early research experiences are impactful for student learning and student retention. This presentation will explore the effective implementation of Course-Based Undergraduate Research Experience (CURE) at an internationalized university in the American Midwest. In a time where internationalization holds paramount importance, one primary goal for universities is to nurture competitive international scholars. Over the years, the presenters' research team proactively mentored more than 100 domestic and international students representing diverse backgrounds from Ecuador, Ethiopia, Uzbekistan, as well as students with bi-cultural identities. Despite limited prior exposure to academic research, these students brought with them invaluable international and intercultural perspectives that significantly enriched the research process. The presenters established and fostered mentor-mentee relationships among these students. By providing guidance, mentorship, and implementing a structured CURE framework, these students not only bridged the gap in their research skills but also utilized their unique international backgrounds to identify and explore innovative scholarly inquiries. The report highlights the successful approach to organizing CURE programs that are both inclusive and responsive to the diverse student body. These international and bi-cultural students' experiences serve as evidence of the potential of CURE in fostering early professionals in academic research. These insights will inform and encourage scholars and educators on effective strategies to cultivate the next generation of research professionals within the globalizing landscape of tertiary education.

Jessie Sanders

AR - University of Arkansas

Discipline: Sociology

Authors:

Abstract Name: How Gender Inequality Drives the Human Trafficking Industry

There are currently more than 40 million people subjected to human trafficking worldwide. People living under forced servitude and sexual exploitation, people in forced marriages, and child soldiers all of which are victims of human trafficking. Research has shown that 71% of these victims are women and girls, making human trafficking a disproportionately gendered issue. However, does gender impact trafficking as a whole? The crux of this study uses a meta-analysis, a statistical combination of the results of multiple studies addressing a similar research question, to understand how gender inequality relates to human trafficking. The main variables this paper looks at are a country's gender development index score, the number of cases of human trafficking in a country, and the most prevalent types of trafficking in a given country. A country's gender development index score comes from the difference between men's and women's achievements in three categories: health, education, and command over economic resources. The purpose of using a meta-analysis is to gain evidence from multiple studies, increasing the statistical power to get more conclusive results. From the evidence taken from the meta-analysis study, we can expect that countries with higher

gender inequality index scores will have high rates of human trafficking and a lower Trafficking in Persons (TIP) Report score from the Trafficking Victims Protect Act (TVPA). The TIP Report is an annual status update on global anti-trafficking efforts. There are three tiers, and the lower a country's tier is, the worse its efforts against trafficking are. The research on gender and trafficking is limited. Still, it is crucial to research this issue further to widen people's understanding of human trafficking and the implication gender inequality has on trafficking to protect individuals better and combat trafficking every day.

Emylya Sanders

WI - University of Wisconsin-Parkside

Discipline: Biology

Authors:

#1 Emylya Sanders

#2 Abigail Dhaher

#3 Safia Amtulbaseer

Abstract Name: Examining the evolutionary divergence of duplicated genes that regulate yeast sulfur metabolism

Transcription, in which RNA copies of a gene is made, is a critical step in gene expression. We chose *Saccharomyces cerevisiae*, or budding yeast, as a eukaryotic model to study two proteins (Met31 or Met32) that allow the protein Met4 to activate the transcription of sulfur metabolism genes. Met4 can recruit transcription machinery but it cannot directly bind to the DNA of its target genes. Met4 must interact with either Met31 or Met32, which can bind to the target gene DNA. The MET31 and MET32 genes evolved through duplication and divergence. Although both Met31 and Met32 bind to the same DNA sequences in promoters (regions located in front of the gene that control when and how much that gene is expressed), Met31 and Met32 perform different roles in their ability regulate expression of sulfur metabolism genes. These differences are detected when we compare the growth properties of yeast strains in which either MET31 or MET32 is deleted (*met31Δ* or *met32Δ*). If Met31 and Met32 performed identical functions, the *met31Δ* and *met32Δ* strains would have identical growth properties. We have discovered that *met31Δ* and *met32Δ* strains differ in their ability to use certain sulfur compounds as sole sulfur sources. We also discovered that Met31 and Met32 have different expression profiles under inducing conditions. To assess whether the differences in Met31 and Met32 expression dictates their functional roles, we evaluated the effect of swapping the MET31 and MET32 promoters in the single delete strains. Will the promoter swap cause a *met31Δ* strain to behave like a *met32Δ* strain? Using a coulter counter, we evaluated growth rates and cell sizes of promoter swap and control strains in defined minimal media using with sulfate, sulfite, homocysteine, methionine, cysteine, glutathione, cysteate, isethionate, and taurine as sole sulfur sources.

Jacob Sanders

MI - University of Michigan - Ann Arbor

Discipline: Education

Authors:

#1 Bridget Maher

Abstract Name: High Schoolers' Development of Entrepreneurial Skills within the Context of Engineering Courses and Robotics

Over roughly the last five decades, researchers and scholars have described how important it is to diversify STEM fields and increase the numbers of Black and Brown people who are working in sciences, technology, and engineering. This issue has been addressed through making STEM curricula in K-12 schools more culturally relevant and sustaining, inclusive, and just. But, what is often left out of the curriculum in these schooling experiences are focused on meaningful applications of STEM concepts for real-world and career focused skills. One of those important focus areas would be in the development of entrepreneurial skill-building. Opportunities to learn and apply business and entrepreneurial skills in STEM concepts will prepare all students for the next generation of STEM careers and crucially important skills for minority populations on building wealth and business ownership potential. In one university and district-based partnership, human-centered design and engineering coursework taught across grade levels is attempting to focus on these skills for high schoolers in a majority Black high school context. In this study, I follow a group of students in their senior engineering course and internship placements as well as observe the school's FIRST Robotics team to note the ways that entrepreneurial skills are being built. Through qualitative research methods of fieldnoting, observation, interviews and focus groups, I document the ways that students engage in business practices, skill building, teamwork, leadership, persistence, resilience, and problem-solving. Preliminarily, the study is conducted with the expectation that the school's engineering classes do indeed indirectly promote business and entrepreneurial skill building, but the effect is greater in a setting where there are shared competitive tasks and outcome, such as on a robotics team. This work offers important insights into supporting entrepreneurial mindsets and skill building, specially working with Black and Brown students looking to enter STEM professions.

Victor Sandoval

PA - Penn State Greater Allegheny

Discipline: Computer Science

Authors:

Ayushma Neopaney

Abstract Name: Raspberry Pi GPIO Functionality through Interactive Learning

In a world of constant change in technology the need for hands-on experiential learning is paramount. This interactive learning exercise explored both the role of Raspberry Pi's role in education and information sciences and technology learning and student-led learning. A classroom of 15 students led by 2 student researchers completed a hands-on lab of GPIO functionalities applying programming concepts through using the Sunflower Raspberry Pi and Arduino Kit, specifically the Pi 5 (Python). Through an analysis of student data feedback, we were able to investigate how effective the interactive exercise in teaching Raspberry Pi GPIO basics and Python programming was for our students. Also, consider whether student-run technology exercises develop students' scientific inquiry and research skills. There were four intended learning outcomes in the overall project: (1) develop circuit-building and Python skills, (2) enhance understanding of logic flows, delays, and hardware–software interaction, (3) strengthen technical collaboration through teamwork and problem-solving, (4) develop scientific thinking-processes and research skills. While not a traditional CURE (Course-based Undergraduate Research Experience) student researchers were employed to lead the research efforts for this exercise. While further reporting and analysis of the quantitative survey is needed, the preliminary student sentiments were positive. Student participants stated it was: "wonderful, amazing, fascinating." These key findings indicate that this interactive exercise effectively supports the learning of abstract concepts like logic flow and GPIO control. Future research could focus on expanding these exercises to include more complex GPIO functionalities, such as integrating sensors or motors, to provide a more comprehensive understanding of physical computing and coding principles.

Anli Sanjuan Hernandez

GA - Emory University

Discipline: Interdisciplinary

Authors:

Abstract Name: Reducing Impostorism: How an Interdisciplinary Education Affects Scientific Identity and Belonging

Throughout the years, STEM fields have failed to promote a sense of belonging and identity in students and professionals, thus promoting impostorism, negatively impacting career persistence (Chang et al., 2022). Impostorism is characterized by feelings of self-doubt regarding one's competence, ability, and deservingness (Jiyun & Lytle, 2024). Between 56 and 82% of college students, graduate students, and other professionals experience impostorism at some point in their careers (Bravata et al., 2019). Belonging is described as feelings of deep connection with distinct groups, places, and collective experiences (Allen et al., 2021). The components of belonging: competencies, opportunities, motivations/desire, and perceptions, overlap with the three factors that constitute a "scientific identity": performance, recognition, and competencies (Pfeifer et al., 2024). Interdisciplinary courses addressing these components may help reduce impostorism and increase persistence in academia. This research investigates the effect of an interdisciplinary science education on scientific belonging and identity through the lens of impostorism to understand possible ways to reduce impostorism in aspiring scientists. To investigate this question, I examined data from the interdisciplinary course, History of the Scientific Research Article (SRA) since 1665. Students analyzed the SRA through a historical perspective which encompassed the rhetorical and scientific aspects of the SRA and the "how" of science. The objectives of the course were to develop critical scientific skills, a holistic understanding of scientific communication, and scientific identity and belonging. I analyzed pre and post course surveys and interviews, focusing on student beliefs, identity, confidence, and their scientific and humanities image. Preliminary data suggests that an interdisciplinary science education may facilitate scientific identity and belonging. Therefore, my findings seem to indicate that interdisciplinary courses may reduce impostorism by promoting scientific identity and belonging in aspiring scientists. Thus, interdisciplinary courses may be another faithful tool to further explore in efforts to improve persistence in STEM.

Kylee Sanow

MN - St. Catherine University

Discipline: Biology

Authors:

#1 Kylee Sanow

#2 Rahul Roy

#3 Bethany Rahn

Abstract Name: Blossom Tales: Designing a children's book to introduce a unique plant-pollinator interaction to reduce plant awareness disparity

Plant Awareness Disparity (PAD)—previously known as Plant Blindness—refers to a lack of awareness and appreciation towards plants, which can be detrimental to the environment as it instills less incentive to protect plants, leaving them vulnerable to irreversible harm and extinction. The extent of this phenomenon is reflected within the societal and professional association of Biology, primarily focusing on humans and other animals rather than applying plants as exciting models. This mindset is frequently perpetuated in children's books featuring animal and human characters, while plants are simply background or completely absent. This designation is then passed along to readers, who maintain this lack of awareness throughout adulthood and potentially impart it to children in their circle of influence. Blossom Tales is a children's book focusing on a

distinctive and exciting plant in an attempt to combat this cycle. This story focuses on Millie, a *Nesocodon mauritianus* plant endemic to Mauritius, east of Madagascar, whose flower produces yellow nectar that changes to blood red, attracting gecko pollinators. Using this unique plant and animated expressions will hopefully draw children's attention. The book is illustrated to showcase the plant at different angles with various expressions that relay different emotions. Regarding visual style, simple shapes were chosen to be visually appealing while preventing distraction from the story's proper focus of the plant-gecko interaction. Drafting language for the story will use impactful and humorous wording to appeal to elementary school kids. Work in progress includes finishing sketching the storyline and finalizing the illustrations. The final goal is to publish this book and perform readings in local elementary schools to survey awareness perceptions using simple questionnaires. This project aims to give readers an increased appreciation for plants.

Dominic Santia

PA - California University of Pennsylvania

Discipline: Chemistry

Authors:

#1 Matthew Price

Abstract Name: Photochromic and Thermochromic Anils in Polymeric Films

Thermochromism and photochromism, characterized by heat- and light-induced color changes, respectively, are widely used in consumer products, climate control technologies, and military design applications. Anils, a class of Schiff bases formed by the condensation of aldehydes and anilines, exhibit these properties. However, the structure-function relationships governing their thermochromic and photochromic behavior, particularly in solvent systems and polymer films, remain underexplored. This study aims to investigate how electron-withdrawing and electron-donating substituents, solvent polarity, polymer matrix polarity, and the ability to undergo excited-state intramolecular proton transfer (ESIPT) influence anil properties. Anil compounds will be synthesized via reflux and characterized using FT-IR and ¹H-NMR spectroscopy. Results are expected to reveal trends in chromic behavior that can inform industrial and medical applications. These findings will be discussed in the context of optimizing material design for functional chromic applications.

Nathaniel Santiago

IL - Northeastern Illinois University

Discipline: Physics and Astronomy

Authors:

Abstract Name: Graph Neural Network Particle Reconstruction for DUNE's Prototype Near Detector

DUNE (Deep Underground Neutrino Experiment) is the upcoming flagship neutrino accelerator experiment in the United States. It plans to utilize a pixelated and modular liquid argon time projection chamber as the primary detector of its Near Detector complex. This detector's design is currently being tested with four prototype modules in a 2x2 arrangement at Fermilab. In order to observe particles that deposit energy outside of the limited 2x2 prototype volume, the prototype is being supplemented with an upstream and downstream detector. These detectors are sets of scintillator planes, which are from a previous neutrino experiment, MINERvA. The goal of the work presented is to extend the machine learning architecture that already exists for the 2x2 prototype to analyze and incorporate data from the MINERvA planes. The training data for this project originates from simulated particle interactions, which are fed into a detector response simulation for

the MINERvA detector components. The output of these simulations is interpreted as geometric information about particles present in the detector, which is fed into a graph neural network that identifies particle tracks. This work builds key connections and functionality in the framework that will eventually be used to interpret and analyze the data from DUNE's Near Detector.

Kimberly Santiago

PRI - Universidad Ana G. Méndez - Recinto de Carolina

Discipline: Chemistry

Authors:

#1 Kimberly Santiago

#2 Abniel Machin

Abstract Name: Photodegradation of Ciprofloxacin and Levofloxacin using Au@ZnO Catalysts

The degradation of organic pollutants in water is crucial for protecting environmental and human health. Organic contaminants such as pharmaceutical residues, industrial chemicals, and pesticides accumulate in aquatic ecosystems, disrupting biodiversity and destabilizing ecological balance. Among these pollutants, antibiotics are particularly concerning due to their overuse and improper disposal, which leads to significant repercussions. Once in water systems, antibiotics contribute to the emergence and spread of antibiotic-resistant bacteria, posing a major threat to public health by complicating the treatment of infections. Moreover, these pollutants can bioaccumulate in aquatic organisms, entering the food chain and potentially harming human health. To address these challenges, it is imperative to develop advanced water treatment technologies and implement policies to minimize antibiotic misuse, thereby safeguarding water resources for future generations. In this study, we investigated the photocatalytic degradation of two fluoroquinolone antibiotics, Ciprofloxacin and Levofloxacin, in aqueous solutions. Gold-doped zinc oxide (Au@ZnO) catalysts with varying gold compositions (1%, 3%, and 5%) were synthesized and evaluated for their photocatalytic activity under UV light. The incorporation of gold nanoparticles onto the zinc oxide surface significantly enhanced the catalysts' surface area and photocatalytic efficiency. Ciprofloxacin degradation reached 96% using the 5% Au@ZnO catalyst within 60 minutes, while Levofloxacin degradation achieved 99% with the 3% Au@ZnO catalyst in the same timeframe. Notably, catalytic efficiency for Levofloxacin began to decline at gold compositions exceeding 3%. These findings demonstrate the potential of gold-doped ZnO composite catalysts as effective agents for antibiotic degradation and underscore their relevance in developing innovative solutions for water pollution remediation.

Daira Santos

TN - Trevecca Nazarene University

Discipline: Psychology

Authors:

Abstract Name: BRIDGING FAITH AND SOCIAL CONNECTIONS

This study explores the relationship between religious orientation, social-behavioral skills, interpersonal relationships, and emotional intelligence. Previous literature signaled possible connections between these variables. Based on that, it was hypothesized that religiousness scores would correlate with emotional intelligence, as well as with social-behavioral skills and interpersonal relationships. Additionally, emotional intelligence was hypothesized to also positively correlate with both social-behavioral skills and interpersonal

relationships scores. The sample comprised 95 participants from research methods, concepts of math, statistics for science, senior seminar and marriage and interpersonal relationships classes at a small southeastern university. Data were collected using the Religious Orientation Scale (ROS), Brief Emotional Intelligence Scale (BEIS), and Social-behavioral skills and Interpersonal Relationships Questionnaire. Upon Institutional Review Board (IRB) approval, data collection involved voluntary and confidential participation, and results were analyzed using correlational methods. Findings revealed that higher levels of religious orientation are weakly associated with higher emotional intelligence, and small but significant positive correlations were found between religious orientation and social-behavioral skills, as well as between religious orientation and interpersonal relationships. Additionally, emotional intelligence demonstrated a moderate positive correlation with social-behavioral skills. However, no significant correlation was found for intelligence and interpersonal relationships. These findings suggest that while religiosity is weakly associated with key social and emotional factors, emotional intelligence may play a bigger role in fostering said skills. Limitations included the homogeneity and size of the sample. Future research should incorporate more diverse populations and explore other study designs to better understand the relationships among these variables. Key words: religious orientation, social-behavioral skills, interpersonal relationships, emotional intelligence, faith, social connections

Daira Santos

TN - Trevecca Nazarene University

Discipline: Psychology

Authors:

Moises Jaimes-Garcia

Abstract Name: Hands-On Happiness: Social Touch, Happiness, and Loneliness as predictors of Well-being

This study explored the predictors of well-being among undergraduate students, focusing on social touch, happiness, and various dimensions of loneliness. A review of previous literature highlighted potential connections between these variables and overall well-being. Based on these findings, it was hypothesized that social touch scores, happiness scores, social loneliness scores, romantic loneliness scores, and family loneliness scores would predict well-being scores. Participants included 128 undergraduate students from Precalculus, Issues in Science, General Psychology, and Behavioral Science Statistics classes. The study utilized the Psychological General Well-Being Scale Index-Short Version, the Social and Emotional Loneliness Scale for Adults (Short Form), the Social Touch Questionnaire, and the Subjective Happiness Scale to collect data. Instrument packets were administered with professor approval, ensuring voluntary and confidential participation. The data was analyzed using multiple regression analysis via SPSS. Results revealed that happiness and family loneliness were significant predictors of well-being, while social touch and other loneliness dimensions did not show significant predictive power. Limitations included the lack of cultural diversity and the relatively small sample size. Future research should aim to diversify the sample population and further investigate the relationships between social touch, happiness, loneliness, and well-being. Keywords: social touch, well-being, happiness, loneliness, family relationships

Prajeet Santra

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

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Abstract Name: Neutral effects of brexpiprazole (REXULTI®) on neurobehavioral recovery after experimental traumatic brain injury

Introduction: Agitation is common after traumatic brain injury (TBI). To manage this behavior, antipsychotic drugs (APDs) are provided despite the risks on cognition. APDs that exhibit D2 receptor antagonism have been shown to impede recovery after TBI and therefore it is important to evaluate APDs that may not hinder recovery. Brexpiprazole is a third-generation atypical APD with partial D2 and 5-HT1A receptor agonist properties. Previous work has shown that pharmacotherapies with such actions improve neurobehavior after TBI. Hypothesis: Brexpiprazole will improve neurobehavior after controlled cortical impact (CCI) injury in adult male rats. Methods: Anesthetized male rats received either a CCI of moderate severity or sham injury and then were randomly assigned to receive brexpiprazole (1 mg/kg) or saline/DMSO vehicle (1 mL/kg), resulting in the following groups: TBI+brexpiprazole, TBI+vehicle, Sham+brexpiprazole, and Sham+vehicle. Treatments began 24h after surgery and were administered intraperitoneally once daily for 21 days. Motor function was assessed on post-operative days 1-5 and cognitive function was assessed on days 14-19. The behavioral data were analyzed by repeated measures ANOVA followed by the Newman-Keuls post-hoc test to determine group differences. Results: There were no differences in any endpoint measured between the brexpiprazole and vehicle-treated sham groups ($p > 0.05$), and thus the data were pooled. As expected, the sham group performed significantly better than both TBI groups in motor and cognitive function ($p < 0.05$). Moreover, there were no motor or cognitive differences between the TBI+brexpiprazole and TBI+vehicle groups ($p > 0.05$). Conclusions: Brexpiprazole had no beneficial effects on outcomes after TBI, which does not support our hypothesis. Importantly, brexpiprazole did not exert deleterious effects, which may make it a more viable option for managing clinical TBI-induced agitation without impairing recovery as has been reported with APDs with D2 antagonistic properties.

Sonya Sar

CA - BASIS Independent Silicon Valley

Discipline: Chemistry

Authors:
Swetha Mantha
Sahana Prasad

Abstract Name: An Investigation of Oxygen and Nitrogen Reactive Species in Helium Plasma-Water Interaction for Wound Healing Applications

In this study, the plasma-water interaction phenomenon was investigated. Non-thermal DBD plasma has wound-healing applications due to its low temperatures. However, the interaction between plasma and the wound is complicated and requires further analysis. As plasma jets interact with water, they entrain the surrounding air, which contains nitrogen and oxygen, and this facilitates the formation of reactive oxygen and nitrogen species (RONS) within the liquid. Medical research shows that RONS play a vital role in all phases of wound healing including hemostasis, inflammation, proliferation, and remodeling. This study investigates what is the impact of different experimental conditions on plasma-water interactions. The DBD plasma torch was operated at 10-12 kV on nitrogen at 10 SLPM to produce a plasma jet of 20-30 mm long. The first set of experiments investigated the impact of nitrogen plasma on the characteristics of deionized water. Increasing the treatment distance by 2 cm and exposure time by 10 minutes established a positive relationship between

these two conditions and the water's absorbance. Absorption spectroscopy was conducted to identify the absorbance of the radicals at each concentration. A standard set of data was determined for each radical by measuring absorbance at varying concentrations of a reference solution. Then, a calibration curve that depicted the concentration of each RONS within the plasma-activated water sample at different UV-VIS wavelengths was established for the nitrogen plasma jet. However, preliminary experimentation with helium plasma demonstrated an increase in absorbance in certain wavelength ranges. In this work, our initial nitrogen calibration curve will be presented, and our further experimentation into the impact of helium plasma on RONS concentration will be explained as well.

Jatin Sarabu

CA - Intelliscience Training Institute

Discipline: Computer Science

Authors:

Abstract Name: Advancing 3D Car Model Reconstruction Using Neural Radiance Fields in the Automotive Industry

Neural Radiance Fields (NeRFs) have revolutionized 3D scene reconstruction by enabling photorealistic rendering from novel viewpoints. Despite their success, applying NeRFs to detailed 3D car model reconstruction has been limited due to practical challenges. Traditional methods like LiDAR scanning and photogrammetry, while accurate, are cost-prohibitive and require specialized equipment, hindering widespread adoption. Manual 3D modeling is another route but is labor-intensive and often inconsistent. Our project introduces an innovative application of NeRFs for reconstructing detailed 3D car models using only standard camera equipment. By capturing multiple images from various angles and employing advanced techniques such as structure-from-motion for precise camera pose estimation, we achieve high-fidelity reconstructions of car geometries. Building upon our initial findings, several key improvements were implemented. The NeRF architecture was optimized to enhance clarity, enabling finer detail capture in complex regions like reflective surfaces and intricate design elements. Additionally, we integrated accelerated training algorithms and efficient data preprocessing steps to significantly reduce computation time, addressing previous speed limitations. The resulting models facilitate interactive rendering from any viewpoint and can be seamlessly integrated into applications for automotive design, virtual showrooms, and augmented reality (AR). The method adopted in this work not only provides a cost-effective and scalable solution but also maintains high accuracy and detail. Experimental results confirm that our improved NeRF-based approach outperforms earlier models in both quality and efficiency. This advancement demonstrates NeRF's potential as a transformative tool in the automotive industry for creating accessible and detailed 3D car models. We will present a comprehensive analysis of our methodology, detailed results, and the developed software at the conference, highlighting the practical implications and future applications of our work.

Rafiatu Sarbah

VT - Norwich University

Discipline: Biochemistry

Authors:

#1 Leigh Knodler

Abstract Name: *Providencia alcalifaciens*: Role of Putative Lipases in Bacteria-Containing Vacuole Lysis

Providencia alcalifaciens is a Gram-negative bacterium within the order Enterobacterales. It has garnered attention for its dual identity as an environmental inhabitant and an opportunistic pathogen associated with diarrheal outbreaks and antimicrobial resistance. Evidence from recent studies of its ability to invade human intestinal epithelial cells and proliferate in the epithelial cytosol has opened new avenues for questions about the mechanisms that enable its intracellular lifestyle. This study investigates the possibility that predicted lipase-encoding genes - *pssA*, *yjjU*, and *pldA* - participate in bacteria-containing vacuole lysis, which is an important developmental stage that precedes cytosolic replication. This study used targeted gene deletions in *P. alcalifaciens* to verify if the predicted lipases participate in vacuole escape. The *yjjU* and *pldA* genes are predicted to encode a patatin-like phospholipase, and phospholipase A, respectively; both are associated with vacuole membrane disruption in other bacterial pathogens. The *pssA* gene is predicted to encode a phosphatidyl transferase important for membrane biosynthesis. Targeted gene deletion by using overlap extension PCR, cloning into the pRE112 suicide plasmid, and *sacB*-based allelic exchange yielded deletion mutants of *yjjU* and *pldA*. At the same time, attempts to delete *pssA* were unsuccessful, implying a possible requirement for its bacterial viability. Phenotypic assays showed that neither $\Delta yjjU$ or $\Delta pldA$ mutants were affected for vacuole lysis, indicating that these lipases are not the prime mediators of this process. However, these are initial results; more data will be required to arrive at definitive conclusions. The immediate continuation of the work will focus on constructing the $\Delta pssA$ mutant and a $\Delta yjjU \Delta pldA$ double mutant. The present study sheds light on some of the mechanisms that may be involved in the proposed contributions of lipases to the pathogenic strategies of *P. alcalifaciens*.

Muhammad Sardar

VA - George Mason University

Discipline: Engineering

Authors:

#1 Kunal Gide

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Abstract Name: Smart Printing: Precise Fiber Alignment in Stereolithography (SLA) 3D Printing of Composite Polymers

Over recent decades, 3D printing, or additive manufacturing (AM), has experienced remarkable growth, finding extensive applications in consumer and light industrial sectors. Despite its advancements, the technology remains constrained by material limitations and challenges in producing composite materials with tailored properties. Stereolithography (SLA), a prominent rapid prototyping technique that utilizes a focused ultraviolet (UV) light beam, offers distinct advantages over other methods due to its exceptionally high resolution. By printing ultra-thin layers, SLA achieves precise replication of intricate details, making it a preferred choice for complex designs. However, commercially available SLA printers face inherent challenges, including anisotropic mechanical properties and difficulties in achieving controlled fiber orientation during composite production. Controlled fiber alignment is critical for composite applications in industries such as aerospace, medicine, thermal management, and computing due to its direct impact on mechanical, thermal, and electrical properties. In these fields, precise fiber orientation enhances load-bearing capacity, structural integrity, and thermal and electrical performance of materials, meeting stringent operational requirements. This paper proposes a novel solution by integrating an electromagnetic fiber alignment system into an in-house-developed SLA 3D printer. By employing electromagnets to manipulate reinforcing fibers in real-time during the printing process, this system ensures precise and consistent alignment at 0 and 90 degrees. The resulting composites exhibit significantly improved mechanical properties, addressing the key limitations of traditional SLA 3D printing. This innovation enables the production of components with enhanced strength, durability, and specialized thermal and electrical characteristics, paving the way for breakthroughs in manufacturing. The proposed approach holds transformative potential for industries including aerospace, automotive, medical, computing, and consumer goods, offering a new horizon for the fabrication of high-performance materials and components.

Arnav Sareen

NC - University of North Carolina at Charlotte

Discipline: Computer Science

Authors:

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Abstract Name: IOAgent and Tracebench: Developing and Evaluating the Performance of AI-Based HPC I/O Performance Diagnoses

The purpose of this research is to create an automated tool to alleviate I/O issues in High-Performance Computing (HPC) applications and benchmark the performance of I/O diagnosis tools. As the prevalence of HPC applications' grows, so does the complexity of optimizing them, particularly their data and metadata access (I/O) efficiency. To alleviate such deficiencies, scientists have historically relied upon a limited number of I/O experts to analyze traces of I/O behavior—an approach that has become unfeasible as the number of HPC applications rapidly increases. The recent advent of robust large language models (LLMs) seemingly provides an avenue to develop an automated tool to make I/O issue diagnosis more accessible, but they are limited by factors such as their propensity to hallucinate fictitious details and inadequate knowledge of HPC I/O. In this collaborative research effort, our team is developing IOAgent, an innovative tool designed to address these challenges. IOAgent combines a trace preprocessor, a curated knowledge base of HPC I/O concepts employable by the LLM via dynamic retrieval, and an iterative summarization approach to extract nuanced I/O issues from application traces, all while mitigating the shortcomings of traditional LLMs. IOAgent aims to provide scientists with comprehensive explanations for the I/O performance issues in their applications and an interactive chat interface that allows researchers to comprehend their I/O problems further. In this project, as the undergraduate researcher, I contribute to the creation of TraceBench, a test suite that evaluates the performance of I/O diagnosis tools according to three key metrics: accuracy, interpretability, and utility. TraceBench utilizes a variety of application traces for its assessment, ranging from synthetic logs simulating isolated I/O issues to real application traces collected on production HPC systems. Evaluation with TraceBench reveals IOAgent can outperform state-of-the-art I/O diagnosis tools, while also providing interactivity previously unobtainable by HPC users.

Satvik Saripalli

CA - University of California - Los Angeles

Discipline: Biology

Authors:

#1 Xuegang Yuan

#2 Gay Crooks

Abstract Name: Generation and Use of Biallelic-dual Fluorescence Reporter Cell Line of BCL11B to Understand T-cell Development via Human iPSC-ATO System

Human and murine T-cells develop from progenitors in bone marrow. The migration of CD34+ progenitors to

the thymus initiates T-cell differentiation. In mouse models, stages of differentiation have been delineated and the effects of transcriptional factors on T-cell development have been studied. One such factor is BCL11B (B-cell lymphoma/leukemia 11B), which is critical for T-lineage commitment. Moreover, recent studies reveal potential differences between the two alleles of BCL11B in regulating T-cell fate. A recent murine study suggests that one BCL11B allele may be silenced and activated days later to ensure differentiation (Pease et al., 2021). However, there are species dependent differences in T-cell development (Parekh et. al., 2012) and there are few studies on the role of human BCL11B in development. One study suggests that Notch1 expression differentially regulates BCL11B leading to TCR $\alpha\beta$ and TCR $\gamma\delta$ T-cell fates (Dolens et al., 2020). However, they do not address differences in human BCL11b allelic expression. BCL11b's bi-allelic role in human T-cell development is unknown. With our lab's artificial thymic organoid (ATO) system, human induced pluripotent stem cells (iPSCs) develop into T-cells, faithfully mirroring the developmental stages found in endogenous human thymi. To answer how BCL11B acts during T-cell development from human iPSCs in the ATO system, CRISPR-Cas9 gene editing will be used to create a bi-allelic BCL11B fluorescent reporter iPSC line. CRISPR-Cas9 allows for precise knock ins of edited genes (donor template) into endogenous DNA. This enzyme system uses a designed guide RNA (gRNA) that directs the Cas9 enzyme to a specific site of DNA cleavage. Utilizing homology directed repair, the cell fixes the break with the exogenous DNA template. With the bi-allelic iPSC reporter line and monitoring of thymopoiesis in the ATO system, this study will provide insights on how each allele of BCL11B regulates T-cell fate in iPSC-based T-cell development.

Isha Satapathy

VA - Virginia Commonwealth University

Discipline: Sociology

Authors:

#1 Isha Satapathy

Abstract Name: Debility of American Transgender Adults: An Analysis of Sociocultural and Medical Factors on Transgender Well-Being

Debility has been a topic of interest in the sociological sciences since Jasbir Puar, former director of the Rutgers University Department of Women's Studies and Gender Studies, popularized the term. However, minimal work has been done to understand the factors resulting in the debilitation of the transgender community in the United States. This paper discusses how the convergence of socioeconomic and cultural factors cause the debility of the American transgender community. The scope of this project spans debilitating factors which fall under the umbrella of systemic discrimination, resulting in disability, lower socioeconomic status, as well as discrimination in health care settings. Ultimately, these factors lead to an inability to pursue or address unmet health needs, resulting in the slow death that is characteristic of biopolitical debilitation. This research outlines models of debility and applies it to the transgender community in the United States. It also utilizes statistical evidence of the outcomes of sociocultural and medical discrimination to substantiate the claims of debilitation of the transgender community in the United States. The evidence presented henceforth is indicative of the lower quality of life which transgender Americans live due to debilitation. Transgender Americans are, overall, more likely to have unmet health care needs, more likely to have lower socioeconomic status, more likely to have lower educational attainment, and more likely to be disabled. The cycle of debility is perpetuated through a lack of social mobility for transgender Americans, facilitated by systematic transphobia. For the cycle of debility to end, it is important to destigmatize transgender Americans in the eyes of broader American society. It is additionally necessary to substantiate the spread of social awareness through infrastructural changes, protecting transgender Americans through more effective legislation, and improving access to health care and participation in the job market.

Isha Satapathy

VA - Virginia Commonwealth University

Discipline: Interdisciplinary

Authors:

#1 Isha Satapathy

#2 Vrushali Papaiya

#3 Vishnu Alavala

#4 Swara Chokshi

Vrushali Papaiya

Swara Chokshi

Abstract Name: An Comprehensive Audit of Dialysis Waste and Recommendations to Reduce Waste Production at VCU Health

Patients with suboptimal kidney function undergo dialysis, a process which can take many forms but which generally subsidizes or replaces the kidneys' filtering capabilities to filter their blood, multiple times per week. Dialysis produces waste from plastic tubing, single-use needles, and dialysis membranes that goes to landfills or is incinerated, producing microplastics and aerosolized pollutants. These pollutants are typically found in the vicinities of communities of low-income, exacerbating poor health outcomes associated with socioeconomic marginalization. In addition to generating adverse environmental and health consequences, needless waste in dialysis poses a serious financial problem for medical institutions. Virginia Commonwealth University Health Systems is one of the largest medical institutions serving central Virginia, and in particular, provides dialysis services at several locations, including the main hospital located in downtown Richmond. In the dialysis clinic, we will categorize the waste streams generated over the course of a single dialysis session into biological, hazardous, plastic, and general waste and quantify the generated waste by weight. The waste collected will be qualitatively described by material and composition and quantitatively recorded before relevant statistical analysis will be conducted. Future comparisons between clinics based on differences in patient population, such as chronic or acute status, as well as adult or pediatric identity, would serve to pinpoint which type of clinic generates the most waste, and how best to mitigate excessive waste. After identifying major contributors to dialysis waste, we will discuss avenues to reduce waste, including educating staff/patients, lobbying for more sustainable practices with VCU management, and identifying vendors for recycling non-hazardous waste.

Jai Satrawada

CA - San Jose State University

Discipline: Engineering

Authors:

Deeya Agarwal

Uma Nair

Abstract Name: Finding the Optimal Relationship Between Aircraft Attributes and Balance Using AI/ML

An optimal weight and balance ratio is critical for the safety, efficiency, and performance of an aircraft. For this reason, this research investigates the optimal relationship between various characteristics of an aircraft (maximum speed, weight, etc.) and its optimal balance. Our hypothesis was that machine learning could be used to predict with reasonable accuracy the optimal balance of an aircraft. The hypothesis was evaluated by using machine learning to predict the balance of the aircraft based on characteristics like maximum speed, empty weight, and number of passengers. The relevant dataset was taken from Kaggle and contained 25,000 data points of aircrafts along with their metrics. Using IBM Watson, a data-analytics processor, multiple

machine learning models were created using these datasets, with enhancements such as HPO-1, HPO-2, and FE. Various other metrics were also used to analyze model success such as the ROC curve and modal accuracy. We predicted that the most important attributes impacting balance are Empty Weight, Wing Loading, and Tail Loading of the aircraft. The Snap Random Forest and XGB Classifier algorithms were the most accurate, achieving an accuracy of about 50%, which we hope to improve further by utilizing balancing of the data and other model improving techniques. Meanwhile, the ROC curve had an area of about 50% underneath, indicating mid-level performance of the models. The results indicate that the Altitude, Number of Passengers, and Landing Weight columns had the biggest impact on the balance. Overall, by implementing the Snap Random Forest model with enhancements, we were able to predict the optimal balance of aircraft with mid-level accuracy that we hope to improve further.

Subrata Satyal

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Abbi Hernandez

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SarahPenny Ryan

Abstract Name: Evaluating Probiotic Delivery of Angiotensin (1-7) for Cognitive and Pathological Improvement in TgF344-AD Rats

Alzheimer's Disease (AD) is a progressive neurodegenerative disorder characterized by cognitive decline and behavioral impairments, both of which cause a loss of independence, as well as hallmark pathological features such as amyloid-beta plaques and neurofibrillary tangles of tau protein. Despite extensive research and ongoing advancements in understanding its pathology, current treatments only alleviate symptoms and fail to halt or reverse disease progression. Angiotensin (1, 7) [Ang (1,7)], a vasoprotective peptide in the renin-angiotensin system, has shown promise in reducing inflammation and mitigating Alzheimer's-related pathology. Its potential to improve cognitive function as a therapeutic modality has made it a target for research, but its clinical application has been impeded by challenges in delivery. Previous studies in *Drosophila melanogaster* models of AD demonstrated that the genetically modified probiotic, *Lactobacillus paracasei* expressing Ang(1,7) (LP-A), improved memory performance, providing a foundation for exploring the gut-brain axis as a therapeutic target. Therefore, we orally administered LP-A to assess the effects of chronic Ang 1,7 exposure on reducing cognitive and pathological deficits in TgF344-AD rats, a transgenic rat model of AD. We aim to assess behavioral performance on a variety of behavioral tasks including measures of spatial navigation, object memory association, fear conditioning and anxiety-like behavior in TgF344-AD rats. We compare cognitive performance across three groups: a control group, a probiotic control group (LP), and a probiotic treatment group (LP-A). LP-A administration has been shown to significantly alter gut microbiome composition and can modify behavioral performance. Thus, suggesting that this intervention may serve as a potential avenue for improving cognitive outcomes in AD in future clinical trials.

Connor Sauers

WV - West Virginia University

Discipline: Physics and Astronomy

Authors:

#1 Alan Bristow

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Abstract Name: Electrical Properties of Semiconducting Films for Infrared Detector Applications

Photonic devices, including infrared (IR) detectors, are supported by materials that are sensitive to IR radiation, with applications in thermal imaging, night vision, and detection of invisible gases, such as carbon dioxide and methane. Typical IR photodetectors are based on semiconductors exhibiting a narrow, direct bandgap that corresponds to low excitation energy. Germanium (Ge) and its alloys with tin (Sn) have a narrow bandgap that is suitable for the IR; however, Ge does not have a direct bandgap, and Sn is not readily incorporated into the Ge lattice to make high-quality, uniform GeSn films. Instead, the growth methods lead to impurities and dislocations that affect electrical conductivity and impact potential photodetector device performance. Here, the charge carrier transport of remote plasma-assisted chemical vapor deposition (RPA-CVD) grown $\text{Ge}_{1-x}\text{Sn}_x$, with $x = 0\%$, 2.6% , and 8.5% , was investigated using terahertz (THz) time-domain spectroscopy. Charge carriers in these films, grown on sapphire substrates and of approximately 200 nm thickness, were photoexcited in short pulses, and the transmitted THz electric field was detected using electro-optic sampling. The alternating current conductivity of each film was determined for a temperature range of 4 K – 300 K, and experimental results were fit with the Drude-Smith conduction model to determine carrier concentration and scattering time. It was found that the charge carrier concentration decreased with Sn concentration and increased with temperature, while the scattering time increased with Sn concentration and decreased with temperature. These results suggest favorable electronic quality of RPA-CVD GeSn for optoelectronic applications.

Amatallah Saulawa

AL - Auburn University

Discipline: Nursing and Public Health

Authors:

#1 Kassi Scott

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Abstract Name: Shared Clinical Decision-Making on Vaccines Among Community Pharmacists

Background: Shared clinical decision-making (SCDM) on vaccination involves an open dialogue between a patient and their healthcare provider, including pharmacists, to make a vaccination decision based on the patient's needs and potential benefits. SCDM recommendations apply to five vaccines when only specific groups of people can benefit from the vaccines. These include- HPV vaccine for those aged 27–45; Meningococcal B vaccine for adolescents and young adults aged 16–23 years; PCV20 or PCV21 for those 65 and older who completed previous pneumococcal series, Hepatitis B vaccine for adults aged 60 and older with diabetes mellitus, and 3rd+ dose of COVID-19 vaccine for immunocompromised individuals.

Objectives: While the CDC provides guidelines for SCDM conversations, it is up to the provider to decide whether to initiate such conversations. Given community pharmacists' increasing role in immunization and their high accessibility in society, this study aims to: 1) identify community pharmacists' barriers and facilitators to engaging patients in SCDM for recommended vaccines and 2) describe how pharmacists determine which patients to approach for SCDM discussion. The findings will inform interventions to bridge the gap between the best practice of SCDM and real-world practice. Methods: The recruitment is on-going.

Pharmacists currently are recruited from the Rural Research Alliance of Community Pharmacies (RURAL-CP) network, the Harrison College of Pharmacy's alumni list, and the Alabama Hayes pharmacist directory. Semi-structured interviews will be conducted until saturation. Transcriptions will be thematically coded, and analyzed to identify patterns. Participants receive a \$100 Amazon gift card as an incentive for participation. Preliminary Results: Preliminary results indicate varying levels of understanding and implementation of SCDM guidelines among pharmacists. Pharmacists who conduct SCDM use their dispensing software to identify qualifying patients. Barriers to SCDM include time and patient's existing knowledge and attitudes. Facilitators include pharmacist knowledge of and attitudes towards SCDM.

Keri Saulino

PA - Pennsylvania State University

Discipline: Biology

Authors:

#1 Samuel Nutile

#2 Lynne Beaty

Abstract Name: Evaluating the Population and Movement of Round Goby (*Neogobius melanostomus*) in Elk Creek, a Lake Erie Tributary

Round gobies, *Neogobius melanostomus*, are an invasive fish detrimental to the stability of aquatic ecosystems, competing for space and resources with native species. While round goby are well-established in Lake Erie, their population size, demographics, and movement in Lake Erie tributaries are unknown. Thus, this study aimed to estimate the population size, understand demographic features, such as size and sex, and assess the movement of round gobies in Elk Creek, a Lake Erie tributary, through a mark and recapture study. For 10 weeks in the Summer of 2024, nine designated 60-m sections in Elk Creek were kick-seined for 30 person minutes to collect round goby. The gobies collected in each section were measured, sexed, and given a section-specific color of a visual implant elastomer (VIE) tag. Recaptured gobies were recorded and retagged with the color of the section in which they were recaptured. Over the 10-week sampling, 1545 gobies were marked, with eight recaptures. Based on the Schnabel Index, the round goby population in Elk Creek is estimated to be 133,188 (95% CI: [78671, 433788]) gobies. There was no significant difference in the size of males and females, but juveniles were significantly smaller than both sexes and the most abundant in mid-June and mid-August. As the summer progressed, fewer gobies were collected overall and within sections. Goby size and sex did not differ significantly over the summer and between sections. Recapture data cannot indicate certain movement patterns, but suggests that significant movement is unlikely. Given this, sections abundant with goby should be targeted consistently for round goby management.

Eric Saunders

MI - Michigan State University

Discipline: Visual Arts

Authors:

Abstract Name: The Choice of Your Life

"What do you want to do with the rest of your life?" This question evokes a lot of complex emotions, fear, anxiety, and the weight of uncertainty. The process of answering can feel like a storm of tangled thoughts: butterflies, twisting guts, or the crushing sensation of self-doubt. This abstract design serves as a visual

representation of those emotions: messy, scattered, and twisting, yet threaded with the freedom and hope that choice provides. It captures the tension between the chaos of indecision and the subtle joy of realizing we have the power to choose, even when the journey is uncertain and fraught with trial and error. This work draws inspiration from observations of everyday life conversations on campus, visits home, and fleeting moments scrolling through social media. The shared struggle to answer life's most pressing question resonates deeply with me. Through this piece, I hope to convey the universal nature of this experience while reflecting my personal journey. I've discovered that creation feeds my soul, even if the process is arduous. The work invites viewers to embrace the trial-and-error nature of self-discovery and find comfort in the idea that uncertainty is part of growth. As a graphic designer, I used Adobe Illustrator to explore abstraction to its fullest potential. Each element was intentionally pushed, twisted, and refined to mirror the emotional complexity of facing life's most daunting questions. This iterative process allowed me to build a design that embodies the raw and unstructured nature of seeking purpose. Both life and art are nonlinear journeys, filled with trial and error. This abstract design reflects that messy, unpredictable process, an emotional snapshot of a deeply human experience.

Benjamin Savala

CA - University of California - San Diego

Discipline: Chemistry

Authors:

#1 Benjamin Savala

#2 Richa Rashmi

#3 Francesco Paesani

Abstract Name: Understanding nuclear quantum effects in the solvation structure and hydrogen bond dynamics of fluoride hydration using many-body potentials

Ion hydration is integral to biological functions, pharmaceutical applications, and future green-energy endeavors. Fluoride compounds, in particular, are known to react with water and play a major role in the stratospheric chemistry of chlorofluorocarbons. Classical molecular dynamics simulations have been able to predict numerous properties of fluoride hydration in agreement with experiment. However, classical simulations omit significant effects arising from the presence of light nuclei like hydrogen and the weakening of covalent OH bonds from the presence of FH bonding, or nuclear quantum effects. A complete understanding of fluoride hydration then necessitates treating these systems quantum mechanically. In this study, we employ path-integral-based quantum dynamical methods, along with MB-pol and MB-nrg, highly accurate data-driven many-body potentials for water and fluoride, respectively, to study the role of nuclear quantum effects in fluoride hydration. For our analysis of hydration structure as a function of solvation shells, we calculate radial and angular distribution functions. In our radial distribution functions, we observe a widening of peaks in each solvation shell due to the delocalization of H nuclei. In our angular distributions, we expect to find lower average HOH bond angles in water due to the electronegativity of fluoride. For hydration dynamics as a function of solvation shells, we calculate diffusion coefficients, mean residence times, and infrared spectra. Due to the strength of the FH bond, we expect lower diffusion coefficients and higher residence times with lower-numbered solvation shells. In our infrared spectra, we observe a second higher-frequency peak in the librations mode, higher frequencies in the bending mode, and lower frequencies in the asymmetric stretching mode of water, attributed to the presence of fluoride, delocalization of H nuclei, and the weakening of local OH bonds, respectively.

Ashlynn Savannah

GA - Georgia State University

Discipline: History

Authors:

Abstract Name: Lathrop Lineage: A Family History of Free Africans in Antebellum America

The purpose of my research project was to find, analyze, and summarize all accessible documentation of my ancestors. In this presentation, I share the results of my continuing document research uncovering the story of three generations of free Africans in Connecticut, beginning with the first in this ancestral line to be emancipated back to the 18th century. The stories of these ancestors give historical insight on the experiences of enslaved Africans in the North and free Africans during the antebellum period. In exploring this history, I discovered an indirect crossing of paths between one of my ancestors and an ancestor of my mentor who guided me in this study.

Ivan Savelyev

VA - Virginia Tech

Discipline: Psychology

Authors:

#1 Scott Geller

Abstract Name: Factors Influencing Expressions of Gratitude: Behavioral observations of pedestrians using a crosswalk

It has been demonstrated that expressions of gratitude boost the subjective wellbeing for both parties involved—the benefactor and the beneficiary of a gratitude expression. However, the impact of behavioral and environmental variables on expressions of gratitude in daily contexts hasn't been determined, such as a pedestrian thanking the driver of a stopped car when crossing the street. This gap in positive psychology research inspired this study. Trained research students observed and recorded various human dynamics occurring after a vehicle stopped for a pedestrian in downtown Blacksburg and on the Virginia Tech campus, including the pedestrian's facial expression (smiling/not smiling), social interactions (walking alone/walking with others), gratitude (expressed/not expressed), age category (under 18, 18-30, 30-50, 50+), and phone use (using/not using a cell phone). Independent sample t-tests showed a significant difference in frequency of gratitude expression between the downtown and campus locations (50% vs. 18% of pedestrians expressing gratitude). Gratitude frequency varied significantly between people who were smiling (64%) and those who were not smiling (28%). Also, substantial differences were observed in the frequency of gratitude expressions as a function of the pedestrian's age. Those in the age ranges of 30-50 and 50+ showed gratitude 49% and 51% of the time respectively, while those pedestrians in the 18-30 age category showed gratitude only 30% of the time. These findings are skewed by a larger proportion of observations of pedestrians aged 18-30 occurring on campus, a location that evidenced less gratitude for all age categories. These findings were analyzed with a linear probability model (LPM). Controlling for location, pedestrians ages 30-50 were 8 percentage points more likely to express gratitude than the reference group (ages 18-30) ($p = 0.028$), and pedestrians aged 50+ were 12.5 percentage points more likely to express gratitude than the same reference group ($p = 0.019$).

Jasmin Sawhney

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Jasmin Sawhney

#2 Zuzana Swigonova

Abstract Name: 3D MODELS OF PROTEIN CONFORMATIONS: AraC, An Activator and a Repressor in One

All complex biological processes rely on enzymatic activity and protein binding – a concept that is emphasized in the biology curriculum. These mechanisms rely on the varying conformations of proteins to either activate or inhibit gene expression. However, textbooks tend to portray these proteins in cartoon-like figures that don't accurately represent the protein. Therefore, despite preaching that "structure determines function," these figures don't provide students with a strong concept of accurate scientific structures of proteins. To combat this learning gap, I am developing 3D physical models and graphics to create scientifically accurate protein structures, specifically looking at the AraC protein which is a transcriptional regulator of gene expression for genes involved in arabinose catabolism to degrade arabinose sugar – an alternative energy source to glucose. AraC is unique in its ability to act as both an activator and repressor depending on its conformation. This project aims to demonstrate these conformational changes, specifically looking at AraC – the protein crucial to the regulation of the arabinose operon, a molecular mechanism allowing cells to utilize arabinose as a source of energy and carbon. Using PDB crystallography proteins 1BL0, 2ARA, 2ARC, and 2K9S, I will create 3D physical models to show the dynamic properties of AraC in a scientifically accurate manner. My goal is to use AraC to accurately show protein versatility to aid students in courses such as Biology, Genetics, and Microbiology to better understand protein structure.

John Sayson

IL - Northeastern Illinois University

Discipline: Psychology

Authors:

#1 Anabelle Jimenez

#2 Christina Esparza-Cassidy

#3 Jennifer Vargas

#4 Andrew G. Young, Ph.D.

Abstract Name: The Effect of Social Comparison on Children's Cognitive Reflection

Previous research suggests that adults are more likely to engage in critical thinking when assessing the reasoning of other people. For example, adults who are told they are receiving information from a specific source (e.g., a prior research participant) are more likely to question the logic of the information as opposed to when it is presented without a source. However, research has not yet examined whether children are more likely to engage in critical thinking in social versus non-social settings. The present study investigates whether children demonstrate more cognitive reflection (the ability to answer tricky brain teasers) in social versus non-social conditions. In an online study, we measured the cognitive reflection of 5-12 year old participants using the CRT-D (example item: "What do cows drink?") before and after a short training activity. In the non-social condition, children practiced generating reasons for why their initial answers on a guessing activity may be incorrect. In the social condition, children practiced generating reasons for why

peers' initial answers on a guessing activity may be incorrect. Data collection is ongoing (current n = 35). Preliminary results suggest that children in the social condition improve their critical thinking (i.e., performance on the CRT-D) more than children in the non-social condition. The results from this study will not only help us better understand ways to reduce thinking biases in children, but also highlight social comparison as a vehicle to improve critical thinking.

Nicole Scalercio

CT - Eastern Connecticut State University

Discipline: Sociology

Authors:

Abstract Name: Parental Alienation, Cult Brainwashing and Belief in Dictatorship: Understanding and Overcoming the Power Dynamics at the Micro, Meso, and Macro Level

The purpose of this project is to bring together different literatures by a thorough review with a theme of how power divides on different levels. This work examines the similarities in personality, behavior, strategies and narcissistic abuse patterns of a parental alienator, cult leader and dictator and how this connects to the micro, meso, and macro levels of society. Divisive concepts are an important topic to understand in the 21st century. Due to the social and technological changes of the last 50 years, there has been a rapid increase of narcissism globally. It is of great import to bring awareness about alienating behaviors and how this is linked to individuals, groups, and society. The intent of this inquiry is to educate and inform on nonviolent ways to counter the destruction that factious tactics procures.

Grace Scanlan

TN - Trevecca Nazarene University

Discipline: Biology

Authors:

#1 Sarah Cawthorne

#2 Grace Scanlan

#3 Evan Simons

Sarah Cawthorne

Evan Simons

Abstract Name: The Effects of Tao Hong Si Wu Tang on Melanoma Cancer Cells

Melanoma skin cancer is difficult to treat and can quickly become life-threatening when it metastasizes, meaning that there is an urgent need for new therapeutic approaches that can induce apoptosis in these cells. We observed the effects of Tao Hong Si Wu Tang, an herb mixture used in traditional Chinese medicine, on melanoma skin cancer cells from the SK-MEL-5 cell line. Our hypothesis was that if we treat melanoma cancer cells from the cell line SK-MEL-5 with Tao Hong Si Wu Tang, apoptosis will occur because Tao Hong Si Wu Tang has been shown to kill breast cancer cells by mechanisms such as decreasing vascular endothelial growth factor (VEGF), which is also found in the epidermis. We started with both positive and negative controls so that we can compare the effects of the treatment. Our positive control was using media without Fetal Bovine Serum, while our negative control was caring for our cells as usual. We tested the mixture of the herb to find if it causes apoptosis, with the goal of separating and testing the individual components if apoptosis occurs. We dissolved the tea pills in our media and tested four different concentrations, 1.5 mg/ml,

3 mg/ml, 6 mg /ml, and 12 mg /ml. We monitored these cells for apoptosis by monitoring the cell growth and death over the span of five days for each different concentration, along with a control group. We will present our results.

Malin Scharmann

UT - Utah State University

Discipline: Film/Photography Studies

Authors:

Abstract Name: Reconsidering Queer Identity in New Taiwan Cinema: on Dear Ex (2018) and Your Name Engraved Herein (2020)

This research project dives deeper into why LGBTQ+ representation in Taiwan's media entertainment challenges people's understanding of identity, nonconformity, values, and empathy. This project examines the portrayal of queer characters through two Taiwanese films, *Your Name Engraved Herein* (2020) and *Dear Ex* (2018). It explores how Taiwan's evolving queer consciousness challenges heteronormative society and traditional familial customs from 1987 to the present. Taiwan has become a leading nation in advocating LGBTQ+ rights in Asia, and with its 2019 legalization of same-sex marriage, it marked a significant achievement in the country's progressive shift toward accepting queer individuals. This essay considers how Taiwan's history of LGBTQ+ activism, social struggles, and political milestones have influenced media depictions of queer life. Both films reflect the social challenges queer individuals face, addressing themes of self-identity, societal expectations, and the complexities of love. *Dear Ex* explored the relationship between a widow, her late husband's former gay lover, and their teenage son, delving into the emotional and social struggles stemming from her husband's hidden queerness. The characters' battle against grief, acceptance, and societal rejection dramatizes the conflict between traditional family values and queer ideals of love, empathy and family kinship. *Your Name Engraved Herein* is set in 1987, the year after the lift of Taiwan's martial law period. The film features the romantic relationship between two high school boys, A-Ho and Birdy, whose bond is challenged by homophobia and societal stigma by their peers, instructors, and family members. The film reflects on the enduring emotional scars of first love, the pain of separation, and the struggle to reconcile personal identity. This essay emphasizes how Taiwanese films offer insight into queer experiences, portraying the emotional and societal challenges queer youth face in their pursuit of love, identity, and acceptance in a society that is gradually becoming more inclusive.

Teresa Schauer

CO - University of Colorado Colorado Springs

Discipline: English and Literature

Authors:

Abstract Name: Hello, Darkness, My Old Friend; The Effects of Lighting on Monsters, Mothers, and Heroes in Beowulf

Beowulf has long been considered a crucial work to the English literary canon. With stage adaptations from lyricists such as Ken Pickering to full length films directed by Robert Zemeckis, the Old English poem has remained relevant within academic and casual spaces. This project explores the relationship between lighting and the moral disposition within Beowulf's cast of characters. My initial inquiry when developing my research was investigating the purpose and power of lighting in medieval prose; specifically, how lighting and

spectacle can foreshadow, reveal, or affect character motivation. By using the framework and ideas popularized by Aristotle's Poetics, I work to prove how “good” and “evil” characters are influenced by their physical conditions and descriptors, such as Grendel’s attacks happening exclusively under the cover of darkness. This absence of light prompts his gruesome and grotesque assaults, in conjunction with his devilish lineage. Simultaneously, I challenge the common perception that Grendel’s Mother and the Dragon are inherently monstrous. Rather, these two characters are driven to act in monstrous ways because of their optical setting. By drawing from Seamus Heaney’s translation of Beowulf and Herbert Wright’s scholarship examining the study of joy and evil in the Old English text, I conclude lighting, as a narrative device, has a direct effect on the motives, actions, and perceptions of Beowulf’s leading characters.

Jacob Schear

WV - West Virginia University

Discipline: Music

Authors:

#1 Jacob Schear

Abstract Name: The Abstract and Artistic Values of Galla's 40 Preludes for Horn

Jacob Schear Abstract Art Proposal Introduction There are many abstract and artistic components of Jacques-François Galla's (1787-1864) 40 Preludes For Horn opus 27 (edited by James Chambers). Galla is a historical staple in the horn community for his many works for the including concertos, various chamber pieces, and most notably, his etude books. In addition to being a composer, Galla was a horn player, as well as a teacher at the Paris Conservatory. An unmeasured prelude is designed to be up to the performer's interpretation. Exploring one's own personal interpretive decisions can be based on historical performance practices and personal expression. In most circumstances these pieces switch back and forth between rhythmically strict passages as opposed to the more lyrical cadenza type phrases. The beauty of these etudes is that everyone plays them a little differently, because every musician is unique. For aspiring musicians, coming up with new ideas and strengthening one's musical creativity by stretching and shaping the music is an essential skill. Learning when to push and pull any given melodic line is an instinct that a player can develop over time. My Experience I perform a new Galla prelude every week for my lessons at WVU. In working through this book, I have quickly improved my ability to communicate dynamics, musical phrasing, and musical creativity. Creating a contrast between these preludes as opposed to more technical exercises has been a key focus for me. The aspect that interests me the most when working on these is that I can try hundreds of different styles before I find the one that resonates with me. Through Galla's preludes, any horn player can gather experience on how to play so much more than what is on the page.

bridget Schelde

MN - University of Minnesota - Duluth

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

Abstract Name: A Systematic Review the Provision of Augmentative and Alternative Communication by Registered Nurses

Systematic reviews provide a high level of bias-resistant scientific evidence for busy, evidence-based healthcare practitioners. This systematic review of five databases was completed following consultation with

a university research librarian, research ethics training, and use of Covidence to implement each stage of the review. Included studies were peer-reviewed, written in English and (a) a patient participant study featuring hospitalized patients who used AAC to communicate; (b) a tutorial for healthcare providers using AAC to support hospitalized patients; or (c) an interview or survey study detailing experiences of healthcare providers or hospitalized patients who used AAC. The systematic search yielded 154 articles narrowed to 58 meeting inclusion: 33 patient participant studies of hospitalized patients, five tutorials on using AAC with hospitalized patients, and 20 studies of providers and/or previously hospitalized patients. AAC systems were similar across study types and included gestures; non-electronic eye gaze systems, books, boards, and pain scales; electronic eye gaze systems and speech-generating devices. Patient populations were mainly adult males, 28% of participants were female, suggesting that females may be underrepresented in this research. Thirty-six percent of patients could not communicate due to surgical intubation; 25% due to traumatic brain injury; 12% had a stroke; and remaining diagnoses included autism and dementia. Patients used AAC systems to communicate about pain (25%), self cares (19%), medical decisions (14%), control of the environment (8%), and to gain providers' attention (7%). In addition, patient participant studies described the desire to reminisce, discuss psychological state, express difficulty breathing or needing suctioning, describe medication needs, provide information, communicate with unfamiliar people, and ask how to operate the AAC system. Findings also include a summary of patients' reported desired to communicate about more than basic needs and a summary of SLPs' and RNs' need to engage in interprofessional education and interprofessional collaboration regarding AAC.

Alexandra Scheman

MA - Babson College

Discipline: Psychology

Authors:

Abstract Name: Perception Beyond Reality: Investigating Temporal Awareness in Virtual Reality

Virtual reality (VR) has become an increasingly popular tool across various sectors, offering users immersive experiences in simulated environments. While much of the research on VR has focused on its applications in gaming, therapy, and training, less attention has been given to how it impacts users' perception of time. This study investigates the effect of immersive VR environments on time perception, particularly in an atypical setting. Participants were exposed to a 15-minute VR experience where they interacted with sea creatures in an underwater environment. The primary objective was to determine whether the immersive nature of VR alters the users' perception of time, specifically whether they perceive time to pass more quickly or slowly than it actually does. Results showed a significant distortion in time perception, with participants consistently underestimating the duration of their VR experience. This suggests that immersion in VR environments may cause users to lose touch with temporal cues from the real world, leading to a skewed sense of time. These findings highlight the need for further exploration of how the length and type of VR exposure influence time perception, with implications for the design of VR experiences in various fields. Future research should consider examining the relationship between time distortion and factors such as user experience, environment realism, and task complexity to better understand the cognitive effects of VR.

Emmalee Schepis

MA - Bridgewater State University

Discipline: Education

Authors:

#1 J. Edward Carter

Abstract Name: Applied Behavior Analysis, SCERTS Model, and Daily Life Therapy: A Continuum for Teaching Students with Severe Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is “a complex developmental condition involving persistent challenges with social communication, restricted interests, and repetitive behavior” and it is estimated that one in 36 children have been diagnosed with ASD. With ASD being such a prevalent percentage of students served within special education it’s important for teachers and schools to know what their philosophical values are for teaching these students. Current research focuses primarily on Applied Behavior Analysis or ABA, however there are numerous other, lesser-known philosophies out there. These philosophies being so different presents the idea of a continuum. This project analyzed the continuum of philosophical interventions used to support students with severe autism. Project activities included reviews of program websites and documentation, site visits to each private residential school program, and focus group interviews conducted with teachers from each school. These data sources created a basis for analysis and a variety of conclusions to describe the contrasting philosophical approaches employed by each program. The summative analysis of the project activities provided greater understanding of the complex continuum of philosophical intervention strategies designed to support students with ASD.

Kelvin Scheurer

WI - University of Wisconsin-La Crosse

Discipline: Physics and Astronomy

Authors:

#1 Shauna Sallmen

Abstract Name: Analyzing the Impact of Changing Planet Location on Large Orbiting Mirrors Experiencing Radiation Pressure

Terraforming is the process of altering a planet, moon, or other celestial body to make it more habitable. One potential solution is to use large, lightweight mirrors in orbit around the planet to redirect starlight. An extraterrestrial civilization on a tidally locked planet within a star's habitable zone might also wish to direct starlight onto the planet's permanently dark side. However, the effects of radiation pressure (RP) on the orbit stability of large, lightweight mirrors are not well known. Our research group is studying the stability of mirror orbits through extensive simulations of mirrors orbiting potentially habitable planets around various types of stars. Whether mirrors survive when experiencing RP depends on the simulation details. Physically, the acceleration caused by RP relative to the star and planet's gravitational accelerations should be important. The ratio of the planet and mirror orbit periods will also influence the outcome, due to the differing RP direction as the planet orbits the star. Initially, we simulated mirrors at different distances from Earth-sized planets at the inner edge of the habitable zone for different star types, as these planets are more likely to be tidally locked. Mirror orbits were initially circular and had several different orientations. We were unable to statistically model the outcomes as a whole because of gaps in the values of these physically important factors. I have expanded the simulation parameter space to include planets at the middle and outer edges of the habitable zone. I will present an analysis of how a planet's location within the habitable zone affects mirror orbit stability, and evaluate how much these additional simulations have filled the gaps in values of the physically relevant quantities.

Chloe Scheve

UT - Utah State University

Discipline: English and Literature

Authors:

#1 Chloe Scheve

#2 Ashley Wells

Abstract Name: Dragging All Stories into the Room: Mentorship and Making Space in Creative Nonfiction

Essayist Leslie Jamison writes that empathy is “a choice we make: to pay attention, to extend ourselves.” Mentorship within the arts requires a similar sense of exertion. For this research project, I examine several creative nonfiction essays that have served as “mentors” for my own writing, specifically for my essay, “Mudfoot,” which explores the unresolved nature of trauma. As a first-generation student, the process of reading and analyzing craft choices from writers I admire—guided by my faculty mentor—is a crucial element of mentorship both within the classroom and beyond. In *Body Work: The Radical Power of Personal Narrative*, writer Melissa Febos recounts how, at a literary conference, a male editor responded to a female audience member’s question about writing her trauma by stating, “I mean, I’m not sure we need any more of those stories.” In a patriarchal society, silencing is power. And in my work, I argue that these stories are absolutely necessary, particularly given the fact that creative nonfiction continues to be male-dominated. In 2022, for instance, only 26.5% of nonfiction books reviewed in Britain’s newspapers were written by women, and *The Best American Essays* anthology has not consistently reached gender parity. How can students cultivate fulfilling mentoring relationships and challenge the historically male-dominated canon? The texts I consult for my project are written exclusively by women, and my presentation will emphasize the importance of cultivating diverse voices through mentorship. Attendees will leave with the knowledge that literary mentorship acts as a catalyst for developing emerging writers, especially first-generation students and members of marginalized communities. I hope to expand the concept of mentorship into a wider perspective, addressing the resources available for students outside of the male-dominated classroom. The presentation will end with a short reading of my own work demonstrating craft choices in practice.

Bryanna Schienholz

PA - Susquehanna University

Discipline: Environmental Science and Sustainability

Authors:

#1 Derek Straub

Abstract Name: Analyzing the effectiveness and uses of a low-cost particle counter

Research on particulate matter (PM) and its impacts has grown in popularity significantly over the past few decades, due primarily to its impact on human health. Particulate matter is solid or liquid particles suspended in the atmosphere, categorized by their size. The EPA regulates emissions of PM_{2.5}, the particle size category recognized as most harmful to humans. This is because exposure to particulate matter smaller than 2.5 microns in diameter is linked to cardiovascular diseases and premature death. Due to this link, the EPA’s Air Quality Index (AQI) uses PM_{2.5} and PM₁₀, along with other pollutant concentrations, to categorize air quality. Optical particle counters using laser diffraction to count and sort particles and then convert these values to a mass surfaced in the early 2000s, but they were too expensive for widespread use. In recent years, smaller and more affordable particle counters have emerged on the market, however, they are just starting to become widely utilized. This study aims to determine if a low-cost particle counter can uncover trends in local air quality and evaluate its usefulness for research. Methods involve evaluating the low-cost sensor (Sensirion SEN55) compared to a research-grade particle counter to determine its accuracy. Data will also be collected on a mobile platform to identify any trends in air quality. So far, readings of PM_{2.5} between 2 and 20 µg/m³ have been observed on a well-traveled local road. The expected outcome of this study is a more comprehensive understanding of the accuracy and applications of the Sensirion SEN55 particle counter.

Ginger Schiffmayer

PA - Grove City College

Discipline: History

Authors:

Abstract Name: Amidst the Storm: The Role of Demonic Conflict in The Writings of Jerome

In recent decades, there has been an explosion of research surrounding the role of demons in the stories of early Christian Saints' Lives, discussing the way demonic combat delineated the powers, roles, and expectations of early monks. The new revelations concerning the literary role of demons in the formation of monastic identity warrant a re-evaluation of theological and polemical passages related to demons, a task admirably begun by historians like David Brakke, who analyzes the intersection of theological instruction and hagiographical depiction, and Gregory Wiebe, who crafted a cohesive summary of Augustine's demonology. This paper, modelled on Wiebe's work, develops this dynamic field by investigating the demonic thought of a distinctive, influential early monastic figure—Jerome of Stridon, translator of the Vulgate. Unlike his famous contemporary Augustine, Jerome never lays out a cohesive demonology, which likely accounts for the relatively small amount of scholarship. Instead, he discusses demons as enemies whose strategies we ought to comprehend and combat. This creates a highly practical body of work, in which demonic rhetoric acts as a marker of unacceptable behavior. This paper investigates the nexus of human-demon relations in the writings of Jerome, highlighting common vocabulary, circumstances, instruments, and markers of demonic influence. In doing so, it reveals how Jerome's writings use demonic language to delineate proper monastic identity or—as he was deeply enmeshed in intellectual networks and debates over orthodoxy—vilify his theological opponents. Jerome views the battle against demons, within the individual and the church, as a battle to preserve “virginity,” to prevent mixing of boundaries and maintain internal purity, giving us new insight into the bodily and gendered aspects of early monastic identity. Jerome's demonic rhetoric reveals an essential, yet overlooked, dimension in his promotion of asceticism and maintenance of orthodoxy, the most fiercely debated issues of his time.

Leah Schilling

WI - University of Wisconsin-Eau Claire

Discipline: Psychology

Authors:

#1 Jennifer Muehlenkamp

Ty Dubman

Abstract Name: Yoga Therapy affects changes in NSSI and Eating Disorder Symptoms

Non-suicidal self-injury (NSSI) and eating disorders (ED), which often co-occur, require a disregard for one's body to engage in these maladaptive behaviors. Previous literature has shown that a lack of self-compassion and body appreciation are associated with greater NSSI and ED symptoms, but could be mitigated through therapies such as yoga, which emphasize the union between body and mind. Our study aimed to investigate if body appreciation and self-compassion act as mediators between participation in an integrative yoga therapy and changes in NSSI urges and ED behaviors among a sample of treatment-seeking adults. To date, 37 participants have completed the study (Mage = 31.23, SD = 12.2; 45.9% cisgender female, 46.8% white/European). Linear regression mediation analyses were conducted using the PROCESS macro (model 4)

in SPSS. The full model was not significant for either outcome ($p = .34 - .42$) and there were no observed indirect effects. Aligned with prior literature, self-compassion had a significant direct relationship with changes in NSSI urges ($b = -0.31$) and body appreciation had a direct effect on changes in ED symptoms ($b = -0.56$). The non-significant effects could be due to having a limited amount of preliminary data. Additional data is currently being collected. At the time of the conference, updated analyses and results will be presented. Current results suggest that yoga treatment may not meaningfully affect body appreciation and self-compassion among treatment-seeking adults so alternative treatments may need to be considered.

Sophia Schlink

MN - Hamline University

Discipline: Biochemistry

Authors:

#1 Lawrence Wackett

#2 Betsy Martinez-Vaz

Abstract Name: Degradation of Cyanoguanidine by Nitrile Hydratase

Anthropogenic biguanide compounds are commonly used in agriculture, industry, and medicine, thus ubiquitous in our environment. Widespread use of biguanide compounds, such as cyanoguanidine, guanylurea, and metformin, has resulted in their accumulation in waterways as pollutants. The purpose of this research was to investigate the microbial degradation of cyanoguanidine, a biguanide compound commonly used as a slow release fertilizer that is persistent in soil and water. We hypothesize that high concentrations of cyanoguanidine in wastewater have acted as a selective agent for microbial cultures capable of metabolizing this compound, and sludge-derived microbial cultures may serve as a source to isolate these microorganisms. The experimental approach consisted of establishing microbial cultures using wastewater treatment plant sludge and growth medium with cyanoguanidine as the only nitrogen source. Aliquots of the microbial cultures were plated on minimal media containing cyanoguanidine to isolate bacteria with the ability to break down this compound. High Performance Liquid Chromatography analysis (HPLC) was conducted to track and measure a decrease in cyanoguanidine, which served as a marker for its microbial degradation. These experiments demonstrated the breakdown of cyanoguanidine and the formation of a product identified as guanylurea. DNA sequencing identified two bacterial isolates responsible for this process: *Pseudomonas stutzeri* strain T13 and *Pseudomonas mendocina* strain YMP. Bioinformatic analyses were employed to identify candidate enzymes responsible for cyanoguanidine degradation, which led to the discovery of nitrile hydratases in both organisms. These findings suggest that nitrile hydratases may be responsible for the metabolism of cyanoguanidine in wastewater bacteria. Future work will focus on the purification and characterization of these enzymes to establish their kinetics, regulation, and role in cyanoguanidine metabolism. These new findings contribute to the development of biotechnological solutions for removing cyanoguanidine and structurally similar compounds from the environment.

Lana Schmidt

MD - Naval Academy

Discipline: Chemistry

Authors:

#1 Lana Schmidt

#2 Manori Perera

Abstract Name: Understanding Antioxidant Activity through Available Polyphenols in Green Tea

Excessive oxidative stress is a significant health hazard with a wide array of causes that can impact many different people. Traditional tea, brewed from the *Camellia sinensis* plant, has been shown as a consistent source of antioxidants due to the polyphenols present in tea. The method of fermentation of the leaf distinguishes different kinds of tea such as black, green, white, and oolong and these methods of preparation create different profiles of polyphenols with catechins and theaflavins, formed from oxidized and polymerized catechins. Research has shown that green and black teas tend to have the highest antioxidant activity. Within the category of green tea, there are further differences in preparation which impacts the final product. In this study, varieties of green tea were examined for antioxidant content variations through ABTS assay. The ABTS radical provides a great mechanism of quantifying scavenging power as the change that ABTS undergoes causes a color change that can be measured through absorption in UV/VIS. The results are compared to a Trolox (a phenol with a single -OH group) equivalence curve. Preliminary results indicate that gunpowder green tea has the highest antioxidant content followed by young hyson, sencha green, then dragonwell green. Further research will be conducted to examine the quantity and identity of the polyphenols present in these green teas to shed light into the mechanism of antioxidant activity.

Otto Schmidt

MN - St. Olaf College

Discipline: Biology

Authors:

#1 Laura Boehm Vock

#2 Takashi Maie

Abby Hahs

Ansel Alldredge

Abstract Name: Statistical Analysis of Regional Variation in Material Properties of the Vertebrae for Predator-Escape Response in Yellow Perch (*Perca Flavescens*)

Morphology of animals often reveals how functional design optimizes performance for specific behaviors and adapts to better meet functional demands. We aim to understand how the different sections of the fish vertebrae are built in responding to mechanical stress imposed on them during predator escape behavior. The response is initiated with a rapid “C” shape motion, involving greater turning rate of the head and tail than the mid section of the body, indicating the vertebral column experiences section-specific stresses. Preliminary data showed higher stress-bearing capacity for the upper trunk and the caudal peduncle than the mid and lower trunk vertebrae. The vertebrae in these sections may have undergone differential calcification or mineralization due to varying mechanical stresses. The vertebrae from all four sections were extracted from 20 perch specimens and placed under axial compression tests until failure. Processes and data collected above were conducted by Professor Takashi Maie and his research team. Our statistical analysis aims to develop a standardized and automated process for extracting Young’s modulus, yield strength, and tensile strength for each bone from the stress-strain data from the compression tests. The automation will allow the extraction process to be easily replicated for each bone and in future studies, enabling large datasets of fish to be studied. Once the automation process is complete, we will use ANOVA to compare the different bone regions and determine if there are significant differences between their material properties. Additionally, we plan to utilize a multilevel model to address the variability between fish and account for differences in fish size and shape.

Mary-Claire Schmidt

KY - University of Kentucky

Discipline: Biology

Authors:

#1 Mary-Claire Schmidt

#2 Dr. Marilyn Duncan

#3 Haleigh Whitlock

Abstract Name: Effects of DLAN on Circadian Rhythms of APP-SAA Alzheimer's Mouse Model

Alzheimer's disease (AD) is a prolific neurodegenerative disease, impacting 7 million Americans. It is characterized by amyloid plaques and neurofibrillary tangles in the brain. Circadian rhythm disruption, such as fragmentation, often precedes AD onset and is an AD risk factor. Female sex and exposure to dim light at night (DLAN) are also AD risk factors. Using an AD mouse model, we tested the hypothesis that DLAN disrupts circadian rhythms and accelerates AD pathology and that females are more affected than males. This study used the SAA mouse model of AD that expresses 3 humanized APP gene mutations and wild type (WT) mice of both sexes. The mice were 12-13 months old, an age at which amyloid plaques have begun to accumulate. Mice were singly housed in cages with infrared motion detectors interfaced with a circadian rhythm recording system (ClockLab). All mice were exposed to a 12 h light (L):12 h dark (D) cycle for 1 week of baseline recording. Then, one group of mice stayed on the 12L:12D cycle while the other group was exposed to a 12 h light:12 h dim-light (5-10 lux) cycle. We recorded daily activity rhythms and nesting behavior, which enhances sleep in mice. After 8 weeks, the mice were euthanized and brains collected for measurement of amyloid-beta and neuroinflammation in the hippocampus and neocortex, regions regulating cognition that exhibit neuropathology in AD patients and AD model mice. Circadian rhythm analysis of the daily activity data revealed that DLAN disrupted rhythms by increasing fragmentation and decreasing inter-daily stability. We are currently analyzing nesting scores and neuropathology markers, and predict that DLAN will adversely affect these endpoints, probably more severely in females. The total results will help to elucidate how DLAN and female sex affect the risk and progression of AD.

Amaranth Schmoyer

NC - Western Carolina University

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

Abstract Name: The Butler Did It: Science and Religion's Justifications of Transphobia

The putative dichotomy between science and religion often finds its grounding in the idea that science deals only with facts, while religion deals with beliefs, which are supposedly disconnected from facts. However, in both scientific and religious rhetoric, one can find arguments insisting that one's expressed gender is only "correct" insofar as it aligns with their sex assigned at birth. In scientific arguments this often culminates in a declaration of "biological sex" as the ultimate determining factor of expressed gender, and in religious rhetoric a cisnormative binary is often insisted upon as being "natural." Using Judith Butler's 2024 book *Who's Afraid of Gender*, I construct a definition of dogmatism, then, in examination of biological texts detailing the complexities of the relation between genetic sex and expressed gender, along with texts examining Catholic narratives of the gender binary, I show that both scientific and religious arguments can have dogmatic bases. Further, using examples of forced sex assignment surgery for intersex people, I show that scientific means can be used towards unjust ends. In conclusion, I suggest ways in which both scientific and religious arguments may be engaged, with an understanding that ideology underlies all arguments, so it must not be ignored, but confronted. Furthermore, I suggest that neither be taken with absolute piety or rejection until their bases have been thoroughly examined.

Zoe Schneider

PA - Carnegie Mellon University

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

Abstract Name: Republican Cosmopolitanism Requires Justice as Non-Domination and Non-Oppression

This paper examines the limitations of the neo-republican conception of non-domination as a global justice approach. Neo-republican global justice interventions argue that globalization's erosion of state sovereignty and domestic democratic decision-making are forms of domination. Though globalization is understood as a natural force of market liberalization driving international development, liberalization perpetuates the economic and political disempowerment of citizens and states. As globalization exacerbates inequalities between high-income countries (HICs) and low-and-middle-income countries (LMICs), it simultaneously erodes the capacity for all states to be sovereign bodies, routinely subjecting states and their citizens to interferences of more powerful states, multinational enterprises, and multilateral institutions. Republicans have debated what is required to ensure international justice as non-domination while suggesting that the primacy of non-domination as a common good makes these obligations of justice morally cosmopolitan. These debates preemptively focus on the institutional arrangement necessary to execute this shared moral responsibility by assuming that the prevailing conception of non-domination is sufficient to capture the domination associated with globalization. Neo-republican Phillip Pettit's account of domination has been critiqued for missing ways systemic and structural inequality undermine the freedom of particular social groups. While Pettit's conception of domination effectively understands how interpersonal inequality impedes agents' freedom, his emphasis on agential, intentional, and commonly known interference is incompatible with redressing the systemic and unconscious barriers to freedom characteristic of many contemporary limitations to agency. I argue that these obstructions to freedom are best understood in terms of oppression: the limitations of agency emerging from structural and collective patterns of privilege and power that subordinate social groups. To combat the various ways agents find their freedoms constrained, republicans must incorporate freedom as non-oppression alongside freedom as non-domination. Realizing the duties of non-domination and non-oppression allows for collective, citizen-motivated approaches to countering dominating and oppressive global institutions, systems, and ideologies.

Erin M. Schneider

WI - Marquette University

Discipline: Communications

Authors:

Abstract Name: Exploring the Role of Key Events and Technological Innovations in Shaping Attendee Experience at the State Fair

As new technologies continue to evolve, organizing State Fair events has become an increasingly dynamic process that relies heavily on innovation, requiring data-driven strategies to optimize attendee experiences. Considerable research has been conducted to explore the social and psychological factors that influence attendance and satisfaction at events (e.g., Fernandes & Krolikowska, 2022). However, the role of key events (e.g., grandstand shows, live music, amusement park rides, attractions, booths and showcases, and livestock shows) in shaping attendees' attitudes toward the event warrants more scholarly attention.

Moreover, as emerging technologies have been increasingly introduced to fair attendees in recent years, the specific role of event information software (e.g., websites and mobile apps) in enhancing user experiences remains relatively understudied. Based on the Experience Value Promise (EVP) (Berridge, 2012) and the Technology Acceptance Model (TAM) (Davis, 1989), this proposed research aims to assess attendees' experiences at the 2024 Minnesota State Fair as a case study. The primary objective is to identify which elements of the fair were successful and which areas need improvement for the 2025 fair. The following hypotheses guide this inquiry: H1: Key events at the Minnesota State Fair will have a positive impact on attendees' attitudes toward the fair. H2: The perceived ease of use and perceived usefulness of event information software will positively impact attendees' attitudes toward the fair. To test these hypotheses, an online survey will be administered via Qualtrics software and promoted through social media or email blasts in early 2025. Participation will be voluntary, and participants must be at least 18 years old, having either attended the Minnesota State Fair in 2024 or expressed an interest in attending in 2025. The survey will focus on questions related to attendees' EVPs, with a particular emphasis on the key events examined in this research.

Kelcie Schnitzler

OH - Capital University

Discipline: Criminology/Criminal Justice

Authors:

Abstract Name: Police Officers' Perceptions of Dropped Charges

Law enforcement officers are the first form of contact with the Criminal Justice System for many individuals. Often, these interactions end in an arrest of an individual who will then be charged with a criminal penalty; however, for some individuals the charges are dropped and the case is dismissed, often due to lack of evidence. To date, not many academic studies have focused on how dropped charges affect the duties and opinions of police. Most studies have focused on the aspect of arrest, the social injury towards the public, and the negative impacts on the arrestee. Also, when discussing dropped charges, most studies have focused on probable cause, Fourth Amendment, and warrant issues, not on the dropped charges themselves. This study examined the experiences and perceptions of law enforcement officers regarding dropped charges. Another area for exploration was how police think dropped charges affect the public's trust in their ability to effectively perform crime-control duties. In-depth, semi-structured qualitative interviews were conducted between October and November 2024 with four officers of the Columbus Police Department with different racial backgrounds. Qualitative data analysis was performed to explore themes and patterns within the data. Themes that emerged from the data include: when making an arrest, law enforcement officers abide by legal standards and procedures; arrest may be seen as the best course of action at the time and serves as a "wake up call" for an arrestee; officers insist that dropped charges negatively influence the public's trust in them to do their jobs well, and the officers question their success and productivity when charges are dropped. The findings of this study serve as the beginning for filling a hole in the literature on dropped charges.

Shelby Schober

TX - Stephen F. Austin State University

Discipline: Exercise Science and Nutrition

Authors:

#1 Amber Chelette

Abstract Name: EFFECTS OF THE MENSTRUAL CYCLE ON BALANCE

Postural control is an important factor in balance and normal movement function. Because estrogen levels are known to affect postural control and muscle strength, this study examines the extent to which estrogen levels impact postural control by assessing balance during two phases of the menstrual cycle: menses (days 1-5) and the luteal phase (days 15-24). It is hypothesized that balance performance will decrease during menses when hormone levels are lowest. A repeated measures design was used to test subjects on three balance assessments: Force Plate Standing (Quiet Stance), Tandem Walking Test, and 4-stage Balance Test. The Force Plate Standing Test measures the center of pressure displacement as subjects stand relaxed with closed eyes for 30 seconds. The Tandem Walking Test counts the number of steps out of line as participants walk heel-to-toe for 10 steps. The 4-Stage Balance Test involves holding four progressively challenging positions for 10 seconds, focusing on balance maintenance without moving the feet. This study is ongoing. The results from six subjects are reported. The average mediolateral sway during quiet stance was 11.63 ± 3.4 during menses and 16.3 ± 15.5 during the luteal period. The average anteroposterior sway during quiet stance was 32.9 ± 11.4 during menses and 37.8 ± 24.5 during the luteal period. The current data sets suggest an effect of estrogen on postural control. Postural sway has no significant effect. Tandem and 4-Stage Balance Test is better off cycle. Given the small sample size thus far and the variability between subjects, more data should be collected before asserting confidence in the hypothesis.

Lily Schoeder

KY - University of Kentucky

Discipline: Biology

Authors:

#1 Sathya Velmurugan

#2 Simon Fisher

Abstract Name: Epinephrine increases the occurrence of arrhythmia under low-glucose conditions in isolated rat hearts

Severe hypoglycemia accounts for up to 10% of deaths in individuals with insulin-treated Type 1 diabetes. Previous research in the Fisher lab has demonstrated that severe hypoglycemia induces fatal cardiac arrhythmias. The counterregulatory response to hypoglycemia triggers a marked increase in epinephrine levels that may contribute to these fatal arrhythmias. We wished to test the hypothesis that the arrhythmias associated with severe hypoglycemia result from elevated epinephrine levels rather than reduced glucose availability. To test this hypothesis, we utilized an isolated heart model. Briefly, hearts were extracted from 10 week-old Sprague-Dawley male rats. Aortas were cannulated and retrograde-perfused with Krebs-Henseleit (KHB) buffer containing glucose concentrations of 5, 2.5, 0.5, and 0.1 mM, with or without epinephrine (1 μ M) using a Langendorff perfusion system. Electrodes positioned in the heart recorded ECG data, allowing us to analyze heart rate, isolated arrhythmic events, and the duration of arrhythmic episodes. Low-glucose (0.5 or 0.1 mM) alone did not significantly increase arrhythmic duration compared to normal glucose levels (5 mM glucose). However, the presence of epinephrine (1 μ M) significantly prolonged arrhythmia duration under low-glucose (0.1 mM) conditions compared to control (5 mM glucose). These results suggest that severe hypoglycemia-induced cardiac arrhythmias may be mediated by synergistic effects of elevated epinephrine levels and low blood glucose.

Michaela Schommer

WI - University of Wisconsin-Green Bay

Discipline: Sociology

Authors:

Abstract Name: Doing "Other Stuff": Negotiating Sexual Identities in Christian Communities

This study explores how individuals within Christian communities negotiate their sexual identities through language. The research focuses on the use of euphemisms and conjunctions when discussing sexual experiences among heterosexual and queer individuals to discern underlying ideologies of sexual superiority or inferiority. The analysis examines how these linguistic choices reflect and reinforce cultural conceptions of sex, often rooted in heteronormative and phallocentric ideologies. The study draws on interviews with participants from diverse Christian denominations, analyzing their experiences and the language they use to describe their sexual identities and practices. Key findings indicate that queer individuals often leave Christian communities to reconcile their sexual identity due to feelings of invalidation and ostracization, leading them to use less euphemistic language. In contrast, heterosexual participants, whether currently or formerly active in their Christian communities, tend to use more euphemisms and conjunctions, reflecting a sense of sexual superiority through culturally sanctioned norms. The research underscores the complex interplay between language, religion, and sexual identity, revealing the broader implications of sociocultural Christian constructs and how individuals navigate these challenges to affirm their sexual selves.

Amanda Schraer

FL - University of West Florida

Discipline: Psychology

Authors:

#1 Amanda Schraer

#2 Lonneke Pottinga

#3 Steven Kass

#4 Sarianna Thomas

Abstract Name: Personality and Frustrated Driving

In 2021, the Foundation for Traffic Safety surveyed the U.S. driving population at approximately 245.3 million. That same year, the National Highway Traffic Safety Administration reported a significant increase in police-reported traffic crashes from 5.25 million in 2020 to 6.10 million in 2021. Notably, 12,330 fatalities in 2021 were attributed to speeding behaviors (National Center for Statistics and Analysis, 2023). As the population of drivers rises, the cases of roadway accidents are on the rise. A proactive approach is needed to see what behaviors are leading drivers to these accidents. Keinath et al. (2017) noted driving violations tend to occur in the presence of emotional impairments such as anger. The risk associated with human behavior in vehicle accidents prompts inquiry into whether some personality traits predispose individuals to higher levels of driving errors. Trait theory has been used to predict enduring behaviors; the relationship is complex. Researchers like Monson et al. (1982) showed that personality can predict behavior in certain situations and cannot in others. Researching the relationship between personality traits and frustration could lead to possible prevention of accidents and fatalities on roadways. Traits such as neuroticism (Luo et al., 2023), extraversion (Harris et al., 2014), and boredom proneness (Mugon et al., 2018) may predispose individuals to aggressive tendencies that lead to unsafe driving. In contrast, a trait like conscientiousness (Harris et al., 2014) has been shown to have more safe driving performance. Using simulated driving for research will allow an investigation into the inclinations of certain driving behaviors like speeding, centerline crossings, proper turn usage, and collisions.

Alexandria Schram

PA - Point Park University

Discipline: Dance

Authors:

Abstract Name: Innovation in Motion: The Intersection of Dance and Technology in Performance Art

Introducing additional technological elements into live performance offers a more immersive and captivating experience for the audience members. In dance composition, when complex technological advancements are incorporated, the creative process is often centered around reacting to and engaging with the specific technology rather than using it to supplement a preexisting idea. However, this research takes a previously created contemporary ballet choreographic work titled anywhere but now and explores how applied scientific and digital investigations could enhance the movement, uncovering deeper interpretations of the concept. The intention of adding technological components is to create a more impactful performance without shifting too much attention away from the dancers and the carefully calculated movement. As a result of applying additional technology that complements the choreography, the piece could gain momentum with a population that does not regularly attend dance performances. Through investigating the potential for 3D interactive projection mapping, virtual reality, the metaverse, and artificial intelligence, this research seeks to curate an experience that amplifies the physical and emotional themes the dancers are portraying by inviting a personal encounter that resonates deeper with viewers. Layering these technologies on an established concept encourages a greater sense of engagement for audience members by fostering curiosity, stimulating internal contemplation, and extending appreciation for the art form. Expanding the creative process for choreographers and dancers beyond standard technical design elements such as lighting, staging, and costume paves the way for innovation in how live dance performances are imagined. Artists can question the possibilities that lie in disrupting the barriers between the physical and digital realms and how to create increasingly captivating projects that broaden the audience that is interested in dance.

Luc Schrauf

PA - Pennsylvania State University

Discipline: Physics and Astronomy

Authors:

#1 Baird Bankovic

#2 Anthony Richardella

#3 Eric Hudson

#4 Nitin Samarth

Abstract Name: Installation of low temperature transimpedance amplifier to improve the performance of a scanning tunneling microscope

Scanning tunneling microscopy (STM) is a well-established technique used to study and characterize the topographic and electronic properties of material surfaces with atomic resolution. We outline an undergraduate research project aimed at restoring and improving the performance of a custom built low-temperature STM. Along with diagnosing and troubleshooting various system components, this restoration involved the building of an in-situ transimpedance amplifier to boost system signal-to-noise ratio (SNR). We conducted a survey to identify a commercially available op-amp candidate that was high vacuum compatible, low-temperature compatible, had sufficiently high bandwidth, and had low input bias. We then carried out ex-situ Bode plot analysis of op-amps in liquid nitrogen to screen for the best performing devices. Multiple rounds of compatibility and installation design testing were performed, followed by a final installation and a significant reduction in 60Hz noise in tunnelling current. Using the installed amplifier, we demonstrate

atomic resolution and spectroscopy capabilities, at room temperature and at low-temperature (77K). Finally, we use the instrument to carry out STM measurements of epitaxially synthesized 2D quantum materials.

Peyton Schreiber

PA - Lafayette College

Discipline: Interdisciplinary

Authors:

#1 Katalin Fabian

Abstract Name: From Fair Play to Power Play: The Political Evolution of Anti-Doping Regulations in International Sports

How have doping policies in the Olympics altered the symbolic balance of power and claims to legitimacy between states? How have anti-doping regulations evolved in response to political pressures made upon institutions like the International Olympic Committee (IOC) and the World Anti-Doping Agency (WADA) and international relations? Anti-doping regulations are shaped by health and fairness concerns, while geopolitical considerations, national interests, and global power dynamics also influence them. The use of performance-enhancing drugs, also known as doping, has been a pervasive problem in international sport. Since the 1960s, the IOC has struggled to eliminate the use of such drugs. A few countries, particularly Russia, have been repeatedly accused of state-sponsored doping, resulting in Russia's ban from the 2020 and 2022 Olympic Games. They have met these controversies with accusations of unfair treatment and criticized the international institutions responsible for these sanctions as biased and selective in their responses. The battles taking place in the international sports scene are a vital indicator of shifting perspectives on legitimacy and strength. The significance of this research lies in uncovering the often overlooked political motivations behind doping policies, demonstrating the ways in which nations like the United States and Russia have manipulated the practice of rule-making and enforcement to make claims of sabotage, cast doubt on the role of international institutions, and assert dominance globally. Taking on a critical lens, this research highlights the political motivations behind doping regulations. Arguing that anti-doping measures serve as tools of soft power and global legitimacy, it reviews the history of the last decade's doping scandals in winter sports, the evolution of WADA policies, state-led responses by the United States and Russia to these policies, and the changes made by the United States and Russia to take advantage of these regulations.

Grace Schroeder

KY - University of Kentucky

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: A Step Ahead: Architectural Innovation as an Educational Experience

The custom staircase in the Grey Design Building, is a statement piece that catches your eye as soon as you walk in. With its sheer size and curves, it draws people in. As you walk, you hear the steel as your shoes hit the surface, feel the coldness and texture of the railing underneath your hands, and see the subtle reflection from the lights above on the matte black surface. What you can't understand just by using the staircase is the engineering feat behind its design, construction, and installation. The staircase hides educational opportunities for the College of Design students and visitors. This research explores the most successful way to design and

integrate an educational experience into the space without interfering with the experience of the staircase itself.

Anika Schroeder

KS - University of Kansas

Discipline: Political Science

Authors:

Abstract Name: Taking the Russia out of the Soviet: Derussification of Federal Language Laws in Post-Soviet Latvia

This paper investigates the relationship between federal language laws, population demographics, and international political events in twenty-first century Latvia. The Latvian federal government has implemented laws restricting the use of the Russian language and mandating minimal proficiency in the Latvian language. Previous research has examined the predominance of the Russian language over native national languages in post-Soviet countries on language displays and the enforcement of language laws on public and private displays. This research will utilize derussification, the process of removing Russian influence to make space for native, national cultural influence. I will thematically code Latvian federal language laws by sociopolitical sphere, severity, and language of restriction. I will then compare the years of law implementation to international events as reported by major Latvian newspapers and to trends of population demographics as reported by the Central Statistics Bureau of Latvia. This project expects to find international events provoke the implementation of federal language law, then in turn provoking changes in population demographics. As future research expects to see international events impact language laws and population demographics, this research project may show derussification could rebuild national identity in other post-Soviet countries.

Magnus Schroeder

WI - University of Wisconsin-Parkside

Discipline: Chemistry

Authors:

#1 Hunter Zoerner

#2 Peter Tagalakakis

#3 Jacob Christensen

Abstract Name: Naturally Derived UV Filters: Comparison of Sun Protection Properties of a Library of Hydroxycinnamic Esters.

Chemical UV filters approved for use in US sunscreen formulations are under increasing scrutiny due to their potential undesirable effects on human health and the environment. Concerns exist over long-term endocrine disruption and developmental toxicity that the sustained use of sunscreens might pose. Plant-based hydroxycinnamic acids (HCAs) and their corresponding esters are safer alternatives, and are known to absorb in the UVB-UVA (290–400nm) region of solar radiation. This study sought to evaluate and compare the potential of HCA esters for use as main UV filters in sunscreens using as performance benchmark existing commercial UV filters. In the first phase of the project, three naturally occurring HCAs, ferulic acid, sinapic acid, and 3,4-Dimethoxycinnamic acid were each converted into their respective esters by Fischer esterification under microwave irradiation, using alcohols of increasing molecular weight C2-C5. Following isolation and purification by column chromatography, each ester product was incorporated in 8% weight in

combination with up to 3% avobenzone into a sunscreen emulsion and subsequently applied as thin film in polymethylmethacrylate plates. The ability to block solar radiation was measured via UV transmittance spectroscopy prior and after irradiation under a solar simulator. Proliferation assays of new compounds were performed on human skin cell. HCA esters were found to be non-toxic, and typically less toxic than commercial counterparts. We have shown that sunscreens containing approximately 8% weight of any one ester with 3% avobenzone compare well a commercial broadband sunscreen with SPF+50 containing 22.5% of a mixture of homosalate, octisalate, and octocrylene with 3% avobenzone. Calculated sun protection parameters were within 90-95% of the corresponding values of the commercial sunscreen. The in vitro data generated from this study suggest that each of the naturally sourced HCA-esters has the potential to replace or reduce the use of three commercial synthetic UV filters.

Katelyn Schwab

NY - Adelphi University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Chana Etengoff

#2 Emily Luong

#3 Irene Yannios

Abstract Name: The Relationship Between LGBTQ+ Mental Health and American Politics

Introduction: Over the past year, over 520 anti-LGBTQ+ bills were introduced in the U.S., with 70 becoming law (Peele, 2023). Such climates contribute to internalized stigma, minority stress, and poor mental health for LGBTQ+ individuals (Gonzalez et al., 2022; Pulice-Farrow et al., 2023). This study builds on existing research by examining the impact of LGBTQ+ political insecurity across different presidential administrations (Trump vs. Biden), congressional acts, and Supreme Court decisions. It aims to understand LGBTQ+ individuals' emotional responses to these political changes and their mental health effects. Method: With IRB approval, 25 LGBTQ+ participants (Mage = 19.9, SDage = 2.59) were recruited through social media, listservs, the university's SONA pool, and snowball sampling. They completed a 30-minute semi-structured Zoom interview with eight demographic and 16 open-ended questions about community involvement, political security, and well-being. Qualitative Analysis: The Principal Investigator (PI) developed thematic codes from recurring interview patterns, reviewed with the co-PI, and coded participant narratives. Results: Seventy-two percent of participants stayed informed about LGBTQ+ politics, with 80% feeling politics significantly impacted their lives. During Trump's administration, 72% felt insecure, compared to 36% during Biden's. Despite Biden's improvements, 36% reported ongoing insecurity. Sixty-four percent viewed the Supreme Court's LGBTQ+ protections negatively, and 48% were concerned about Congress's role. Forty-four percent reported negative effects on well-being, with another 44% expressing anticipatory anxiety. Conclusion: This study adds depth to Minority Stress Theory (Meyer, 2003) and suggests future research should use participatory action models to improve LGBTQ+ political security and well-being.

Ari Schwartz

GA - Kennesaw State University

Discipline: Biology

Authors:

#1 Ari Schwartz

#2 Premila Achar

#3 Mohammad Halim
#4 Sharif Taimuzzaman

Abstract Name: The In Vivo Study of Clove Essential Oil against Aflatoxin B1 Production in *Aspergillus flavus* Contaminated Georgia Peanuts

Georgia produces half of U.S. peanuts, but the southeast loses \$25M annually due to aflatoxins from *Aspergillus* spp. contamination. *Aspergillus flavus* produces aflatoxin B1 (AFB1), affecting humans, livestock, and crops globally. AFB1, a class 1 human carcinogen, is the most toxic, according to the International Agency for Research on Cancer (IARC). Synthetic fungicides degrade slowly, harming ecosystems, while biological controls like genetic engineering and antimicrobial compounds have had limited success against *A. flavus*. Therefore, the need for biological controls, such as plant-based antimicrobials against crop-damaging molds, is increasing. Our previous in vitro study confirmed the anti-aflatoxigenic properties of clove essential oil (EO) against *A. flavus*. Our current in vivo study evaluates the effectiveness of clove EO against *A. flavus* and its production of AFB1 in peanuts harvested from contaminated Georgia seeds. Seeds were exposed to clove EO at 250 ppm, 500 ppm, and 2000 ppm for 24 hours in sealed flasks, with five replicates each. Exposed and unexposed seeds were sown with Miracle-Gro potting mix in a greenhouse and watered as needed. Seedlings were monitored weekly, with few showing signs of disease or remaining stunted before harvest. Peanuts were harvested, shelled, and air-dried after seven months. AFB1 in harvested peanuts was quantified using Liquid Chromatography-Mass Spectrometry (LC-MS) with Selected Ion Monitoring (SIM). Unexposed seeds served as a negative control, and seeds exposed to a synthetic fungicide served as a positive control. Our findings demonstrate a strong negative correlation between clove EO in exposed seeds at different concentrations and AFB1 production. We observed that with an increase in concentration, there was a decrease in AFB1 production ($IC_{50} = 63.15$ ppm, $R^2 = 1.000$), which corroborates with our previous in vitro findings. Since the magnitude of inhibition was marginal, we plan to investigate further the potential of clove EO under field conditions.

Cassandra Sciarra

WI - University of Wisconsin-Stout

Discipline: Sociology

Authors:
#1 Tina Lee

Abstract Name: Social Determinants of Substance Use Disorders and Addiction Treatment: Evidence From Arbor Place Professionals

Drug addiction has been on the rise in the United States over the last ten years, with more individuals being diagnosed with a substance use disorder (SUD). Traditional discourse surrounding drug addiction tends to focus on genetic and biological factors that can lead to the development of SUDs, with less discussion of the environmental, social, and financial aspects that also contribute. In addition, some of this discourse has exhibited a victim-blaming stereotype surrounding individuals with drug addictions. In order to better understand the complex causes of SUDs, I take a holistic and intersectional approach by collecting the narratives of professionals who work in the SUD field. Specifically, I seek to answer the following questions: How do different demographic factors impact the development of substance use disorder and influence the process of recovery? How do financial difficulties impact access to treatment and other support programs? To address these questions, ten interviews were conducted with clinical substance abuse counselors and other staff at a treatment center in Menomonie, WI. In analyzing their narratives, the following themes emerged: the impact that trauma has on substance use and recovery, the significant intersection of socioeconomic status and geographic location, and the benefits of having support systems in place. This information is crucial to understanding the social and environmental aspects which contribute to SUDs among different demographic populations. Through obtaining a meaningful understanding and raising awareness on this social problem,

new strategies and clinical approaches can be developed to assist people who struggle with addiction. Responses from clinical staff bring awareness to and attempt to discredit these stereotypes through recounting firsthand experiences, highlighting financial barriers, and addressing environmental aspects which render these stereotypes inaccurate and develop a new and precise understanding and representation of individuals with SUDs.

Alec Sciutto

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Elaine Robbins

#2 Te-Hsuan Tung

#3 Steven Wellman

#4 Takashi D Kozai

#5 Tracy Cui

#6 Franca Cambi

Abstract Name: Neurochemical Monitoring of Glutamate Content in Hippocampal CA1 Region of FusOLcKO Hypermyelinating mice

Oligodendrocytes play an important role in maintaining the integrity of neuronal circuits. Our lab developed a hypermyelinating mouse model by conditionally knocking out Fused in Sarcoma (Fus) in oligodendrocytes (FusOLcKO). Electrophysiological recordings using microelectrodes implanted through the visual cortex to CA1 revealed sustained neural activity in CA1 of FusOLcKO mice compared to wild type (WT), suggesting oligodendrocyte regulated hippocampal neural signaling. However, the excitatory nature of the activity remains unclear. To address this, custom microelectrodes measured glutamate concentration in dorsal (d)CA1, medial (m)CA1 and ventral (v)CA1. A gradient of decreasing glutamate concentrations was observed from dorsal to ventral CA1 in both genotypes, suggesting spatial regulation of glutamate production. Glutamate concentration in (d)CA1 was higher in the FusOLcKO vs. WT mice. The increased glutamate content is consistent with the enhanced neural activity in CA1. We hypothesize that elevated glutamate in FusOLcKO mice reflects increased synaptic density in CA1. To investigate the neuroanatomical and cellular basis underlying the electrophysiology, we localized the electrode tracts in brain sections by staining for mouse IgG leakage at implantation sites. Cellular environments at recording sites will be characterized by immunohistochemical staining for glial markers GFAP (astrocytes) and Iba1 (microglia), myelin markers MBP (Myelin Basic Protein) and MOG (Myelin Oligodendrocyte Glycoprotein), and axonal marker NF200 (Neurofilament Heavy Chain). Additionally, excitatory synaptic density will be quantified using markers for presynaptic (vGLUT1) and postsynaptic (PSD95) proteins. This study aims to elucidate the relationship between myelin integrity and excitatory neurotransmission in the CA1 hippocampal region, providing insights into pathologies where hippocampal synapse degradation is prominent.

Markelle Scott

AL - Auburn University

Discipline: Biochemistry

Authors:

#1 David Riese

Abstract Name: Do ERBB4-ERBB2 heterodimers drive ERBB4-dependent, ERBB2-dependent, BRAF WT melanoma cell lines?

Melanomas are aggressive and deadly subtypes of skin cancer. Approximately 50% of melanomas harbor a gain-of-function mutation in a BRAF allele and these tumors respond to immune checkpoint inhibitors (ICIs) or a combination of BRAF and MEK inhibitors. Unfortunately, the ~50% of melanomas that possess wild-type BRAF alleles (BRAF-WT melanomas) are not responsive to targeted therapeutics and ICIs are not highly effective against these tumors. Thus, our long-term goal is the development of agents that are effective against BRAF-WT melanomas. Four BRAF-WT melanoma cell lines are driven by elevated transcription of wild-type ERBB4 or gain-of-function mutant alleles of ERBB4. ERBB4 encodes a receptor tyrosine kinase that is closely related to the Epidermal Growth Factor Receptor (EGFR), ERBB2 (HER2), or ERBB3 (HER3). Moreover, three of these ERBB4-dependent, BRAF WT melanoma cell lines are also dependent on ERBB2. Since ERBB4 homodimers inhibit tumor cell proliferation, we hypothesize that ERBB4-ERBB2 heterodimers drive these ERBB4- and ERBB2-dependent, BRAF-WT melanoma cell lines. To test this hypothesis, we are evaluating the activity of mutant alleles that affect the cytoplasmic ERBB2/ERBB4 dimer interface. We are testing whether mutations in the N-lobe of the ERBB4 kinase domain cause loss-of-function phenotypes (reduced signaling and stimulation of proliferation) and whether mutations in the C-lobe of the ERBB2 kinase domain cause loss-of-function phenotypes. Finally, we will test whether loss-of-function ERBB4 N-lobe mutant alleles can be rescued by loss-of-function ERBB2 C-lobe mutant alleles. Positive results would suggest that ERBB4-ERBB2 heterodimers drive the proliferation of ERBB4- and ERBB2-dependent melanomas and that such melanomas will respond to combination therapies that feature FDA-approved anti-ERBB2 agents, including pertuzumab and lapatinib.

Lyla Scott

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

Abstract Name: The Art of Consent

This piece of visual art is titled, "The Art of Consent," it was sourced from the original consent form for Jonas Salk's poliovirus vaccine trials. It was made using plywood and acrylic. The design was created using Adobe Illustrator and made tangible through the use of a laser engraver. The artwork is meant to show how consent forms have developed over time. The piece consists of a plywood back and frame, various plastic-colored pieces, and a cover made out of plywood. When the cover is lifted, it reveals the artwork underneath. Each plastic-colored piece represents a different section of a modern-day consent form. The pieces fit together in a specific way showing how each section is essential to provide a full picture of consent for a participant. The artwork is interactive, as you can take the plastic pieces out of their place and put the work back together. On the back of the cover reads Jonas Salk's original one-paragraph consent form. The presence of the original consent form allows for a comparison between the past and the present. This interactive piece is meant to show the intricacies of consent forms today. The piece should raise certain questions to the audience about the changing nature of consent and its relationship to liability, both for and on the participant as well as the company or entity delivering the informed consent.

Tatiana Scott-Anchietta

TX - Texas Woman's University

Discipline: Education

Authors:

#1 Sara Ishii-Bear

#2 Azucena Verdin

Abstract Name: The Exploration of Art Education in Character Development and Self-Actualization: A Focus on Gratitude

This study aims to examine how art education can empower primary students to self-actualize their identity, values, and social-emotional strengths. Stable values and the ability to know oneself can aid individuals in advocating for themselves and others. Based on research by The National Endowment for the Arts, The American Academy of Arts and Sciences, and The Journal of Aesthetic Education, art education classroom experiences can facilitate free expression about prosocial values and behaviors. This study will examine how middle school students express ideas about gratitude in an art education experience. It will explore what gratitude means to them and their identity, which may help develop critical thinking skills that will foster a more positive community. Semi-structured individual interviews with ten students will be conducted to elicit responses about their experiences within a small art class before the art lesson that reflects on the value of gratitude, observe that classroom's experience during the lesson, and interview each student after the lesson to evaluate their ideas about gratitude and their own identity. Using thematic analysis to analyze both the students' interviews and artwork made during the lesson allows me to evaluate how the ideas expressed in their interviews are demonstrated through their artwork. With this information collected, I want to determine how art education curriculum can intertwine with social-emotional learning and self-discovery. This research aims to better our education and communities with a further understanding of how using art education as a vehicle of self-expression and reflection can develop stable and kind character development for our future.

Dorian Scourtos

PA - Villanova University

Discipline: Economics

Authors:

#1 Dorian Scourtos

Abstract Name: The Impact of OECD Population Aging on Economic Growth and Productivity

Population aging is expected to slow economic growth. A recent paper by Maestas et. al (2023) finds that a 10% increase in the US population share of individuals aged 60+ decreases GDP per capita by 5.5%, and attributes approximately two-thirds of this decline to a slower growth in labor productivity, using the variation in the predetermined component of aging. I expand this research to all OECD nations, using a similar identification strategy. I find that a 10% increase in share of a nation's population aged 60+ decreases labor productivity per worker by 0.348 percentage-points and decreases GDP growth by 0.375 percentage-points. Additionally, these results are stronger for earlier members of the OECD, indicating that older nations are at greater risk of economic stagnation due to these demographic shifts.

Madison Sealey

NC - William Peace University

Discipline: Psychology

Authors:

Abstract Name: Sleep, Napping, and Their Impact on Academic Performance

On average, 60% of college students report poor sleep each night (Mbous et al., 2022). Sleep deficiency is frequently caused by factors such as poor work-life balance, social obligations, and extracurricular activities (Liu et al., 2023). Lack of sleep can lead to negative student health outcomes and increased distress (Liu et al., 2023). However, many students may need to be made aware of how inadequate sleep affects their academic performance (Ye et al., 2015). Sleep deprivation, particularly late bedtimes and irregular sleep/wake cycles can impair concentration and academic performance. Students will often compensate for lack of sleep by napping during the day, but this behavior can further disrupt their nighttime sleep patterns (Taylor et al., 2013). This study aims to examine the association between sleep quality, napping behaviors, and academic performance among college students. The primary objective is to determine whether students who get adequate sleep perform better academically and if napping can mitigate the effects of poor nighttime sleep. A sample of students from first-year seminar and psychology courses at a small liberal arts college will complete a survey on sleep quality and napping habits. This survey study assesses sleep using the Pittsburgh Sleep Quality Index (PSQI; Shahis et al., 1989), while napping behavior is measured with the Napping Behavior Questionnaire NBQ; Lovato et al., 2014). Participants will indicate their current GPA, in addition, data from the registrar will be used to assess academic performance at the end of the semester. Multiple regression analyses will be conducted to explore the relationship between sleep, napping, and academic performance. Initial findings suggest that sleep quality is not strongly correlated with academic performance, but further data collection is ongoing. Understanding the role of napping behavior will allow for more specific recommendations regarding sleep among college students.

Zachary Seaman

PA - California University of Pennsylvania

Discipline: Chemistry

Authors:

#1 Zachary Seaman

#2 Matthew Price

Abstract Name: Imidazo[1,2- α]pyridine Derivatives from Synthesis of α -bromoacetophenone

Imidazo[1,2- α]pyridines are nitrogen-containing bicyclic aromatic molecules studied due to their biological activity. They may act as antiparasitic, antibiotic, anti-inflammatory, and other biological agents which make them useful as drug candidates, and the potential for these structures to exhibit excited-state intramolecular proton transfer fluorescence applies them to molecular switches and biomarkers. Existing methodologies to synthesize imidazo[1,2- α]pyridines focus on the condensation of 2-aminopyridine and acetophenone in basic conditions. We propose the synthesis of α -bromoacetophenone derivatives from acetophenone derivatives, and experimentation of one pot and two-step synthesis methods to determine the preferred methodology for the condensation of α -bromoacetophenone and 2-aminopyridine in the synthesis of imidazo[1,2- α]pyridines capable of fluorescence. The chosen methodology will alleviate the limitations from previous literature including low yield and restrictions of available starting materials for a more efficient and cost-effective synthesis of imidazo[1,2- α]pyridine derivatives. Once the desired products are synthesized, a mixture of products in poly(methyl methacrylate) plastic films will be created by solution casting to observe their fluorescence in an application setting.

Zachary Seaman

PA - California University of Pennsylvania

Discipline: Biology

Authors:

#1 Zachary Seaman

#2 Michelle Valkanas

Abstract Name: Targeted Knockout of oprM Gene in Pseudomonas Species to Investigate its Role in Toxin and Antibiotic Resistance

An understanding of how efflux pumps contribute to antibiotic and toxin resistance is crucial for the development of strategies to combat bacterial infection and environmental pollution. One example is the MexAB-OprM efflux pump which is most well known in *Pseudomonas aeruginosa* for its clinical applications, as well as in other species such as *P. fluorescens* and *P. mendocina* for its role in expelling toxins and drugs from the cell. The objective of this experiment was to perform a targeted knockout of the oprM gene using CRISPR-Cas9 technology to interpret the role of OprM in toxin and antibiotic resistance. This study investigates the function of the OprM protein in expelling toxins and antibiotics from multiple *Pseudomonas* species, using ethidium bromide (EtBr), heavy metals (Cu, Zn), and antibiotics (tetracycline, ciprofloxacin) as model substrates. Following oprM knockout, toxin and antibiotic resistance in these bacterial species will be observed to indicate the role of the OprM subunit in the efflux pump, and thus give insights into its role in bacterial antibiotic resistance and toxin defense.

Noelani Segree

FL - The University of Tampa

Discipline: Communications

Authors:

#1 Noelani Segree

Abstract Name: Few Places to Learn, Few Spaces to Talk: Reproductive Health Literacy Among Gen Z Women

The present study investigates reproductive health literacy among Generation Z women aged 18-29, focusing on their understanding of fertility and (in)fertility. Despite the peak fertility window for women occurring in their late teens to early 30s (Delbaere et al., 2020), existing research specific to women in Generation Z remains lacking, suggesting that young women lack knowledge about reproductive health (Martins et al., 2023). This study examines women's knowledge levels specific to fertility and infertility treatment using a modified version of Kudesia et al. (2017), Fertility & Infertility Treatment Knowledge Score Survey (FIT-KS). Results suggest a gap in knowledge specific to fertility and reproductive health among Gen Z women. Few spaces or places encourage dialogue specific to fertility, and those that do, such as a doctor's office, are still perceived as "uncomfortable" by some (26%), and 58% "never" to "rarely" discuss reproductive health with their doctor. Respondents were split between those who feel informed about their fertility (40%), those who do not (48%), and those who feel neutral (12%). More research is needed to define what "informed" means for Gen Z, to examine the information of Gen Z, and how to improve access to health education.

Austin Segrest

OK - University of Central Oklahoma

Discipline: Mathematics

Authors:

#1 Brittany Bannish

Abstract Name: Systematic Analysis of Parameter Variations in a Stochastic Fibrin Fiber Degradation Model

Fibrinolysis is the biological process where fibrin, the main structural protein in blood clots, is broken down. This process is critical in wound healing and maintaining blood flow by preventing excessive clotting that could lead to thrombosis. Dysregulation of this process can lead to heart attack and stroke. Fibrinolysis is mainly achieved by the enzyme plasmin, which is activated from its precursor plasminogen by tissue plasminogen activator (tPA). We present a stochastic model of the enzymatic degradation of a single fibrin fiber. This model uses the Gillespie algorithm which is a stochastic method for simulating the time evolution of systems with random events. It calculates when the next reaction occurs and which reaction it is, based on reaction probabilities and random numbers. Model outputs include cleavage time (time for fiber to degrade) and cleavage success rate (proportion of simulations that resulted in cleavage). We systematically alter various parameters to obtain cleavage times and success rates for a range of physiological and pathophysiological conditions. Our results are then compared to in vitro experiments from collaborators to obtain a better understanding of the underlying mechanisms driving fibrinolysis.

Shreya Sehgal

PA - University of Pittsburgh

Discipline: Psychology

Authors:

#1 Daniela Uliana

#2 Anthony Grace

Abstract Name: THPP-1 PDE10A inhibitor mitigates the hyperdopaminergic state in a neurodevelopment model of schizophrenia.

Schizophrenia (SCZ) is a complex neuropsychiatric disorder marked by significant disruptions in brain function, including dopamine (DA) dysregulation in the ventral tegmental area (VTA), which is driven by hyperexcitability in the ventral hippocampus (vHipp). Current antipsychotic treatments primarily address positive symptoms of SCZ, but are limited in reducing vHipp hyperexcitability. Phosphodiesterase 10A (PDE10A) inhibition has emerged as a novel therapeutic strategy to treat multiple symptom classes of SCZ. Our study examines the effects of THPP-1, a PDE10A inhibitor, on DA dysregulation and vHipp activity in rats. This is investigated using a well-established neurodevelopmental rodent model of SCZ induced by prenatal exposure to methylazoxymethanol acetate (MAM) injection on gestational day 17 (20 mg/kg, i.p.). Adult male offspring of pregnant MAM-treated or Saline-treated rats were administered acute (3 mg/kg, i.p.) doses of THPP-1. Electrophysiological recordings were used to assess changes in DA neuron activity in the VTA and pyramidal neuron activity in the vHipp. Our findings indicate that acute THPP-1 administration reduced the abnormal, elevated number of spontaneously active DA neurons only in MAM-offspring rats ($p < 0.05$, $F_{1,24} = 9.2$, two-way ANOVA) without affecting the average firing rate and spikes in burst of DA neurons ($p > 0.05$, Kruskal-Wallis). The saline-offspring rats were unaffected by THPP-1 treatment in all measures. In the vHipp, THPP-1 did not alter the number of spontaneously active pyramidal neurons ($p > 0.05$, two-way ANOVA) and spikes in burst ($p > 0.05$, Kruskal-Wallis). THPP-1 was also unable to decrease the enhanced firing rate of pyramidal neurons observed in MAM rats ($p > 0.05$, Kruskal-Wallis). Our results demonstrate that THPP-1, a PDE10A inhibitor, normalizes the hyperdopaminergic state in the MAM phenotype but does not normalize vHipp hyperexcitability. Therefore, THPP-1 may modulate a different brain circuit to mitigate the VTA hyperdopaminergic state in the MAM model of SCZ.

Veronica Seipel

TN - Middle Tennessee State University

Discipline: Chemistry

Authors:

#1 Kevin Bicker

Abstract Name: Synthesis and Analysis of Antifungal Peptoid Dendrimers

Fungal infections, particularly those caused by *Cryptococcus neoformans*, present a significant global health burden, with high mortality rates in immunocompromised populations. There are several antifungal treatment options available, but they exhibit high toxicity levels and drug-resistant variants of *C. neoformans* have become increasingly common. Peptoids, derivatives of peptides, offer a promising alternative due to their high antifungal activity, excellent half-life, low toxicity, and quick-killing kinetics. This study focuses on enhancing RMG8-8, a peptoid developed by our lab with high antifungal activity against *C. neoformans*, by synthesizing peptoid dendrimers to allow for more potent treatment options. Dendrimers are macromolecules with a unique branched structure that has been shown to improve drug efficacy by increasing the drug's half-life, solubility, and localized concentration. This presentation will show the results of the synthesis of peptoid dendrimers, accomplished through a mix of solid-phase synthesis and convergent synthesis. The resulting dendrimers are verified, characterized for their size, surface charge, and purity, and tested against *C. neoformans* using an MIC assay to determine antifungal properties.

Natalie Seitz

MI - Michigan State University

Discipline: Psychology

Authors:

#1 Natalie Phillips

Allison Doneth

Yigit Akan

Abstract Name: Examining the Effects of Enculturation on Narratives and Interpretation of Music Excerpts

This study investigated how participants' imagination is impacted by enculturation, specifically the imagination of narratives in response to instrumental excerpts. Participants were grouped into three cohorts; one from an isolated rural setting in Dimen, China; one from Springfield, Arkansas; one from East Lansing, Michigan. Each participant was tasked with listening to instrumental music and describing any narrative they imagined in response, including momentary imagery or full-fledged narratives. Some musical excerpts elicited narratives describing the same topics, themes, and words across all cohorts. For example, all groups reported imagining themes of grief while listening to a track titled "Groans of the Sick", and all three mentioned Tom and Jerry while listening to "Four Etudes for Orchestra, No.4: Allegro con moto" by Stravinsky. The latter phenomenon inspired our creation of the term the "Tom and Jerry effect", which we use to describe niche pop culture references that appear in narratives across all the examined cultures. Western and Chinese listeners also mentioned themes that were not observed in the opposite culture. For example, Disney was only mentioned by Western cohorts, and the Chinese Grand Song was only referenced by Chinese listeners. As we investigate these moments of cultural alignment and divergence in music inspired stories, we point toward an innovative model for linking specific structures and tempo in music to the kinds of stories

people hear. Through this presentation, moreover, we aim to provide a comprehensive overview of when and why instrumental music yields culture-influenced narrative listening. There are important applications of musical narratives analysis in reducing cross-cultural misunderstandings, and research examining the role of music in manipulating emotional state.

Varun Sekar

IL - Elmhurst University

Discipline: Economics

Authors:

#1 Avraham Baranes

#2 Mary Kay Mulvaney

Abstract Name: Impact of Rebates on Home Loan Interest Rates and Homeownership

This research examines the impact of home loan interest rate rebates on homeownership rates among middle-income families, addressing the central question: Do interest rate rebates significantly increase homeownership by reducing borrowing costs? Rising housing unaffordability and escalating interest rates have created substantial barriers to homeownership for middle-income families. Policymakers and financial institutions have implemented interest rate rebate programs as a potential solution to reduce borrowing costs, but their effectiveness remains underexplored in the literature. This study seeks to fill this gap by analyzing the relationship between interest rate rebates and homeownership rates, while also identifying areas for further investigation. Using a mixed-methods approach, we analyzed historical mortgage data from financial institutions to assess changes in homeownership rates following the implementation of rebate programs. Preliminary findings reveal a positive correlation between the availability of rebates and increased homeownership among middle-income families. Specifically, rebates have been shown to reduce monthly mortgage payments, making homeownership more accessible significantly. These quantitative results are supplemented by qualitative insights from surveys and interviews with recent homebuyers, highlighting how interest rate rebates influenced their decisions to purchase homes. Building on these findings, future research will expand the dataset to include longitudinal studies across different regions and demographic groups, providing a more nuanced understanding of the long-term impact of interest rate rebates. Additionally, we plan to explore how such rebates interact with other housing policies and economic conditions to influence homeownership trends. By identifying best practices, this research aims to inform policy recommendations for expanding rebate programs to promote housing affordability and economic equity. This study contributes to the broader discourse on affordable housing solutions, emphasizing financial incentives in addressing systemic barriers to homeownership. The findings provide actionable insights for policymakers, and financial institutions, fostering a collaborative approach toward creating a more equitable housing market.

Emma Selle

IL - Elmhurst University

Discipline: Theatre/Drama

Authors:

Abstract Name: A Dramaturgical Examination of The Life of King Henry the Fifth by William Shakespeare

This paper serves as a digest of the historical and theatrical context of Shakespeare's "Henry V," as well as an investigation of the question central to all dramaturgy: why this play now? The project approximates the sort of informational packet that a director, actor, or designer might expect to receive to aid in the development and production of the play to provide a deeper contextual and thematic understanding of "Henry V." The information is structured to be digestible and flow thematically; it begins with the historical context in which Shakespeare wrote, outlining the broad strokes of Elizabethan England, particularly as concerns the Church and the Queen, but also the lives of ordinary men; then an explanation of the history play as a genre, which was at its peak of popularity at the time, and the genre into which Henry V falls; then a biography of Shakespeare himself. An analysis of the play ends the digest; first the play is placed within the context provided at the beginning of the paper. There is a summary of the action, a breakdown of three of the main historical characters as compared to the real men and woman, and a comparison between three productions of the play: Laurence Olivier's 1944 film adaptation, Kenneth Branagh's 1989 film adaptation, and the fall 2024 Chicago Shakespeare Theater production. The conclusion explores whether Shakespeare's work, specifically "Henry V," remains relevant today. The paper ultimately concludes that the works of Shakespeare, specifically "Henry V," remain relevant and timely even today. Literary and historical research, utilizing sources from resource texts, the books and articles of Shakespearean scholars, film productions, and a contemporary stage production, comprise the body of sources that are the foundation of this project.

Matthew Selvaggio

NY - SUNY New Paltz

Discipline: Engineering

Authors:

#1 Matthew Selvaggio

#2 Mahdi Farahikia

#3 Eric Rosenfield

#4 Ping-Chuan Wang

#5 Alexander Gorzula

Abstract Name: Numerical Computations of Advanced Water-Cooled Cold Plates for Thermal Management of Microchips with Hotspots

Computers lie at the heart of today's technological world, powering everything from simple web searches to the development and testing of sophisticated systems like spaceships. Computer chips are the core component that allows for such a world to exist, and their processing power is continuously increasing. This demanding increase in performance brings many challenges. Overheating and uneven temperature distribution in microchips is a significant issue that undermines their reliability and lifespan. Traditional cooling methods, such as air cooling, often fail to address these challenges effectively, as they do not have an adequate heat transfer rate and struggle to dissipate heat from localized high-temperature regions known as hotspots. To enhance the thermal management of the chips, liquid cooling solutions have emerged as a promising alternative, utilizing convective heat transfer. Inside the cold plate, the use of pin fins within the regions of

high heat flux allows for a targeted approach to combating hotspots. This study investigates the influence of cold plate geometrical parameters on its thermal and hydraulic performance using finite element analysis in COMSOL. The results indicate that cold plates designed with an increased density of pin-fins near the hotspot significantly outperform conventional designs in terms of thermal efficiency. This level of thermal efficiency is further improved with higher flow rates. However, the advantages come with trade-offs; higher flow rates require increased pump power, which directly translates to higher energy consumption and higher operational costs. These findings underscore the importance of carefully optimized designs that balance superior thermal performance with energy efficiency, ensuring practicality and sustainability in real-world applications. Finding this balance is the critical objective of this research.

Anastasia Semenova

VA - Virginia Tech

Discipline: Psychology

Authors:

#1 Anastasia Semenova

Abstract Name: Student-to-Teacher Expressions of Gratitude: Impact of a “Thank You” on Subjective Well-Being

The Actively Caring for People Movement—www.ac4p.org—integrates humanism and behavioral science (i.e., humanistic behaviorism) to promote the occurrence of interpersonal acts of kindness and/or prosocial behavior. This ongoing research has been assessing the impact of expressing interpersonal gratitude on various mood states of students after they deliver a customized thank-you card (TYC) to the instructor of their university class. As a benefactor of personal gratitude, a research student delivered a TYC to his/her instructor after class. The benefactor, as well as a second randomly-selected student in the class (i.e., in a control group), completed a mood survey before and after the class. The survey employed a Likert Scale to assess 19 mood states (e.g., vulnerability, confidence, interest, and happiness) from 1 (untrue) to 10 (true) in order to reflect the student’s current emotional feelings. The TYC included a section for the benefactors to express personal words of appreciation to their professor/instructor. Qualitative analysis revealed uniformly positive emotions from all instructors and from each of the 64 students who delivered a TYC. The quantitative analysis demonstrated a significant 36% increase in the students' overall positive mood states, after delivering a TYC to their professor/instructor, compared to the control group that showed no significant change in the positive mood states that were assessed. The results of this study support the notion that expressing interpersonal gratitude can enhance a person’s subjective well-being (SWB) across multiple mood states. This study also highlights an advantage of designing and implementing interventions to increase occurrences of interpersonal expressions of gratitude among individuals, perhaps with a customized TYC, as an evidence-based strategy for enhancing SWB. Thus, this research accentuates the significance of gratitude expression for the enhancement of interpersonal relations and SWB, as well as the beneficial application of humanistic behaviorism to cultivate an AC4P culture.

Benoy Sen

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 William Rabon

#2 Hansen Deng

#3 Rida Mitha

#4 Nitin Agarwal
#5 David Okonkwo
#6 James Mooney
William Rabon

Abstract Name: C7-T1 Anterior Cervical Discectomy and Fusion for Cerebrospinal Fluid Leak Repair

Introduction: Cerebrospinal fluid (CSF) leaks can be spontaneous, traumatic, or iatrogenic and can result in potentially serious complications such as CSF hypotension leading to headaches and neurologic dysfunction. In most spontaneous cases, an epidural blood patch is successful in sealing the leak. However, in severe cases unresponsive to less invasive treatments, surgical intervention may be necessary. Anterior cervical discectomy and fusion (ACDF) is a rarely reported treatment for spontaneous CSF leak. Herein, we present a unique case of repair of spontaneous ventral CSF leak with ACDF to treat symptoms of CSF hypotension. **Methods:** The patient presented with intractable, positional headaches and associated nausea/vomiting. Initial brain and spine imaging revealed a spontaneous CSF leak with signs of CSF hypotension and CSF buildup ventral to the spinal canal at the C5-T3 levels. A non-targeted blood patch provided minimal relief. Dynamic computed tomography (CT) myelogram demonstrated evidence of a focal CSF leak at the C7-T1 level associated with a ventral osteophyte. ACDF was performed in standard fashion with removal of the posterior longitudinal osteophytes. A small subcentimeter dural defect was noted at the C7-T1 level and repaired with two 7-0 prolene sutures followed by Tachosil fibrin sealant and Duraseal. Valsalva maneuver showed no further egress from the defect prior to graft and plate placement. **Results:** Postoperatively, the patient noticed significant improvement in positional headaches. Recurrent frontal headaches were determined to be from prolonged cerebrospinal fluid loss, and gradually improved as expected. The patient sustained a recurrent laryngeal nerve injury resulting in minor dysphonia from surgery that was improving at six-week clinic follow-up. **Conclusion:** Spontaneous CSF can result in refractory intracranial hypotension leading to headaches and potential neurologic dysfunction. When unresponsive to traditional treatments such as blood patch, an anterior cervical approach can be utilized to repair accessible ventral spontaneous CSF leaks.

Michael Sensenbrenner

IL - Northern Illinois University

Discipline: Interdisciplinary

Authors:

#1 Ziteng Wang
#2 Allison Gladfelter
#3 Milijana Buac
#4 Sinan Onal
John White

Abstract Name: iGAIT: A Smartphone-accessible Early Screening Tool of Autism Spectrum Disorder for Children Using Video-based Gait Analysis

One in 36 children are autistic in the U.S. We are experiencing a public health crisis related to autism diagnosis. Although children show clinical signs of autism early in their development, many children are not diagnosed until well into preschool years, and children from minority, low-income, and rural backgrounds are diagnosed at an even later age. This autism equity crisis is due to lack of access to reliable and appropriate tools for screening as well as the proven racial and gender biases in existing tools. Without a timely diagnosis, autistic children are prevented from receiving early intervention services. There is a critical need for accessible, innovative, less subjective, and more inclusive tools for early detection of autism. We created a website, called iGAIT, as a free mobile-accessible web-based application developed to provide easy accessibility for early screening of Autism Spectrum Disorder (ASD) in children using video-based gait

analysis. This new screening tool leverages computer vision algorithms and deep learning models to screen for autism based on gait parameters extracted from user-recorded videos of children walking. Preliminary tests on a dataset of 41 children (16 autistic, 25 non-autistic, aged 5-12 years) demonstrated promising accuracy of up to 90%, with ongoing enhancements and validation underway. Powered by the university's high-performance computing cluster and commercial cloud-based computing and storage services, iGAIT can generate results in less than one minute, providing a fast and efficient experience for families worldwide. This tool is friendly to non-speaking children and children of any gender and race. The tool could lower the barrier to autism screening and diagnosis for low-income families, raising autism awareness and reducing delays in intervention. The research also advances gait-based health evaluation technology.

Kayal Senthil

KY - University of Kentucky

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Beacons of Alliance? Mapping the Fading of Lesbian Bars in the United States

Third spaces provide a place of refuge outside the bounds of home and work. Particularly for women, these spaces also provide solidarity, a place to affirm identity, and socialize in community without fears of being harmed and ostracized. For lesbian women, dedicated bars have provided this refuge, but it is quickly disappearing. From 200 lesbian bars to less than 30 in the span of 45 years, lesbian communal culture has shifted gears in the United States. The definition of lesbian bars differ among the queer; interpretations include bars for just lesbian women and bars for all marginalized queer who are empowered by the label of lesbian. The aim of the project is to map the disappearance of lesbian bars in the United States over the last 50 years and analyze reasons for why these shifts occurred. Building on previous research on queer experiences in queer-labelled spaces, this study will approach the gradual shift in the physical presence of bars to explore if and how these queer spaces provided a safe space where people were able to affirm, appreciate and explore their identity, whether gender or desire. Queer experiences of populations along the LGBTQIA+ spectrum being considered allows interpretations of the limitations that lesbian-labeled spaces stage in queer culture. Community is central to groups facing systematic discrimination. To combat isolation and move towards progress, the process of community building and being "communally queer" is a form of advocacy and an act of resistance to the social exclusion faced. An analysis of the locations and general phasing out of the lesbian bars will reveal how acts of resistance through community building and the presence of safe spaces show a directional movement in the changing queer culture.

Anish Senthilkumar

TX - Southern Methodist University

Discipline: Linguistics and World Languages

Authors:

#1 Anish Senthilkumar

#2 Paola Buckley

Abstract Name: Bridging Divides: The Impact of EU Immigration Policies on Economic Assimilation and Political Polarization

Immigration is a defining feature of the 21st century, reshaping the social, economic, and cultural landscapes

of Europe. The European Union, with its diverse member states, presents a unique arena to examine how immigration policies influence the economic assimilation of immigrants and contribute to political polarization. This research explores the multifaceted relationship between these policies and their societal outcomes, addressing the central question: How do the immigration policies of EU countries affect the economic assimilation of immigrants and fuel political polarization? The study employs a mixed-methods approach, combining interviews with immigrants, policymakers, and scholars, analysis of economic data from EU statistical agencies, surveys of immigrant and native populations, and social media content analysis. These methods aim to uncover the nuanced dynamics of policy implementation, economic integration, and public sentiment across diverse policy regimes. By integrating qualitative insights with quantitative metrics, the research offers a comprehensive perspective on the effects of EU immigration policies. Preliminary findings suggest that perceptions of immigrant contributions to the economy are shaped not only by policy frameworks but also by broader societal narratives, often amplified through social media. This research aims to provide actionable insights for policymakers, highlighting the interconnectedness of economic integration and political stability. By doing so, it seeks to inform more inclusive and effective immigration policies, fostering harmony in an increasingly diverse Europe.

Sachitaa Senthilkumar

FL - University of Central Florida

Discipline: Health and Human Development

Authors:

#1 Taj Azarian

#2 Eleonora Cella

#3 Eva Armao

Abstract Name: Genomic Epidemiology of *Staphylococcus aureus* Sequence-type 72

Staphylococcus aureus (SA) is a gram-positive bacterial colonizer and pathogen commonly carried on the skin and in the anterior nares of humans. SA colonization may lead to a variety of non-invasive (e.g., skin and soft tissue infection, SSTIs) and invasive (e.g., bacteremia and osteomyelitis) infections. The SA population is comprised of multiple lineages that can be delineated through multi-locus sequence typing (MLST), which compares nucleotide sequences within seven housekeeping genes. Strains belonging to an MLST share a common evolutionary history as well as phenotypic characteristics such as antibiotic resistance or virulence. As a result, the epidemiology of lineages can be distinct from one another. One such MLST, sequence type 72 (ST72) is an emerging community-associated (CA) and healthcare-associated (HA) lineage made up of both methicillin-resistant and methicillin-susceptible (MRSA and MSSA) strains. To characterize the epidemiology of ST72 and track its emergence, we performed an extensive literature review and meta-analysis of SA genome sequences belonging to ST72. We found that ST72 has been associated with healthcare transmission and is frequently isolated from blood, sputum, and SSTIs among patients hospitalized in the ICU. Individuals who are immunocompromised or have had recent surgery are at a higher risk of ST72 infection. This lineage is prominent in the United States, China, and South Korea and is known for its antibiotic resistance and virulence. In eastern countries, ST72 has also been associated with zoonotic infections, which may have potentially contributed to its spread. Currently, we are performing genomic and phylogenetic analysis to assess the geographic distribution and rate of spread.

Joseph Serio

MS - University of Southern Mississippi

Discipline: Biology

Authors:
#1 Sweta Khanal
#2 Alex Flynt

Abstract Name: circRNA Accumulation on Neurodegeneration and Fitness in *Drosophila melanogaster*

Circular RNAs (circRNAs) are a class of ubiquitous eukaryotic RNA created by back splicing. They accumulate in postmitotic cells, such as neurons, and are a hallmark of cellular aging. circRNAs are also linked to neurodegeneration in Alzheimer's Disease and repeat expansion diseases such as ALS. To limit the contribution of circRNAs to aging and pathobiology it will be essential to understand how turnover of these molecules is regulated. Unfortunately, it is not clear which enzymes are responsible for degrading circRNAs in neurons. This study evaluates the roles of four ribonucleases potentially involved in neural circRNA turnover using the model fly *Drosophila melanogaster*. Transgenic flies with ribonuclease inactivation induced by a mifepristone-activated Gal4/UAS gene switch were assessed for locomotion, lifespan, neural circRNA accumulation, and overall neurodegeneration through immunohistochemistry. If a candidate ribonuclease is involved in circRNA turnover, inactivation would result in hyper-accumulation which will lead to impaired neural function as measured by decreased movement, shorter lifespan, increased circRNA levels, and heightened neurodegeneration. These results will provide novel insights into our understanding of circRNA turnover in neurons and may inform potential therapeutic strategies to mitigate aging and neurodegeneration phenotypes.

Barry Sermons

GA - Georgia State University

Discipline: History

Authors:
#1 Barry Sermons

Abstract Name: All You Have In Life Is Your Name: Uncovering My Family's Story

The purpose of my research was to use any available documents to uncover the story of my family by working my way from my parents backward from one generation to the next. In this presentation, I will discuss the process and results of my ongoing genealogical research, which I began this past summer under the guidance of my faculty mentor. Through gathering and analyzing oral histories, family documents, legal records, and documents from digital databases, I am able to craft a narrative of several generations of my family history. As a senior citizen returning to pursue my educational goals, this project has been fulfilling in ways that I had not imagined. Through telling my family's story, I am able to offer an intimate understanding of the history of African Americans.

Aarthi Sethuraman

CA - Leland High School

Discipline: Biochemistry

Authors:
Ashna Zavery

Abstract Name: Investigating the Impact of Plasma Power on Total Flavonoid Content Across Robusta Coffee

Flavonoids are known for their therapeutic potential in treating diseases such as cancer, Alzheimers, and other neurological diseases. This study follows a preliminary experiment focusing on investigating the flavonoid content in Robusta, Arabica, and Liberica coffee beans. In the second phase of this experiment, we explore how plasma treatment might influence flavonoid levels in these species at various power levels. Our hypothesis is that increased plasma exposure will increase flavonoid content across Robusta coffee. In the first phase, filtered extracts were collected from each coffee species using hydroethanolic solvents and water-bath extraction to maximize the yield of bioactive compounds. The total flavonoid content (TFC) was then measured using a colorimetric aluminum complexation assay. UV-Visible spectroscopy was employed to analyze differences in flavonoid content across the coffee species. The absorbance values for the Total Flavonoid Content assay were compared against a calibration curve of (+) Catechin. Results indicated that Robusta coffee beans had significantly higher levels of total flavonoid content (mg Catechin/mL) compared to Arabica and Liberica beans. In the second phase, Robusta coffee beans were exposed to a DBD plasma jet. Experiment was performed to measure the plasma powers at various operating conditions. The colorimetric aluminum complexation assay and UV-Visible spectroscopy were employed to analyze the differences in flavonoid concentration between the different plasma exposures and powers. It was found that for 24 Watts plasma input power, 15 minutes plasma exposure was able to increase the flavonoid concentration, and with higher exposure duration, flavonoid content significantly decreased. This experiment shows that around 15 minutes was the optimal duration to ensure the highest flavonoid concentration for Robusta coffee. The experiment is now being repeated at various plasma input powers to find the optimal plasma power for highest flavonoid concentration. Experimental results will be included in the final presentation.

Aidan Setlock

PA - Point Park University

Discipline: Law and Legal Studies

Authors:

Abstract Name: Addressing the Mental Health Crisis in Allegheny County Jail: Failures, Reforms, and Comparative Insights

The ongoing mental health crisis within correctional systems presents substantial challenges, as evidenced by systemic failures such as inadequate staffing and insufficient resources. This research examines these issues through a focused investigation into the conditions within the Allegheny County Jail (ACJ), where legal cases such as *Howard v. Williams* (2020) and *Lagrotteria v. Allegheny County* (2023) highlight the severe consequences of neglect, including unmet health needs and preventable deaths. Special attention is given to the human effects of this crisis by analyzing the direct harm experienced by ACJ inmates, drawing on recommendations and mortality reviews conducted by the National Commission on Correctional Health Care (NCCCHC). These evaluations reveal systemic gaps in suicide prevention, crisis intervention, and healthcare integration, emphasizing the need for immediate reform. The study evaluates the potential of Mental Health Courts (MHCs) as diversionary systems designed to address the root causes of criminal behavior through treatment rather than incarceration. Additionally, it explores the potential effects of trauma-informed systems of incarceration, including California's "California Model," Oregon's rehabilitative approaches, and Norway's internationally lauded prison system. These models prioritize humane treatment, dynamic security, and rehabilitation over punitive practices, offering innovative frameworks to address the crisis. Furthermore, the research investigates the detrimental effects of inadequate staffing and resource shortages at ACJ on inmates and staff. These shortages not only harm inmates but also burden staff with extended hours and unreasonable expectations beyond their professional capabilities. Consequently, alarmingly low rates of job satisfaction, increased stress, and high turnover rates are observed. A financial analysis demonstrates the cost-effectiveness of investing in mental health services, vocational training, and educational programs. Such investments, as exemplified in alternative corrections approaches, substantially reduce recidivism rates and

associated costs. Ultimately, this transformation of correctional systems into equitable and rehabilitative institutions benefits both individuals and society.

Ava Severino

PA - Lafayette College

Discipline: Biology

Authors:

#1 Eric Ho

Abstract Name: Long Conserved 3'UTRs

3' untranslated regions (3'UTRs) were previously considered junk DNA. However, research has identified sequence elements in 3'UTRs essential for mRNA stability, localization, and translation in the last two to three decades. With the advance of multi-omics, efforts have been made to annotate the diverse biological functions of sequence elements in the 3'UTRs. This project aims to unearth long (>200 bp) and conserved sequence fragments in 3'UTRs of mammals, followed by functional annotation. Phenotypic information from databases such as COSMIC and miRbase will be mapped on the conserved fragments in humans, shining light on their biological functions. This study focuses on five mammals: human, mouse, cow, rat, and platypus. The UTR sequences of these species were downloaded from UTRdb, a curated database of 5' and 3' untranslated sequences of eukaryotic mRNAs. The files were read and processed using the R-package seqinR. Specialized R-codes were curated to isolate only the 3'UTR sequences and their corresponding gene symbols. Mammalian orthologous gene information was obtained from NCBI Datasets. The 3'UTRs of orthologous genes from the five targeted mammals were grouped and aligned by the multiple sequence alignment program MAFFT for conservation analysis. The top 50 genes containing the longest conserved fragments were shortlisted for further analysis. Their descriptions from the NCBI Gene database and OMIM were collected and analyzed by a ChatBot, such as Google Gemini. Although subject to frequent mutations, certain paralogs, e.g., PURA and PURB, of the top 50 genes have shown significant similarity in their 3'UTRs, suggesting that duplication occurs before speciation. The extent of conservation will be obtained by multiple sequence alignment across the five mammals. The information extracted should help to elucidate the biological functions of 3'UTR conservation in gene regulations, and the mechanisms underlying the retention of these sequences across species.

Ashley Sevier

CA - California State University - Bakersfield

Discipline: Biology

Authors:

#1 Kara McCloskey

#2 Jose Zamora Alvarado

Abstract Name: The importance of pericytes in the stability of microvascular tissues

Blood vessels form a complex network of arteries, veins, and capillaries that collaboratively transport blood, nutrients, and oxygen throughout the body, sustaining vital functions. Stability in blood vessels is essential for maintaining proper blood flow and pressure, preventing leakage or rupture, and ensuring the efficient delivery of oxygen and nutrients to tissues while removing waste products. Pericytes, a supplementary cell type, play a critical role in maintaining the stability of microvasculature. Here we explore the relative importance that

pericyte density plays in establishing vascular networks emerging from human umbilical vein endothelial cells (HUVECs) and pericytes co-cultures within a microfluidic device. Specifically, we varied the ratios of pericytes while maintaining the HUVEC density at 4,000,000 cells/mL. The ratios explored were 1:1, 1:2, and 1:10 pericytes to HUVECs. We found that our 1:10 ratio formed the most efficient vessels while the other two had little to no formation. While these vessels can form within the channels of microfluidic devices, their longevity remains a challenge.

Jordan Sexstone

WV - West Virginia University

Discipline: Biology

Authors:

#1 Abigail Jones

#2 Daniel Panaccione

Abstract Name: Ergot alkaloids in the fungus *Aspergillus leporis* affect the foraging behavior of the slime mold *Physarum polycephalum*

Ergot alkaloids produced by fungi affect mammals and insects. We hypothesized they also affect the interactions of fungi with protozoans. We investigated the interaction of the acellular slime mold *Physarum polycephalum* with the soil-inhabiting, ergot alkaloid-producing fungus *Aspergillus leporis*. Wild type *A. leporis* and a previously characterized *easD* knockout strain which differ in ergot alkaloid profiles were grown on sucrose yeast extract agar (SYE) for 6 or 13 days. Plugs (8 mm diameter; 400 μ L) of fungus-colonized SYE were removed and inserted into wells cut into water agar plates. Inoculum of *P. polycephalum* was placed equidistant between the two fungus sources. Observations of preference (or lack thereof) of *P. polycephalum* for either fungus plug was recorded 20 hr later. Ergot alkaloids were quantified from replicate plugs from the same cultures by high performance liquid chromatography. Total ergot alkaloids did not vary by strain and day, but 6-day wild type samples were dominated by lysergic acid α -hydroxyethylamide (LAH) which was converted primarily to lysergic acid by 13 days. Chanoclavine was the most abundant ergot alkaloid in both 6 day and 13 day samples of *easD* knockout. When presented with 6-day-old samples of SYE colonized with wild-type *A. leporis* (containing mainly LAH) or the *easD* knockout of *A. leporis* (containing mainly chanoclavine), *P. polycephalum* preferred the *easD* knockout strain over the wild type ($P = 0.0005$). In contrast, when given the same options at 13 days, the most common outcome was for *P. polycephalum* to not make a clear choice ($P < 0.001$). With these older samples, there was no preference for *easD* knockout over the wild type ($P = 0.42$), which by 13 days had lost most of its LAH. We conclude that ergot alkaloids affect the foraging behavior of *P. polycephalum*, which appeared especially sensitive to LAH.

Jaylin Seymour-Valery

VA - Norfolk State University

Discipline: Business

Authors:

#1 Mojtaba Sirjani

Dalon Tolson

Abstract Name: Consumer decision making behavior

In our world, every person wants something. Whether it is a toy for a child or a car for an adult, humans will

always have their eye on a product. A product is an article or substance manufactured or refined for sale. They are used in a person's daily life and are imperative for human living. For example, soap is used for cleaning or food for eating and health. During the 2021 pandemic, some products that were imperative for human living were tissue paper and disinfecting agents. The problem was that there was a shortage of these items. Stores had less and less as the demand went up. Some markets would even make their products much more expensive than average. As a buyer, what steps should one take to buy this product? How do they strategize to ensure they can find what they need? This study analyzed an individual consumer's economic decision-making and behavior about supply and demand. People behave and make decisions in supply and demand situations based on five steps: recognition, information search, alternative evaluation, purchase decision, and post-purchase evaluation. The study found that internal factors, such as attitudes, beliefs, and past experiences, and external factors, including social influences and marketing efforts, influence this process. This process helps businesses refine their marketing strategies and foster stronger customer relationships.

Keywords: Consumer decision-making, recognition, purchase decision, supply, demand, information search

Nina Shaffer

IN - DePauw University

Discipline: Biology

Authors:

#1 Philips Akinwole

#2 Kaija Carr

#3 Thi Doan

#4 Zoe Green

#5 Kenneth Brown

#6 Crimson Hickman

Emma Jacobs

Abstract Name: Exploring Subterranean Microbial Dynamics of an Indiana oligotrophic cave ecosystem

Subterranean ecosystems, characterized by limited nutrient availability, offer critical insights into microbial adaptations to extreme environments. This study investigated bacterial communities and physicochemical properties of soil and water samples from four distinct locations within the Deep Darkness section of Indiana Caverns and reference sites outside of the cave. Results revealed significant spatial heterogeneity in bacterial carbon metabolism, microbial biomass ($p < 0.001$), sediment % N ($p < 0.001$) and percent total organic carbon [TOC] ($p < 0.001$). The low TOC (0.373 - 0.793%), % N (0.044 - 0.073%), and microbial biomass (6.55 - 76.16 nmol PLP/gdw) compared to the reference site (4.035%; 0.348%; and 122.51 nmol PLP/gdw, respectively) indicates the cavern is an oligotrophic environment. Metal concentrations in the cave and reference sites were comparable to Indiana state averages for potassium, aluminum, and calcium, lower for phosphorus, iron, and heavy metals, and higher for titanium and magnesium, indicating minimal anthropogenic impact in the cavern system. Principal Component Analysis (PCA) highlighted distinct metabolic profiles between sediment samples inside and outside the cave. PC 1 and 2 accounted for 59% of the variance observed in the bacterial community structure, differentiating sediment, water, and reference samples based on carbon utilization patterns within the 96-well BIOLOG Ecoplate. Sedimentary bacteria utilized Tween 40, Tween 80 (polymer), L-Asparagine (amino acid), Pyruvic Acid Methyl Ester (carbohydrate), γ -Hydroxybutyric Acid (carboxylic/acetic acid) disproportionately compared to cave stream bacteria which utilized more of D-Cellobiose, α -D-Lactose, and D-Xylose (carbohydrates). This study characterizes the Indiana Caverns as oligotrophic environments with low anthropogenic impacts and diverse metabolic groups that are important to conservation, providing a baseline for assessing future impacts like tourism or industrial development. Metagenomic analysis is needed to assess microbial diversity despite extremely low biomass in the Deep Darkness.

Karan Shah

CA - Bellarmine College Preparatory

Discipline: Biology

Authors:

Bhavya Bellannagari

Abstract Name: The Effects of Therapeutic Frequencies on EEG Brain Output

Electroencephalography (EEG) is a technique that uses electrodes to measure the electrophysiological brain signals. Specifically, it focuses on measuring, amplifying, and interpreting postsynaptic potentials to understand how different stimuli influence brainwave patterns. EEG is often used to measure brain activity during events like sleep, stressful situations, concentration, etc. A specific stimulus to consider in the measurement of brain activity is therapeutic frequency. The use of different wellness frequencies to trigger various neurological responses is an emerging field within audiology and psychiatric disorders. This study aims to explore the effects of therapeutic frequencies on EEG activity (brain activity). Using a previous study done based on the effects of different monaural (played in one ear) and binaural (played in both ears) frequencies, this study further elaborates on the use of specific therapeutic frequencies rather than normal frequencies. Experimentation involved playing various wellness frequencies in both ears in order to measure the differences in EEG activity. A portable EEG headband with 4 electrodes was used, as well as the implementation signal processing softwares to average the different bands of frequencies from each electrode. Different waves such as alpha, beta, gamma, and theta waves were observed and relative changes in their pattern were observed during the testing. As such, the resulting impact of various signal bands are currently being interpreted and analyzed, with reference to existing literature to conclude the effects of different frequencies on brain activity. These findings can be valuable in understanding the role of frequency-based music in music therapy, personalized sound therapy, and mental health treatment. This presentation will include the details of the experiment, the data and analysis, and the conclusion of the results obtained.

Muhammad Shah

VA - George Mason University

Discipline: Biology

Authors:

#1 Holger Dannenberg

Abstract Name: Use of Novel Acetylcholine Sensor, GRABACH3.0, to Measure Extent of Acetylcholine Changes in the CA1 Hippocampus Region after Optogenetic Inhibition of Septo-Hippocampal Cholinergic Projections

The goal of this project is to quantify to what extent optogenetic inhibition of septo-hippocampal cholinergic projection neurons in the medial septum/diagonal band of Broca (MS/DBB) in freely behaving mice reduces acetylcholine release at projection sites in the hippocampus (HC). Toward that end, I will combine optogenetic manipulation of cholinergic neurons in the MS/DBB with fiber photometry measurements of acetylcholine release in the HC. Using transgenic ChAT-Cre mice, I will perform stereotactically guided microinjection of a Cre-dependent adeno-associated recombinant virus (rAAV) coding for the inhibitory opsin Archaelrhodopsin T 3.0 into the MS/DBB. In the same mice, I will inject an rAAV coding for the fluorescent acetylcholine sensor (GRABACH3.0) into the HC and, in collaboration with other members of the lab, implant an optical fiber to enable fiber photometry measurements in freely behaving mice. After obtaining data pertaining to acetylcholine release as a function of optogenetic manipulations, the brains of the experimental mice will be harvested to verify, in brain slices of the MS/DBB, the location of the implanted

optical fiber and expression of the inhibitory opsin and, in brain slices of the HC, the expression of the GRABACH3.0 sensor. These data are important in the investigation of the causal effects of cholinergic neuromodulation on hippocampal activity underpinning hippocampus-dependent learning and memory

Prashmi Shah

PA - California University of Pennsylvania

Discipline: Biology

Authors:

Abstract Name: The Oral Microbiome and Dental Hygiene: Assessing the Impact of Brushing and Mouthwash on Microbiome Composition

The human mouth hosts a diverse community of microorganisms, collectively known as the oral microbiome, which plays a crucial role in oral health. Imbalances in this microbiome can contribute to conditions like cavities, gum disease, and other oral infections. Dental cavities, which affect over 90% of adults globally, are among the most common health problems. While the role of diet and bacterial activity in cavity formation is well understood, the relationship between specific oral hygiene behaviors—such as daily use of mouthwash, brushing, or both—and the oral microbiome is less clear. This research aims to investigate the connection between oral hygiene habits and the composition of the oral microbiome, focusing on how specific practices influence microbial diversity and contribute to oral health. To collect data for this IRB-approved study, a group of college age students are being recruited at PennWest California to give buccal swab samples and complete an anonymized questionnaire about their oral hygiene habits, including whether they use mouthwash, toothpaste, or both, as well as history of cavities. DNA will be extracted from each sample and quantified. Illumina MiSeq metabarcoding will then be performed to identify the microbial species present. A secondary analysis will compare the microbiome results with cavity history, while controlling for oral hygiene behaviors. We aim to uncover microbial differences between students who use both toothpaste and mouthwash versus either alone, providing valuable insights into how oral hygiene practices influence oral health. Understanding the relationship between oral care habits, the microbiome, and dental health could lead to more personalized dental care strategies, improving prevention and treatment of oral diseases.

Viral Shah

PA - University of Pittsburgh

Discipline: Engineering

Authors:

#1 Aravind Parthasarathy

#2 Akshat Dhamale

#3 Leslie Zhen

#4 Maggie Zink

Abstract Name: Age-related changes in neural representations of binaural temporal fine-structure cues

Aging is associated with hearing deficits that often do not manifest as changes in overt hearing thresholds. Rather, middle-aged and older listeners experience difficulties listening in noisy environments. One reason for these deficits may be the progressive loss of afferent synapses in the cochlea with age, which remains “hidden” to current clinical tests. This cochlear deafferentation may affect the accurate, binaural representation of temporal fine structure (TFS) cues in speech, which are critical for speaker localization and

identification. Here, we use an objective measure of binaural processing in young and middle-aged listeners with normal hearing thresholds to ascertain the changes in binaural TFS representations. Binaural TFS processing were indexed using the inter-aural phase difference following response (IPDFRs). IPDFRs are phase-locked EEG-based neural ensemble responses that ‘follow’ periodic shifts in interaural phase. IPDFR’s were collected to a 520 Hz tone carrier with phase modulated at 6.8 Hz and amplitude modulated at 40.8 Hz. Phase was shifted at 0°, 22.5°, 45°, and 90° across each ear in opposing directions, and presented at a sound level of 85 dB SPL. IPDFRs decreased in amplitude with the degree of binaural separation, suggesting they are a sensitive metric of binaural TFS coding. IPDFR amplitudes were significantly lower in middle-aged adults, when compared to young adults. There was no change in amplitudes of the phase-invariant EFRs at 40.8Hz, confirming that the IPDFRs were selectively sensitive for binaural TFS coding, while the EFRs represented overall neural phase-locking abilities. EFR amplitudes were also significantly decreased in middle-aged adults compared to the young. Our data suggest that middle-aged listeners experience significantly reduced binaural TFS coding, and these binaural coding deficits may be driven by overall decreases in neural phase locking with age.

Aashka Shah

VA - Virginia Commonwealth University

Discipline: Nursing and Public Health

Authors:

#1 Aashka Shah

Abstract Name: Historical Redlining Practices: Influences on Rising Contemporary Infant Mortality Rates in Richmond, Virginia

Redlining was a discriminatory practice employed in the 1930s of denying loans, credit, and other services to families based on the economic status of their neighborhoods. The practice began when the Home Owners’ Loan Corporation (HOLC) drew maps of residential neighborhoods in 239 cities across the United States between 1935 and 1940 and assigned each neighborhood a grade. The practice of redlining was used to target neighborhoods that had large minority populations, thus reducing their social mobility and quality of life often leading to dramatic racial disparities in healthcare outcomes. The Fair Housing Act of 1968 banned redlining, but the consequences of this discriminatory practice still affect people living in these neighborhoods today. The purpose of this study was to analyze the effects of historical redlining on infant mortality rates in Richmond, Virginia. A literature search of relevant articles from electronic databases was performed from January 2010 to December 2024 to identify original research pertaining to the impact of historic redlining on current infant mortality-related healthcare outcomes. The redlining status of all the neighborhoods in Richmond, Virginia was analyzed to find patterns related to infant mortality, and infant mortality rates were found to be significantly higher in previously redlined neighborhoods due to less access to resources, worse environmental conditions, and racial disparities. Legislative actions to alleviate the effects of redlining such as building hospitals and healthcare facilities, improving access to educational resources, and increasing access to economic opportunities in these neighborhoods were recommended.

Nishat Shama

TX - The University of Texas at San Antonio

Discipline: Biology

Authors:

#1 Shahabullah Mandozai

#2 Amber Arooj

#3 Kelly Nash
#4 Ferhat Ozturk

Abstract Name: Efficacy and Cytotoxicity of Texas Honey and Honey-Coated Nanoparticles on Wound Healing

Honey is a natural therapeutic agent with antibacterial, anti-inflammatory, antioxidant, and anti-biofilm properties, making it highly effective for wound healing. Silver nanoparticles (Ag-NPs) also exhibit strong antibacterial properties and have shown promise in wound healing. However, their high toxicity significantly limits their medical applications. To address this challenge, coating nanoparticles such as Ag, Se, and Ag₂Se with honey offers a promising solution. This approach may reduce the toxicity of nanoparticles while enhancing their antimicrobial activity and wound-healing potential. Using Pulsed Laser Ablation in Liquid (PLAL), honey-coated nanoparticles will be developed, aiming to improve both efficacy and safety in medical applications. This study focuses on the wound-healing potential of Texas honey by examining its effects on fibroblast cell migration through scratch assays and its antibacterial properties using zone-of-inhibition tests. Additionally, cytotoxicity assay is used to measure the toxicity of silver nanoparticles. This research could lead to innovative honey-based medical applications, including coated devices that prevent infections and biofilm formation, ultimately improving wound care.

Keira Shannon

OK - University of Central Oklahoma

Discipline: Art History

Authors:

Abstract Name: Trina Robbins and the Empowerment of Women Through Comics

This paper explores the life and career of Trina Robbins, an American comic book illustrator, author, and feminist. Trina Robbins' everlasting impact on comic book history is detrimental to understanding feminist art and design history and the transformation the comic book industry underwent following the start of her career. The research collected in this paper strives to give insight into the life, motivations, and career of famous illustrator Trina Robbins, as well as the societal views surrounding women in the workplace that were present in the United States in the 1960s and 1970s. By better understanding the societal views involving women in the workplace, one can better understand the impact Trina Robbins had on the comic book industry and feminist history as a whole.

William Sharp

NC - Duke University

Discipline: Biology

Authors:

#1 Michael Sindoni
#2 Jorg Grandl

Abstract Name: Human Piezo2 Single Channel Conductance is Modulated by Alternative Splicing

Piezo2 is a mechanosensitive ion channel responsible for many sensational experiences including

proprioception and light touch sensitivity. Human Piezo2 has 6 alternatively spliced exons, producing various isoforms with tissue-specific expression differences. However, the effect of alternative splicing in human Piezo2 on intrinsic channel properties remains undiscovered. To address this, I first analyzed electrophysiological data collected in my lab measuring the sensitivity of human Piezo2 isoforms to membrane tension, the physical stimulus these ion channels sense. My analysis showed human Piezo1, human Piezo2, and isoforms of human Piezo2 differ in their sensitivity to membrane tension, suggesting that alternative splicing may control mechanosensing by human Piezo2. Second, I focused on the single channel conductance of human Piezo2 isoforms. Piezo2 has a high level of structural homology compared to Piezo1. The only splice variant of mouse Piezo1, mouse Piezo1.1, lacks amino acids known to form a structure that plugs the pore, thereby modifying its single channel conductance. Since an alternatively spliced exon in Piezo2, exon 33, corresponds to the same amino acids absent in mouse Piezo1.1, I asked if exon 33 in human Piezo2 affects single channel conductance. Through cell-attached patch-clamp electrophysiology, I recorded single channel opening events. I found that a construct lacking all exons (Piezo2Min) has a significantly greater single channel conductance ($g = 32.1 \pm 3.6$ pS) than a construct containing all exons (Piezo2Max) ($g = 20.4 \pm 2.2$ pS). These results indicate that alternative splicing in human Piezo2 modifies single channel conductance in addition to tension sensitivity. My current focus is on investigating the necessity and sufficiency of exon 33 in determining single channel conductance of human Piezo2. These findings indicate that alternative splicing in human Piezo2 is a mechanism of modulation for intrinsic channel properties and is utilized physiologically to meet tissue-specific mechanosensing and channel conductance needs.

Evan Sharp

FL - Jacksonville University

Discipline: Engineering

Authors:

#1 Evan Sharp

Abstract Name: A Study on Multivariable Interactions Concerning Radar Cross Section Reduction through Geometric Attributes

Radar Cross Section (RCS) is a quantifiable measurement of radar stealth, often used in military application. Despite the presence of many studies concerning how radar cross section is impacted by geometric attributes, there is a lack of discussion on how different geometric variations may interact together to drastically impact the resulting RCS. This resolution 5 (2^5-1 factorial) study aimed to ascertain an understanding of the interactions between different geometries on the resulting RCS of a target. This experimental study utilized 16 custom specimens to quantify the effect of each variable on the specimen RCS, and to find potential interaction points. The results of the study are in line with the general understanding of the impact different geometries have on RCS and did not show any impactful interaction points, but did find that geometries can also influence the variance of measured RCS. It was concluded that typical attributes that reduce RCS also increase the variance of the measured RCS. Notably, an increased angle between the front face of a plate and the direction of the radar signal decreased RCS but increased the variance of the RCS measured. This research may be used to better understand the impact of geometric qualities on RCS variation, allowing for more efficient and stealthier design for military application.

Julia Shawn

OK - University of Central Oklahoma

Discipline: Exercise Science and Nutrition

Authors:

Abstract Name: Does Treadmill Walking While Studying Increase Academic Performance in College Students

As we know college can be where young adults transform and become their true authentic selves, therefore the habits they create will follow them throughout their lives. Physical activity can be hard to promote on campus because college students think they do not have time for it, with other responsibilities they have. However, physical activity is crucial to student health and should be seen as a top priority along with other student obligations. The purpose of this project was to increase physical activity and improve academic performance in UCO students over the 2024-2025 academic year by using a treadmill desk in the Chambers Library while studying. A treadmill and desk were set up in the University Library where participants had access anytime they wanted during operating hours. Participants were required to fill out four questionnaires (i.e., QR codes) throughout the course of the study. The first QR code was a participant waiver and the second contained questions to gather participants' academic standing, exercise habits, and study habits. The third QR code had questions regarding if their test scores improved and if their ability to focus in school had improved - this questionnaire occurred after each time on the treadmill. The fourth QR code contained questions regarding the participants' GPA for the fall 2024 semester, how many times they walked on the treadmill, if their focus in school improved, and if their motivation regarding exercise and school occurred at the completion of the study. Data collection is still underway and data will be analyzed once the treadmill intervention ends in mid-March 2025. Walking is an everyday activity and as college students we also study daily. Being able to do two activities at once is beneficial to using our time wisely and may benefit student health and academics.

Ethan Shearer

PA - Duquesne University

Discipline: Computer Science

Authors:

#1 Ethan Shearer

#2 Lauren Sugden

Abstract Name: A Data-Driven Analysis of Public Transportation Accessibility and Efficiency Amid Contentious Transition

Public transportation around the United States of America saw large changes in travel patterns following the COVID-19 pandemic, with decreased ridership and increased safety precautions (Federal Transit Administration, 2024). Specifically, in Pittsburgh, these changes that may never return back to normal caused the local public transit authority, Pittsburgh Regional Transit (PRT), to raise questions about the system's effectiveness and propose potential new route layouts (Deto, 2024). The thought of community-impactful changes, whether positive or negative, raised concern and caution among citizens (Pittsburghers for Public Transit, 2024). The purpose of this project is to identify flaws in the current (prior to PRT's redesign) system in terms of accessibility and operational efficiency, as well as identifying regions that could benefit from higher public transit presence. Previous work in public transit analysis has focused on developing methods for determining system operational efficiency, calculating a system's special coverage, and proposing networks using graph theory. This project focuses on PRT specifically, leveraging these existing tools while incorporating PRT's particular circumstances (topography, existing infrastructure, walkability, etc.) in order to assess accessibility and efficiency. I use open-source PRT data, Allegheny County census data, and self-collected vehicle counts to understand the effectiveness of Pittsburgh Regional Transit. Through this work, we can uncover which regions of Pittsburgh are underserved by PRT's current system, and what effects recently proposed changes will have. Additionally, findings may show redundancies in transit routes that are costing the organization.

Brock Sheehan

UT - Utah Valley University

Discipline: Biology

Authors:

#1 Brock Sheehan

#2 Jake Wallin

#3 Jeremy Wilson

Jeremy Wilson

Jake Wallin

Abstract Name: Isolation and partial characterization of a bacteriophage that effectively kills a clinical strain of the pathogenic bacterium *Pseudomonas aeruginosa*.

Background: *Pseudomonas aeruginosa* causes lung infections in subjects with cystic fibrosis and respirator users, skin infections in subjects with burn injuries, systemic infections in people with a compromised immune system, and ear, nose, eye, urethra, and soft tissue infections in healthy subjects. Many pathogenic strains of *P. aeruginosa* are multi-drug resistant (MDR), and some are extensively drug-resistant (XDR). This study aimed at isolating bacteriophages that can be used for phage therapy to treat MDR and XDR infections caused by *P. aeruginosa*. **Methods:** The MDR *P. aeruginosa* strain Boston 41501 (ATCC27853) was obtained from ATCC (Manassas VA). The strain was used to screen lytic bacteriophages found in untreated wastewater using standard phage-enrichment/overlay agar methods. Phages that created large clear plaques were plaque-purified to homogeneity and characterized. **Results:** We isolated one strain of bacteriophage that rapidly kills the bacterial strain and creates large clear plaques (~3 mm in diameter). The bacteriophage is stable in the refrigerator and at -80 °C for at least three months. The lack of formation of mesas on overlay agar plates infected at high multiplicity of infection indicates that the bacteriophage does not cause lysogenic infection and, thus, is potentially suitable for phage therapy. We have sequenced the genome of the bacteriophage and are planning on studying the genomics, virology, and therapeutic utilities of the bacteriophage. **Conclusions:** We have isolated a lytic bacteriophage that can have the potential of phage therapy to treat infections caused by MDR strains of *P. aeruginosa*. Detailed studies on taxonomy, genomics, virology, and clinical applicability of the bacteriophage using an in vivo model are underway.

Haley Sheffield

VA - Virginia Commonwealth University

Discipline: Criminology/Criminal Justice

Authors:

Abstract Name: Enhancing Police Response to Domestic Violence

There is a growing concern in the criminal justice field that shows police officers' poor effectiveness in responding to domestic violence calls. This inadequate response is not only increasing risk to victims but is also diminishing trust in law enforcement which potentially creates cycles of violence. This research will employ quantitative data on response rates and qualitative data on officers and victims. Some studies suggest that domestic violence calls are among the low priority, which further intensifies the issue. My research will explore three potential key interventions to improve these response rates: de-escalation instructor courses, scenario-based training, and implementing domestic violence response teams (DVRTs). Analyzing the impact

of these interventions aims to show how they can enhance officers' empathy and competence when responding to domestic violence calls. My poster presentation will show that incorporating these interventions in policing will ultimately reduce recidivism rates, increase community trust, and increase victim cooperation.

Tanmay Shekhar

MI - Michigan State University

Discipline: Psychology

Authors:

#1 Tanmay Shekhar

Abstract Name: Testing the Role of Rhythm in Auditory Selective Attention

Rhythms exist throughout our world, from locomotion to speech. Dynamic Attending Theory (DAT) proposes that there are internal attentional rhythms that can be entrained (synchronized) by external stimulus rhythms. This means that attention becomes aligned with the timing of temporally predictable events, thereby enhancing perception (Large & Jones, 1999). In several studies testing DAT-based predictions about the role of rhythm in selective attention to target speech, McAuley et al. (2020, 2021) found a background rhythm effect where disrupting the rhythm of background speech improves target recognition. This aligns with the Selective Entrainment Hypothesis (SEH), which proposes selective attention to target speech is facilitated by entrainment to target rhythms but can be disrupted by inadvertent entrainment by competing background rhythms. From this perspective, the background rhythm effect emerges because varying the background rhythm makes inadvertent entrainment unlikely. Two experiments test SEH using regularly and irregularly-timed tone sequences. In Experiment 1, participants listened to isochronous tone sequences presented with or without background isochronous sequences at different tempos. The sequences were followed by two tones marking out a time interval shorter or longer than the interval marked out by the target sequence. Participants made shorter/longer judgments about the final interval relative to the target while ignoring the background. Experiment 1 showed an overall background effect where performance was worse when the target sequence was presented with a background sequence than when it was presented alone. A tempo effect was also found where the tempo of background rhythms systematically biased duration judgments. Experiment 2 uses the same task as Experiment 1 but includes irregular background sequences. If the effects in Experiment 1 are due to inadvertent entrainment to the background sequence, disrupting the background rhythm should reduce the effects of the background in Experiment 2. Results will be discussed in the context of SEH.

Samantha Shelffo-McGrath

IL - University of Chicago

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: "Altogether A Most Improper Looking Spectacle:" Gender Transgressions and the Policing of Deviant Sexuality in Chicago's Levee Districts, 1893-1911.

Throughout the 1890s and 1910s, same-sex desire began to be increasingly understood as an identity rather than a set of behaviors as the primary framework through which queerness was understood shifted from theological to medical. This shift towards an identity-based model created a queer interior androgyny whose

expression was persecuted as a ‘gender transgression’ in a way that differed from other forms of sexual deviance like prostitution. Chicago’s red-light districts, known as the “Levee” functioned as a safe haven for all forms of vice, as an early gathering place for queer men, and a district through which the differential treatment between gender- and sex-based transgressions by policing and reform efforts can be analyzed. Using documentation around arrests, legal trials, and reform missions, I find that while (white, female) prostitution, much like alcoholism, was treated as a vice arising from circumstance and environment, this new understanding of same-sex desire as stemming from an internal characteristic caused gender transgressions to be treated as a dangerous and potentially corrupting force. Though both prostitution and same-sex desire were forms of deviant sexuality, the internally-motivated nature of the homosexual meant he could not be saved by Christian reformers, only repressed – and as ‘the homosexual’ became better understood as an identity he was assigned character traits through which police were able to persecute nascent queer communities on the basis of seeming queer without the proof of sodomy.

Ethan Shelstad

FL - University of West Florida

Discipline: Engineering

Authors:

Abstract Name: Optimized Routing for Bio-Inspired Traversal (O.R.B.I.T)

This project will develop a robust algorithm to enable a bio-inspired spider robot to efficiently walk and navigate within uncontrolled environments. The robot is equipped with eight legs, making it stable after sustaining leg loss. However, if two or more legs are lost, the robot’s gait can become unstable. To maintain the gait stability, this algorithm will analyze information about the status of the legs. As limbs are removed, the gait pattern will be adjusted according to Cruse’s rules of motion and attempt to maintain a stable support polygon. There are several examples of gait adjusting algorithms in current legged robot research, however, this project will prioritize body stability. Since payloads will be mounted to the robot, the body must remain within nominal tilt parameters. The control policies are learned in a simulator and then deployed on the robot. The system will be closed loop, and the robot is mostly “blind”, only receiving proprioceptive data and simple obstacle feedback. The tilt will be monitored by internal sensors, and verified by external monitoring software. To gather the most accurate data, a leg will be fully removed when testing for stability after leg loss. For testing, the robot will run a predetermined course before and after a limb has been removed, and the mean tilt error (the difference between nominal parameters and maximum tilt) will be analyzed.

Felicia Shen

PA - University of Pittsburgh

Discipline: Psychology

Authors:

#1 Felicia Shen

#2 Einat Heyd-Metzuyanim

#3 Melissa Libertus

Abstract Name: Examining Routinized Math-Learning in Parent-Child Conversations: A Commognitive Analysis

The proposed study seeks to use discourse analysis to investigate how parents may create math learning

opportunities for their 4-year-old children during pretend grocery shopping. Past research focused on the quantity of math talk, e.g., frequency counts of number words and different categories of math talk, finding that the frequency of parents' math talk shows a small, but positive association with children's math skills (Silver et al., 2024). However, this approach does not address how learning may occur during these conversations. To address this gap, the current study will use Commognitive Theory to guide an in-depth discourse analysis. The Commognitive Theory states that learning mathematics is becoming a participant in a historically established discourse by individualizing the discourse without consulting an authority figure. There may be communicational gaps between the learner and the teacher that prevent the learner from completing the task, creating a discursive gap. Parents have the unique opportunity to act as knowledgeable others to help bridge those gaps for their child and guide their child through the math learning process. Transcripts and video recordings of 4-year-old children and their parents will be analyzed to identify patterns of routines, ritualization, de-ritualization, and discursive gaps, aiming to examine how math learning emerges during semi-structured parent-child interactions. This research is expected to provide deeper insights into math learning, emphasizing the language and discourse content employed during pretend play. Furthermore, this study aims to uncover how routines can aid in math learning and how parents and children may collaboratively close gaps.

Noah Shepardson

IA - Iowa State University

Discipline: Computer Science

Authors:

#1 Noah Shepardson

#2 Owen Harty

#3 Vicky Lee

Owen Harty

Vicky Lee

Abstract Name: Imperial vs. Metric: Evaluating the Impact of Unit Choice on LLMs

Large Language Models (LLMs) excel in various natural language processing tasks such as text generation and contextual analysis. Because of their advanced capabilities, LLMs have become commonly used by people across the globe for a wide variety of applications. Evaluating LLMs requires understanding the factors influencing their accuracy across diverse task formats. Their ability to handle diverse measurement systems becomes crucial for maintaining reliability between cultural contexts. This concept of metrics is important for LLMs to understand because they may otherwise output improper conversions that users cannot easily correct or may miss entirely, leading to potential issues. This study systematically analyzes the differences in metric versus imperial units across multiple datasets (GMS8K, MAWPS, and ASDiv-A) to understand how these differences impact reasoning and accuracy with Math Word Problems. In our research, we will be testing the particularly popular models ChatGPT (4o and 3.5-Turbo), Llama (3 and 3.2), and Gemma (7B). We test against various models because of their differing parameter sizes and open or closed-source nature, allowing for a broad analysis. By isolating the influence of metric representation on these models' behaviors, this research can potentially help develop more accurate frameworks and inform the design of more reliable LLM models that can consistently handle real-world measurement variations in the future.

Sviatoslav Shevchenko

MA - Boston University

Discipline: Interdisciplinary

Authors:

#1 Sviatoslav Shevchenko

#2 Jerry Whitmore

Abstract Name: The Student Loan Market and the Risk of Student Loan Asset-Backed Securities

Credit enhancements and strict underwriting standards have mitigated the market's vulnerability to systemic shocks (Xu & Ortiz-Eggenberg). Loan delinquency rates and correlations of previous defaults with broader economic conditions could hint at similarities with mortgage-backed securities' liabilities before the 2008 financial crisis (Duque). The SLABS' (Student Loan Asset-Backed Securities) securitization process, coupled with disadvantageous forbearance and deferment policies, will further exacerbate the financial burden on borrowers (Rall & Olin) and decrease market transparency, possibly destabilizing both the economic and educational landscapes (Rall & Olin). The framework of this research considers the perspectives of SLABS' financial risk and the socioeconomic accessibility of education. Similar to previous studies, data sources will include the Federal Reserve Board, the Securities Industry and Financial Markets Association, and Bloomberg. SLABS' market trends will be quantitatively analyzed with regression analysis from secondary data, namely factors such as the performance of securitization trusts, their delinquency rate, and the pattern of defaults likely to occur in such trusts. The expected outcomes of these risks will assess implications for public policy, including potential reforms to reduce reliance on securitized debt in the financing of higher education. This research contributes to understanding SLABS as both financial instruments and social determinants, thereby informing sustainable strategies for balancing investor interests with educational accessibility. Uniquely, this study aims to analyze how these macro trends in the student loan market could differently affect student borrowers based on their socio-economic background. Research Question: What are the risks of SLABS, and how do they affect the accessibility and affordability of higher education for students based on their unique socio-economic background?

James Shi

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Louis Nabors

#2 Natalia Filippova

Abstract Name: Screening for Dominant Pathways Underlying Mitochondria Transfer to GBM Cells from Neutrophils and Astrocytes Associated with Tumor Progression

Recent studies indicate that the expression of TREM1 is elevated with tumor grade and correlates with poor patient outcomes. The analysis of spatial TREM1 distribution found an accumulation of the protein in perinecrotic inflammatory loci in both human and mouse GBM. This project explores the transfer of mitochondria from neutrophils and astrocytes to glioma microenvironments, particularly to GBM cells, and the potential role TREM1 plays in this transfer. Using differentiated human neutrophils, we discovered mitochondria transfer between neutrophil-like differentiated HL-60 cells and human GBM xenolines. We noticed similar mitochondria transfer between human astrocytes and human GBM xenolines. To explore the mechanisms of this mitochondria transfer, we used a genome-wide knockdown library to look for genes essential for mitochondria transfer in both control and proinflammatory conditions. GBM genome-wide knockdown cells expressing EGFP were treated with neutrophils and astrocytes containing pre-labeled, red-fluorescent mitochondria. The GBM cells with acquired mitochondria (EGFP+RFP+ cells) were detected by flow cytometry techniques and separated from the GBM cells unable to acquire mitochondria (EGFP+RFP- cells). The genomic DNAs were isolated from the various populations of cells and DNA amplicons corresponding to gRNAs were generated and sequenced. Data will be presented on the prevalence of certain

gene knockdowns in each population of cells. The various populations of cells were grown in-vitro and in-vivo to evaluate proliferation speed. Data will be presented on the relative rates of in-vitro and in-vivo growth between mitochondrial transfer versus no mitochondrial transfer populations of GBM cells.

Kellan Shiffer

CO - Regis University

Discipline: Biology

Authors:

#1 Kellan Shiffer

#2 Vincent Nguyen

#3 Kimberly Cadiz

#4 Bethany Lucas

#5 Allyson Sterling

Abstract Name: Determining optimal conditions for His-tag protein purification and creating split GFP plasmids to confirm protein:protein interactions

T-cells are critical cells in the immune system, responsible for the coordination, development, and eventual suppression of an immune response in the presence of potentially harmful pathogens. T-cells detect antigens using T-cell receptors (TCRs), resulting in initiation of appropriate immune responses. Upon activation of mature T-cells, a protein called Nur77 is upregulated alongside other cellular functions including proliferation and acquisition of effector functions. During development of immature T-cells, Nur77 assists in apoptosis. Thus, the exact functions of Nur77 in different types of T-cells is unclear. In order to elucidate the role of Nur77 in T-cells, it is important to learn with which other proteins Nur77 interacts. Previously, our group used a yeast-two-hybrid (Y2H) screen to identify novel proteins that may interact with Nur77 in different types of T-cells. This study began to develop the appropriate protocols to confirm the Y2H findings: 1) bimolecular fluorescence complementation (BiFC) and 2) purifying His-tagged proteins. BiFC involves a circular DNA called a plasmid containing two portions that specify the instructions for making half of the Green Fluorescence Protein (GFP). DNA coding for Nur77 was added to one half of GFP and DNA coding for Notch1, a known binding partner for Nur77, was added to the other half of GFP. Once DNA coding for both proteins is added to the BiFC plasmid, we can use this system as a positive control for protein binding with unknown interactors. For the second goal, we used multiple protocols to determine which was most effective for purifying His-tagged proteins in the future by first purifying the His-tag on it's own. These experiments pave the way for future confirmation of novel protein:protein interactions with Nur77.

Maxwell Shiffman

FL - Stetson University

Discipline: Biology

Authors:

#1 Holley Lynch

Abstract Name: Protocol for Live Imaging Vanessa Cardui Embryos

Embryonic development of *Vanessa cardui* (Painted Lady butterflies) involves large-scale cell and tissue movements. As a first step to characterize these motions and determine their driving forces, we developed a protocol to image these embryos live at the tissue level. Cell-level resolution could also be accomplished with

this imaging protocol with appropriate microscopy. It can even be combined with microinjections of targeted fluorescent dyes to track cellular features. With removal of the two outermost egg layers – the chorion and vitelline membrane – being necessary for imaging, a key part of the process was determining how to keep the embryos relatively still while ensuring that they can develop in a 3-dimensional way. Removing the embryo from these protective layers was reliably successful as early as 24 hours post-oviposition while keeping the embryo intact with its yolk – also necessary for continued development. We determined sustained life to be possible in a custom imaging chamber for at least 48 hours, with development for at least 20. However, development proceeds at a slowed rate and appears to stop prior to reaching the larval stage. The success of development within the chamber also depends upon embryonic age at time of dissection. Further, microinjection of nuclear dye shortly after collection appears to slow development. While this protocol shows promise – particularly for observing processes that take less than 20 hours and begin after 24 hours of development – we will continue to explore modifications that may further optimize it.

Isabella Shimko-Lofano

AL - Auburn University

Discipline: Biology

Authors:

#1 Payal Agarwal

#2 Sumbul Khan

#3 Theresa Higgins

Abstract Name: Cytotoxic and immunogenic properties of an armed oncolytic adenovirus in osteosarcoma

Cancer immunotherapy enhances the immune response to target and recognize tumors in the tumor microenvironment (TME). However, there is limited research on the effects of immunotherapies in solid tumor cancers, such as osteosarcoma. Conditionally replicative oncolytic adenoviruses are specifically replicative in tumor cells and lyse only tumor cells without harming non-cancerous tissues. Oncolytic adenoviruses can remodel the tumor microenvironment and turn the “cold” tumor (immunity-wise) into a “hot” one. Another aspect to this immunotherapy is using immune checkpoint inhibitors such as PD-1 and PD-L1 which prohibit T cells from attacking cancer cells. By inhibiting this interaction between T cells and tumor cells it can allow T cells to recognize the tumor and kill it. We have modified canine adenovirus to generate CAV2-AU-M3 to replicate in tumor cells conditionally and to produce and secrete canine anti-PD-1 antibodies. We analyzed the cytotoxic effects of CAV2-AU-M3 in canine osteosarcoma cell lines (D17, D22, CF11, and MCKOS) in 2D and 3D models. Cell viability was determined using images and luciferase assays. Additionally, we plan to test the immunogenic properties of CAV2-AU-M3 by measuring INF- γ and TNF- α cytokine levels cytokines released by tumor cells after CAV2-AU-M3 infections using ELISA tests. CAV2-AU-M3 is effective at lysing canine osteosarcoma cells, and we expect infected tumor cells to release cytokines into the TME.

Erika Shirer

AR - University of Arkansas

Discipline: Biology

Authors:

#1 Erika Shirer

#2 Alisun Watson

#3 Samantha Howe

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#5 Charles Maxwell
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#7 Pete Wilcock
#8 Amanda Gerhart
#9 Jiangchao Zhao
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Abstract Name: Effect of Fiber and Stimbiotic on Growth Performance and the Gut Microbiome in Pigs Challenged With F18 Enterotoxigenic Escherichia coli (ETEC)

This study's intended purpose was to understand the effectiveness of dietary fiber treatments and stimbiotic on the sustainability of the F18 enterotoxigenic Escherichia coli (ETEC) challenge. A total of 216 piglets were blocked by weaning BW and randomly assigned to 1 of 4 dietary treatments, including corn-SBM based control diet (CC), high fiber diet (HF: 5.0, 3.8, 2.5% sugar beet pulp and 4.0, 3.0 and 2.0% soy hulls for phases 1, 2, and 3, respectively), CC plus 0.01% stimbiotic (CS: Signis, ABVISTA Marlborough, United Kingdom), and HF plus 0.01% stimbiotic (FS). Pigs were fed a four-phase feeding regimen: phase 1 (d0-9), phase 2 (d9-16), phase 3 (d16-22), phase 4 (d22-41). Dietary fiber and stimbiotic were provided from weaning (d0) to d22, and then a common diet was fed from d22 to the end of the trial. On d5 postweaning, all pigs were orally inoculated with 10 ml of F18 ETEC (108 CFU/ml.) One median BW pig from each pen was selected at weaning for fecal sampling on d8. Samples were used to quantify the live E. coli using 3M Petrifilm (3M Food Safety, St. Paul, MN) and virulence genes of the isolate were qualified using multiplex PCR. Of 466 colonies, 53 colonies that expressed F18 also presented LTb, Stb, and Stax simultaneously. Pigs fed high fiber diets (HF and FS) decreased the percentage of F18 encoded E. coli ($P < 0.0001$) than low fiber diets (CC and CS), while pigs fed stimbiotic (CS and FS) had higher percentage of F18 encoded E. coli ($P < 0.0001$) than diets devoid of Signis (CC and HF). Results of this study demonstrated that high fiber and stimbiotic had a distinguished result on the percentage of virulence genes expressed in live E. coli colonies thus suggesting a different mechanism to mitigate ETEC challenge.

Morgan Shirley

VA - George Mason University

Discipline:

Authors:

#1 Sarah Español
#2 Christina Eagle
#3 Grace Francis
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Sarah Español
Christina Eagle

Abstract Name: Family-School Partnerships in Low-Income Communities: A Critical Discourse Analysis of how Family-school relationships are communicated through Title 1 Missouri School Websites

Title I of the Every Student Succeeds Act (ESSA), the U.S. general education law, allocates funding to schools who educate high numbers of students from families with low incomes. These funds are designed for schools to enhance their programming and infrastructure to support students who are, or who are at the most at risk of, failing to meet state academic standards. In addition, given the criticality of family-professional partnerships on student, family, and professional outcomes, schools receiving Title 1 funding are required to “jointly develop with, and distribute to, parents and family members of participating children a written parent and family engagement policy, agreed on by such parents...” Despite the benefits of positive family-professional partnerships, barriers such as negative biases and assumptions, professional jargon. Despite

additional funding and support, such barriers are exacerbated in Title 1 schools. The purpose of this study was to address the following research questions: (1) What underlying ideologies are embedded within MO Title I school websites regarding families? (2.) How does language usage in MO Title I school websites reflect or reinforce power imbalances between families and school professionals? and (3) What underlying ideologies are embedded within MO Title I school Parent and Family Engagement Plan? The five-member research team employed Critical Discourse Analysis, to analyze language, accessibility, power, and ideologies reflected on over 200 Title 1 school websites in Missouri. Preliminary findings indicate a preponderance of school-centric and family engagement practices. The researchers also found limited accessibility to policies and practices relevant to families.

Jessica Shoemaker

CO - University of Colorado at Boulder

Discipline: Engineering

Authors:

#1 Gabriella Schauss

#2 Allison Hayman

Abstract Name: Effect of Calibration Conditions on Measurement Error in Force Sensitive Resistors for Mechanical Counter Pressure Spacesuits

Current gas pressurized, extravehicular activity (EVA) space suits cause high injury rates and metabolic stress on astronauts due to bulk and poor indexing. Mechanical counter pressure (MCP) space suits may offer solutions to these challenges, but development and operational feasibility necessitate a method to accurately measure the pressure being applied to the body. Force sensitive resistors (FSRs) are the current gold standard to monitor on-body pressure but require calibration for the sensors to be reliable and repeatable. To determine the effect of radius of curvature, substrate material, and pressure application method on sensor output, we tested these sensors using three different setups to simulate on-body applications. Additionally, we compared calibration of the sensor on a hard surface and a human body analog material. Calibration of these sensors was conducted in a pressure range of 20-100 mmHg in increments of 20 mmHg, concurrent with relevant MCP magnitudes. Differences in conditions were determined through coefficients of each calibration curve and the variability within them. We found that the different material substrates used for the calibration setup had an effect on the analog sensor output. The curvature of the substrate was less impactful on sensor output than the material of the substrate. Calibrating the FSR sensors is important for determining the variability of the sensor output. Calibration curves were created from this data in order to analyze the effect of different material substrates had on sensor output. We used the calibration curves to compare different calibration setups and determine which variables change the accuracy and repeatability of the sensor. Future work will allow the continued development of MCP spacesuits technology as an alternative to gas pressure EVA space suits to enable planetary surface exploration.

Benjamin Shoemaker

PA - Pennsylvania State University

Discipline: Biology

Authors:

#1 Farishta Faruk

Gabriel Roman

Fiona Liu

Abstract Name: Using Basement Membrane Constituents to Study Endothelial Cell Growth and Glycocalyx Deposition In Vitro

The endothelial glycocalyx (EG) is an apical network of glycoproteins, glycolipids, proteoglycans, and glycosaminoglycans, predominantly heparan sulfate (HS), found to mediate many vascular processes. Despite its critical role in cardiovascular health, replicating the EG in vitro remains a persistent challenge, primarily due to its vulnerability under traditional cell culture conditions. Given the variability in substrate choice in prior research, this study aimed to evaluate the efficacy of five biologically relevant basement membrane-associated substrates: collagen types I or IV; a mix of collagen types I and III; laminin; and collagen type IV layered with laminin on bovine aortic endothelial cells (BAOEC). Due to the known prevalence of collagen type IV and laminin in the basal lamina, it was hypothesized that these substrates in a layered configuration would yield optimal confluency, classic morphology, and most identifiable EG deposition after a 24-hour culture period. Cell confluency and morphology were assessed via phase-contrast imaging while EG deposition was evaluated through HS biotinylated streptavidin antibody staining and immunofluorescence (IF) imaging. Cell morphology and IF signals were quantified using ImageJ, an open-source image processing and analysis program (NIH). The results indicate that collagen type IV with laminin yielded cells with high confluency, a classic elongated morphology, and a greater raw integrated density value per pixel, denoting IF signal, than the other substrates. Data also suggests that although laminin alone yielded cells with the least IF signal, a classic elongated morphology was observed; demonstrating that while laminin can augment BAOEC growth, it can not effectively induce EG deposition. These results add to the current knowledge base for optimal in vitro culturing conditions for BAOECs in conjunction with monitoring EG deposition via HS IF signaling using ImageJ quantification. Future research aims to optimize this system using laminar flow, assessing barrier function, and culturing in a microvasculature chip.

Natalie Shortreed

WI - University of Wisconsin-Whitewater

Discipline: Geography/Geology

Authors:

#1 John Frye

Abstract Name: Post-Fire Ecosystem Recovery in Yellowstone

Fire ecology and restoration are essential components of ecosystem management, particularly in landscapes like the Greater Yellowstone Ecosystem (GYE), where fire plays a crucial role in shaping the environment. This project aims to explore the long-term ecological effects of wildfires, focusing on how fire regimes influence vegetation dynamics and wildlife habitats over time. The research question to investigate is: What are the long-term ecological consequences of wildfires in the GYE, and how do fire regimes affect vegetation and wildlife habitats over time? The study will examine the recovery of fire-affected areas at 10-, 20-, and 30-year intervals. By understanding the mechanisms driving ecosystem recovery, the research seeks to inform fire management practices and enhance ecological restoration efforts. The project will involve comprehensive field surveys of fire-affected areas in GYE, evaluating vegetation, soil quality, and wildlife activity. This will help identify patterns of ecological succession following wildfires and provide data to inform decisions about park management and restoration. The findings will be valuable to both academic communities and conservation stakeholders. My background in Soil Science equips me with the skills to assess soil properties, a critical aspect of post-fire recovery. Courses in Ecology, Biology, and Environmental Sociology provide a strong foundation in ecosystem dynamics and the social aspects of conservation. My proficiency in scientific writing, statistical analysis, and drone technology will enhance data collection and analysis, offering a comprehensive approach to the project. Ultimately, this research will contribute to understanding fire ecology and restoration in GYE, helping to inform management strategies for conservation and ecosystem resilience. It also aligns with my long-term goals of sustainable land management, providing the tools to promote ecological resilience in both park restoration and my future farming endeavors.

Aayush Shrestha

TX - Midwestern State University

Discipline: Engineering

Authors:

#1 Pranaya Pokharel

Abstract Name: Optimization of Jet engine through structural, thermal and flow analysis

This research focuses on optimizing jet engine performance, particularly the compressor, through thermal, flow, and structural analysis. As global air traffic rises, the need for efficient, eco-friendly aviation solutions becomes critical. This study aims to enhance compressor designs, guided by the Brayton Cycle principles, to achieve optimal pressure ratios while ensuring durability and reliability. Using ANSYS software, we performed computational fluid dynamics (CFD) simulations with a Moving Reference Frame (MRF) approach on basic and modified compressor designs. These simulations provided key metrics such as pressure ratios, efficiency, and flow characteristics. Results revealed that the compressor performs external work on the fluid, increasing the total pressure at the outlet. Additionally, when operational, static pressure at the inlet transitions into dynamic pressure as kinetic energy is imparted to the fluid. To further investigate, we are incorporating the Euler turbine equation to evaluate energy dynamics within the compressor region. This enables us to determine the maximum fluid velocity achievable and analyze how blade angles, size, and configurations affect pressure and energy losses. CFD simulations will optimize blade geometry and number to maximize pressure output while minimizing losses. Our strategy includes designing advanced blade geometries and inlet configurations, selecting materials capable of withstanding high pressures and temperatures, and employing manufacturing techniques to enhance strength and durability. Currently, we have procured a testing kit to establish boundary conditions for validating simulation results through empirical testing. Future work will focus on completing simulations, testing new designs, and refining the compressor to achieve superior performance. This study contributes to the development of efficient, reliable compressors, addressing the aviation industry's growing demand for sustainable and high-performance solutions.

Aaron Shue

WI - University of Wisconsin-Eau Claire

Discipline: Nursing and Public Health

Authors:

#1 Aaron Shue

#2 Brandon Voelker

#3 Mel Skoff

Brandon Voelker

Abstract Name: Literature Review of the Role of Nursing, Students, Registered Nurses, and Nurse Practitioners Within Advanced Care Planning

Background: Advance care planning (ACP) is critically important to providing care consistent with the patient's wishes. Registered nurses (RN) and Nurse Practitioners (NP) are relied upon to lead ACP discussions with patients. RNs and NPs often struggle to have these conversations with their patients due to lack of confidence in their abilities to have these discussions, lack of time in the clinical setting, and concerns that ACP is outside their scope of practice. Incorporating ACP training into school curriculum would bridge

the gap between RNs and NPs educational preparedness in leading ACP discussions. Methods: A review of literature examined 16 articles that focused on the role of nursing students (NS), RNs, and NPs in ACP, RNs and NPs confidence about their role in ACP, and what has worked for ACP training events in the past. Key words searched included: ACPs, ACP training programs, NSs, RNs, and NPs. The databases CINAHL, MEDLINE, UpToDate, Web of Science, and PubMed were searched. Results: Sixteen articles were identified as eligible for the subject matter. The core theme of improving ACP education was highlighted throughout these articles. Conclusion: Current attitudes of NSs, RNs, and NPs reflect feelings of uncertainty about their role within ACP, how to initiate conversations about ACP, and improving confidence in leading these conversations. It was found that ACP training programs have been effective in increasing the number of ACP conversations. An ACP facilitation project's goal is to create an educational program that trains graduates and prelicensure NSs to facilitate ACP conversations. Keywords: Advance care planning; Advanced care planning training; Registered Nurses; Nurse Practitioners;

Hailyn Shuster

FL - The University of Tampa

Discipline: Biology

Authors:

Abstract Name: Investigation of Copy Number Variance in Human Obesity Model Using Zebrafish

Obesity is a major problem in the world today, and in many eukaryotic organisms, it is seen to debilitate their immune systems. This causes these organisms to become more susceptible to disease and illness. The Centers for Disease Control and Prevention has provided data that shows that obesity has a strong correlation to the development of heart disease, type 2 diabetes, breathing problems, and musculoskeletal problems. The *Danio rerio*, also known as zebrafish, is a model organism for humans that is used in this study. A group of fish were fed a regular diet (0.006 g of artemia/day), and another group of fish were fed a high-fat diet (0.06 g artemia/day, resulting in normal and obese fish. The livers from these fish were dissected, and transcriptome sequencing was performed. The most overexpressed and the under-expressed genes in obese fish compared to normal fish were observed by RNA-seq. These were then put on a plot to be able to visualize what was happening between the different genes. Copy numbers were evaluated between obese and normal fish using R analysis. Copy number variation was examined one mb upstream and downstream of the transcription start to determine overlap with genes and direct and indirect effects. An eQTL using Spearman Rank Correlation was run to analyze associations between copy number variance and gene expression to determine what was different between the obese and normal fish. Understanding obesity in this manner could assist in the understanding of obesity-related human diseases.

Joshua Shuster

FL - Embry - Riddle Aeronautical University

Discipline: Engineering

Authors:

#1 Jackson Schuler

#2 Daewon Kim

Angelina Scalice

Abstract Name: Facilitating Deployable Structures Utilizing Origami Structures and Semi-Living Composite Hinges

This study explores the use of composite materials in deployable architecture, specifically to minimize stress in load-bearing origami structures, currently a major issue in this field. This is done by utilizing origami structures and composite hinges, which offer a way to minimize the mass of deployable structures while not compromising strength and flexibility. Several simulated origami structures using facets made with stringers and honeycomb core paneling which were connected via composite hinges underwent a series of virtual loading tests, highlighting the best folding pattern and providing minimum strength for the hinges to withstand. Initial testing of composite coupons was performed using new manufacturing techniques, with variations to samples in the material used for the flexing region of the hinges, as well as varying materials used to prevent resin uptake into the flexible aramid fabric region. It was determined that Kevlar as the flexible hinge material and vegetable-based shortening as the resin uptake material were the most viable options based on their resistance to deformation under tensile loading. Testing was also performed to determine the strongest and most flexible hinge layup configuration for the intended application. The best-performing samples resisted more than fifteen times the maximum anticipated stress of the anticipated loading while maintaining $\pm 180^\circ$ of flexibility. Later, a scaled-down physical model of the faceted origami structure was constructed to showcase flexibility in real-world structures, and the hinge modeling method was updated to more accurately reflect this new physical structure. Current findings demonstrate the potential of this model for use in extraterrestrial surface habitats, as well as micro-g applications including deployable solar panels and thermal radiators. Future work will refine manufacturing methods and materials selected, minimize process variability, and test resin uptake prevention requirements.

Isabel Sichlau

PA - University of Pittsburgh

Discipline: Psychology

Authors:

#1 Alex Silver

#2 Melissa Libertus

Abstract Name: Associations between maternal and paternal spatial talk and toddlers' spatial skills

We use spatial skills to interact with and navigate the world around us. Spatial reasoning is often defined as processing the relations between and within objects and the space they inhabit (Uttal et al., 2013). Children's spatial skills develop and change throughout their childhood. Understanding the development of spatial skills in toddlerhood is particularly important as children are quickly acquiring language during this period and early spatial language skills are correlated with later spatial performance (Pruden et al., 2011). Individual differences in spatial skills may be influenced by aspects of children's environment, including parental use of "spatial talk", or discussions about spatial concepts like shapes, relations between objects, and directions (Fox et al., 2024). Importantly, prior work examining math activities between mothers and fathers and their children has indicated differences between how each parent engages with math concepts with their toddlers (e.g., Silver et al., 2023). However, no research has looked at potential gender differences in parents' spatial talk and associations with children's spatial skills. The current study seeks to examine how the frequency and diversity of child-directed spatial talk from mothers and fathers relates to their toddlers' concurrent spatial skills. Data were collected through two Zoom sessions consisting of a semi-structured parent-child interaction, assessments of toddlers' spatial skills, and a demographic questionnaire. Parents' interactions with children were transcribed and coded for usage of spatial words (e.g., above, tall, triangle). Spatial skills were measured through two tasks where children's shape and spatial relation comprehension were tested. Scores on these tasks were averaged to form a composite score. Final analyses will test whether mothers' and fathers' frequency and/or diversity of spatial talk relate to toddlers' spatial skills. These results can inform future spatial skill interventions especially in early childhood.

Soha Siddiqui

VA - Virginia Commonwealth University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Women's Gender Inequality & Leadership in *The Devil Wears Prada*, *Hidden Figures*, and *On the Basis of Sex*: Portraying Women in Power through the Cultivation Theory and Theory of Planned Behavior

This paper plans to examine the portrayal of women in leadership roles in the films *The Devil Wears Prada*, *Hidden Figures*, and *On the Basis of Sex* through the cultivation theory and the theory of planned behavior. By analyzing these portrayals, the paper plans to explore how popular films contribute to the stigmatization of real-life women in power and reinforce gender inequality in leadership positions such as CEOs. Hollywood and other mainstream media play a critical role in shaping societal perceptions of gender roles. This paper defines key terms such as cultivation theory, which examines how media consumption can affect a person's beliefs, and the theory of planned behavior, which states that people's intentions determine their behavior. The films chosen in this paper were due to their portrayal of female leadership. This paper plans to highlight how these portrayals of women in movies contribute to the real-life perception that women must overcome extraordinary barriers to succeed in leadership.

Asiya Siddiqui

VA - George Mason University

Discipline: Psychology

Authors:

#1 Amanda Sanchez

Abstract Name: Examining Clinician-Reported Barriers to Cultural Assessment

Evidence based treatments (EBTs) have mainly been created and tested in Western societies with predominantly middle-class, white populations, leading to a lack of systematic consideration of a client's culture and context. Conducting cultural assessment can help to support provider understanding of a client's cultural context (e.g. stressors and supports related to their social identity) and has been shown to increase family engagement in treatment, therapeutic rapport, and overall patient satisfaction, however, it is rarely implemented in routine practice. This study aims to understand clinician-reported barriers that prevent the implementation of cultural assessment. Clinicians (N=212) who treat youth with anxiety and OCD from across the United States were interviewed for a larger study focused on culturally responsive practices. The clinicians completed a survey including questions about their background, caseload, and barriers to cultural assessment. Descriptive statistics were used to analyze the frequencies of reported barriers to cultural assessment. Further, means testing was conducted to determine mean differences in barriers to engaging in cultural assessment between clinicians' training backgrounds. The descriptive analysis revealed that the two most common barriers were concerns about stereotyping the client (32.9%) and concerns about placing a burden on the client (31.1%). The Kruskal-Wallis H test revealed a statistically significant difference in barriers across the groups, $H(4)=12.87, p=.012$. Post-hoc pairwise comparisons using the Bonferroni-adjusted test indicated that clinical psychologists reported significantly more barriers to using cultural assessment compared to social workers ($p = .015$). There was no significant difference between any other groups. The findings suggest that clinicians hold some negative beliefs about the effects of cultural assessment on their clients, and that clinical psychologists encounter more barriers than social workers. Providing training and

education to change clinicians' perceptions of cultural assessment could improve clinicians' ability to provide culturally responsive care.

Iman Siddiqui

NY - Brooklyn College

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: Reshaping the Narrative of Leprosy: Reducing Stigma through Effective Physician-Patient Communication, Earlier Diagnoses, and Compassionate Care

Leprosy, known as Hansen's disease, has existed for thousands of years. The chronic condition is caused by the bacteria *Mycobacterium leprae* and results in nerve damage, primarily in the peripheral nervous system, such as the hands and feet. The disease has been highly stigmatized for centuries, making it more difficult for patients to cope. The social stigma associated with leprosy furthers its physical stigma. The illness seems to define the patient, who is often shunned from society. This is a predominant issue in developing countries, where a lack of knowledge causes patients to seek treatment later--in turn leading to the formation of more deformities and causing fear of the illness to increase. Stigmatization of the disease can also cause self and bodily dissociation, exacerbating physical symptoms due to self-neglect. The best way to reduce the social stigma is to have earlier diagnoses, which would lead to less severe symptoms and more effective treatments. My project examines the impact of leprosy patients' relationship with their physicians, especially regarding communication, patient outcomes, and the role stigma plays in the diagnosis, treatment, and recovery of their illness. My research strategy will utilize interviews with physicians and analysis of scholarly articles based on case studies, experiments, and longitudinal reports regarding the experiences of leprosy patients. The moment patients receive their diagnosis is critical because, from that point onwards, patients begin unconsciously spinning a story of what their life will entail for the next several years. If physicians do not give patients the complete story, such as explaining medicinal complications, patients may become overly optimistic. Then, if patients suffer from side effects, they might believe the medication is problematic, causing them to mistrust the physician. Medication's side effects can also worsen stigma because they bring physical symptoms to the attention of patients' co-workers and family.

Amelia Sidney

CA - Chapman University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: What Should A Woman's Body Look Like? Here's What Digital Media and Pop Culture Says...

My research will explore how the visual representation of women's bodies in media and pop culture over the past 30 years have influenced modern society's unrealistic body standards for women, as well as how these stereotypes have harmed our current generation. Research has shown that the body stereotypes of women shown in digital media have severely worsened body dysmorphia for generations of young girls. That dysmorphia lowers self-esteem, which often leads to symptoms of depression and anxiety. This has ultimately led to increased levels of self-harm, suicidal ideation, and other mental illnesses in adolescents. In addition to those findings, I will be looking at the correlation between women's bodies in video games and animated

movies/TV shows, and how the combination of those digital medias has resulted in reaching a wider audience. Over the years, the online misrepresentation of women's bodies has only continued to grow exponentially, through body-altering filters on social media apps such as tik tok and instagram, as well as celebrities who post pictures of themselves that are edited to make their bodies look closer to the ones the media keeps showing on screen. My methodology involves looking for existing studies that show the impacts of gender biases in digital media. I will also be using the other research strategies outlined in the Information Literacy portion of my FFC canvas program, which includes using the Leatherby Library database to find peer-reviewed articles and published studies. I envision that my research will clearly demonstrate that the popularity/exposure of animated women has direct linkage between changing the body standards society holds for real women. Evidence is also expected to show the detrimentality of these unfair stereotypes upon young girls in particular, but also the general population.

Elizabeth Sikora

WV - West Virginia University

Discipline: Visual Arts

Authors:

#1 Joseph Galbreath

Abstract Name: Wood Type Specimens

The purpose of this project is to explore traditional letterpress production methods and create a set of hand-printed type specimens using wood type from the Triangle Poster & Printing Company, which was donated to West Virginia University in 2014. Triangle Poster is based in Pittsburgh, Pennsylvania, and was founded in 1905. Their body of work consists of posters, billboards and other advertisements for circuses, traveling road shows, auto races, and other local events. This project draws inspiration from a collection of letterpress posters, broadsides, and type specimens designed and printed by WVU, School of Art and Design faculty Cliff Harvey and Joe Galbreath over several decades. These samples pull inspiration from the history of the printing history, formal relationships of letterforms, and the evolution of type specimens from commercial to artistic. I examined historic specimen examples, books, and past Triangle Poster catalogs. The original purpose of type specimens was to showcase a type foundry's offerings and highlight each typeface's unique characteristics and visual capabilities. This project showcases a small selection of WVU's Triangle Printing Wood Type Collection, which includes an italic typeface, a rare find in wood. Each specimen's composition was created based on the typeface to enhance the letterforms characteristics. I focused on the elements of each letter and how they interacted with one another, as well as the positive and negative space within and around the letterforms. I was liberated from traditional specimen conventions and allowed the letterforms to reveal interesting formal relationships in the dynamic compositions. After initial research and examining the typefaces in the collection, my process began with sketches and digital renderings. Then physically hand inking proofs and using the letterpress, I have been able to fully develop the compositions. The process has been filled with trial and error - rearranging blocks until the composition feels complete.

Nolan Sila

TX - Midwestern State University

Discipline: Engineering

Authors:

#1 Mahmoud Elsharafi

Mario Sanchez

Jabez Mackey

Abstract Name: Emissions Study and Equipment Design/Build for Stripper Well Production

Global warming and the rise of greenhouse gasses in the atmosphere are at an all-time high and continue to increase. One of the major contributors to this is methane (CH_4) in natural gas from being released into the atmosphere. Government agencies, both domestically and internationally, have raised concerns about this rise in greenhouse gas levels, recognizing its harmful effects on the environment, as demonstrated by global warming. In response, these agencies have implemented laws requiring companies to decrease the greenhouse gas emissions released from their oil wells into the atmosphere. In the context of oil wells, about 80% of U.S. oil and natural gas production sites are classified as low-production or small well sites. In fact, these low-production wells release approximately 50% more methane than the entire Permian Basin, one of the largest oil and gas-producing regions globally. It is estimated that these wells are responsible for nearly half of all methane emissions from oil and gas operations, emphasizing the need for more effective emission control strategies for smaller sites. Conventional natural gas management methods are often inefficient or too large-scale for the limited methane produced by these wells. For this reason, our team has developed a compact flaring tower add-on designed to connect to smaller wells and burn off emitted methane, converting it into CO_2 and water. The goal of this project is to safely and efficiently reduce greenhouse gas emissions from smaller well facilities.

Maria Silva

TX - Texas Woman's University

Discipline: Chemistry

Authors:

#1 Shiru Lin

Abstract Name: Pt Cluster Doped molten-salt Carbon Nitride in Methanol Dehydrogenation

As fossil fuels are decreasing, hydrogen could be the next solution to our energy crisis. Hydrogen is a good source of energy that could be cost-effective, clean, and easy to transport. To produce and easily store it we would have to use methanol dehydrogenation. Methanol dehydrogenation is a chemical reaction that produces hydrogen and formaldehyde from methanol using aqueous methanol-reforming and anhydrous methanol decomposition. A good catalyst to use for methanol dehydrogenation is molten-salt carbon nitride (MCN). However, it does have its weaknesses as it can only absorb methanol weakly. To improve the performance of MCN, we composite the Pt13 cluster on MCN to form a Mott-Schottky photocatalyst. In this work, we use Density Function Theory (DFT) to compute the interaction energies of Pt13@MCN with reaction intermediates of methanol dehydrogenation, including CH_3OH , CH_2O , and H_2 , and the reaction energy of methanol dehydrogenation on Pt13@MCN. We also explore the charge distributions of Pt13@MCN before and after adsorptions of intermediates to understand the adsorption mechanism. We compare the Pt13@MCN with pure MCN to see how the Pt cluster can enhance the catalytic performance theoretically.

Skye Simms

MD - Bowie State University

Discipline: Physics and Astronomy

Authors:

#1 Skye Simms

#2 Natasha Goldson

#3 Jordan Oliver
#4 Andre Honore
#5 TyNiah Dates

Abstract Name: Measuring Electromagnetic Radiation of an iPad

The electromagnetic radiation emissions (EMR) from electronic devices, such as iPads, have raised concerns about their potential effects on the human body due to their widespread use in daily life. This study investigates the radiofrequency (RF) emissions from an iPad Air Gen. 4 in three distinct operational states: off, on (idle), and during video streaming. These emissions were measured at varying distances of 5 cm, 10 cm, and 15 cm using a calibrated RF meter. The primary goal of this research is to assess how RF emissions fluctuate depending on the device's activity and the proximity of the user to the device. To ensure the accuracy and reproducibility of the results, all measurements were conducted in a controlled environment. The data analysis focused on calculating the average power density in $\mu\text{W}/\text{m}^2$, providing a standardized measure of RF exposure. The findings revealed that the highest RF emissions were observed when the device was actively streaming video, followed by the idle state, and the lowest emissions were recorded when the device was turned off. Additionally, it was found that RF power density decreased as the distance from the iPad increased, indicating that closer proximity to the device results in higher radiation exposure. These results underscore the dynamic nature of RF emissions, which are influenced by both the device's usage and the distance between the device and the user. The study provides valuable insights into the variability of RF exposure, highlighting the importance of considering both device activity and proximity when evaluating the potential health impacts of prolonged electronic device usage. The findings serve to inform consumer awareness and contribute to the development of safety standards regarding safe distances and usage habits to minimize RF radiation exposure.

Skye Simms

MD - Bowie State University

Discipline: Biology

Authors:

#1 Skye Simms
#2 Summer Jenkins
#3 Kamaria Early
#4 Teriney Haywood
#5 Natasha Goldson

Abstract Name: Characterizing the Diversity of Bacteria and Viruses Within the Fungus Didymosphaeria

Samples of fungi were previously collected from beech trees around Bowie State University. This research was conducted to identify and characterize the diversity of endo-hyphal microorganisms (mycoviruses and bacteriophages) and bacteria found within the beech fungus *Didymosphaeria variabile*. To characterize this diversity, fungus cultures were grown, DNA and RNA were extracted, sent for metagenome and metatranscriptome sequencing by Novogene, then bioinformatic analyses were performed. The results show a high diversity of mycoviruses, bacteriophages, and endohyphal bacteria within *Didymosphaeria*. Results also show the presence of several double-stranded DNA viruses. The most abundant groups of bacteria are Sphingobacteriia and Bacillota. The most abundant groups of viruses are Caudoviricetes and Megaviricetes. This study contributes to the knowledge of endohyphal viruses and bacteria diversity, shedding light on their potential interactions with its host.

Bayliss Simon

VA - Virginia Tech

Discipline: Architecture, Construction Management, and Interior Design

Authors:

#1 Mehdi Setareh

Abstract Name: The Estimation of Natural Frequencies of Architectural Structures Using a Smartphone

Any object has a natural frequency: the speed at which an object can freely vibrate when hit by a force. The natural frequency depends on the mass and stiffness of the object. To prevent buildings from experiencing excessive movement subjected by external forces, it is important to understand, and estimate, the natural frequency. Due to the high strength of construction materials, use of computer-aided design, and the desire of architects and building owners to have long-span, column-free designs, modern architectural structures have become susceptible to large vibrations as a result of human movement. These vibrations generally occur at their natural frequencies. Accurate estimation of natural frequencies help engineers and architects design structures impervious to large vibrations. This will ultimately improve the lifespan of building sustainability as well as its ability to service its occupants. The main goal of this project is to determine the accuracy of an inexpensive, smartphone application in measuring natural frequency. There are a wide range of precedent research studies that estimate the natural frequencies of structures using high-end engineering equipment, however, said equipment tends to be expensive and not easily accessible. The research methodology of this project consists of conducting a heel drop or jump test on various architectural structures, such as building floors, staircases, footbridges, etc., to measure the natural frequencies from the generated vibrations. The results obtained by the smartphone application are compared to the results of a high-end accelerometer. The data suggests that, despite being inexpensive, the smartphone accelerometer provides adequate results. In the development of the technological age, the research supports the idea that high-end equipment is not always necessary to produce a valuable outcome.

Sara Jewel Simpson

GA - Georgia College and State University

Discipline: Psychology

Authors:

#1 Jessica Berry

#2 Zoe Cain

Abstract Name: Examining the Use of an Emotional Learning App to Facilitate Social-Emotional Learning in Children

Educational applications and technology have been utilized to enhance children's learning in recent years. Children are increasingly using tablets and smart devices for learning at home and in classrooms. Research indicates that Social-Emotional Learning in children is crucial for their interpersonal relationships and future success, as it enhances their emotional intelligence (Greenberg, 2023). Technology-based SEL can contribute to improvements in emotional skills, peer relations, and prosocial behaviors (Low et al., 2023). However, the effectiveness of using technology and applications has not been fully examined. This study is thus aimed to investigate the effectiveness of an Emotional Learning App in facilitating social-emotional learning in preschool-aged children, using data from the larger Empathy Learning Project, which focuses on emotional coaching in community preschools. The present interdisciplinary study began with a computer science student developing an app using Swift. The app is designed to teach social-emotional learning (SEL) to improve emotional skills. It includes features to help children learn to identify facial expressions and customize them by interchanging various facial parts, encouraging imaginative play, and enhancing social-

emotional skills. The app is then used in a community preschool for children ages 3-5. Twenty-three children participated in the study. The accuracy of emotional recognition was first tested to establish a baseline (pre-test), and again followed by 2 months of SEL using the app and other methods. Teachers are asked to complete the Social Competence Behavior Checklist (SCBE, LaFreniere, 1998) before and after the SEL lessons. The data collection is underway. It is expected that using the app will promote emotional learning in children. Further details and implications of the app will be presented at the conference. These findings will contribute to the growing research on the importance of SEL in young children.

Neha Singaravelan

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Neha Singaravelan

Abstract Name: Understanding the Synergistic Effects of the Combination of Polyphenols Indole and Curcumin in Breast Cancer Cell Lines to be used as a Preventative Treatment

Breast cancer is the second most common cancer worldwide and the leading cause of cancer death in women. This presents a need to develop a preventative treatment to control the manifestation of breast cancer. Polyphenols such as Indole and Curcumin are natural compounds that have the ability to regulate the epigenome, influence inflammatory stress, and induce apoptosis, resulting in the prevention of cancer. Indole, found in Brassica vegetables, is an HDAC inhibitor that prevents tumorous growth. It is also a negative regulator of estrogen that contributes to cancer progression at high concentrations. Curcumin, found in turmeric, is a DNMT inhibitor that reactivates silenced tumor suppressor genes. It also has an inhibitory effect on the NF- κ B pathway and Wnt/ β -catenin signaling that suppresses metastasis. While many polyphenols have been studied individually, there have been limited studies demonstrating the combinatorial effects of multiple polyphenols. Thus, this project focuses on analyzing the novel combination of Indole and Curcumin on breast cancer cells to observe if there is a synergistic effect in the inhibition of cancer to be used as preventative treatment. Through MTT assays, the combination treatment was shown to have a decrease in cell viability in the MD-MBA-453, MD-MBA-231, and MD-MBA-157 cell lines, demonstrating reduced cellular proliferation. In addition, there was limited toxicity for the control cell line MCF10A, indicating that the combinatorial treatment was not harmful for normal cells. Western blot results indicated that there was a decrease in HDACs and DNMTs with the combination of 200 μ M of indole and 0.25 μ M of curcumin. Additional studies are being conducted in RT-qPCR to evaluate the changes in gene expression of HDAC and DNMT targets. Overall, experimental studies showed a synergism between Indole and Curcumin, indicating that the combination can be utilized as a potential preventative treatment for breast cancer.

Veer Singh

MI - Wayne State University

Discipline: Chemistry

Authors:

#1 Jeremy Kodanko

#2 Meher Prakash

Abstract Name: Synthesis of Anabaenopeptins Using a Scalable Method: Applications Of Organic Chemistry

Cyanobacteria are photosynthetic microorganisms that dominate harmful algal blooms (HABs), which are increasingly prevalent in freshwater ecosystems due to climate change and agricultural runoff. HABs frequently occur in recreational waterways, exposing humans and animals to toxins that threaten public health. To defend against parasites, cyanobacteria produce various toxic metabolites, including Anabaenopeptins (ABPs), raising concerns about their potential health effects. However, detecting ABPs in the environment and studying their biological activity remains a challenge due to the limited availability of pure samples and detection difficulties. To meet the need for ABPs in environmental monitoring and biological research, we have developed a scalable synthetic route for ABP production. Our work includes efforts toward the total synthesis of novel ABPs, including those containing homophenylalanine, a feature recently identified in environmental samples.

Arushi Singh

PA - University of Pittsburgh

Discipline: Engineering

Authors:

#1 Arushi Singh

#2 Yucheng Shen

#3 Noah Schweitzer

#4 Bistra Iordanova

Abstract Name: In vivo two photon imaging of cerebral blood flow in capillaries of Alzheimer's mice show decreases with age

Neurodegeneration associated with Alzheimer's disease (AD) leads to cognitive decline, dementia and behavior changes in diagnosed individuals as they age. The AD continuum spans decades beginning with prodromal brain changes that are unnoticeable by the affected person to obvious problems with memory and eventually physical disability. What specific vulnerabilities drive the conversion from mild cognitive impairment to severe dementia is still unclear, however the consensus is that the early disease events are driven by ageing, decline in vascular and immune health, genetic susceptibilities and socioeconomic factors. Changes in cerebral blood flow (CBF) play a central role in the pathology of AD, they are accompanied by decreases in oxygen and glucose delivery to the tissues and this further impairs the neural circuits and slows down the clearance of noxious cellular waste. Analyzing subtle blood flow changes in the small blood vessels of the brain can provide cellular insight into vascular disfunctions associated with AD. Because this cellular level data cannot be obtained in humans, we focused on mouse models of AD. We used longitudinal in vivo two-photon imaging through chronic brain optical windows to evaluate changes in red blood cell velocity in the brain capillaries. We applied image processing algorithms to quantify the red blood cell velocity and probed the relationship between age and volumetric flow rate. The linear regression model of the normalized volumetric flow rate showed significant decrease across age in AD mice compared to wild-type mice. Our results indicate that early decrease in blood flow is evident in small blood vessels in the prodromal stages of the disease prior to accumulation of hallmark proteinopathies of AD. Our work suggests that improving cerebrovascular health during midlife can slow down the progression of dementia.

Rajvir Singh

CA - Evergreen Valley High School

Discipline: Environmental Science and Sustainability

Authors:

Abstract Name: Comparing Tornado Magnitudes in Eastern and Midwestern States Using ARIMA, LSTM, and Prophet Machine Learning Algorithms

Tornado occurrences in the United States are becoming increasingly unpredictable due to global environmental changes. On average, tornadoes cause approximately \$400 million in damage each year. As extreme weather events may continue to intensify (Zhang et al., 2023), their impact on public well-being grows. Notably, Tornado Alley is shifting its borders toward eastern states (Texas, Georgia, Mississippi, and Tennessee) and midwestern states (Illinois and Indiana). Through the use of AI and machine learning, we have predicted tornado Enhanced Fujita (EF) scale rating based on the previous records of several decades for up to 10 years in the future, especially within eastern states, with accuracies of over 90 percent. We found that within Texas and Georgia mean EF is predicted to increase, whereas in Mississippi and Tennessee mean EF is predicted to decrease to lower values. We aim to compare tornado shifts especially within the eastern states and midwestern states. This research utilizes Auto-ARIMA, Prophet, and LSTM algorithms in Google Colab to forecast the future EF scale intensity of tornadoes through time series analysis of the date, state, and EF scale intensity of each tornado. Our dataset of the U.S., sourced from Kaggle's SB and NOAA's SWM, spans from 1950-2023. The data for the eastern states and midwestern states from 1950 to 2010 was to develop the model, while data from 2011 to 2023 served as test data to measure model accuracy, indicated by RMSE values for each state. While more sophisticated models exist, this research highlights the potential of AI and machine learning algorithms, their predictive capabilities, and their practical applications. Detailed results will be presented and discussed at the conference.

Vivaan Singh

PA - Pennsylvania State University

Discipline: Computer Science

Authors:

#1 Mahfuza Farooque

Abstract Name: Integrating Behavioral Health Features into Machine Learning Models for Enhanced Type 2 Diabetes Prediction

Type 2 diabetes (T2D) is a growing global health crisis, affecting millions and leading to severe complications such as cardiovascular disease, kidney failure, and premature mortality. Early detection is critical to preventing its progression and reducing healthcare burdens. While traditional predictive models focus on demographic and clinical features, this study explores the untapped potential of behavioral health variables—mental health, physical activity, and sleep—in improving the accuracy of machine learning (ML) models for T2D prediction. Building upon prior research that demonstrated the predictive utility of environmental metal exposure (Xu et al., 2023), this study tests whether behavioral health features can similarly enhance model performance. Two models were developed: Model 1, using a baseline set of demographic and clinical features, and Model 2, which combines these with behavioral health variables. Data from the National Health and Nutrition Examination Survey (NHANES, 2017–2018) provided a sample of 9254 respondents and 20 selected variables (11 baseline and 9 behavioral health variables). Behavioral health features included specific indicators such as "How often do you snore," "Moving or speaking too fast or slow," "Vigorous exercise," "Usual wake times," "Feeling down or depressed" et cetera. Feature selection involved correlation analysis, T-tests, Lasso regression for multicollinearity, and logistic regression for absolute predictivity. A soft voting ensemble model, incorporating Random Forest, XGBoost, and LightGBM classifiers, was trained and evaluated on the dataset. Preliminary results show that Model 2 achieved a higher area under the curve (AUC) score compared to Model 1, confirming the hypothesis that behavioral health features significantly enhance T2D prediction. These findings underscore the importance of incorporating

behavioral health variables into ML models, providing a more comprehensive tool for early T2D detection and advancing personalized diabetes prevention strategies.

Ashish Singh

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:

#1 Simon Gregory

#2 Odmaa Bayaraa

Abstract Name: Creating a data processing pipeline for single cell RNA sequencing and spatial analysis on cells of the entorhinal and occipital regions of the brain using Seurat v5

Single-cell RNA sequencing (scRNA-seq) revolutionized the study of gene expression and RNA analysis. The study of spatial transcriptomics (ST) developed alongside it, allowing researchers to measure all gene activity in a sample and map where it occurred relative to all other activity. By using software developed to process raw scRNA-seq and ST data, researchers can determine the type of cell, how it is expressing genes, and its location inside a sample. This project aims to create a data processing pipeline for scRNA-seq using the Seurat v5 software, and test the pipeline on tissue samples from the entorhinal and occipital regions of the brain. These regions have well-documented cell types and gene expression, allowing testing of the effectiveness of the pipeline by comparing its results to known controls. Raw scRNA-seq and ST data was gathered from tissue samples using a 10x Genomics Xenium Analyzer, and was passed through multiple iterations of a data processing pipeline created using Seurat v5 toolkits. The pipeline's accuracy was measured by comparing cell types assigned by the pipeline to control cells found in the tissue samples, and by comparing gene expression results in astrocytes to control genes that express specifically in the astrocytes of the entorhinal and occipital regions. High expression of the PLP1 and MBP genes was found in the entorhinal astrocytes, which encode proteins that make up the myelin sheaths of oligodendrocytes. High expression of the ATP1A2 gene was found in occipital astrocytes, which encodes for a protein vital to maintaining Na⁺/K⁺ ion balances across cell membranes. This pipeline can serve as a control comparison to the development of future scRNA-seq pipelines that aim to process raw scRNA-seq data, and can be modified to fit specific needs such as looking for specific gene expression or cell types in samples.

Neha Singhal

AL - University of Alabama at Birmingham

Discipline: Interdisciplinary

Authors:

#1 Virendra Mishra

#2 Taylor Davis

Abstract Name: Designing a User-Friendly Preprocessing Software in Python for the Analysis of Functional Magnetic Resonance Imaging (fMRI) Data

Background: Functional magnetic resonance imaging (fMRI) is the workhorse for understanding cortico-cortical dynamics, spanning early brain development to neurodegenerative disorders. However, fMRI remains an active research area with emerging data analysis approaches that often use laboratory- or project-dependent, with multiple adjustable parameters, making reproducibility of conclusions challenging, even with

identical data. Although several preprocessing packages exist, they generally require expertise or are limited to singular execution, hindering novel analyses of the same data. Therefore, this study aims to develop an easy-to-use preprocessing routine for fMRI data analysis that ingests scanner-generated DICOM or anonymized NIfTI data, producing processed data ready for statistical evaluation. Methodology: We will develop a graphical user interface (GUI) and a command-line interface (CLI) subroutine to preprocess fMRI data. The key steps include MRI signal optimization and anonymization, skull-stripping, spin-echo correction for geometric distortions, motion correction and removal of patient-induced artifacts using MCFLIRT (Motion Correction using FMRIB's Linear Image Registration Tool), band-pass filtering to preserve signal quality, and regression of motion parameters. We will also exclude fMRI/BOLD (blood oxygenation level-dependent) data from cerebrospinal fluid (CSF) and white matter (WM). Additionally, images will be co-registered to a standardized template for easier hypothesis testing through statistical analysis. Results: We plan to create a routine that standardizes and streamlines fMRI data preprocessing, enabling the identification of functional connectivity disruptions linked to the scientific problem under study. This adaptable program will ensure reproducibility and can be applied to new fMRI datasets, advancing analyses of neural network abnormalities in brain development and neurodegeneration. Conclusion: Developing this routine marks a crucial step toward enhancing neural connectivity analysis using fMRI data. A standardized and adaptable framework will facilitate high-quality data preparation, enabling more accurate and reproducible identification of functional network disruptions and advancing our understanding of the neural mechanisms underlying brain development and neurodegeneration.

Vivaan Singhvi

MI - University of Michigan - Ann Arbor

Discipline: Computer Science

Authors:

#1 Matthew Moreno

Abstract Name: Optimizing Digital Phylogenetic Tree Reconstruction through Algorithm Design and Computational Techniques

The development of digital evolution has offered a way to simulate its physical counterpart in a fraction of the time and with much more control, offering ways to answer overarching questions about evolution as a whole. Thousands, if not millions, of digital organisms that each have their own genetic code and behavior interact with each other through hardware, with their data extracted at the end of the simulation. One common method of analysis involves constructing a phylogenetic tree from the hereditary information of these organisms; however, with millions of records, these computations are no easy task, often taking dozens of compute hours and complex algorithms. With simulations becoming increasingly expansive, current methods eventually lack in efficiency and scalability. Therefore, this research aims to develop new techniques for phylogenetic reconstruction, optimizing everything from algorithms to low-level data handling. Several such techniques were developed as part of the 'hstrat' package, involving a direct naive approach, a smarter consolidation-based approach, and versions of each using different programming languages and data structures. It was found that using a search-table based consolidated C++ algorithm performed the best, processing data from over 6 million organisms in under a minute, which is several orders of magnitude faster than previous approaches. The algorithm can be even further optimized using parallelization, splitting tree construction across several subtrees, and combining them together at the end. By overcoming computational barriers, these findings pave the way for much larger-scale evolutionary simulations. Therefore, more complex, high-level conclusions can be made about evolution by simulating in hours what would otherwise take years.

Vamsi Singu

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Vamsi Singu

#2 Ryan Tuckey

#3 Rory Greer

#4 Hunter Dean

#5 Erik Roberson

#6 Yuhua Song

Abstract Name: MD simulations of Alzheimer's disease-associated APOE isoforms, such as APOE3-Christchurch, highlight potential shared mechanism of protection.

The lipid carrier protein Apolipoprotein E (APOE) is the most prominent risk factor for late onset Alzheimer's disease (AD). The three most common alleles are APOE3, APOE2, and APOE4 which provide neutral, decreased, and increased risk of developing AD, respectively. Several rare variants in APOE have been identified to be protective against AD. One such variant is APOE3-Christchurch (R136S) which was identified in a case study of familial AD. ApoE3-Christchurch is thought to be protective, in part, due to its reduced affinity for apoE receptors by reducing spread of toxic proteins. ApoE, a lipid-transport protein, is largely lipid-bound in vivo and undergoes distinct structural changes upon lipidation to enable binding to receptors like low-density lipoprotein receptor (LDLR). To better understand how rare isoforms, like apoE3-Christchurch, affect receptor binding, we used molecular dynamics (MD) simulations to study lipidated apoE structure and apoE binding to receptors like LDLR. We have obtained a lipidated apoE structure, provided by Prakashchand et al., which was generated from coarse-grained MD simulation of a mutant apoE structure (PDBID: 2L7B) in the presence of DPPC lipid molecules. After energy minimization, we converted the mutant apoE to apoE3 and ran MD simulations to generate representative apoE3 structures which were converted to the remaining apoE isoforms using PyMOL. Three replicate simulations for each apoE isoform, each with 300ns of equilibrated simulation, were used for final analysis. We then docked apoE3 to a structure of LDLR (PDBID: 2FCW) to create a model of apoE bound to LDLR. We examined changes in apoE structure, conformation, dynamics, and binding interactions. Results indicate that apoE3-Christchurch has similar structure, conformational stability, dynamics, and binding to apoE2. Analysis of apoE3-christchurch provides insight into similarities and differences it shares with common apoE isoforms that could be predictive of downstream functional changes resulting in altered AD risk.

Savar Sinha

CA - California Institute of Technology

Discipline: Physics and Astronomy

Authors:

#1 Nathanan Tantivasadakarn

Abstract Name: Exploring Entanglement Transitions in the 4-Level Qudit Projective Transverse Field Ising Model

Quantum error correction is an indispensable step towards scalable quantum computation. Errors and syndromes in quantum systems can be modeled as stochastic measurements, which act as non-commuting, competing projections. These measurements drive entanglement transitions between topological phases, delineating regimes where projective measurements either preserve or destroy quantum information. These transitions are commonly studied via the 1D projective transverse field Ising model (PTIM), a quantum variant of the classical Ising model wherein nearest-neighbor and external field interactions correspond to

stochastic projective measurements of Pauli ZZ and X on a qubit chain. In this study, we extend the PTIM to 4-level qudit chains featuring three non-commuting generalized Pauli operators to identify novel entanglement transitions. We efficiently simulate entanglement dynamics via a cluster model whose runtime scales linearly with system size. By averaging the entanglement entropy and mutual information across thousands of quantum trajectories for different probabilities of the three measurement types, we demonstrate the existence of three distinct entanglement phases whose transition lines meet at a critical point along the boundary of the phase diagram. Moreover, we illustrate that the scaling prefactor of the entanglement entropy along the transition lines is equivalent to that of the qubit model along all points except for the critical point, where this value doubles. We corroborate this by demonstrating that the averaged entanglement quantities computed for two coupled qubit PTIMs are identical to those of the 4-level qudit model. Future work will involve an alternative derivation of these observations from a conformal field theory perspective via a mapping to bond percolation in addition to an investigation of the applications of these results to quantum error correction schemes.

Sophia Siong

CO - Regis University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Geoffrey Bateman

Abstract Name: Who are the Hmong: Using Oral History and Community Based Qualitative Research to Retrace History and Explore Sense of Belonging in the Hmong Community of Colorado

This study explores how Asian Americans, specifically the Hmong community journeyed to the United States after displacement in Southeast Asia and forged a sense of belonging. It provides the opportunity to learn more about how the Hmong community experiences a sense of belonging as immigrants, refugees, or children of either, along with any significant factors that positively or negatively affect how they belong. An oral history and community based qualitative research framework were used to collect fifteen 30–45-minute interviews from Hmong individuals living in Colorado. Each interview was recorded and transcribed before comparison between each other to identify major themes or patterns. Preliminary results highlighted three common topics mentioned by each participant which were stories of migration, connections to culture, and the significance of storytelling. Through this perspective, Hmong Americans can be better understood as a part of the larger Asian American and Pacific Islander (AAPI) community. Some of the questions addressed in this study were: Who are the Hmong people and why did they come to the United States? How do they find a sense of belonging, and how does this sense impact how they stay connected to and preserve Hmong culture? Does this sense of belonging have any connection to age, generation or where a person lives? This research serves as one piece of the larger puzzle in identifying the ways AAPI communities face justice issues including racism and discrimination, offering insight as to why it is important to hear the stories of marginalized people.

Rosa Sisneros-Jimenez

NM - University of New Mexico - Valencia Campus

Discipline: Health and Human Development

Authors:

#1 Rosa Sisneros-Jimenez

#2 Piotr Filipczak

Abstract Name: CC-115, a DNA-PK and mTOR kinase dual inhibitor, induces toxicity in p53 mutated lung cancer cells cultured in vitro

Increased genomic instability of cancer cells makes them sensitive to drugs which inhibit DNA repair enzymes. While targeting DNA repair pathways proved to be successful in clinical treatment of BRCA-deficient malignancies of breast and ovary, so far it showed little efficacy in lung cancer. Since this malignancy remains the number one cause of all cancer related deaths in the United States, identifying specific subtypes of lung cancer which could benefit from such targeted therapy is an object of intense research. This study was conducted using two lung cancer cell lines, H1975 and H1299, characterized by p53 inactivation mutation and resulting increased level of genomic aberrations. In vitro toxicological experiments tested sensitivity of these cell lines to three drugs targeting different DNA repair mechanisms – Olaparib, Ceralasertib and CC-115. Consistently with a few recent reports, we demonstrated that both cell lines are sensitive to CC-115, a DNA- PK and mTOR kinase dual inhibitor, while they are resistant to Olaparib and Ceralasertib. Combinations of these drugs did not produce additive or synergistic effects. Altogether, our study suggests that CC-115 could be tested as a sensitizer in a combinatory treatment with DNA damaging agents such as cisplatin or ionizing radiation.

Kishan Sivakumar

TX - The University of Texas at Austin

Discipline: Engineering

Authors:

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#3 Benjamin Jessie

Abstract Name: Thermal Analysis of Flexible Micro Patch Antenna Excitation in Tumor Detection

Infrared thermography (IRT) is a technique currently utilized in early breast cancer diagnostics, however, recent analysis has shown that this method is ineffective in detecting tissue anomalies between variations of human breast structure. In this research project, the process of using electromagnetic fields (EMF) via an array of microstrip patch antennas to excite breast tissue to thermographically detect tissue anomalies is analyzed. Because tumors have a higher metabolic rate than healthy, surrounding tissue, a hotspot, or region of significant temperature increase, can be associated with the presence of a tumor when exposed to the same amount of excitation. Furthermore, in this study, a more effective design method for EMF detection is proposed and analyzed. Through the use of a flexible substrate, polydimethylsiloxane (PDMS), the microstrip patch antennas can be curved to match breast structure in practical usage. Therefore, they can be manufactured with large dimensions to minimize gaps of tissue unexposed to excitation, which can be easily implemented in an effective arrangement for wearable devices. With the use of finite element modeling (FEM) in ANSYS, the designed flexible microstrip patch antennas were simulated on the breast of a 3-D human body model with assigned breast tissue material properties and an artificially-placed sphere with tumor material properties, while analyzing the thermal response of the tissue anomaly in comparison to surrounding healthy tissue. A steady-state thermal analysis of this model depicted a noticeable thermal hotspot in the region of the artificially placed tumor. Overall, this study serves as a precursor for the implementation of PDMS microstrip patch antennas in portable breast cancer detection by depicting its efficacy in thermographically detecting tissue abnormalities.

Sruti Sivan

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Joel Berry

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#4 Jessy Deshane

#5 Kayla Goliwas

Abstract Name: Enhancing Anti-Tumor Immune Response in Non-Small Cell Lung Cancer by Targeting IL-6 Signaling and Immune Checkpoint Interactions

Introduction: Tumor-stromal interactions in the tumor microenvironment (TME) of non-small cell lung cancer (NSCLC) drive progression and therapeutic resistance, with interleukin-6 (IL-6) playing a key role by regulating immunosuppression. We hypothesize that targeting IL-6 signaling in combination with immune checkpoint inhibitors may improve treatment efficacy by reducing immunosuppression and enhancing anti-tumor immunity within the TME. Methods: Using an ex vivo perfusion culture platform, remnant tumor tissue specimens from 12 patients were cultured. Starting on day 3 of culture, tissues were treated with an immune checkpoint inhibitor (ICI, 10 µg/ml anti-PD-1, Pembrolizumab biosimilar) and an IL-6 receptor inhibitor (5 µg/mL anti-IL6R, Tocilizumab biosimilar) or ICI alone (11 days treatment, 14 days ex vivo culture). Flow cytometry, histologic analyses, and spatial transcriptomics were performed. Results: Tissue specific increases in apoptosis was observed in 70% of combination therapy treated tissues when compared to ICI alone ($16.4\% \pm 3\%$ (ICI + anti-IL6R) vs. $14\% \pm 3\%$ (ICI)). Tumor cell death was assessed using a viability dye, an increase in tumor specific death was observed in 91% of tissues when combination therapy is compared to ICI alone ($15.7\% \pm 6.3\%$ (ICI + anti-IL6R) vs. $9.8\% \pm 4\%$ (ICI), $p=0.03$). The ratio comparing CD8+ T cells to immunosuppressive myeloid derived suppressor cells (MDSC) was increased in a subset of tissues in response to combination therapy. Using spatial transcriptomics, pathway analyses were completed to assess immune exhaustion and T cell checkpoint expression in tumor, stroma, and CD8 T cell segments. In the subset of tissues that contained an increased CD8+ T cell to MDSC ratio, these pathways were downregulated in the CD8 T cell segments with combination therapy. Conclusions: This combination strategy may enhance long-term therapeutic outcomes by reducing immune suppression, but further study of cell-cell interactions and alterations in the TME are essential.

Jackson Skeeters

KY - University of Kentucky

Discipline: Architecture, Construction Management, and Interior Design

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#2 Helen Turner

Abstract Name: Immersive Recycling: The Merging of Art and Audits to Encourage Behavioral Change

Strategies for the ways in which sustainability is incorporated in design education commonly revolve around “reduce, reuse, recycle”. Much attention in the interior design body of knowledge has focused on sustainable design practices, factors influencing the adoption, and integration of sustainable design knowledge into the curriculum. Although students from CIDA accredited programs are exposed to the principles of sustainable design and apply these strategies to their coursework, the actual materials often used in teaching and project submissions are paper-based. Thus, interior design students while learning about sustainability are simultaneously consuming the most prevalent item found in the waste stream. This is particularly important

because Americans produce daily almost three times as much waste as the global average. In fact, several of the most prevalent items in municipal solid waste could be recycled, such as paper-based products, plastics, and metals. This begs the question: Are interior design students integrating sustainability principles into their design projects without acknowledging sustainable actions in their own practice? Waste audits have proven useful to draw attention to the material consuming nature of the design process while art installations have been successfully used to advocate behavioral change. This research conducted a waste audit to understand what recycling occurred and what materials were incorrectly recycled by current design students. The waste audit included sorting all the recycling bins in the building and sorting them into different categories. At the completion of the audit, materials collected were then utilized to create an immersive piece of art with the goal of encouraging behavioral change towards sustainable practices within the teaching and learning of design. Furthermore, the use of different formats have been incorporated to reach students and inform them of better practices and options related to sustainability.

Hayley Skillens

PA - Commonwealth University - Mansfield

Discipline: Music

Authors:

Abstract Name: Universal: The Blending of Musical Traditions in the Music of William Grant Still

William Grant Still was a pioneering African-American composer whose works had a significant impact on the development of classical music in the United States. At a time when much of the classical genre was still based on European models, William Grant Still chose to create a more American sound, which he referred to as the “universal idiom.” Often known as the "Dean of African American Composers," Still's legacy is marked by his ability to combine classical traditions with African American cultural elements, creating a unique and universal voice that resonates in American music. In what scholars believe was an early version of his essay “An Afro-American Composer’s Point of View,” Still discusses how he feels that he should write the music of his own people because that is what he knows best. Unlike many of his European contemporaries, Still avoided radical modernism, and instead focused on using and modifying folk forms and music of what he considered to be his people. This paper outlines the parallelisms between William Grant Still’s efforts to be an educated and successful classical music composer, with his compositions which transcended the very cultural and racial boundaries against which his own life struggled.

Katherine Skillings

WV - West Virginia University

Discipline: Education

Authors:

Abstract Name: The Art of Storytelling: An Educational Art Book

In the modern high school art classroom, students are tasked with projects structured around foundational artistic practices such as figure drawing, portraiture, and still life. These exercises, while grounded in art history and technique, can be seen as rudimentary and redundant when retaught year after year, becoming monotonous and dull. Specifically, there is a lack of personal engagement that can be put into these projects as the main goal is to produce the most “realistic” or “representational” copy of what has been placed in front of the artist. For this age demographic (about 14-18), the ability to infuse personal meaning into their artwork

—whether by incorporating elements of their identity, emotions, or the media they engage with—is essential for fostering a deeper connection to the creative process. The objective of this project, based on qualitative research, aims to address this gap between curriculum and student interest by blending traditional techniques with a more flexible, personalized approach to art instruction. Through the lens of an Advanced Painting and Drawing curriculum for high school students, the project integrates a contemporary "art book" that diversifies how core artistic techniques are taught, while also cultivating a space to help students learn how to visually create stories to express their own experiences.

Sylvie Skrzypinski

NY - St. Lawrence University

Discipline: English and Literature

Authors:

#1 Sylvie Skrzypinski

Abstract Name: Eve in Chains: From Paradise Lost to Lucifer, Patriarchy Still Dominates the Story of the First Woman

The aim of this essay is to evaluate changes in perceptions and depictions of Eve, the infamous first woman, by examining how she is portrayed in John Milton's *Paradise Lost* (1667) and in the television show *Lucifer* (2016). Though Eve has undergone some crucial changes, many aspects of her story remain strikingly similar. In particular, the lack of agency Eve has over her fate, her subordination to male characters, and the stereotype of Eve as wife and mother are closely looked at. I also note that while *Lucifer* breaks new ground by exploring Eve as a queer character, the show still holds her to patriarchal standards in her romance with a female partner. Finally, the use of the male gaze in the cinematography perpetuates the same type of objectification Eve experienced in *Paradise Lost*. Comparing Milton's Eve to *Lucifer*'s Eve reveals that, despite the progress feminist movements have made, misogyny and traditional gender roles still have a powerful hold over the stories we tell.

Colm Slevin

PA - University of Pittsburgh

Discipline: Chemistry

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#1 Colm Slevin

Abstract Name: How Molecules Wind Down: Knowledge Based Searching for Optimal Correlated Torsional Angles of Conformers

Many biological functions are based on secondary properties, such as three dimensional conformation. Protein folding is a widely studied phenomenon, and is considered the foundation of protein function and malfunction. The same can be said about enzymes and drugs, as a molecule's shape determines how it interacts with a binding site. The majority of molecular variations are small: bond length and bond angle only vary by minute amounts (a few tenths of an angstrom or a few degrees), whereas torsional angles can vary by large amounts (up to 180 degrees in some cases). Most conformer determination methods use crystallographic databases to determine molecular geometry, limiting them to molecules that are able to be synthesized and crystallized. In this work, torsional preferences are determined by comparing molecular substructures using knowledge based searching methods. This work is particularly concerned with correlated torsional angles,

where changing one torsional angle impacts the stability of another. The goal of this project is to not only to build a predictive model for correlated torsional angles, but to build a model that works efficiently.

Emma Sloan-Garza

TX - Texas Woman's University

Discipline: Nursing and Public Health

Authors:

#1 Jennifer Wilson

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Abstract Name: FAVOR - Feasibility and Acceptability of Virtual Reality for Older Acute Stroke Patients

Background: Stroke is the 5th leading cause of death globally, and age is a predictor variable. Virtual reality (VR) has effectively improved patient outcomes in post-stroke rehabilitation across age groups, including Baby Boomers (born between 1946-1964), Generation X (1965-1980) and Millennials (1980-1996). Early VR use after stroke could accelerate recovery and improve patient outcomes. However, age-related patient perceptions regarding VR adoption during the acute phase of recovery has not been studied. Purpose: To explore the acceptability and feasibility of different age groups toward VR use to promote post-stroke recovery. Methods: This prospective non-randomized observational study enrolled stroke patients admitted to an acute stroke unit or neuroscience intensive care unit. Wearing a VR headset, patients played a standardized VR game that required movement of at least one arm for 5 minutes. After playing the VR game, the patients completed two validated measures: the Acceptability of the Intervention Measure (AIM), and Feasibility of the Intervention Measure (FIM). The lowest survey scores were imputed for participants who did not complete the VR game and/or survey. Results/Conclusion: The 30 patients included 21 Baby Boomers, and 9 Generation X. AIM and FIM scores were generally high. Among all subjects, VR was measured as implementable and seemingly possible (88.9%), seemingly doable (81.4%), seemingly easy (74%), appealing (81.5%) met their approval (85.2), 81.5% found VR to be a learning tool, and 84% welcomed VR. Among age groups, there was no difference in total AIM scores ($P=.25$) nor FIM scores ($P=.29$). Several subjects had never played video games and described VR as fun and engaging. One participant gained functional arm mobility during the VR intervention. VR is feasible and acceptable across age groups in acute and critical care settings. These findings support future studies exploring the impact of VR in early rehabilitation on patient outcomes.

Jacob Slusser

VA - Liberty University

Discipline: History

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#1 Jacob Slusser

Abstract Name: America's Pastime Under the Fog of War: A Study of the Impact of World War II on Major League Baseball's Finest

World War II was a crucial point in world history and many men could not escape the desire to fight and defend their country. One subsection of men that fought in the war is the many men that competed in Major League Baseball and its affiliate leagues, the minors and the Negro League. Players that served in the war lost valuable time in their playing careers, despite this many would eventually enter the National Baseball Hall of

Fame. This research aims to analyze the military service of Major League Baseball players and how that service impacted their careers. How did service in World War II impact the careers of Hall of Famers and did that service help or hurt their careers? This study will employ an analysis of primary and second sources to determine where players served and analyze their pre- and post-war careers. Primary sources such as newspaper reports and interviews with the players themselves provide insight into the impact of the war on these players. The case study specifically will look at the careers of Warren Spahn, Yogi Berra, Joe DiMaggio, and Ted Williams. This research seeks to deepen the understanding of baseball during World War II and shed light onto the oftentimes unknown stories of these baseball legends. Each of these four players had promising careers and were inducted into the Hall of Fame despite missing several seasons to military service.

Samantha Small

PA - Elizabethtown College

Discipline: Chemistry

Authors:

Abstract Name: Effect of Temperature and Sulfuric Acid Concentration on Pattern Formation in BZ Chemical Reaction Systems

Waves and oscillation patterns are found at all levels of biological organization, from cellular to supracellular and even social organisms. For instance, the rhythmic beating of the heart is driven by the intricate spatiotemporal distribution of oscillatory signals in cardiac pacemaker cells, while Beta-cells in the pancreas release insulin in response to fluctuations in calcium concentrations. Similarly, amoeboid cells exhibit wave-like propagation patterns that generate movement. The Belousov-Zhabotinsky (BZ) reaction serves as a model for studying the dynamic behaviors of biological, chemical, and physical systems. This reaction involves the oxidation of an organic acid by bromate ions in acidic aqueous solution in the presence of a metal ion catalyst. When the precise conditions are met, this metal catalyst undergoes repeated oxidation and reduction cycles that can be visualized by alternating colors. Variations in the BZ reaction mixture and environmental conditions, such as temperature, affect oscillation and wave patterns. We report our investigations into the effects of temperature and sulfuric acid concentration on spontaneously propagating wave patterns in a quasi-two-dimensional BZ reaction-diffusion system conducted isothermally at temperatures between 3.0°C and 50°C. The average wave velocity, wavelength, and period measurements show a strong temperature dependence. At low acid concentrations, as temperature increases, the wave patterns transition from target to spiral and chaotic wave patterns, while in isothermal conditions, the wave patterns transition from target to spiral with increasing sulfuric acid concentration.

Anna Smetek

MI - University of Michigan - Ann Arbor

Discipline: Business

Authors:

Abstract Name: The Phenomenon of Busyness: Leadership, Time Management, and Its Implications in Law, Economics, and Business

This study, conducted under the ODESI framework, explores the phenomenon of “busyness” in leadership within the fields of law, economics, and business. The research examines how leaders’ time management

affects their professional actions, personal decisions, behavior toward others, and career trajectories. By conducting interviews with CEOs and leaders from diverse firms, companies, and organizations, the study investigates the nature and functions of time management, examining both its positive and negative consequences. The methodology includes contacting potential interviewees, conducting interviews, transcribing them using Otter AI, and summarizing key insights into concise memos after analyzation. The study's core questions are: What is busyness? What are its functions? And what are its implications for leadership success? In its practical application, this study aims to enhance organizational effectiveness by fostering better communication across hierarchical levels, inspiring purpose-driven leadership, and supporting balanced, productive work environments. The research holds significant relevance for both academic and corporate fields by uncovering insights that contribute to building efficient teams and sustainable career paths. It is expected that the study will reveal how professionals manage their time and happiness in both their professional and personal lives by examining how they handle busyness. Additionally, the study aims to identify the most successful leadership structures for creating efficient and balanced work-life schedules. This research aligns with the shared vision that collaboration between industry and academia can drive innovative advancements benefiting society. By examining the effects of busyness and time management, it ultimately seeks to inform strategies for balancing professional and personal lives, promoting individual well-being and organizational productivity.

Vanesa Smielak

FL - Florida International University

Discipline: Biology

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#6 Andrew McCallion

Abstract Name: Leveraging single cell transcriptomics to inform prediction and prioritization of biologically relevant candidate genes in emerging Parkinson's disease GWAS loci

Parkinson's disease (PD) is a common progressive neurodegenerative disease affecting motor control, with preferential loss of dopamine neurons in the substantia nigra (SN). Despite being extensively studied, a full understanding of the genetic causes of disease risk and progression in both familial and sporadic PD remains elusive. Through genome-wide association studies, more than 90 independent loci have been associated with disease; however, pinpointing the affected genes and causal variants within these loci remains a challenge. We leveraged single-cell transcriptomics to upgrade a computational scoring system to predict and prioritize top candidate genes within a 1 Mb window centered around the lead variant within 98 loci. Genes were scored using five different gene lists: genes with an average expression above 0.5 transcripts from SN cell populations in the scRNA-seq data from both Hook et al. (2018) and La Manno et al. (2016); genes that were differentially expressed between post-natal day 7 (P7) subset clusters; genes found to be specifically expressed in the P7 midbrain SN cluster; and genes enriched for PD in the weighted gene co-expression network analysis modules. Altogether, we predicted candidate genes for 97% of PD loci; 11.2% of loci had only 1 candidate gene; and 43.9% of loci had 3 or fewer scored candidate genes. For loci with more than 2 or more scored genes, the probability of loss-of-function intolerant was used to prioritize the top candidate gene. Our top gene candidates SNCA, KCNN3, and CPLX1 have been previously shown as directly associated with PD, supporting the use of context-specific data in prioritizing candidate genes in PD GWAS loci. This systematic approach facilitates the prioritization of biologically pertinent gene candidates for sporadic PD, informing PD genetic research.

Taylor Smith

FL - Florida Atlantic University

Discipline: Health and Human Development

Authors:

Abstract Name: In the Eyes of the Consumer: Food Labels and Safety in America

The American food industry encompasses many characteristics that play crucial parts in the economy. However, increasing concerns have arisen regarding the ingredients in packaged foods available in U.S. grocery stores and their safety, due to substantial amounts of toxic additives and preservatives. While some see it as a deadly health problem, others are unaware of the issue. Motivated by this variation, I developed a survey to assess the public's knowledge regarding America's food system. Specifically, the project focuses on comparing male and female responses regarding how often they check food labels when grocery shopping and their perceptions of the safety of American packaged foods. The survey consisted of 16 questions and 152 responses were collected via the Amazon MTurk platform. After further analysis through IBM SPSS software, results revealed significant gender differences indicating that 88.3% of females check ingredient lists when grocery shopping very often or somewhat often, compared to 69.9% of males. This difference is statistically significant at the 1% level. Additionally, 7.7% of females perceive packaged food products in the U.S as somewhat unsafe, while only 1.4% of males share this view. This difference is statistically significant at the 1% level. These findings reveal significant gender-based differences, with females demonstrating greater attention to the American food industry. This research could have important implications for the future, particularly considering the knowledge disparities between females and males on this critical issue.

T'yKuan Smith

TN - Tennessee State University

Discipline: Education

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#3 Andrea Tyler

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Kaleb Gibson

Abstract Name: Bridging the Gap: The Impact of Black Success through Equity, Support, and Representation

This research was grounded in identifying ways to promote racial equity by advancing research that disrupts anti-Black norms, values, and beliefs in science, technology, engineering, and math (STEM). This study aims to enhance Black students' academic and personal success in post-secondary education. The research participants included four undergraduate students of diverse STEM majors, sexes, and ethnicities. All four participants attend a Historically Black College or University (HBCU). During a 40-minute semi-structured focus group, the participants were led into a discussion designed to learn about the specific intersection of their identities. The focus group session was recorded via Zoom and transcribed verbatim. The transcripts were analyzed using an equity framework lens and coded for common themes. Through analysis of the transcription, common themes were discovered that impacted Black success in post-secondary education. The findings revealed that student-faculty relationships and role modeling were positive influences, and student-faculty relationships, colorism, and educational funding are examples of negative influences. These findings highlight the complex dynamics influencing Black student success in post-secondary education. We found that student-faculty relationships have positive and negative influences, emphasizing the inconsistency in

those interactions. Role modeling is also prevalent, as many students need to see successful individuals with similar backgrounds and present as role models for upcoming generations. Furthermore, students are affected by the systematic challenges of colorism and the barrier of underfunding that many HBCUs face. As a result of the findings, it is suggested that strengthening student-faculty relationships by nurturing supportive environments, advocating for increased funding, and implementing mentor programs or the visibility of successful alumni at universities are needed to increase black student success in post-secondary.

BREANNA SMITH

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: Modern Ranch-Style Retreat

Modern Ranch-Style Retreat focuses on designing an accessible living environment for a family member diagnosed with severe myopia. Myopia is a refractive error due to the eyeball becoming too long, causing light to focus in front of the retina rather than directly on it. As a result of this elongation, light does not properly focus on the retina, making distant objects appear blurry, and unclear outside visual scope. The user can distinguish objects within five feet, but anything beyond that becomes unclear. Designing an accessible home for the family includes reviewing related articles, videos, and attending a live presentation from a guest speaker with a visual impairment. Myopia typically develops between ages 8-12 and progresses through childhood, often stabilizing in late adolescence. However, individuals with myopia are at higher risk of developing eye conditions like glaucoma, cataracts, macular degeneration, and retinal detachment later in life. Key design strategies of this project for the user are emphasizing thoughtful hardware placement, material reflectance values, and creating contrasts between furniture and structural elements. Additionally, wainscot railings as handrails, matte finishes to reduce glare, layered lighting with dimming switches, ADA-compliant grab bars in the bathroom, nightlights, laminate flooring, a recessed sprinkler system, and low-pile carpet were considered to support the user's navigation and safety within the home. Universal design principles were also incorporated to accommodate both visually impaired and sighted family members, such as widening the corridors, placing cabinetry at accessible heights, using sliding doors for closets, and using three-way switches for convenience in controlling lighting from multiple locations. In conclusion, the design effectively prioritizes the needs of all household members by implementing a universal design that is functional for everyone, and integrating ADA-compliant solutions throughout the home, to promote independence and comfort.

Dana Smith

FL - Florida Atlantic University

Discipline: Engineering

Authors:

#1 Dana Smith

#2 Jinwoo Jang

Abstract Name: Creating a High-Resolution, Immersive City Environment Model Through the Integration of Photorealistic 3D Mapping

The advent of Photorealistic 3D Tiles (P3DT) offers groundbreaking opportunities to better understand

streetscape infrastructure (e.g., buildings, street assets, roads, and vegetation) through high-resolution 3D mapping. This technology enables the creation of high-fidelity, immersive streetscape environments, a crucial step toward advancing next-generation, human-centered infrastructure design and optimizing streetscape functionality. The core objective of this project is to develop a 3D digital twin—an accurate, geographically aligned, visually and physically immersive representation of real-world streetscape elements including but not limited to buildings and road networks. The project focuses on producing detailed, photorealistic renderings of streetscapes, capturing the intricacies of multiple buildings, roadways, and pedestrian infrastructure. This goal was achieved through the integration of various software tools, including the Google Maps API, P3DT, Blender, and Unity. The workflow began with modeling buildings in Blender, incorporating data from OpenStreetMap (OSM), Google P3DT, and real-world terrain. Each building model underwent meticulous refinement to achieve high-quality, visually accurate results. OSM data guided the precise arrangement of streetscape components by providing critical details like building locations, road outlines, railway alignments, sidewalks, and forestry placements. After the buildings were modeled and placed, road and sidewalk systems were created by tracing OSM's road outlines. Once the streetscape modeling in Blender was complete, the components—including buildings, roads, and sidewalks—were exported to Unity. This step was essential, as Unity's cross-platform development environment supports the integration of advanced simulations, such as traffic modeling, predictive analytics, and agent-based interactions. These features enable the creation of immersive and functional 3D virtual streetscapes, bridging the gap between visual realism and practical application in urban infrastructure planning. This project demonstrates the potential of P3DT in revolutionizing streetscape modeling and urban development.

BREANNA SMITH

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: When Tragedy Strikes!

What happens when students or faculty are caught in the crossfire in the hallway during an active shooting lockdown? Tragedy. Research shows that school districts implement lockdown protocols once a security breach occurs in the facility. During the lockdown, instructors are not allowed to open or unlock doors once they are shut for safety reasons. Individuals left on the other side of the door must find a place for refuge. Safety Pods are a unique solution essential in public education to protect students and faculty during active shootings. In 2022, 34 students and adults died, while more than 43,000 children were exposed to gunfire at school. The average Emergency Services response time is between 2–6 minutes. In 2019–20, there were a total of 25 school-associated violent deaths in the United States, which included 23 homicides and one suicide. Because of this terrible reality, it is imperative to construct the interior and exterior of the Safety Pod to withstand gunshots and support the person inside. The Safety Pod features life-sustaining qualities to increase survival rates for those accessing the pod. Features include air vents to circulate airflow, steel material applied to the front exterior to reduce the penetration of the bullet fragments, and Kevlar bulletproof padding and acoustic lining on the interior backside of the door. A first-aid safety kit and textured, antimicrobial fabric are incorporated into a seat inside the pod to help comfort users while waiting for rescue. The pods are recessed next to student lockers. The pods can also be stored next to restrooms, vending machines, and dead-end corridors as a freestanding single unit. The Safety Pod is a solution for everyone in public education stranded in corridors needing immediate shelter. The design safely accommodates users while waiting for law enforcement to secure the site.

Aryanah Smith

NC - Wake Technical Community College

Discipline: Social Work and Human Services

Authors:

#1 Aryanah Smith

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Abstract Name: Food Insecurity and Sustainability in North Carolina

Community-driven initiatives in Johnston and Wake Counties, North Carolina, are transforming lives by addressing food insecurity, fostering sustainability, and empowering vulnerable populations. Central to these efforts, Nourish International collaborates with local organizations to cultivate leadership and promote social impact through food security programs and sustainable agricultural practices. Partnerships with organizations like the Benson Area Ministerial Association (BAMA), the Raleigh Food Corridor, and the Raleigh Relief Project emphasize providing essential resources such as food, financial support, and hygiene products to underserved communities. Educational initiatives like urban gardening workshops and sustainability projects aim to build long-term resilience and community empowerment. These programs embody a shared mission of compassion, collaboration, and meaningful social change.

Garrett Smith

FL - University of West Florida

Discipline: Computer Science

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Abstract Name: Exploring LLM-Assisted Gap Analysis for Cybersecurity Compliance Auditing

Ensuring adherence to cybersecurity frameworks and standards is a prevalent challenge that numerous organizations face. Conventional auditing necessitates extensive manual analysis that requires an excessive quantity of time and resources to verify compliance and discover gaps in adherence to best practices. Recent advancements in large language models (LLMs) have generated many new opportunities to streamline tedious tasks. Artificial intelligence and machine learning have been increasingly applied to numerous aspects of cybersecurity, including threat detection as demonstrated by Lee et al. (2019). However, the application of these technologies in compliance auditing, though, remains largely unexplored. This study proposes a novel approach that employs a specialized LLM that aids in cybersecurity compliance auditing by finding compliance gaps and providing actionable recommendations by analyzing organizational reports. To ensure pertinent gap analysis in a dynamic and evolving sector, we review numerous contemporary cybersecurity standards as a set of training data, including the National Institute of Standards and Technology (NIST) Cybersecurity Framework (CSF) and the North American Electric Corporation Critical Infrastructure Protection (NERC-CIP) Standards. Furthermore, we address the ethical and practical challenges of using LLMs, including issues of hallucinations, transparency, and potential data security risks. A user-friendly interface must also be emphasized to facilitate accessibility for individuals with limited technical expertise. Our preliminary findings indicate that the proposed LLM auditing process could significantly reduce the time required for compliance audits while maintaining relative accuracy. However, due to certain persistent and unvalidated issues, the jury is still out on LLMs. Notwithstanding these limitations, LLMs can still be tapped as a tool for regulatory compliance and audit as demonstrated by a proof-of-concept system resulting from this study.

Emma Smith

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Discipline: Biology

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Abstract Name: Transgenic Expression of Human CD20 in Mice Leads to Motor Coordination Deficiency.

Introduction: CD20 is a marker for B cells in humans, but not expressed endogenously on mouse B cells. Transgenic mice expressing human (h)CD20 can undergo B cell depletion with treatment with Rituximab. We showed that B cells can migrate into the brain after injuries, such as stroke, facilitating recovery and influencing motor function and control. To understand B cell-mediated mechanisms of neuroprotection we crossed tamoxifen (tam)-inducible hCD20 mice with floxed brain-derived neurotrophic factor (BDNF) mice, BDNF is a key protein for neuroplasticity and the growth, survival, and maintenance of neurons.

Methods: Transgenic 11 to 12-month littermate male hCD20tamCRE(+) and hCD20tamCRE(-) mice were used for this study as well as 13 to 14-month male hCD20tamCRE(+)/fBDNF(+/+) and hCD20tamCRE(-)/fBDNF(+/+). Mice underwent rotarod testing for 9 days, followed by RNA sequencing of the hippocampus and motor cortex. Results: We found that mice expressing hCD20 had a significant deficiency in motor coordination during rotarod testing compared to the control in the absence of brain injury. Additionally, the presence of floxed BDNF in these mice exacerbated this deficiency. RNA sequencing analysis showed that 18 genes in the hippocampus associated with muscle function and cell development were affected. Among which, SYNPO2 and NHLH2 have been shown to affect muscle development, including skeletal muscles, through positive regulation of actin filament bundle assembly and differentiation and regeneration of muscle tissue after exercise respectively. Additionally, NEGR1 and TIAM2 are involved in locomotion and BCOR plays a role in cell death and lymphoid development. Conclusion: Human CD20 expression in mice affects genes in the hippocampus leading to a deficit in motor coordination which is further exacerbated by fBDNF. The effect of hCD20 on those genes may play a key role in this deficiency and suggest a role for B cells in brain function and motor cortex coordination.

Ryan Smith

PA - Elizabethtown College

Discipline: Chemistry

Authors:

#1 Ryan Smith

#2 Lauren Toote

Abstract Name: Development of Nanoparticle-Based Lateral Flow Assay for Detection of Mercury in Drinking Water

Heavy metals (e.g., arsenic, mercury, and lead) contaminate water supplies through natural deposits and industrial and/or agricultural pollution. Consumption of heavy metals may cause brain and kidney damage, reduced growth of a fetus, generalized birth defects, and immune system issues in humans. One effective strategy to prevent heavy metal consumption is to test potable water to ensure its safety. Typically, these analyses are done using expensive instrumentation, such as F-AAS and ICP-OES, that are not as accessible in many areas. Our goal is to create simple and inexpensive paper-based lateral flow assay (LFA) to make heavy metal testing accessible to the general public. Lateral flow assays are rapid tests (5-30 mins) used to detect or quantify analytes in mixtures. Each LFA has a control line, which ensures the test's functionality, and a test line(s), which indicates the presence of the analyte(s). In this work, we developed pH-sensitive polymer nanoparticles (NRNP) for the control line, and mercury responsive nanoparticles for the test line. The control nanoparticles were synthesized using neutral red and poly (styrene-co-maleic acid) (PSMA), in acetone, with a 1% polyvinyl alcohol (PVA) solution. The resulting control line changed from yellow to red with the addition of a water sample. The control line was optimized by testing the optimal number of drops added to the test, the ideal volume of each drop, and the water sample size. ImageJ was used to analyze the intensity of the control line signal during the optimization. The test line nanoparticles were synthesized using a derivative of rhodamine b. The polymers and solvents used in the synthesis were optimized, and the sensitivity and specificity of these nanoparticles to mercury were also analyzed. Both nanoparticles were then incorporated onto test strips to be used for detection of mercury.

Eden Smith

NC - Elon University

Discipline: Political Science

Authors:

Abstract Name: The Impact of State Approved Student Voter IDs on College Students Voter Turnout

Following the Help America Vote Act (HAVA) of 2002, states began implementing voter ID requirements with a variety of strictness. Many scholars have identified these laws as a barrier to voting for certain groups, including college students. There has been significant research on the effects of these requirements on voter turnout, but the evidence is inconclusive. In an effort to lower barriers to voting for college students, some universities have sought to get their student ID approved as a valid form of voter identification. This research aims to answer the question: Is there evidence that having an approved student ID increases voting rates among college students? In order to achieve this, states who have the same voter ID requirement strictness level were paired together for most scenarios—one that allows student voter IDs to some degree and one that does not. A university in each state was selected and matched to another in the pair that fit the criteria. Schools in different states were matched based on type of institution—public or private, and size of the undergraduate population. Within each pair, one university had their student ID approved by their state, while the other did not. Results suggest that having an approved student ID as voter ID has a positive effect on turnout. As more states add voter ID requirements and young people become more of a focus for political scientists, this research works to combine these two areas into a project that could have policy implications throughout the country.

Lor Smith

TX - St. Edward's University

Discipline: Psychology

Authors:

#1 Jessica Boyette-Davis

Abstract Name: Invalidation and Amplification: Medical Gaslighting's Role in Pain Perception

This study investigates the interplay of medical gaslighting (MG) and pain catastrophizing (PC). MG is defined by patient experiences in which they feel dismissed, invalidated, or inadequately treated by healthcare providers, often leading to doubts about their own health. These experiences may be amplified by social inequities such as gender, race, and socioeconomic status, which contribute to broader healthcare disparities. PC refers to an exaggerated focus on and fear of pain, causing a bidirectional effect on pain perception: pain can cause catastrophic thoughts, and those thoughts can, in turn, exacerbate the pain. We hypothesized that individuals who report more frequent experiences of MG would also display heightened levels of PC. Data was gathered via an online survey with 10 participants (ages 19 to 52). Participants reported on their experiences of MG and levels of PC using standardized scales. In line with our hypothesis, results revealed a statistically significant correlation between MG and PC. Possible contributing factors include the subjective nature of MG experiences, individual pain thresholds, and varying levels of psychological resilience. These findings underscore the complex interplay of the MG-PC, suggesting that different variables may influence this interaction. Further studies should aim to identify these factors and analyze how cultural and contextual differences shape the way MG and PC are experienced.

Isabella Smith

NY - Long Island University

Discipline: Interdisciplinary

Authors:

Abstract Name: Honoring the Tapu Wāhine Māori's voice in Rongoā Māori

The accelerating global environmental crisis fueled by climate change, biodiversity loss, and pollution has sparked a growing reinvestment in the knowledge, values, and practices of Indigenous peoples within their local communities. As the environmental crisis escalates, Indigenous knowledge is becoming increasingly recognized as critical to understanding the drivers and impacts of western modernization and the systems that derived from settler colonialism. The purpose of this qualitative case study research project was to listen to the perspectives of wahine (women) Māori about Rongoā Māori (traditional healing practices) in Whanganui, Aotearoa/New Zealand. It explored how returning to traditional healing practices aids in reciprocal restoration, where Rongoā Māori heals both the people and the land. This case study was conducted with a kaupapa Māori-centered approach and grounded in mana wahine theory through a three-month internship with the Healthy Families team at Te Oranganui, a Māori-led health organization in Whanganui. Qualitative methods were semi-structured interviews, participant observation, and an autoethnographic reflection of Afro-Indigenous. The findings revealed how Rongoā Māori operationalizes Māori philosophical concepts such as kaitiakitanga (guardianship of the environment), tangata whenua (people of the land), and wairua (spirit) to foster reciprocal restoration—healing that benefits both the people and the environment. Kaitiakitanga was practiced through the sustainable harvesting of medicinal plants, tangata whenua emerged as a deeply personal and collective sense of identity tied to place, and wairua was intricately linked to the efficacy of Rongoā Māori, connecting practitioners and recipients to spiritual dimensions often overlooked in western frameworks. These findings underscore Rongoā Māori as not only a culturally rooted alternative to western medicine but also as a transformative framework for environmental conservation grounded in traditional ecological knowledge (TEK). The study highlights the critical need for further research centering wahine Māori perspectives in both the Rongoā Māori space and broader conservation efforts.

Savannah Smith

Discipline: Psychology

Authors:

#1 Maureen Habashy

#2 Anu Vasireddy

#3 E. Scott Geller

Abstract Name: Positive Psychology and Relationship Outcomes: The Impact of Gratitude Expression on Romantic Relationships

This study examined the connection between romantic relationship satisfaction and gratitude expression in order to improve beneficial outcomes. By understanding these connections, couples can implement behavioral interventions to cultivate more fulfilling relationships. Although previous research has shown that these factors are positively correlated, there is a gap in the research with regard to including nonbinary participants. By including nonbinary participants in this research and adding gender inclusive language, the research team aimed to provide a safe space for individuals. Information regarding distance from a partner (long distance, living together, or living separately but in the same area) has also been overlooked. For this study, the participants (primarily Virginia Tech students) completed a 15-minute survey. They were asked a series of questions based on modified versions of the Couples Satisfaction Index (CSI) and the Appreciation in Relationships (AIR) Scale, which examine relationship satisfaction and gratitude expression, respectively. Demographic information about the participants and their partners was also collected, including distance from a partner and length of time in a relationship. Three main hypotheses guided this research: a) Higher levels of gratitude expression will be positively correlated with higher levels of relationship satisfaction, b) Gratitude expressions will decrease as the duration of a relationship increases, while reported relationship satisfaction will remain stable, and c) Participants who are living together will report lower levels of both gratitude expression and relationship satisfaction than will those who are long-distance partners or are living separately. The results showed that romantic relationship satisfaction and frequency of gratitude expression were moderately positively correlated. Satisfaction and distance from a partner were only weakly positively correlated. Satisfaction and length of time with a partner were also weakly correlated. Overall, these results showed that factors beyond duration and physical distance, like gratitude expression, can lead to satisfaction for individuals in relationships.

Caitlyn Smith

KY - University of Kentucky

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: Illuminating Sustainable Design: Teaching Design Students About Low-E Windows

The University of Kentucky College of Design recently relocated the Gray Design Building (GDB) which is a sustainably repurposed tobacco warehouse. This building is itself a learning opportunity for the students who study in it. One such opportunity is the use of Low-E windows to reduce unwanted interior heating by the sun. This is a sustainable design choice that is crucial to preserving energy use in the GDB, yet this information is not being shared with students and other building occupants. Through research into the science behind Low-E technology, exploration of various teaching tools, and an iterative design process, this project investigates how the technology of the Low-E windows can be creatively conveyed to design students. The project will result in an interactive art installation that manipulates sunlight to visually explain the scientific principles of Low-E technology, thus making the information digestible and engaging for students.

Rachel Smith

NC - High Point University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Rachel Smith

#2 Melike Kahya

#3 Brad Manor

Abstract Name: The Impact of Fear of Falling on Brain Activity and Cognitive Performance in Older Adults

Elevated fear of falling (FoF) among older adults is associated with an increased risk of cognitive decline. Previous research has indicated that reduced electroencephalogram (EEG) alpha activity in frontal regions is correlated with diminished cognitive performance, particularly in areas of attention and executive function. Nevertheless, the interplay between FoF and brain activity related to attention and executive function remains insufficiently explored. This cross-sectional research aimed to understand the effect of FoF on resting-state EEG alpha power and cognitive performance in older adults. We hypothesized that older adults with high FoF would demonstrate reduced alpha power and decreased cognitive performance compared to older adults with low FoF. Twenty-two participants (age: 75 ± 7 years; 16 females) completed the Falls Efficacy Scale and were divided into low FoF (<18 ; $n = 14$) and high FoF (>18 ; $n = 8$) groups. They also completed a cognitive test battery (Montreal Cognitive Assessment, Hopkins Verbal Learning Test, Digit Span, Digit Symbol Substitution Test, Trail Making Tests, and Verbal Fluency) and a resting-state EEG. Independent Sample t-test results indicated that older adults with high FoF had lower alpha power in the anterior left region compared to those with low FoF ($p = 0.007$). While cognitive test scores did not significantly differ between groups, a trend towards lower Digit Symbol Substitution Test performance was observed in the high FoF group ($p = 0.05$). These results suggest that high FoF is associated with reduced alpha power and potentially impaired executive function and attention. Further research is needed to investigate the neurophysiological mechanisms underlying these observed relationships, as well as to determine the timing of changes in FoF, alpha brain power, and cognitive decline which can provide deeper insights into their interconnections.

Karrie Smith

OH - Defiance College

Discipline: Biology

Authors:

#1 Patrick Cain

Abstract Name: Measuring diversity and estimating density of ticks (Family Ixodidae) in Defiance County, Ohio

Tick-borne diseases are spreading with the range expansion of the black-legged tick (*Ixodes scapularis*). Black-legged ticks can survive cold winters by staying beneath leaf cover at the edge of woodland habitats. The spread of *I. scapularis* has been facilitated by terrestrial and aerial hosts as far north as Canada. One method to record this spread and better inform local health departments is to estimate the increase of tick-borne disease hosts through sampling. The goal of this project is to measure and compare tick species diversity in Defiance County, Ohio. Between December 2023 and October 2024, we drag-cloth sampled a heavily managed wildlife preserve (Thoreau Nature Preserve) and an unmanaged natural area (Penney Nature Center) in Defiance County, Ohio. We found a total of 44 ticks and two species between the two sites: 88.6% *Dermacentor variabilis*, and 11.4% *Amblyomma americanum*. Penney Nature Center had the highest abundance with 81% of all ticks collected. We suspect that controlled burns and targeted mechanical vegetation removal may have eliminated the leaf cover ticks rely on to overwinter. Overall, we found fewer ticks than expected, especially for the time period through the summer and fall. Unusual dry seasonal conditions may have driven ticks to lower, ground-level vegetation, thus precluding accurate sampling.

Brianna Smith

WI - University of Wisconsin-Eau Claire

Discipline: Computer Science

Authors:

#1 Jacob Diamond

#2 Naeem Seliya

Abstract Name: Patterns and Characteristics Unique to AI-Generated and Human-Generated Text Responses

The recent advancements and broad applications of Large Language Models (LLMs) and Gen-AI tools, such as ChatGPT and Gemini, have a critical goal of effectively and efficiently identifying and modeling a multitude of complex patterns and characteristics associated with human-centric languages, in both spoken and written forms. Generally based on LLMs and Gen-AI algorithms, existing literature works have yielded performance success; however, at considerably different levels. For example, multiple research works have noted there were specific characteristics associated with the respective AI-generated and human-generated responses to a given input prompt. The current focus of our research is investigating natural language processing based solutions to identify hidden patterns and semantic constructs that are respectively unique to an AI-generated response and a human-generated response to a collection (dataset) of input prompts. Our preliminary work has been on data processing, such as removing punctuation characters, removing common stop words, and converting text to lowercase format. The initial dataset of our research project consists of approximately 2000 records where each record is associated with four attributes: full text of a published article; the AI-generated abstract of the article; the human-generated abstract of the article; and a class label for whether the given abstract is AI-generated or human-generated. A manual inspection of some records of the dataset revealed that several AI-generated abstracts contained text of the article's title. The to-date tasks

completed in our project include extensive related literature reviews, collection and preliminary analysis of multiple datasets best suited to the context of our current empirical goals. An ongoing step of our work is exploring various algorithms to effectively model text data as inputs to both traditional machine learning and deep learning algorithms. Such investigations are important for improving AI-detection tools, evolving LLMs responses to input prompts.

Amanda Smitley

PA - California University of Pennsylvania

Discipline: History

Authors:

#1 Amanda Smitley

Abstract Name: Ruffs Dale Unwritten: Discovering the Roots and History of Our Hometown

This project, Ruffs Dale Unwritten, explores the untold history of Ruffs Dale, Pennsylvania, a small town with a rich yet largely overlooked past. Using a combination of archival research, oral history interviews, and community engagement, this work uncovers the town's significant contributions to national industry, railroads, and economic growth, as well as its role in pivotal historical events. From the French and Indian War and the Underground Railroad to the town's impact on the coal and coke industry, the research highlights the resilience and spirit of Ruffs Dale's residents—pioneers, Native Americans, enslaved individuals, immigrants, and laborers. The project began with exploring the town's name and quickly grew through vibrant community participation on social media, where hundreds of residents shared personal stories and historical insights. Visits to the town revealed forgotten landmarks like the Dillinger Distillery and roads named for pioneer families, while archival resources such as historic newspapers and historical biographies provided additional layers of detail. Key discoveries include the Ruff family's foundational role in the town's history, the presence of slavery and subsequent involvement in the Underground Railroad, and the forgotten narrative of Dillinger Distillery, which operated for over 80 years. This research not only reconstructs the town's history but also underscores the broader significance of local history in understanding cultural identity. This work aims to provide a comprehensive narrative of a town that history has forgotten. Ruffs Dale has largely impacted national industry and events, yet it has often been left out of our nation's history. This project demonstrates the power of local history to connect communities, preserve collective memory, and illuminate the stories that have shaped our shared heritage by illuminating a town that has been hidden for decades.

Kaitlyn Sneed

TN - Lipscomb University

Discipline: Biology

Authors:

#1 Kaitlyn Sneed

Abstract Name: "Investigating the Role of Human Alpha Defensin-5 (HD5) in Impaired Wound Healing and Pathogenesis of Crohn's Colitis: Implications for Diagnostic and Therapeutic Advancements"

Inflammatory bowel disease is a chronic illness that affects the digestive tract. It includes two subtypes, Ulcerative Colitis (UC) and Crohn's Colitis (CC). CC is a subset of Crohn's Disease that is localized to the large intestine. CC, specifically, and UC are commonly misdiagnosed. One promising preliminary discovery to help improve diagnostics is that the expression of innate immune peptide, human alpha defensin-5 (HD5)

is elevated significantly in Crohn's Colitis patients versus Ulcerative Colitis patients by as much as 118 fold. Our current study has two aims in studying the effect of this HD5 overexpression. We have preliminary data indicating that HD5 is impairing wound healing in colonic epithelial cells. Therefore, we would first like to measure the wound healing capability in NCM460 cells of the colon in response to HD5. Secondly, we would like to further measure the protein expression of VTN (Vitronectin), WISPI, and Wnt5a in NCM460 cells after exposure to HD5. This will be done with qPCR and Western Blots to look at the expression of these important wound healing proteins. Based on the preliminary data around HD5 and Crohn's Colitis patients, we know that HD5 decreases wound healing in the colon. So, we expect the HD5 peptide to decrease colonic wound healing in a dose-dependent manner. A preliminary wound healing array has also shown an increase in VTN, WISPI, and Wnt5a as the levels of HD5 rose. We expect our qPCR and western blot studies to validate this data. These experiments are important to elucidate the role of HD5 in CC, hopefully giving us more mechanistic insight to CC pathogenesis, which could lead to better treatments of the disease.

Benjamin Snyder

WI - University of Wisconsin-Madison

Discipline: Biology

Authors:

#1 Benjamin Snyder

#2 Taylor Voelker

#3 Gail Robertson

Abstract Name: Understanding Ion Channel Association in mRNA Decay

Dysregulation of the function and balance of cardiac ion channels can cause arrhythmias and sudden cardiac death. One critical component of this balance is the potassium channel hERG1, which conducts the delayed rectifier outward current I_{Kr} and contributes to the repolarization phase of the cardiac action potential. Mutations or dysfunction of hERG1 lead to Long-QT syndrome and arrhythmias. I_{Kr} is conducted by heterotetrametric hERG1 channels, which consist of hERG1a and hERG1b subunits whose mRNA has been found to physically associate during translation. Interestingly, depletion of one mRNA by subunit specific shRNA corresponds with a concomitant depletion of the other, observed in both HEK293 cells and iPSC-derived cardiomyocytes (iPSC-CMs). The mechanism underlying this "co-knockdown effect" is unknown. The study investigates this mechanism by probing two potential models of co-knockdown, that hERG1a and hERG1b mRNAs are degraded together or they are destabilized independently. Using HEK293 expressing both subunits, we will transfect hERG1a-specific shRNA and collect samples at 3-hour intervals post-transfection. The use of qPCR will be used to quantify mRNA levels in order to resolve the depletion time course for each transcript. If both transcripts are depleted simultaneously, it would suggest co-degradation into a shared complex. If hERG1b depletion is delayed, it may suggest a dissociation of the mRNA pair, followed by destabilization and degradation of hERG1b. A similar approach will be used in the physiologically relevant model, iPSC-CMs. This study will provide valuable insight into an important regulatory mechanism of cardiac ion channel biogenesis. We will also lead to future study further dissecting the co-knockdown mechanism in hERG1a/1b and in other co-translationally associated ion channels, and their implications for cardiac arrhythmia.

Madison Snyder

VA - Roanoke College

Discipline: Psychology

Authors:

Abstract Name: Differences in Stress Between Freshmen and Seniors in College Focusing on Presenting

Stress is a prominent factor for all individuals, especially those within the college population. Understanding stress, its impacts, and how to manage it are strategies to improve daily lives of many. The focus of this research study was to determine the differences of stress levels between freshmen and senior college students when presenting. Using the Trier Social Stress Test (TSST), this lab-based stress-inducing task incorporates a presenting aspect which is highly applicable to the college student population. Another purpose of this study was to consider its results and understand stress levels in order to provide quality stress management skills in the future. The TSST used in this research study had participants spend 15 minutes preparing a 5-minute speech on a fake autobiography. The participants were then instructed to present the speech in front of a configured Zoom call audience which consisted of six faculty members from different departments at Roanoke College. Although this Zoom call was not live and rather used prerecorded videos of the faculty members, it was presented in a way to deceive participants into thinking it was live. This is a strategy to evoke stress. This study included self-report and physiological data collection. Specifically, surveys consisting of the State Trait Anxiety Inventory (STAI Y-6 and Y-2) along with heart rate. Data was compared between three segments: baseline, preparation, and presentation. Analyses indicate a significant difference in stress levels in segments for both physiological ($F(2, 29) = 101.94, p < .001$) and self-report ($F(2, 29) = 9.037, p < .001$) data collection – indicating the TSST accurately induces stress. However, there was no significant difference in class standing. Therefore, stress levels do not differ depending on presentation experience.

Guiliana Sodaro

TX - The University of Texas at Austin

Discipline: English and Literature

Authors:

Abstract Name: Who Tells Your Story: The Implications of Historical Inaccuracies in Hamilton

While research into Hamilton and the genre of historical fiction as a whole often lends itself to the debate of historical accuracy, this research aims to understand how these historical inaccuracies impact an individual character's perception in society. In so doing, this research examines Lin-Manuel Miranda's Hamilton and its presentation of founding father Alexander Hamilton. First, an analysis of the impact historical fiction has on the real world helps us understand historical fiction's responsibility toward audience perceptions. Then, an analysis of the musical's framing of the Reynolds Affair and the presentation of the character of Alexander Hamilton as an abolitionist suggests that these misrepresentations serve as a glorification of American history and allow audience members to absolve themselves from any discomfort associated with the establishment of America. Lastly, this research examines Hamilton fan art to determine how audience members connected with figures inside the story of Hamilton; it discovers that, through its desire for a compelling narrative, Hamilton causes many audience members to view historical figures as simply characters inside a story. Findings suggest that Hamilton upholds the mythos of American creation and disguises a whitewashed history behind a multiracial cast, allowing audiences to bask in the ideals of the American dream without the shame of the American past.

Inari Sohn

DC - American University

Discipline: Political Science

Authors:

Abstract Name: How Discourse Made Greece the Problem Child of Europe

The Eurozone Crisis saw financial struggle across the European Union, and no member country saw a more negative portrayal in politics or the media for their role in the crisis than Greece. Using discourse analysis, this paper examines how a lasting consensus was established on Greece's blame in the Eurozone Crisis. Pre-crisis cultural stereotypes and attitudes towards Greece as well as the hegemonic dynamics between EU member countries are found to be distinguishing factors in Greece's treatment and portrayal. While current literature chooses to focus on singular factors, this paper analyzes the discourse produced from cultural, hegemonic, and linguistic standpoints, and how those discursive strategies combined and intersected to create the narrative of blame toward Greece. Looking at the specific aspects of the crisis that the producers of this narrative chose to focus on also reveals more about how the discourse shaped Greece itself, not just its image to the rest of the world, as well as the implications of this narrative for the rest of Europe and the European Union. Comparing the discourses of speakers from different backgrounds regarding their economic and political status further determined how those different backgrounds influenced their use of discursive strategies. Cultural and economic prejudices seeped into how the political elite and general populations presented and perceived information about the crisis. Comparing those features allows for further conclusions to be made about discursive strategies, influences, and effectiveness. By examining the case of Greece during the Eurozone Crisis, this paper shows the strength and multitude of methods with which discourse can be used to shape the public perception of an entire country.

Abigail Sokoloskis

WI - University of Wisconsin-Whitewater

Discipline: Education

Authors:

#1 Courtney Wilt, Ph.D.

#2 Lauren Zepp, Ph.D.

#3 Joelle Sigwarth

#4 Kara Blangin

Abstract Name: Forging Ahead with New Perceptions about Disability through Book Study with Preservice Special Educators

This research was undertaken to answer the research question: How does reading young adult books impact the way teacher candidates view their future role as an educator? As well as the second research question: In what ways do young adult texts featuring disabled characters disrupt or reinforce how teacher candidates think about disability? This presentation advances the concept of positional empathy, a process-oriented empathy consisting of an individual's ability to a) empathize with the internal world of others, b) foster a sense of agency and responsibility, c) face discomfort in the pursuit of understanding, and d) to enact transcendent relational competency. We illustrate this stance through a qualitative analysis of a preservice educator book study featuring disability-centered young adult fiction. Positional empathy draws from theoretical notions of care and consists of theory-of-mind empathy which comes from consuming media, self-efficacy from modeled scenarios and discussions, relational competence developed through fiction, and the ability to put oneself in challenging and uncomfortable situations in order to gain understanding. A corresponding study of literature on the work of (special) educators, whose professional responsibilities involve care, connection, and proximity to young people with intersecting identities and vulnerabilities, supplements the concept of positional empathy. Findings on the effects of fiction coinciding with structured

discussion revealed nuanced, relational forms of empathy. This presentation supports participants to view the work of teaching through a lens of positional empathy.

Nicole Solick

IL - Governors State University Honors College

Discipline: Health and Human Development

Authors:

#1 Nicole Solick

Abstract Name: Therapeutic Alliances: Examining the Influences of Patient-Therapist Relationships on Recovery Outcomes

The relationship between a patient and their physical therapist is a critical factor in achieving successful treatment outcomes. This dynamic goes beyond just the technical skills or interventions applied; it encompasses communication, trust, empathy, and patient engagement, all of which can significantly influence a patient's motivation, adherence to treatment, and overall satisfaction. Research shows that a strong therapeutic alliance—a term often used to describe the relationship between healthcare providers and patients—can enhance a patient's perception of treatment efficacy and their likelihood of following prescribed exercises or lifestyle changes. To inform what we know about the patient-physical therapist relationship, I will conduct a comprehensive literature review of scholarly sources that focus on patient-physical therapist relationships and their impact on treatment outcomes. In order to do this, I will utilize google relevant scholarly databases to find peer-reviewed research on my chosen topic. This analysis will explore various examples of how a strong therapeutic alliance influences diverse patient populations and recovery scenarios, highlighting the depth of its effects on health outcomes, and suggest where future research is warranted. By enhancing awareness among both patients and practitioners, this study seeks to promote a deeper understanding of the therapeutic alliance in physical therapy. In doing so, the field can advance strategies for fostering trust, ultimately contributing to improved patient outcomes and long-term recovery success.

Gisell Solis

TX - The University of Texas at El Paso

Discipline: Health and Human Development

Authors:

#1 Adaly Alvarez Alvarez

#2 Alyssa Herrera

#3 Manuel Eloy Morales

Andrea Caudillo

Abstract Name: Supporting Student Nutritional Health in Educational Settings to Promote Well-Being

Food insecurity is a prevalent issue affecting students at the University of Texas at El Paso (UTEP), with a recent survey revealing that approximately 61% identify themselves as food insecure. Based on this data, our team developed Empowered Rehabilitation Station, a service-learning initiative designed to support students pursuing a degree in Rehabilitation Sciences by providing nutritious bars. Our aim is to support students' academic and mental performance to foster their success and well-being. To implement the program, we first acquired a table and containers used to display the protein bars, along with a feedback box for students to add written comments. We stocked our table with protein bars, which is located in UTEP's Health Sciences

building, near the offices of professors from the Department of Rehabilitation Sciences. Our station displayed a promotional poster and flyers that describe the importance of maintaining a nutritious diet. Additionally, these promotional materials also included a QR code that linked to a Google Form survey with three questions to collect feedback. These questions identified student's experiences with our station. Through the course of our program, we distributed 136 bars. The majority of survey respondents felt that the snacks improved their nutritional health (90.9%), and improved their social/academic performance (69.7%). Furthermore, a feedback box placed on our table reveals positive written reviews from students. Overall, these main findings showcase the positive impact of our service-learning program, and feedback is continuously being accepted to improve our program and its sustainability. This service learning project was initially funded through The \$100 Solution and it will continue to be sustained by UTEP's Rehabilitation Sciences program. Our team hopes that Empowered Rehabilitation Station highlights the importance of supporting students nutritional health in educational settings to promote student well-being.

Eric Solnosky

PA - Saint Francis University

Discipline: Business

Authors:

#1 Eric Solnosky

#2 Giambi Nesbitt

#3 Antonio Marasco-Keene

Antonio Marasco-Keene

Giambi Nesbitt

Abstract Name: "Motivations and Influences When Acquiring Tattoos"

This research project investigates the motivations and influences behind individuals' decisions to acquire tattoos, reflecting cultural shifts towards the acceptance and mainstream recognition of body art. Through our comprehensive literature review, the study identifies key factors that drive consumers to seek tattoos, including personal expression, social identity, and cultural significance. Employing a mixed-methods approach, the research utilizes surveys and interviews to gather qualitative and quantitative data from a diverse demographic. The findings reveal that motivations for getting tattoos are multifaceted, encompassing emotional, social, and aesthetic dimensions. Additionally, the study examines the impact of marketing strategies within the tattoo industry and how they resonate with consumer behavior. The conclusions drawn from this research not only contribute to the understanding of tattoo acquisition but also provide valuable insights for marketers aiming to engage effectively with this evolving market.

Egar Solomon

NY - Brooklyn College

Discipline: Biology

Authors:

#1 Egar Solomon

#2 Agnes Wong

#3 Aditi Durga

#4 Tracy Wong

Abstract Name: Diet, Drinks, And Danger: Gender Gaps in Colorectal Cancer Risks Behaviors Among

African American Teenagers.

Colorectal cancer is a significant public health concern, and its incidence among African American adults highlights the importance of early prevention efforts. This study investigates gender differences in colorectal cancer risk behaviors—specifically diet, physical activity, alcohol consumption, and smoking—among African American teenagers aged 15 to 19. Using an intersectional theoretical framework, we explore how gender, race, and socio-economic factors intersect to shape health behaviors. Using data from the 2021 Adolescent Behaviors and Experiences Survey (ABES) -- which examined the dietary habits, physical activity, and substance use of high school students -- we analyzed high risk behaviors among African American adolescents. Bivariate analysis, conducted using SPSS, found significant gender differences in dietary and alcohol consumption behaviors. Male participants reported higher levels of alcohol consumption and unhealthy dietary choices compared to their female peers. These behaviors are associated with an increased risk of colorectal cancer later in life. Our findings underscore the need for targeted public health interventions focusing on reducing high-risk behaviors in African American youth, particularly in boys. Promoting healthier lifestyles at a younger age could mitigate colorectal cancer risk in adulthood.

Marina Somo

MI - Wayne State University

Discipline: Biology

Authors:

#1 Anjalie Amarasinghe

Abstract Name: Generation of gRNA Expression Vectors for CRISPR-Cas9-Mediated Editing of SIN3 187

SIN3 is an important, co-transcriptional repressor that regulates gene transcription. SIN3 is the scaffold protein of the SIN3/HDAC complex, that removes acetyl groups from histone proteins. SIN3 is essential for progression through the cell cycle, cell viability, and supporting energy production in cells. Previous studies conducted in *Drosophila* used RNA interference (RNAi) mechanism to knock down Sin3A to examine regulated genes. This technique, however, has a few drawbacks, mainly that the reduction in protein expression is incomplete. We aim to develop a new tool to rapidly deplete SIN3 from the nucleus and export it to the cytoplasm. We will use CRISPR-Cas9-mediated homology directed repair to add the light-inducible nuclear export system (LEXY) at the C-terminus of one of the SIN3 isoforms in *Drosophila*, SIN3 187. *Drosophila* express different versions of SIN3, called isoforms, which have some unique functions. As a part of developing this tool, I created two guide RNA (gRNA) vectors using DNA cloning. These gRNA are intended to target the C-terminus of the SIN3 187-specific exon of the Sin3A gene. First, I annealed the top and bottom gRNA strands, which were ligated into the PU6-BbsI-chiRNA vector and then carried out transformation of chemically competent DH5 α cells. Colonies were isolated from selective media agar plates. A DNA mini-prep was done to isolate the plasmids with the gRNA vectors and the successful ligation was confirmed with DNA sequence analysis. Next, these vectors will be used with the repair template donor vector to develop the LEXY system for SIN3 187 isoform. Generation of this new tool will allow us to investigate the phenotypic consequences of removal of a critical SIN3 isoform while allowing other isoforms to retain function.

Jaerin Song

TX - Tarrant County College

Discipline: Social Work and Human Services

Authors:

Abstract Name: Hospice Care: the last stage of cradle-to-grave

The central research question explores whether physician-assisted suicide (PAS) can ethically go along with hospice care. Hospice care is a form of medical care that provides comprehensive care for terminally ill patients to spend their last stage of life. The idea of hospice care was introduced in the United States in 1963 by Dame Cicely Saunders, and the first hospice was established in Bradford with the name of “Connecticut Hospice.” Hospice care evolved into four common forms: routine care, continuous care, inpatient care, and respite care. In terms of autonomy and end-of-life decisions, four principles of medical ethics, which are autonomy, beneficence, nonmaleficence, and justice, exist. Each principle puts emphasis on improving the quality of life and giving the best care for the patients. Amid these considerations, PAS is allowed in 10 states and is controversial among hospice associations. One who agrees to the PAS with hospice care argues that it helps terminally ill patients with intolerable pain to be prepared for their death with dignity. The research applied a qualitative research approach, analyzing the case studies and getting ethical guidelines from scholarly sources and professional medical associations. However, the research is expected to conclude that PAS cannot ethically partner with hospice care due to their conflicting goals. While PAS emphasizes autonomy by letting the individuals decide their timing of death, hospice care focuses on non-maleficence and physical and mental comfort at the final moment of life. Moreover, the palliative care that hospice care adopted was built on the foundation of neither hastening nor lengthening life expectancy, which goes against the PAS that intentionally ends the life.

XingYu Song

PA - University of Pittsburgh

Discipline: Computer Science

Authors:

#1 Aakash Gautam

Daniel Cheng

Abstract Name: Teaching Data Literacy for All within Informal Learning Environment

As technologies and data increasingly shape daily life, fostering critical data literacy among children is essential. Critical data literacy enables learners to analyze and contextualize data, make informed decisions, and critically evaluate the power of data-driven systems. This is particularly significant for children from low socioeconomic status households, who often face limited access to formal education in this domain. Community-led efforts, embedded in local knowledge and context, offer valuable pathways for critical data literacy education. Informal learning environments, such as community centers and summer enrichment programs, support these efforts, though they come with challenges, including diverse learner backgrounds and maintaining engagement. This research presents reflections from a four-day critical data literacy session held in summer 2024 at a community center in Pittsburgh. Led by a community facilitator with support from the research team, the program engaged 12–15-year-old students in interactive, detective-themed activities to explore the data cycle: question, collect, analyze, interpret, and report. Observations highlighted the facilitator’s adaptability to fluctuating student attendance and varying skill levels, creating an inclusive learning environment. Contextual discussions, such as those about hacking and digital footprints, sustained engagement but occasionally overshadowed core data literacy practices. Activities like applying the CRAAP method to evaluate online information and analyzing timestamps enhanced students’ critical thinking and engagement with data. Findings underscore the importance of balancing contextually engaging content with foundational data literacy skills to ensure transferable learning outcomes. This work contributes to the growing field of informal critical data literacy education and offers insights for designing community-led programs that effectively support underserved populations. By leveraging community knowledge and

emphasizing adaptability, these initiatives can provide meaningful opportunities for students to develop as responsible digital citizens.

Souleymane Sono

MI - Oakland University

Discipline: Computer Science

Authors:

#1 Pranav Sinha

#2 Arnav Sharma

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Abstract Name: Using Large-language Models for Performing Trial-and-Error Experiments for Autonomous Scientific Laboratories

A survey conducted by Nature revealed that about 70% of biological experiments are not reproducible. Autonomous scientific laboratories envision robots conducting cutting-edge experiments autonomously, reducing uncertainties introduced by humans and thus improving reproducibility. Argonne National Lab's Workflow Execution Interface (WEI) library facilitates the integration of multiple devices and sensors for complex scientific workflows required for autonomous labs. However, existing experiments rely on expensive robots and sensors for performing these experiments and are out of reach for most students and researchers. To improve the accessibility of these potentially revolutionary ideas, we design an experiment that utilize low- cost equipment, including Arduino robots and web cameras, in addition to large language models (LLMs) and object detection, to perform autonomous experiments. Specifically, we perform a pick-and-drop experiment using the Arduino Braccio robot and a web camera and control it using a locally fine-tuned Llama-3.1 LLM and YOLO-v3 object detection network. The positions of the pickup object and the drop position are obtained from the camera by using YOLO-v3. The variability in the output generated by the object detection network, coupled with low-cost robots that are not precise and have unwanted errors due to loose tolerance during manufacturing, makes the simple task of picking an object and putting it in another location challenging and error-prone. An interactive web application accesses our fine-tuned Llama-3.1 LLM and can be used to restart or adjust and potentially correct any error occurring during the experimentation. Overall, low-cost robots, cameras, YOLO-v3 object detection network, and Llama-3.1 LLM provide an accessible but varied learning experience for autonomous scientific laboratories for students and researchers.

Eduardo Soria Chiroque

KY - University of Kentucky

Discipline: Health and Human Development

Authors:

#1 Julie Plasencia

Abstract Name: Bridging Clinical Expertise and Community Advocacy: Integrating Registered Dietitians and Promotores de Salud in Latinx Diabetes Education

Title: Bridging Clinical Expertise and Community Advocacy: Integrating Registered Dietitians and Promotores de Salud in Latinx Diabetes Education **Background:** Type 2 diabetes disproportionately affects the Latinx population in the United States, with a prevalence of 11.5% among Latinos, significantly higher than the 7.2% seen in non-Hispanic Whites. Given the growing importance of cultural competency in healthcare delivery, calls have been made for an integrated model employing both registered dietitian nutritionists (RDN) and promotores de salud (health advocates in Latinx communities). However, there is a lack of research focusing on the specific training needs of RDNs and promotores in the context of Latinx diabetes self-management. **Objective:** This study aims to explore what both RDNs and promotores know about each other's roles within the context of type 2 diabetes management among Latinx communities as well as potential barriers and facilitators for effective collaboration. **Methods:** This study employs data from an online survey (n=95) made up of RDNs (n=60) and promotores (n=35) to explore perspectives on the feasibility, perceived effectiveness, and practical challenges of integrating promotores into RDN-led diabetes education efforts. **Results:** This study will identify key factors affecting the successful integration of RDNs and promotores in delivering diabetes self-management education, along with the perceived efficacy of this model in enhancing diabetes outcomes. **Conclusion:** Findings may have the potential to provide insights for a scalable framework for addressing diet-related health disparities and improve diabetes self-management outcomes by integrating promotores into healthcare teams, thus extending the reach of RDNs to underserved Latinx communities.

Catherine Sorrels

LA - Louisiana State University, Baton Rouge

Discipline: Biology

Authors:

#1 Anthony Lau

#2 Mary LoGiudice

#3 Jonathan Steller

#4 Jeffery Chancellor

Abstract Name: Impact of continuous, low-dose-rate neutron irradiation during gestation on fetal development

Background: It is unknown how space radiation impacts the maternal fetal system, specifically fetal skeletal development. We hypothesized that continuous, low-dose-rate neutron radiation exposure during gestation would lead to abnormalities in fetal skeletal development observed as alterations in external morphology. **Methods:** Female, C57Bl/6J mice (n=38; 8-12-week-old) were pair mated. Dams where mating was confirmed (plug positive) were randomized to irradiated or non-irradiated groups (~n=20/subgroup) and group housed (n=4/cage). Exposure to near-continuous, whole-body neutron radiation (1mGy/d) at the Colorado State University Neutron Radiation Facility began at gestation day 0.5. Non-irradiated animals were housed in a separate vivarium. All animals had ad libitum access to food and water. At 12.5 days of gestation, the dams were euthanized and whole fetal samples were collected. Samples were stored in 95% ethanol at +4C until analysis. Each fetus was examined under the dissecting scope for external malformations and morphometric measurements were taken using digital calipers. Nested-T Tests were used to compare measurements of irradiated and non-irradiated animals. **Results:** Litter sizes were not different between irradiated and non-irradiated groups (p=0.292). Irradiated animals had a shorter tail length (p=0.0075) and a longer left limb bud than right limb bud (forelimb asymmetry) (p=0.0075). Crown rump length, head width, head length, abdominal width, abdominal depth, width at the base of tail, left and right forelimb and hindlimb lengths, paw widths, and paw width symmetry were not statistically significant (p > 0.292). **Discussion:** By 12.5 days gestation, it is apparent that neutron radiation exposure may have caused some alterations in skeletal development. Further analysis of the samples using histology or micro-CT will assist in determining the extent to which external morphological changes are caused by skeletal deformations.

Abigail Soskil

PA - University of Pittsburgh School of Nursing

Discipline: Nursing and Public Health

Authors:

#1 Jamie Zelazny

Abstract Name: Barriers to Sexual Assault Care in Rural Communities: A Scoping Literature Review

Purpose: Rural communities often rank lower than their urban counterparts on common public health indicators due to environment related barriers to healthcare. Sexual assault care is a specialty that is often missing from care in rural areas and a scoping review of existing literature is required to discover the specific barriers to sexual assault care access. **Methods:** I used the Pubmed database to conduct my literature review. The first search used key terms “Sexual Assault,” “Rural,” and “United States,” yielding 3 relevant results. The second search used “Barriers to care,” “Sexual Health,” and “Rural communities,” yielding 4 relevant articles. The third search was “Barriers to care,” “Sexual Assault,” and “Rural Communities,” resulting in 1 relevant result. Eligibility was determined by the involvement of adults (18+), published within 5 years, within the United States, and relevance to sexual assault care. A total of 8 articles were included. **Results:** Through evaluation of the articles, it is clear that rural communities have significant disparities in introducing and maintaining sexual assault care as well as community needs for such programs. Three of the 8 articles included the cost SANE licensure and lack of educational opportunities as barriers for healthcare professionals, and 3 of the 8 studies found geographic location, cultural ideologies, and mistrust to be barriers for patients seeking care. **Conclusion:** Due to the specific barriers that rural communities face when accessing sexual assault care, unique solutions are required. Before implementing programs, more research is needed to identify the driving forces behind why rural residents may not seek care and validate current research on why rural communities have a lack of SANE programs. Encouraging education and mentorship programs for nurses and outreach programs have shown to be a beneficial first step. Additionally telehealth programs present a promising solution, but require more data on effectiveness.

Michelle Soto

OH - Capital University

Discipline: Psychology

Authors:

#1 Michelle Soto

#2 Taylor Roberts

#3 Katherine Stranger

Abstract Name: Let's Make Online Learning More Effective

As educational institutions and workplaces adopt online learning platforms it is important to know what kinds of learning support online students may need. The purpose of this study is to identify the aspects of online learning that help students achieve the student learning outcomes for the course and to gain information about what can improve students' experience in online courses. Students enrolled in online courses completed a survey about their personal experiences with online learning. The survey included measures of online learning self-efficacy, learner-content interaction, learner-instructor interaction, learner-learner interaction, student satisfaction, and perceived learning (Alqurashi, 2019). Students were also asked about aspects of their online courses (Busch et al., 2022), their satisfaction with their online learning experiences, their need for accommodations, and what can improve their experience. Consistent with other research, we hypothesized that students will report difficulties communicating with the instructor, getting help when needed, and having

their accommodations met. Results provide suggestions for faculty who teach online courses to help students achieve the student learning outcomes and meet their learning needs. This research adds to our knowledge of effective online learning.

Bailey South

WV - West Virginia University

Discipline: Art History

Authors:

Abstract Name: Investigating Themes of Isolation and Despair in Edward Hopper's Ground Swell

The artist Edward Hopper's works deal with themes of isolation and loneliness during the early 20th century. Hopper has come to be best known for his rather austere depictions of urban life in the early twentieth century, which is often the sort of depictions that art historians investigate in relation to his work. The work of art Ground Swell, located in the National Gallery of Art in Washington, D.C., dates to 1939, and was produced during the modern period in the Realist style. Ground Swell deviates marginally from Hopper's other works with its more lighthearted subject of individuals on a boat during a warm day but it also hints at the impending turmoil of the period. The social dynamics of the 20th century led to a sense of imminent danger being a focus in this piece, primarily the lead up to WWII, with a sense of foreboding and distress. Ground Swell fits into the artist's greater body of work as a representation of both Hopper's past and his present, speaking to the anxiety of both the interwar period and the initial outbreak of WWII in his iconic style. While Ground Swell has been given less attention, aside from brief mentions of its place within Hopper's body of work, it merits deeper consideration for its connection to his larger themes.

Bailey South

WV - West Virginia University

Discipline: History

Authors:

Abstract Name: As American as Mickey Mouse? Reconsidering Euro Disneyland as a Means of American Cultural Imperialism

Americanization, or the spread of American culture and customs abroad, has been a topic of interest in many regards, especially when applied to the European context. The proliferation of American corporations, media, and consumer goods on the European continent has been studied, including the addition of American culture to the European built environment - through the construction of Euro Disneyland. Euro Disneyland (now known as Disneyland Paris) opened in 1992. As a physical representation of an American corporation and its American values, the French had a particular disdain for the park upon its opening. Such a representation of the process known as Americanization has garnered research from numerous academic circles, yet current research does not address the evolution of Americanization in France, namely through the lens of the Walt Disney Company. Looking into the evolution of sentiments provides an interpretation of French attitudes towards the United States, especially during the Cold War period. Historians have previously drawn conclusions relating to the idea of Euro Disneyland as the ultimate vector of Americanization (arguing that the overwhelming association with America was responsible for the park's initial lack of success), whereas this paper will argue that Euro Disneyland was not as wholly American upon opening as it may have seemed. Investigating the historical context of Euro Disneyland; interpreting the period in which it opened and was

designed; the climate of the Disney company in years prior; and the thought processes which were integral to the construction of the park as provided through primary source analysis and secondary rhetoric. This paper examines how Euro Disneyland has been argued as the most American enterprise Europe has ever seen and instead argues how it exists in a space beyond solely Americanization, instead speaking to corporatization and the globalization of popular culture.

Lauren Sowards

OK - University of Central Oklahoma

Discipline: Engineering

Authors:

#1 Quinton Fister

#2 Gang Xu

#3 Daniel Ladiges

#4 Johannes Blaschke

Abstract Name: In Silico Analysis of the Flagella-Propelled Cell Swimming in Viscous Fluids

Flagella are whiplike subcellular organelles that bend actively to propel cells (algae, sperms etc.) or move fluids in airways or other passages. Flagellar motility is central to many biological and ecological phenomena, from cellular motility to enhanced biomixing and transport. These processes involve complex interactions between flagellar biomechanics and fluid dynamics. This project aims to create a computational fluid dynamics model of a green algae cell with two beating flagella moving through a viscous fluid. We utilize the AMReX- based fluctuating hydrodynamics solver, which features custom algorithms to simulate the flagella as an immersed chain of discretized force particles with specified motions. A key aspect of our approach involves leveraging Berkeley Lab's supercomputer, Perlmutter, by employing both CPU and GPU-compatible codes to enhance simulation performance. We have also improved the previously developed JupyterLab notebook with pyAMReX, a native Python API for AMReX codes, to streamline data importation, visualization, and analysis. The simulation, executed on Perlmutter, has allowed us to visualize and analyze fluid flow fields and forces on the beating flagella and the moving cell body. The results will improve our understanding on the hydrodynamic impacts of flagella-actuated cell swimming and biomixing, and provide a biophysical and mechanistic basis for development of novel microfluidic and biofuel devices that exploit these effects.

Lily Sowell

TX - Lubbock Christian University

Discipline: Chemistry

Authors:

#1 Lily Sowell

#2 Byron Rogers

Abstract Name: UV-vis spectrophotometry for kinetic study of the Dushman reaction

The Dushman reaction describes the interaction between iodide and iodate ions in acidic solution: $5\text{I}^- + \text{IO}_3^- + 6\text{H}^+ \rightarrow 3\text{I}_2 + 3\text{H}_2\text{O}$. Under normal conditions, this reaction is in the fifth order overall, with a second-order rate law with respect to iodide (I^-). However, at micromolar I^- concentrations (approximately $5 \times 10^{-7} \text{ M}$), the reaction follows a different mechanism and becomes first order with respect to I^- . The aim of this study is

to use the UV-vis spectrophotometric method to measure the rate of the reaction at micromolar I⁻ concentrations, and to use that rate to measure the concentration at which the rate law of the reaction changes. Seven concentrations of I⁻ will be tested in triplicate: for each trial, aqueous KI, KIO₃, and HClO₄ will be combined in a cuvette, and the reaction will be allowed to run to completion inside a UV-vis spectrophotometer. The initial absorbance and the absorbance at 30 seconds will be used to determine the reaction rate, and a data set comparing the rate to the initial concentration of KI will be collected. Graphing the natural logarithm of the rate versus the natural logarithm of the initial KI concentration will reveal the order of the reaction with respect to KI: the slope of the linear graph will equal the order of the reaction, and the point on the graph at which the slope changes will represent the I⁻ concentration of interest (expected to be near 5×10^{-7} M). This research will serve to lend credibility to the spectrophotometric method of testing the rate of the Dushman reaction as it is used in chemical engineering (micromixing) applications, as well as providing data on which to base the usage of UV-vis spectrophotometry for other kinetic studies in a classroom or student lab setting.

Oluwabusolami Soyemi

MD - Bowie State University

Discipline: Physics and Astronomy

Authors:

Joel Duah

Abstract Name: Optimizing Performances: Essential Physical Quantities for Track Runners from the Starting Line

This study explores the forces impacting track athlete's performance through an analysis of displacement, velocity, kinetic energy, and force. Using a timer, the track, and athlete data, the experiment focused on a runner weighing 150 pounds and standing at 5 feet 11 inches tall. Results indicate a displacement of 0.124 meters, a final velocity of 0.53 m/s, and an average velocity of 0.26 m/s. Kinetic energy was calculated at 9.02 joules, while the force exerted by the athlete measured 153.9 Newtons. These findings underscore the importance of understanding fundamental physics principles in athletic performance. Future research could explore additional variables to deepen insights into athletic dynamics, potentially informing training regimens and equipment designs to optimize athlete performance.

Emma Spangler

PA - Villanova University

Discipline: Environmental Science and Sustainability

Authors:

#1 Emma H Spangler

#2 Mikaela R. Anthony

#3 Dr. Steven Goldsmith

Abstract Name: Understanding the Degradation, Toxicity, and Environmental Impact of Macroplastics in Streams

Riverine systems have shown to be major contributors of macroplastics (>4mm in diameter) to the global ocean. Yet, few studies have evaluated the degradation and potential ecosystem impacts of macroplastics within these freshwater environments. Recent studies have suggested that biofilms which grow on the surface

of macroplastics bioaccumulate metals over time. In the mid-Atlantic region of the United States, the cumulative application of road salt has led to increased concentrations of metals in stream water via reverse cation exchange in soils. Therefore, biofilms could theoretically bioaccumulate higher concentrations of metals in streams with higher salinity, if controlling for geology and land cover. In this study, we deployed replicates of 4 common debris types (Non-Biosourced Dixie™ plastic forks (used at Villanova University); DASANI® polyethylene terephthalate (PET) plastic water bottles; Coca Cola™ aluminum cans; and Hefty® polyethylene plastic bags), suspended in three southeastern Pennsylvania streams for a total of 60 days. All three streams had the same underlying geology, yet varying salinity. Upon collection, biofilm metabolism was determined through the light/dark method; assessing gross primary production and community respiration to calculate the net primary production. Total metal concentrations on the surface of the debris were determined using x-ray fluorescence spectrometry. Select metal concentrations (Al, Ba, Cd, Cr, Cu, Pb, Sb, and Zn) were compared to the respective non-deployed material to determine the relative state of weathering. In addition, the bioavailability of metals was determined using an acetic acid extraction and inductively coupled plasma mass spectrometry. The study results provide valuable insights into the degradation and potential ecosystem impacts of macroplastics in riverine systems.

Anthony Sparta

PA - Saint Vincent College

Discipline: Chemistry

Authors:

#1 Michael Antonacci

#2 Jason Vohs

Abstract Name: Catalytic SABRE H Hyperpolarization of Pyridine in Aqueous Media by [Ir(Cl)(ITEG)(COD)]

Signal Amplification By Reversible Exchange (SABRE) is an emerging method to increase Nuclear Magnetic Resonance (NMR) signal by hyperpolarization of target substrates using an organometallic catalyst and parahydrogen. SABRE is also a promising technique for enhancing MRI sensitivity in vivo; however, the standard catalyst used, [Ir(Cl)(IMes)(COD)], is insoluble in water, and few potential catalysts have shown the ability to hyperpolarize substrates in a solely aqueous media. Here, we report the synthesis of a novel water-soluble iridium-based catalyst, [Ir(Cl)(ITEG)(COD)], which showcases the ability to hyperpolarize pyridine in both deuterated methanol and deuterium oxide. ¹H-NMR signal enhancement of pyridine was observed up to 83.5-fold higher than the thermal NMR signal in methanol-d₄ using a 60.0 MHz NMR spectrometer. Similarly, enhancement in D₂O was observed up to 1.6-fold. While research continues to work to improve [Ir(Cl)(ITEG)(COD)]'s efficiency in aqueous media, the ability to successfully hyperpolarize pyridine in both methanol and water provides a valuable step towards applications of SABRE hyperpolarization in vivo.

Lauren Spencer

KY - University of Kentucky

Discipline: Education

Authors:

#1 Lauren Spencer

Abstract Name: Special Education in Appalachian Kentucky: Teacher Shortages and Health Factors Driving Rising Demand

The rising percentage of students with Individualized Education Plans (IEPs) in the United States reflects not only improvements in diagnostic tools but also broader systemic issues. In the "Disability Belt," a region spanning Appalachia, the mid-South, and the Mississippi Delta, socioeconomic challenges such as poverty, inadequate healthcare access, and limited educational resources contribute to disproportionately high disability rates. In Kentucky, Appalachian counties experience some of the most severe disparities in the state, with elevated poverty rates, lower educational attainment, and significant health challenges. Factors like smoking, low birth weights, and insufficient prenatal care often result in developmental issues that increase the demand for special education services. This rising demand coincides with a critical shortage of special education teachers, particularly in high-need areas like Letcher and Harlan county. These shortages directly impact schools' ability to comply with the Individuals with Disabilities Education Act (IDEA), which mandates appropriate educational services for students with disabilities. When schools lack the necessary staff, they struggle to provide the individualized instruction and support that students with IEPs require. To address these challenges, targeted policy interventions are essential. Expanding community programs such as KY-SPIN (Special Parent Involvement Network) can enhance family support systems, while initiatives like KY-Moms MATR (Maternal Assistance Towards Recovery) aim to improve maternal and child health. Additionally, increasing teacher salaries and offering retention incentives for special education staff could alleviate staffing shortages, ensuring that schools can meet IDEA requirements. These policy proposals are evaluated based on cost, feasibility, and long-term impact, with a focus on breaking cycles of disability and improving educational equity. By addressing both immediate needs and root causes, these initiatives aim to create sustainable improvements in special education services and overall community well-being in Appalachian Kentucky.

Kristen Sperber

OH - Baldwin Wallace University

Discipline: Biology

Authors:

#1 Dr. Clare Mathes

Abstract Name: The Influence of High-Fat Diet on Alcohol Preference in Male and Female Rats

Obesity's prevalence necessitates understanding and refining treatment. Surgical procedures such as Roux-en-Y gastric bypass (RYGB) are effective but, after surgery, people are more likely to develop alcohol use disorders; these behaviors can be modeled in rodents. However, research from our lab found that, while RYGB in "cafeteria" diet-fed female rats decreased body weight and rebalanced blood sugar homeostasis, it did not impact ethanol preference relative to sham surgery in similarly-fed rats. Chow-fed unoperated rats showed higher ethanol preference than either cafeteria-diet fed group. Here, we measure how diet impacts preference for low ethanol concentrations in male and female rats fed either a commercial high-fat diet (HFD) or standard chow (CHOW). HFD rats underwent sham surgery while CHOW rats remained unoperated. Ethanol preference testing consisted of 24 h free access to first 2% ethanol solution and water; after intake stabilization, ethanol concentrations will be increased to 4%, then 6% and 8%. We plan to assess group and sex differences across preference scores (intake of ethanol / total fluid intake) via 2-way repeated measures ANOVA. We hypothesize that, independent of sex, CHOW rats will prefer ethanol more than HFD rats, suggesting that higher body weight or a varied diet may be protective against alcohol consumption. We hope to assess the impact of RYGB-induced weight loss on alcohol preference in a later experiment.

Cassandra St. Peter

MN - College of Saint Benedict/ Saint John's University

Discipline: Biology

Authors:

Kayla Goar

Olivia Beck

Abstract Name: Agonistic behavior in plains zebra (*Equus quagga*) relative to distance to safari jeep, Ngorongoro Crater and Serengeti National Park, TZ.

Plains zebras (*Equus quagga*) are one of the many ungulates located in the Ngorongoro Crater and Serengeti National Park, Tanzania. They are a common prey among predators in these areas and they have multiple antipredator behaviors to increase probability of survival. We were interested in these antipredator behaviors (APB) – would we see a higher frequency when zebras were adjacent to the safari jeep. Are zebras viewing vehicles as a potential threat. We hypothesized that zebra proximity to jeeps would influence zebra antipredator behavior rates. Based on this hypothesis, we predicted that APB rates would increase the closer the animals were to the jeeps. Data was collected in the forementioned areas on May 28th to June 1st, 2024. APB data was collected relative to distance from jeep. Distances were determined using a rangefinder and categories were <25m, 25m-50m, 50m-75m, and 75m-100m. Antipredator behaviors observed (via binoculars) were herding, biting, kicking, ears pinned, and teeth barred. We observed a total of 512 individuals in 23 groups. Our results indicated that zebras closest to the jeep showed significantly more APB as compared to the other distance categories ($\chi^2 = 141.66$, $df = 3$, $p < 0.0001$). Our results supported our hypothesis. This research was important in understanding the way zebras may react to potential threats and greater vigilance should increase overall survival rates. This would help us understand how certain interactions and behaviors may increase their fitness and what we can do to further protect their role in the ecosystem.

Braden Staats

PA - California University of Pennsylvania

Discipline: Biology

Authors:

Abstract Name: Effects of the Oral Microbiome on Generalized Anxiety Disorder

Generalized Anxiety Disorder (GAD) affects nearly one-third of adolescents and 31% of adults in the United States, and is accompanied by symptoms that severely impact daily functioning, such as irritability, difficulty concentrating, and physical manifestations like heart palpitations. Despite its prevalence, GAD's underlying causes remain poorly understood. Previous studies have explored the role of genetic predispositions and the role of the gut microbiome in anxiety regulation. These have shown that an individual's genotype may influence susceptibility, and that microorganisms in the gut interact with the brain and nervous system through the gut-brain axis. Links between the oral microbiome and anxiety, however, have received less research attention and may offer new insights into anxiety disorders. This study investigates the potential connection between GAD and the microbial composition of the oral microbiome, a topic that could have important implications for understanding mental health. To collect data for this IRB-approved study, a group of college age students from PennWest California were recruited and asked to complete the GAD-7 questionnaire, a validated tool to assess anxiety levels, as well as provide buccal swab samples. DNA will be extracted from each sample and quantified. Illumina MiSeq metabarcoding will then be performed to identify the microbial species present. Statistical analyses will be used to compare microbial profiles with self-reported anxiety levels from the GAD-7 questionnaire to identify potential correlations between the presence or abundance of specific microbial strains (e.g., *Treponema*, *Actinomyces*, *Fusobacterium*). We aim to reveal distinct microbial patterns associated with varying anxiety levels, which would implicate the oral microbiome as a potential contributor to GAD. This research seeks to enhance our understanding of GAD's biological

basis, offering a foundation for novel diagnostic and therapeutic strategies, which could pave the way for innovative approaches to managing anxiety by addressing microbial imbalances.

Ellis Stafford

TN - Belmont University

Discipline: Biology

Authors:

#1 Andrea Florian

Abstract Name: Exploring the Synergistic Effects of Cisplatin and Curcumin in Osteosarcoma Cells

Osteosarcoma (OS) is a highly aggressive bone cancer characterized by rapid metastasis, which drastically reduces patient survival rates from 70% in localized cases to 30% upon metastasis. Current treatments combining chemotherapy with cisplatin and surgical intervention are often ineffective against metastatic OS and are associated with significant side effects. Cisplatin targets cancer cells by binding to DNA, disrupting transcription and replication, and inducing apoptosis. To address the challenges associated with current treatments, this study investigates the potential of combining cisplatin with curcumin, the bioactive compound derived from turmeric, as a novel therapeutic approach. Curcumin has shown anticancer properties through the induction of oxidative stress, mitochondrial damage, and increased reactive oxygen species, leading to cell death. We treated OS cells with cisplatin and curcumin, both individually and in combination, to assess their effects on cell proliferation, migration, and apoptosis. Our results demonstrate that the combination therapy significantly decreases cell viability compared to either agent alone while potentially mitigating the adverse effects associated with traditional chemotherapy. These findings suggest that the synergistic effects of cisplatin and curcumin offer a promising new therapeutic strategy for improving outcomes in patients with OS.

Elizabeth Stahovich

PA - Duquesne University

Discipline: Biochemistry

Authors:

#1 Sol Aranibar-Chang

#2 Warren Lowther

#3 Luke Bohrer

#4 David Lapinsky

#5 Michael Cascio

Abstract Name: Mapping the Binding Site of a Novel Paroxetine Analog on the Serotonin Transporter with Crosslinking and Mass Spectrometry

Serotonin transporter (SERT) dysfunction is implicated in psychiatric diseases such as depression and anxiety. SERT is an integral membrane protein in neurons that reuptakes serotonin into the presynaptic neuron. Selective Serotonin Reuptake Inhibitors (SSRIs), such as paroxetine, target and inhibit SERT, thereby increasing the concentration of serotonin in the synapse. SSRIs reduce levels of anxiety and are the most prescribed antidepressant in a clinical setting. For this work, we aimed to map the SERT-ligand binding site of a photoreactive analog of paroxetine to determine if the paroxetine ligand binds analogous to paroxetine on SERT. Paroxetine was derivatized with a photoreactive diazirine and a click chemistry terminal alkyne to

develop a SERT-selective clickable photoprobe. This novel ligand was subsequently incubated with purified rat SERT reconstituted into lipid vesicles. After photoactivation, mass spectrometry (MS) was utilized to identify sites of covalent crosslinking to this paroxetine ligand. Following in-gel proteolysis, analyses of bottom-up MS data identified mass-shifted peptides derivatized by the paroxetine analog. These peptides were then selected for further fragmentation (MS/MS). Our MS studies reproducibly showed that the analog specifically binds in the known paroxetine binding site within SERT. The crosslinking sites of the paroxetine ligand to SERT were refined within the peptide using MS/MS, further confirming our results. Therefore, this paroxetine analog can be utilized in subsequent physiological studies to exploit the utility of this SERT-selective probe. Future studies will include click chemistry applications, including attaching affinity ligands for the purification of paroxetine protein targets and fluorescent tags to visualize SERT. Overall, the goal of our research is to understand SSRI interactions within SERT better in working towards creating more novel and effective antidepressants.

Lily Staib

PA - Slippery Rock University of Pennsylvania

Discipline: Dance

Authors:

#1 Melissa Teodoro

Abstract Name: Dancing Off Center: How George Balanchine's Agon Paved the Way for Contemporary Ballet Choreographers

After being hired as a dancer and then ballet master at Ballet Russe by Sergei Diaghilev, George Balanchine is known for pioneering the dance technique of contemporary ballet. From his unique elongated movement aesthetic to his work, *Agon*, that kickstarted the contemporizing of ballet, Balanchine redefined this form by making dance and movement the emphasis of the performance, rather than depending on an elaborate plot or storyline. Contemporary ballet is separate from contemporary dance, for it remains deeply rooted in the ballet aesthetic, while contemporary dance is not. How has Balanchine's work in contemporary ballet inspired the work of future ballet choreographers? Are there similarities between Balanchine's work and current contemporary ballet artists such as William Forsyth and Wayne McGregor? I was interested in analyzing the development of movement aesthetics and trends throughout the brief history of this form. Through comparative viewing of videos of contemporary ballet works, one can notice trends and steps that have withstood the test of time, and what areas of the technique and movement have evolved. It is important to see the trajectory of choreographic trends stemming from Balanchine, and to see how the definition of contemporary ballet has changed drastically as time has progressed. With contemporary dance holding upmost popularity today, one can notice traditional ballet steps appearing in contemporary ballet works less and less, while the work still maintains its ballet validity through its aesthetics. In the spring of 2025, this research will be used as a foundation to create a twenty-minute work on ten or more dance students at Slippery Rock University and will be rooted in the contemporary ballet aesthetic. I envision the movement of the piece contemporizing as time progresses to represent the technique's modernization from the time of Balanchine to today.

Allee Stakebake

UT - Utah State University

Discipline: English and Literature

Authors:

#1 Allee Stakebake

Abstract Name: Affect, Empathy and Feminine Writing: An Comparative Reading of Kim Jiyoung, Born in 1982 and Convenience Store Woman

This essay offers a comparative analysis of affect, empathy and feminine writing as exemplified in two women authors' texts: Kim Jiyoung, Born in 1982 (2016) by Cho Nam-ju and Convenience Store Woman (2016) by Sayaka Murata. Cho Nam-ju's Kim Jiyoung, Born 1982 draws on affect to evoke empathy, highlight the emotional toll of patriarchal structures, and illustrate how cumulative emotional experiences shape identity and mental health. Through the protagonist's experiences, affect is shown through different stages of her life, demonstrating how societal pressures and discrimination erode her emotional well-being. Jiyoung's feelings of injustice and powerlessness as she witnesses everyday sexism result in the accumulation of small, daily emotional injuries, which build a sense of exhaustion and resignation. In Convenience Store Woman, Keiko ties her identity to the convenience store which provides Keiko with stability, purpose, and belonging. The store's hum of activity and routine mirrors her internal emotional rhythm. However, the societal expectations placed on Keiko create an atmosphere of tension and frustration and interrupts the calming affect of the precise sanctuary Keiko's convenient store provides. This emotional weight affects both Keiko and the reader, who feels her growing alienation. Both Kim Jiyoung, Born 1982 and Convenience Store Woman use affect as a powerful tool to explore the societal pressures placed on women. While Kim Jiyoung, Born 1982 elicits empathy through its emotionally charged narrative and portrayal of systemic injustices, Convenience Store Woman challenges traditional notions of empathy by presenting a protagonist who finds fulfillment outside societal expectations.

Justin Staley

PA - Villanova University

Discipline: Environmental Science and Sustainability

Authors:

#1 Kabindra Shakya

Abstract Name: Philadelphia Roadside and Subway Black Carbon Assessment

High levels of particulate matter (PM) in subway systems can pose health risks to commuters and workers. Subway systems, particularly those in urban areas, are especially vulnerable to elevated PM levels. This is due to inadequate ventilation and the friction created by the train's metal wheels breaking on the tracks, generating additional PM. This study focuses on measuring black carbon (BC) concentrations in an underground subway station during the summer of 2024 and comparing them to levels aboveground in Philadelphia and in a suburban location. Black carbon, essentially a form of soot, comes from the incomplete combustion of fossil fuels from vehicles, posing serious threats to human health and the environment through warming and contamination. The findings revealed that the highest BC concentrations were recorded in the subway environment, followed by the roadside location in Philadelphia, with the lowest concentrations observed at the suburban site. This study helps indicate that while trains do not emit BC inside the subway systems, external factors, such as outdoor traffic can also influence the underground BC levels. The findings underscore the need for improved ventilation and pollution control measures in subway systems to protect public health, given the high BC level observed in subway systems.

Tess Stanley

PA - Lafayette College

Discipline: Biology

Authors:
#1 Tamara Stawicki

Abstract Name: The Role of Apoptosis and Mitochondrial Dysfunction in Hair Cell Loss in Zebrafish Cilia Mutants

Hair cells are the sensory cells of the auditory and vestibular systems and consist of densely-packed stereocilia and a single primary cilium, or kinocilium. Mutations in cilia intraflagellar transport (IFT) genes *ift88* and *dync2h1* result in the loss of the kinocilium. Mutations in *ift88* and *dync2h1* have also been found to cause decreased numbers of hair cells along the zebrafish lateral line, with some cells undergoing apoptosis, a form of cell death. Previous research has established a link between defective ciliogenesis in IFT mutants and increased susceptibility to mitochondrial-induced apoptosis in other cell types. However, the extent to which apoptosis accounts for the observed cell loss in zebrafish hair cells and the role of mitochondria in hair cell apoptosis has yet to be established. One main aim of this study is to assess the protective effects of apoptosis inhibition by comparing *ift88* and *dync2h1* mutant hair cell populations with wild-type fish following treatment with an apoptosis inhibitor. The second aim of this study is to evaluate if mitochondrial dysfunction in IFT mutant hair cells occurs independently of cell death. To achieve this aim, I will examine *ift88* and *dync2h1* hair cell mitochondria for network fragmentation, a marker of dysfunction associated with apoptosis, in early hair cell development before cell death. Next, to establish if mitochondrial dysfunction is a cause or consequence of apoptotic hair cell death, I will assess whether apoptosis inhibition attenuates mitochondrial network fragmentation. These findings would demonstrate that the observed hair cell loss in *ift88* and *dync2h1* zebrafish IFT mutants is primarily caused by mitochondria-induced apoptotic cell death. This study will provide insight into the mechanisms of cell death in hair cells lacking a primary cilium, further demonstrating the vital role of the primary cilium in sensory hair cell survival.

Amaya Stanley

WI - University of Wisconsin-Madison

Discipline: Biology

Authors:
#1 Hope Holt
#2 Sean Palecek
#3 Eric `Shusta

Abstract Name: The Blood Brain Barrier: The Role of NOTCH3

The Blood Brain Barrier (BBB) acts as a semi permeable layer around the blood vessels within the brain that regulates movement of molecules between the blood and the brain. Vascular smooth muscle cells and pericyte-like cells, also collectively called mural cells, regulate development of the BBB. The differentiation process of pericyte-like cells derived from NCSC is not well understood. Compared to in vivo samples, in vitro models of human brain mural cells show reduced expression in important mural cell genes, including NOTCH3. In this study, we explore if NOTCH3 signaling in hPSC derived neural crest stem cells (NCSC) can direct differentiation of brain mural pericyte-like cells. There are multiple methods to do this differentiation. Many use serum supplemented media, thus it can be said they are undefined methods. hPSC derived Neural Crest treated with Lentivirus that includes Notch3 intracellular domain (N3ICD) and GFP are seen to have differentiation of cells that have brain mural cell properties. N3ICD expression can be known by expression of green fluorescent protein (GFP) that is also in the Lentivirus. Our next steps include generating a dox-inducible line to have the ability to control the timing of N3ICD expression and levels of expression.

Abigail Staub

PA - Washington & Jefferson College

Discipline: Biology

Authors:

#1 Abigail Staub

#2 Jazmyne Jackson

#3 Courtney Worrell

#4 Amanda Muir

#5 Kelly Whelan

Abstract Name: Investigating the Impact of Inflammatory Mediators of Eosinophilic Esophagitis on Key Regulators of Mitochondrial Biology

Eosinophilic esophagitis (EoE) is a chronic, food-allergen mediated inflammatory disease of the esophagus characterized by the transmural infiltration of eosinophils and epithelial remodeling in the form of basal cell hyperplasia. Recent genetic evidence implicates a role for mitochondria in this disease. Preliminary immunohistochemistry (IHC) data revealed increased expression of mitochondrially encoded protein MTCO1 in the esophageal epithelium of active EoE patients compared to normal controls. qPCR analysis revealed increased levels of mitochondria DNA (mtDNA)-encoded genes, MTCO1 and ND6, in response to chronic exposure (7 days) to IL-13, a central regulator of EoE inflammation, in immortalized esophageal keratinocyte cell line, EPC2-hTERT. To understand if these phenomena are occurring due to Jak/STAT signaling, broad pharmacological inhibition was achieved with Ruxolitinib (Rux). Western blotting showed increased expression of phosphorylated nuclear STAT6 and STAT3705 as well as mitochondrial STAT3S727 in IL-13 treated cells and suppressed phospho-STAT expression in Rux treated cells in the presence and absence of IL-13. Furthermore, IL-13-mediated accumulation of mitochondria was suppressed in the presence of Rux. To further elucidate how the EoE inflammatory milieu impacts key mitochondrial regulators, EPC2-hTERT cells were treated with IL-13 and IL-4 across 7 days to analyze expression levels of genes associated with mitochondrial biogenesis, fission, fusion, and degradation. RNA was collected on days 0, 1, 3, 5, and 7. qPCR data revealed an upregulation of genes involved in mitochondrial biogenesis (TFAM) and degradation (Park2), downregulation in fission (DRP1), and overall steady levels of fusion (MFN1/MFN2), and genes related to mitochondrial stress protection (Pink1). Future studies will assess the expression levels of inflammatory signaling genes, and presence of mtDNA in the cell free media during this time course. These data will allow us to understand how regulators of mitochondrial biology are influenced by EoE inflammation as well as the involvement of novel mitochondria-related inflammatory signaling pathways.

Francisca Stedman

PA - Carnegie Mellon University

Discipline: Physics and Astronomy

Authors:

#1 Valentina Dutta

Shujin Stedman

Abstract Name: Searching for Dark Matter with LDMX

Dark Matter is extremely prevalent in our universe, making up 85% of the matter in the Universe. One theory about the origin of dark matter is that it exists as a thermal relic of the early universe. The Light Dark Matter Experiment (LDMX) was proposed with the intent to create Dark Matter particles from the interaction of energetic electrons with nuclei in a fixed target. A machine learning algorithm will be very important in

helping to discriminate between dark matter signals and known Standard Model (SM) interactions. In this work we utilized two different machine learning algorithms for signal vs background discrimination in LDMX: a boosted decision tree and a deep neural network (ParticleNet). The performance of both approaches is discussed and compared for future use in LDMX.

Sarah Steele

WI - University of Wisconsin-River Falls

Discipline: Psychology

Authors:

Katrina Steele

Abstract Name: Effects of Environmental Enrichment on Enhanced Nicotine-Seeking Behavior Following Exposure to Chronic Variable Stress

Drug addiction is a major public health and serious economic concern in the United States costing taxpayers billions of dollars annually. Chronic unpredictable stress increases the response to nicotine-rewarding properties in the conditioned place preference (CPP) test (Biala et al., 2018). Contrary to the effects observed following exposure to variable stress, both running and environmental enrichment (EE) reduce CPP for cocaine (Mustroph et al., 2016). Based on the interactions observed between EE and chronic stress on learning and memory (Wright & Conrad, 2008), it is reasonable to postulate similar interactions on the rewarding properties of nicotine. Only one study (Biala et al., 2018) has assessed the effects of chronic stress on the rewarding effects of nicotine in the CPP model and none have measured the potential of EE in attenuating this effect. Therefore, this study will investigate and determine whether EE can prevent, reverse, or abolish, the enhancement in the rewarding properties of nicotine following exposure to chronic variable stress in either adolescent or adult rats.

Kristiyan Stefanov

FL - Embry - Riddle Aeronautical University

Discipline: Computer Science

Authors:

#1 Brady Heddon

#2 Adam Kuzmicki

Kaitlyn Cavanaugh

Abstract Name: An Efficient and Data-driven Learning Algorithm to Evaluate Facial Recognition

Facial recognition technology plays a crucial role in numerous fields, from national security to social media platforms. Convolutional Neural Networks (CNNs) stand out as the most prevalent technique for facial recognition due to their impressive accuracy and adaptability in various scenarios. However, CNN-based learning faces considerable challenges, including high computational demands, a dependence on large volumes of labeled data, and significant storage requirements, which all impede its overall efficiency. We aim to implement an innovative and efficient facial recognition approach utilizing structured neural networks grounded in Discrete Cosine Transforms (DCTs), achieving accuracy comparable to conventional CNNs. The extensive and varied facial dataset used for testing guarantees robustness against diverse features, expressions, and lighting conditions. Furthermore, we will conduct a comprehensive comparison between our proposed neural network and traditional methods such as Eigenfaces, emphasizing their performance in facial

recognition applications. Experimental implementation of DCTs show reduction in computational complexity while maintaining comparable accuracy to its traditional CNN model.

Emily Steinbach

VA - Virginia Polytechnic Institute & State U

Discipline: Psychology

Authors:

#1 Anastasia Semenova

#2 E. Scott Geller

Anthony Laub

Abstract Name: Determinants of Psychological Safety in Higher Education: The determinant, uncomfortable comments, includes remarks unrelated to academic growth that cause another person distress

Psychological Safety (PS)—the degree of personal inclusion, contribution, and engagement one experiences in given situations—has become a popular issue in industrial settings. However, PS has not been studied in educational settings. This research examined students' perceptions of PS in various college courses with an innovative 51-question survey. A total of 124 students provided answers for this survey, each responding with reference to a university course taken within the past year. This questionnaire assesses PS with an eight-question "Psychological Safety in Education" scale, adapted from PS scales for industrial settings. It assesses students' perceived PS by asking them to respond to statements on a "strongly agree" to "strongly disagree" Likert Scale. Average Psychological Safety Scores (APSS) varied as a function of the specific class the student evaluated and were influenced by other factors. Specifically, a significant determinant of personal inclusion was a student's connection with classmates. Students who reported that they couldn't relate to other students in the class scored significantly lower on APSS (APSS=4.41) versus those who indicated they could relate to other students (APSS= 5.42). Additionally, it seems uncomfortable comments were another determinant of PS. Preliminary analysis revealed that APSS was lower (APSS=3.84) for students who reported uncomfortable comments toward them versus students who did not report uncomfortable comments toward them (APSS=5.05). While initial findings showed APSS to vary significantly as a function of relationships with peers in the class, additional factors are being analyzed, including the gender of the student versus the gender of the instructor, as well as the source of the uncomfortable comments toward them (e.g., from the instructor or from another student). This study is ongoing as we are exploring other determinants that potentially affect PS in the classroom along with students' connection with classmates and uncomfortable comments towards them.

Maegen Steiner

PA - Point Park University

Discipline: Exercise Science and Nutrition

Authors:

#1 Maegen Steiner

Abstract Name: Injury Rates Among Collegiate Dancers: Developing an Optimistic Approach for Treatment and Prevention

Dance, a fusion of artistry and athleticism, is one of the most arduous forces that is exerted on the human body. This art form is taught at a young age, and dancers consider seriously training for their professional

careers while in college, whether in a pre-professional program or obtaining an undergraduate degree in the subject. As with other athletes, dancers exhibit their fair share of injuries. “Injuries are a problem for the dancer beginning at a young age, with 43.1 percent of dancers between the ages of 10 to 18 becoming injured. Collegiate dancers have self-reported injury rates ranging from 67 percent to 77 percent each semester” (Williams et al.). Given their unfortunate, repetitive nature and unpredictability, developing a strategy for treating and preventing injuries among collegiate dancers is critical. This presentation will discuss what types of injuries are the most frequent in a university population and how it has impacted their training. It will also include background on these injuries, the gathering of information in a student-driven survey, and the benefits of a plan to facilitate appropriate care and precaution.

Nathan Stensaas

MN - Augsburg University

Discipline: Economics

Authors:

Abstract Name: Medicaid Expansion and Lung Cancer in the US

Lung based cancers are historically and currently the most deadly cancers with predicted deaths in 2023, according to the American Cancer Society, being above 127,000 deaths with around 238,000 new cases estimated. Factors that damage lung tissues are significant as smoking tobacco is estimated to be responsible for 80 to 90 percent of lung cancer deaths. This study is centered around finding the impact of the medicaid expansion implemented in 2014 and its impact on access to prevent lung cancer deaths in the states that accepted the expansion versus those that declined. This state level policy study gathers data from federal sources to compile risk factors of lung cancer mortality rates across the states. The primary exposure variable that is focused on in this study is the states that expanded medicaid and those that did not expand it. The data is studied in a quasi experimental difference in difference format so the medicaid expansion policy exposure variable takes the form of an interaction term from the dummy variables for expansion states and policy periods. The results show that alongside risk factors like smoking and regions, the reduction of financial risks with the medicaid expansion by select states had no significant impact on reducing lung cancer mortality rates from the pre expansion period to the post expansion period. This implies that medicaid expansion policy does not correlate to lower mortality rates suggesting that it failed in providing preventative measures to uninsured individuals. The significance of the smoking variable shows that perhaps policy should also target smoking prevention as this study provides further evidence to a correlation between smoking and cancer. The regional dummy variables shows that there may also be unequal healthcare availability in the southern states, further investigation should be taken to deliver equitable care in all regions.

Layla Stenson

MN - Hamline University

Discipline: Biology

Authors:

Abstract Name: Antibacterial Activity of *Artemisia ludoviciana* Associated Yeasts: Potential for Novel Antibiotic Development

Beyond their role in food production, yeasts play a vital ecological role. Plant-associated species represent an understudied potential source of novel antimicrobials to combat rising antibiotic resistance. The antimicrobial

activity of plant-associated yeast and their metabolites is largely understudied. These metabolites, having evolved to be effective against diverse microbial competitors, may also be effective against human pathogens. This study aimed to investigate whether wild yeasts from white sage (*Artemisia ludoviciana*) exhibit antimicrobial activity against high-priority multi-drug resistant bacteria. We hypothesized that plant associated yeasts produce secondary metabolites with antimicrobial activity as defense mechanisms due to their vital ecological role and interactions with other microorganisms. Bioinformatic analyses were used to predict secondary metabolite gene clusters in wild and model yeast genomes. These genomes contained regions encoding compounds with potential antimicrobial activities, including terpenes, beta-lactones, and non-ribosomal peptides. Yeasts were isolated from diverse parts of *A. ludoviciana* using direct plating and enrichment methods. The antimicrobial activity of seven isolates was tested against five relatives of pathogenic bacteria using disk diffusion and direct plating assays. The direct plating assay was most successful, with six out of seven isolates displaying antimicrobial activity against all five tester strains. The average zone of inhibition for the direct plating assay was 6.99 ± 6.77 mm. One of the isolated species was identified as *Wickerhamomyces anomalus*, a yeast recently noted for its strong antimicrobial activities. These findings support the potential of wild plant-associated yeasts as a source for developing novel antimicrobials, which is crucial in the face of increasing antibiotic resistance.

August Stephens

PA - Point Park University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Let's Get Physical: How We Can Redefine Queer Sexuality through BDSM

The LGBTQIA+ community has historically been, and presently is, a community with its own social dynamics, hierarchies, and structures in place. The correlation and relationship between the queer community and kink BDSM practices especially exemplifies the existence of power dynamics amongst LGBTQIA+ people. This presentation will examine how queer individuals in a post-modern state often identify with BDSM and kink. It will also examine how it has influenced their process of re-learning sexuality after growing up in a predominantly heteronormative educational system and media culture, where there were mostly cisgender and heterosexual examples of relationships. Through a surveying of individuals and exploration of the conversations from other researchers such as Muzacz, Bowling, and Montaro navigating the correlation between gender identity, sexual orientation, and identity exploration, this presentation will examine people's viewpoints on sexual freedom and power. Additionally, I will seek IRB approval to conduct anonymous and voluntary surveying of individuals over the age of 18 of how queerness and kink impacts their identity development. Several LGBTQIA+ documentaries will also be referenced to consider how the films represent people's interaction with queerness. Any approach to redefining queer culture and sexuality must also take into account factors of gender dysphoria, discrimination, and potential lack of physical spaces for queer people to comfortably exist and build community within. This presentation will also strive to provide solutions for how queer people can reimagine the impact BDSM and kink has on queer sexuality. Additionally, I will consider how different approaches to social dynamics in queer communities could be utilized to deconstruct and reconstruct more authenticity in ideas of human sexuality. In a predominantly online world, there should be an understanding of how queer and kink identities are inherently interlaced, and this presentation will make an effort to address those intersections.

Paris Stephens

VA - George Mason University

Discipline: Health and Human Development

Authors:

#1 Paris Stephens
#2 Golda Anderson
#3 Farah Bahr
#4 Tanvi Bhat
#5 Juliet Bonnah
Farah Bahr
Golda Anderson

Abstract Name: The Effectiveness of Culturally Relevant Breast Cancer Education Messages Tailored for Young Black Women

Background: Black women under the age of 50 have an excessively high breast cancer mortality rate. This disparity is due in part to the higher incidence of late-stage breast cancer diagnoses in this population. Previous studies have shown that young Black women have low awareness about breast cancer and breast cancer screening. Based on the results of our previous studies, we developed a series of brief breast cancer education messages that were tailored for young Black women and were designed to be disseminated via social media platforms. The purpose of this study was to assess the effectiveness of our breast cancer education intervention on the knowledge of young Black women. Methods: Black female college students ($n = 32$) were recruited to participate in the pilot test. The participants completed a breast cancer knowledge pre-test before watching 5 brief culturally relevant videos. After watching the videos, the participants completed a posttest. A paired samples T-test was conducted to determine if there was a significant difference between the pre-test and posttest scores. Results: The majority of the participants (78.2%) were upper-level students with a mean age of 20 years ± 1.524 . The breast cancer knowledge pre-test and posttest scores ranged from 1 to 7 and 2 to 8, respectively. The mean breast cancer knowledge posttest score (3.97 ± 1.38) was statistically significantly higher than that the mean pre-test score (6.47 ± 1.37) ($p < .001$). Conclusion: Breast cancer education messages that are targeted towards young Black women are highly effective at increasing breast cancer knowledge. Given the disproportionately high incidence of late-stage breast cancer among this population, more culturally relevant interventions are needed to increase awareness and decrease breast

Jaesylin Stephens

KY - University of Kentucky

Discipline: Biology

Authors:

#1 Mariah Donohue
#2 David Weisrock

Abstract Name: Investigating Seasonal Shifts in the Diet and Gut Microbiome of Madagascar's Red-Fronted Lemur

The gut microbiome (GM) is a dynamic community of microorganisms in the GI tract that aids in digestion and metabolism. The GM can respond to rapidly changing environmental pressures quicker than the host genome, suggesting it evolved as an adaptive mechanism for animal hosts. Seasonal changes in food availability are common ecological stressors that animals endure. However, while host diet is known to shape GM assembly, few studies have examined how the GM is affected by dietary changes between seasons. Here, we investigate how seasons drive rapid GM shifts using a species of brown lemur endemic to southeastern Madagascar. *Eulemur rufifrons*, the red-fronted lemur, occupies a montane rainforest that experiences heavy rain and extreme heat during the wet and dry seasons, respectively. Primarily frugivorous during the wet season, *E. rufifrons* resorts to consuming fallback foods (i.e., leaves, seeds, and flowers) when fruit is scarce during the dry season. We confirmed this with 160 hours of behavioral data from 2020, showing that *E.*

rufifrons consumed fruit for 88% of their feeding time during the wet season vs 61% during the dry season. To test whether the GM fluctuates with diet and season, we generated 16S rRNA metabarcoding data from 88 fecal samples spanning both seasons. Our results suggest *E. rufifrons* experiences seasonal shifts in gut microbial diversity and composition in response to different amounts of carbohydrates and fibrous foods. GMs had significantly higher microbial taxonomic richness during the dry season. Microbial community composition had the most variation explained by season relative to sex, location, and group. We conclude that GMs cycle throughout the year to buffer nutritional differences between seasons. By contributing to host plasticity, the GM may help primates cope with unprecedented changes in feeding ecologies caused by anthropogenic habitat disturbance and climate change.

Felicity Sterling

TN - Belmont University

Discipline:

Authors:

#1 Felicity Newton-Sterling

#2 Shawn Sterling

#3 Ashlyn Ryan

Abstract Name: Utilizing Undergraduate Research in the K-12 Classroom Fosters Confidence in Both Populations

Scientific communication is a challenging skill to practice within the classroom setting. Therefore, it is essential that faculty provide opportunities for students to engage with the public in a low stakes environment. However, it is also important to find the proper population to work alongside. Middle school students are a strong group to work with, because many students decide in middle school that they aren't cut out for science. This is particularly true for middle school girls with most deciding to pursue other fields in the sixth grade. Previous studies demonstrated that exposure to hands on science, such as science fairs and interactive labs, improve middle school students' attitudes towards careers in STEM. However, most schools are underfunded, thereby decreasing availability to hands on labs, science fairs, and scientific clubs. Therefore, bringing undergraduate students with resources may be a potential avenue for improving retention in the sciences. In this study, undergraduate research students brought raw data to a middle school in Nashville, TN. Together, the research students taught middle schoolers how to use ImageJ software to analyze live cell microscopy data and generate a figure. Survey data demonstrated that middle school students had a higher chance of pursuing science after the semester long project, and undergraduate students felt a deeper connection to their work and its overall purpose.

Hayley Stewart

IL - Governors State University Honors College

Discipline: Psychology

Authors:

#1 Will Ravetto

#2 Jade Groble

Will Ravetto

Abstract Name: Mindfulness and Regret: Finding Peace in the Present

A. Problem or major purpose: Research has shown that regret is linked to anxiety, depression, and cognitive distortions (Markman et al., 2009; Markham & Miller, 2006). Painful experiences stemming from past actions and decisions can lead to negative rumination (Olatunji et al., 2013). However, by reducing this rumination, there is potential to gain valuable insights from previous decisions, even those that were distressing. This study examines the potential of mindfulness to alleviate the intensity of regret. It was hypothesized that participants would report lower levels of regret after practicing mindfulness meditation. B. Procedure: The study was conducted in two phases. In the first phase, participants were asked to recall a regrettable life event and rate the intensity of their emotional responses, including feelings of regret. After focusing on this memory, all participants took part in a guided mindfulness session. Following the session, they re-evaluated the recalled memory by completing post-session self-report measures, including a short 12-item version of the Five Facet Mindfulness Questionnaire (Baer et al., 2006) and the 12-item Self-

Compassion Scale (Neff, 2019). Participants were then instructed to practice the same meditation at least twice over the next week using an audio recording provided by the researchers. One week later, in the second phase of the study, phone interviews were conducted with the participants . C. Results: Thirty students will participate the study for a partial course credit. We expect to find that participants will report experiencing significantly less amount of regret following guided meditation. D. Conclusions or Implications: We expect that present study will demonstrate the mitigating effect of mindfulness on experience of regret. Future direction and implications will be discussed.

Ryan Stewart

FL - The University of Tampa

Discipline: Biology

Authors:

#1 Sofia Cuello

#2 Kimberly Dobrinski

Abstract Name: Investigating Resveratrol and its Mechanisms on Drug Resistant Breast Cancer

Breast cancer will develop in about 1 in 8 women in their lifetime, and is responsible for more than 40,000 deaths per year. Currently, drug resistance is a major reason for poor prognosis which keeps mortality rates high each year. Resveratrol, a potential treatment option, is a natural occurring antioxidant found in the skin of grapes and various plants. In previous studies, resveratrol has shown promising anticarcinogenic effects in multiple cancers such as prostate, pancreatic, colorectal and others. Therefore, this study aims to investigate resveratrol's effects on both drug-resistant and drug-sensitive breast cancer using MDA-MB-231 and MCF-7 cells respectively. Preliminary research from this study has shown resveratrol to cause cell death in both MDA-MB-231 and MCF-7 cell lines. These results were produced via CyQUANT assay which measured cell viability at various resveratrol concentrations (100µM, 150µM, and 200 µM). As resveratrol concentration increased, a decrease in cell viability was observed indicating resveratrol's promising apoptotic effects. Previous results from this study demonstrate cells are not changing their metabolic growth strategy to oxidative growth. This was shown by no significance for oxygen plate and lipid peroxidase assays at various resveratrol concentrations (100µM, 150µM, and 200 µM). In an attempt to elucidate resveratrol's mechanism of induced apoptosis, this study will investigate the PI3K/Akt and NF-κB pathways.

Jacob Stewart

PA - Duquesne University

Discipline: History

Authors:

Abstract Name: The Recovery of the North American Turkey: A Historical Approach to Successful Privatized Conservation Efforts.

Humans have long had a complex relationship with the landscape and the animals who call it home. The advent of game management and the conservation movement in the early 20th century reframed this relationship into a more fact driven, sophisticated science rather than an abusive theft of ecosystems. In turn, these changes gave rise to specialized advocacy groups that promoted conservation as a means to manage healthy animal population levels for multiple uses including hunting, fishing, and trapping. My research examines one of these groups, the National Wild Turkey Federation (NWTf), and its efforts to conserve and

rebuild the wild turkey population in North America during the twentieth century. In doing so, it shows how their achievements apply to not only the turkey but other game species. The NWTf's model of using involved sportsmen to aid in conservation efforts set a precedent for animal relocation, habitat management, and ethical standards of harvest. These strategies and more helped create a relationship between citizens and game agencies to repopulate a robust wild turkey population to the continental United States, Hawaii, Canada, and Mexico. The NWTf is one of many groups that pieced together small contributions by individual members to yield large dividends in the restoration of habitat for wild birds, fish, and other game animals. This sportsman-led model of conservation helped to provide a template for other interested parties to develop conservation plans for other game species. The intent of this research is to show the broader implications of sportsman-led conservation efforts and their effect on the greater ecosystem and, in doing so, it offers a different way to view the history of conservation in the United States.

Jacob Stewart

TN - University of Memphis

Discipline: Mathematics

Authors:

#1 Thomas Hagen

Abstract Name: Barrier Effects on the Escape and Pursuit of an L1 Pursuer and L2 Target

In mathematical pursuit and escape games a pursuer (agent 1) tries to catch a target (agent 2) by closing the distance between them. Both pursuer and target can move as long as their movement is unobstructed. The distance in traditional pursuit and escape games is taken as the Euclidean distance given in terms of the so-called L2-norm where the Pythagorean Theorem holds true. During this project, the effects of limiting one of these -agents to movement measured in the L1 norm and the addition of a finite, straight-line barrier, or obstacle, were investigated, both analytically and numerically. The earliest time in which the pursuer and target -can meet defines their dominance regions. It was found that even with lower speed (up to a ratio of 50%), an L2 target -can escape from an L1 pursuer if the target takes the "optimal" path within its dominance region. Escape is defined when the target's dominance region becomes unbounded, meaning that it has freedom of movement in an infinite region. To define these (what is "these" referring to?), the dominance region functions were fitted to oblique asymptotes (probably would leave this sentence out entirely because you cannot explain briefly what these functions are and why you use fitting). When introducing the barrier, there are three cases for the L1 pursuer's path: one axis of movement (AoM) blocked, both AoM blocked, and no AoM blocked. The case with single AoM and both AoM being blocked results in global change of the dominance regions, whereas the case with no AoM blocked only results in local- change. Models of pursuit and escape are used to describe and explain real-world phenomena, including predator-prey interactions, and find applications in unmanned ground vehicle (UGV) to unmanned aerial vehicle (UAV) pursuit and target-tracking algorithms.

Angel Stigers

TX - Texas Woman's University

Discipline: Education

Authors:

#1 Angel Stigers

#2 Juan Armijo

#3 Zlata Stankovic-Ramirez

Juan Armijo
Zlata Stankovic-Ramirez

Abstract Name: Improving the quality of education of special needs students with intentional physical environments, adaptive devices, and family support.

In this session, we will explore how to create high-quality physical environments in special needs classrooms for students in 4th through 8th grade. The focus of our presentation will center around three adaptive devices currently being utilized in special education classrooms. We will focus on adaptive devices that benefit students and explore the challenges that some of those devices pose in daily and practical use. Family support and practical techniques will be shared in the session to help improve the utilization of adaptive devices. By creating intentional physical environments that meet the needs of each student in the special education classroom, the teachers are taking the first step in improving oral quality care and education. Through administrative support in the form of budget and prompt delivery to classrooms, teachers and students can familiarize themselves with adaptive devices and utilize them daily to enhance learning. Additionally, an important factor is family engagement and involvement. The suggestion shared in this session will bridge home and school and ensure a holistic approach to supporting the teacher, the family, and every unique student.

Callie Stillion

IN - Valparaiso University

Discipline: Nursing and Public Health

Authors:

Abstract Name: The Impact of Social Determinants of Health on Nicaraguan Immigrants in Costa Rica

During Valparaiso University's annual service learning trip to Costa Rica in March 2024, five public health clinics were conducted in the communities of La Carpio, Boca Arenal, and San Gerardo, which held a combined population of approximately 69,000 at the time, most of which were Nicaraguan immigrants. These clinics were led by students and translators, small groups of which were sent out each day to conduct home visits within these neighborhoods to gather quantitative and qualitative data, including demographic information, details about the home environment, health insurance status, reasons for immigrating to Costa Rica, and perception of health threats in the community from their members. Participants' blood pressures were also collected. A total of seventy-nine families provided us with invaluable information, which helped us answer questions surrounding the impact of social determinants of health on Nicaraguan immigrants in Costa Rica in several areas, as well as gain insight into the perception and prevalence of preventable and chronic disease in these communities. Some findings of interest from this sample of participants were that the main reason for immigrating to Costa Rica was poor economic conditions in Nicaragua, the average blood pressure was 130/78, and that the two are potentially related. We were also able to obtain an understanding of the perception of Nicaraguan immigrants towards the Costa Rican public healthcare system. It is hoped that more data can be collected on how to assist the three above mentioned communities and better their health status in the future.

Amanda Stockton

MI - Wayne State University

Discipline: Anthropology and Archaeology

Authors:

Abstract Name: History By The Bottle: Prohibition-era Beverage Bottles From The Gass Saloon, Hamtramck, Michigan

During Hamtramck's heyday, the city had more saloons per capita than any city in the United States. For residents of the industrial city, places like the Gass Saloon were at the heart of daily life during the 19th and early 20th centuries, providing spaces for business, entertainment, political discussions, and community development. The Gass Saloon operated between 1890 and 1927, including as an illegal bar during Prohibition in Michigan (1917-1933). In 2022, archaeologists excavated at least 181 beverage bottles from the Gass Saloon, including many bottles dating to the Prohibition era and labeled as containers for soda and other non-alcoholic beverages. Records from the 1920s confirm that the business continues to operate illegally as an alcohol-serving saloon during Prohibition. This paper analyzes glass beverage bottles during the Prohibition era and integrates historical and archaeological data to suggest the likelihood that the containers concealed alcohol.

Gavin Stodden

MN - Gustavus Adolphus College

Discipline: Exercise Science and Nutrition

Authors:

#1 Connor Wiberg

Peighton Lynskey

Lauren Maas

Abstract Name: Effect of Low Dose Caffeine Consumption on Time-Based Academic Performance

In 2018, 92% of college students who were surveyed reported consuming caffeine in the past year (Mahoney et. al., 2018). Of that sample, 31% reported using caffeine to improve concentration. The average adult living in the U.S. consumes a moderate level of caffeine at 280 mg per day (Titchenal et al., 2020). Minimal research surrounding the effects of low dose caffeine (80mg) on academic performance has been conducted. This study aims to determine whether consumption of a low dose caffeinated drink has an effect on the accuracy of a timed multiplication assessment. Students from a small residential liberal arts college will be recruited via mass email. Independent variables will include a low-dose caffeine beverage trial, a no-caffeine beverage trial and a control trial. Participants will be asked to refrain from caffeine consumption prior to all data collection trials. During each trial, participants will be given a timed multiplication test. During the beverage trials, participants were required to wait 10 minutes after consuming one of the beverages to allow caffeine to enter the bloodstream. Research is being conducted in a double-blind manner as only one member of the research group and the faculty advisor will know who is receiving caffeine and when it will be administered to the participant. A repeated measures ANOVA ($p < .05$) statistics will be used to analyze the data. We anticipate caffeine consumption will cause an increase in accuracy on the multiplication assessment due to the effect of low-dose caffeine. To better understand caffeine and its effects on academic performance, future studies should examine different levels of caffeine through a double-blind study to determine what levels of caffeine are efficient and/or harmful. Data collection is in progress.

Adrien Stoen

WI - University of Wisconsin-Eau Claire

Discipline: Economics

Authors:

#1 Sarthak Behera

#2 Divya Sadana

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Abstract Name: Relationship between Affordable Care Act Medicaid Expansion and Diabetes

According to CDC, among chronic conditions, Diabetes is one of the leading causes of morbidity and mortality in the US. Access to health care is most essential to stay healthy for a diabetic person. With high cost of supplies, medication, education, and medical care to manage diabetes, affordable and adequate health insurance is imperative. Before the Affordable Care Act expansion in 2014, Medicaid program primarily covered pregnant women, low-income families with children, and elderly and disabled people with Supplemental Security Income (SSI). The expansion extended coverage to most of the adults up to 138% Federal Poverty Level (FPL), and it was adopted by 27 states in 2014 and by 2021, it increased to 39 states (including DC). Past literature provided evidence that this led to a significant increase in the total Medicaid coverage and consequently a decrease in the total number of the uninsured individuals in the expansion states. This paper examines the impact of the Affordable Care Act (ACA) Medicaid Expansion on diabetes diagnoses, and its management to prevent health complications caused by diabetes. Exploiting the differential timing of adoption of Medicaid expansion by different states, we employ a staggered difference-in-difference framework to compare the diabetes outcomes in the expansion states (treatment group) with the non-expansion states (control group).

Salma Stohy

EGY - The American University in Cairo

Discipline: Film/Photography Studies

Authors:

#1 Salma Stohy

Abstract Name: Unveiling the Relation between Art and Environment: Documentaries, Social Media, and Climate Change

Climate change has emerged as a paramount global issue over the past few decades, manifesting as long-term shifts in temperatures and weather patterns due to human activities, particularly fossil fuel burning, which has elevated greenhouse gas levels in the atmosphere. This research delves into the profound impact of climate change and explores how media channels, specifically documentary films and social media, play a crucial role in raising awareness and inspiring action to mitigate the effects of this pressing phenomenon. Despite extensive scientific discourse on climate change mitigation strategies, public comprehension of the issue remains limited. This gap underscores the necessity of leveraging media channels to demonstrate the gravity of climate change and mobilize societal engagement. Documentary films, characterized by their capacity to combine imagery, narrative, and music, have proven effective in emotionally engaging audiences and providing insightful information. Social media, on the other hand, has become a pivotal platform for disseminating information and fostering public discourse on climate-related issues. The research examines secondary data from 12 sources, analyzing documentaries like *An Inconvenient Truth* (2006) and *Climate Refugees* (2010) to identify storytelling techniques that enhance audience comprehension and motivation. Social media's role in spreading awareness, such as through viral moments like the 2019 Australian bushfires, is also explored. While the American film industry has significantly addressed climate communication, the Egyptian industry has yet to fully engage with this topic. In conclusion, findings suggest that integrating scientific information with engaging narratives in documentaries and using social media's immediacy can enhance public understanding of climate change. These channels serve as accessible platforms for education

and action, demonstrating their potential to mobilize collective efforts toward sustainability. This study highlights the intersection of media, art, and activism as a vital tool in addressing the climate crisis.

Gillian Stolz

VA - Christopher Newport University

Discipline: Art History

Authors:

#1 Gillian Stolz

Abstract Name: Threaded Allegiances: Catherine de Medici's Valois Tapestries as Agents of Admiration and Devotion

This paper explores the role of art as diplomacy through an examination of Catherine de Medici's commissioning of the Valois Tapestries during the Renaissance. Amidst political and cultural exchange in 16th-century France, Catherine used these tapestries as agents of devotion and admiration for her children, their Valois heritage, and her own Medici lineage. My study investigates the context surrounding Catherine's patronage, her motivations, and the thematic elements embedded within the tapestries. Methodologically, this research combines contextual analysis with art historical inquiry to dissect the composition, symbolism, and stylistic influences of the Valois Tapestries. By contextualizing Catherine's commission within the broader framework of Renaissance diplomacy, this paper sheds light on the intersection of politics, art, and identity. It addresses gaps in existing scholarship by providing a nuanced understanding of Catherine's strategic use of artistic patronage to foster dynastic unity and promote her family's legitimacy. The thesis argues that the Valois Tapestries served as powerful tools for reinforcing loyalty and allegiance, while also facilitating the synthesis of Italian Renaissance and French artistic values. Ultimately, this study contributes to our understanding of the multifaceted role of art in shaping diplomatic relations and cultural identities during the Renaissance period.

Dylan Stone

WI - University of Wisconsin-Oshkosh

Discipline: Environmental Science and Sustainability

Authors:

#1 Jennifer Schuttlefield-Christus

Abstract Name: Microplastics in the Laurentian Great Lakes Watershed as a vector for toxicant transport and their capacity as environmental reactionary surfaces

In an economy dominated by petroleum-based plastic commodities that pose low front-end costs for production, there is growing concern and research into the scale and potential effects of plastic pollution, degradation, and environmental persistence. Plastic waste is difficult to contain absolutely with current waste infrastructure, which significantly varies by country, while plastic ubiquity continues to rise. There are myriad vectors by which plastic enters the environment, including, but not limited to; laundry effluent from washing clothes containing nylon or polyester, environmental degradation of plastic bags and bottles which often contain polypropylene or polyethylene terephthalate, or films used in shipping and packaging that often compose of low-density polyethylene. The behavior of microplastics (MPs) can often be generalized as many plastics are driven by non-polar interactions within their environments and many MPs share a resistance to degradation under natural conditions. The non-polar interactions of these MPs lead them to not only adsorb

non-polar toxicants, such as organochlorides, but also to sequester in fatty tissues of biological organisms and have even been shown in studies to complex with metals such as arsenic and exhibit phytotoxic effects. Photodegradation of plastics occurs in freshwater and marine environments by UV light along with mechanical wave action, leading to dispersal of micro- and nano-plastics (MP and NPs). The movement within these systems is dependent on individual plastic species density, which may be greater or less than water, as well as sorption of sediments, and biological accumulation in filter-feeding species. This study aims to characterize the compounds that are carried by MPs and understand the potential transport of persistent organic pollutants (POPs) within this watershed. By using standardized testing methods from current research and characterizing the compounds carried by MPs, we may be able to describe plastics as reactionary surfaces within freshwater environments and predict metabolites of interest.

Jackson Stone

IN - Purdue University Main Campus

Discipline: Interdisciplinary

Authors:

#1 Jackson Stone

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Haley Zeri

Nate Albin

Abstract Name: Students in Action: Fostering a K-12 School and University Partnership to Promote Community Engagement and Professional Development through Bi-Annual Conferences

Multiplying Good was a nonprofit organization partnering with communities to foster service engagement. Students in Action (SIA) is an initiative implemented in K-12 schools to provide students with the skills to lead service-learning projects. The dissolution of Multiplying Good due to financial difficulties resulted in the need for a charter to continue to serve as the liaison between K-12 schools across the community, such as through planning bi-annual conferences. We took on this role by fostering a connection between Purdue University and our local Greater Lafayette K-12 partner schools, serving as coaches working alongside the students and teachers, and taking over Multiplying Good's former role in planning the annual conferences. To do so, we coordinated all conference logistics, facilitated communication between attendees, and created engaging, personalized lesson plans for SIA students. The conference created a space to facilitate inter-school conversations, allowing students to deepen their understanding of their role in SIA and their community. Students and teachers viewed the conference positively, with multiple common themes emerging from narrative and observational data. The conference helped foster connections across schools through discussions and activities made possible through a collaborative environment. Additionally, our activities and lessons were beneficial for students regardless of experience in the program, ranging from those who were new to those who had participated in SIA for several years. Finally, the conference left students feeling empowered to take on service-learning projects in their respective schools, prepared with new skills that will help them further their endeavors within their respective SIA teams. We hope our work can serve as the foundation for other universities nationwide to support youth service-learning initiatives, such as the partnership created between Great Lafayette SIA teams and Purdue University.

Andrea Storer

MT - Montana State University - Bozeman

Discipline: Interdisciplinary

Authors:

#1 Amanda Haab
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#4 Carly Jensen
#5 Andrea Storer
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Calla Castro
Jessminda DiCello

Abstract Name: Advancing Undergraduate Research Through Systems of Shared Governance

Undergraduate research is a cornerstone of experiential education that fosters critical thinking, problem-solving skills, and professional development. At Montana State University, the Undergraduate Research Council (UGRC) has pioneered a model that leverages shared governance to enhance access, equity, and sustainability within undergraduate research programs. By engaging diverse stakeholders, the UGRC integrates the voices of undergraduates into decision-making processes that directly affect the research culture at Montana State. The UGRC serves as a formal student-led part of the shared governance framework at our university that elevates students voices to balance with other researchers. Initiatives the UGRC have tackled include standardizing the process for earning research credits, integrating peer research support, hosting an annual Research Fair, and publishing the student-run journal *Curiositas*. These efforts to create streamlined access have resulted in record-breaking participation in undergraduate research programs, increasing representation from historically marginalized groups. The UGRC's model highlights strategies for fostering collaboration across institutional silos by examining barriers to participation in undergraduate research. The Council addresses resistance to organizational change and gaps in communication through inclusive and transparent practices that promote interdisciplinary collaboration. By prioritizing student agency within governance frameworks, the UGRC aims to serve as a replicable model for other institutions seeking to advance undergraduate research on a systemic level. As higher education increasingly prioritizes equity and access, the UGRC's model offers a blueprint for embedding student voices into systemic change, ensuring the long-term sustainability of undergraduate research programs.

Cameron Stott

FL - University of Central Florida

Discipline: Engineering

Authors:

#1 Cameron Stott
#2 Om Vishanarga
#3 Pavan Senthil
#4 Kalie Walker
#5 Peter Smith
#6 John Sparkman
#7 Albert Manero

Abstract Name: Novel Socket Designs for Myoelectric Prostheses: Innovative Solutions for Enhanced Comfort and Fit

Rejection rates for upper limb myoelectric prostheses remain high at 35%. Among factors leading to abandonment, the comfort of the interface between the user and their device is a major point of concern. To address such concerns, this research outlines the development and improvement process of these interfaces for a customizable myoelectric prosthesis socket. This research laboratory's preliminary socket designs were

limited to diameter and length alone without consideration of irregular topologies that naturally occur with limb difference. The need for an improved approach capable of accommodating each participant's limb is evident and has now been implemented. Various photos and videos of the residual limb are taken to develop an accurate 3D model, from which a custom interface is generated. The 3D modeling process begins with Blender to create a limb model; Autodesk Fusion is then used to design the socket and its corresponding components for the final design. Features including surface electromyographic electrodes, a battery adapter, and an adjustable tension dial to accommodate fit are then added. To improve socket fit and comfort, the previously wired gel electrodes have been replaced with dry counterparts embedded into the socket for enhanced signal reading and ease of placement. The dry electrodes provide direct access to target muscles that may be inaccessible by the gel electrodes, improving the signal quality from the contracted muscle. Additional development methods are being explored for future implementation in the socket production process. For increased efficiency in designing the sockets, a 3D scanner and casting methods may offer improvements to accuracy while reconstructing the residual limb models. By integrating these findings into the user interface, this research seeks to improve comfort and lower the rejection rates of upper limb prostheses.

Franklin Stout

MD - Bowie State University

Discipline: Biology

Authors:

Abstract Name: Beaver Lodges Host Diverse Visitors in the D.C.-Baltimore Corridor

American beavers (*Castor canadensis*) are noted ecosystem engineers who transform landscapes when they fell trees and dam rivers and streams. However, relatively little research has focused on the impact of their lodges – 10 to 50-foot wide woody structures that can outlast beavers in many ponds and wetlands. Here, we characterize animal activity at seven beaver lodges in the largest green space of the D.C.-Baltimore corridor, including the Patuxent Research Refuge and Fran Uhler Natural Area. We recorded animal movements for >25 days using 13 trail cameras placed approximately 6-12 feet from beaver lodges on metal poles. In total, over 20 species used the lodges for activities such as basking (eastern painted turtles, *Chrysemys picta picta*), foraging (Great Blue Heron, *Ardea herodias*), and resting (Common Grackle, *Quiscalus quiscula*). Within species, we counted photos separated by at least 30 minutes as independent observations. We then quantified the frequency of observations and species richness in relationship to lodge location (island versus bank), time of day, temperature, and human presence. Overall, our data demonstrate commensalism between American beavers and a diverse assemblage of birds, mammals, and ectotherms. We also find evidence that animals divide their use of lodges by time and temperature, and we provide one of the first investigations of human, beaver, and beaver-predator interactions on lodges in a nationally important wildlife refuge.

Stefan Stratimirovic

PA - Duquesne University

Discipline: Biology

Authors:

#1 Stefan Stratimirovic

Abstract Name: Macrophage-targeted nanomedicine reduces fibrosis in a mouse inflammation model by downregulating TGF-beta and other pro-fibrotic factors in a sex-dependent manner.

Fibrosis is abnormal tissue scarring seen in later stages of injuries, cancers, genetic disorders, and or following an infection. It is characterized by an increased amount of extracellular matrix (ECM) material or changes in the ECM degradation processes. Emerging research shows that macrophages and other immune cells play a key role in the development of fibrosis. We previously showed that macrophage-targeted COX-2 inhibition using theranostic nanomedicine reduces inflammation in both sexes. Connections between macrophage COX-2 and TGF-beta, one of the theorized supermolecules in fibrosis, have been shown in other studies. In this study, we aimed to investigate the impact of macrophage-specific COX-2 inhibition on fibrosis and unveil previously unknown sex differences. We induced inflammation in male and female mice by injecting CFA (Complete Freud's Adjuvant). Tissues collected on Day 21 were analyzed by immunofluorescence and immunohistochemistry, while tissues collected on Day 40 were stained with picrosirius for collagen. Images were processed with Pathfinder R for immune cell detection and with CT Fire to assess collagen characteristics. Pathway enrichment was performed using pathfindR and gene analysis was performed by Nanostring. Literature searches were performed on each significant gene to assess involvement in fibrosis. We found that treatment with macrophage-specific COX-2 inhibiting Nanoemulsions significantly downregulated TGF-beta and other theorized immune cell pro-fibrotic factors in both sexes. Both sexes also had a significant reduction in fibrotic collagen characteristics, with females showing more of a reduction compared to males. Additionally, we uncovered a possible non-canonical fibrotic pathway that is significantly upregulated in males even with treatment but is unaffected in females.

Erin Stratton

KY - University of Kentucky

Discipline: Biology

Authors:

#1 Erin Stratton

Abstract Name: "It was nice to know there was a backup plan": Investigating Student Perceptions and Final Grade Outcomes Across Multiple Non-Traditional Grading Schemes in Introductory Biology Courses

Nearly half of undergraduate students who pursue undergraduate degrees in STEM fields ultimately change their major, many after introductory gateway courses with high failure (D/F) and withdrawal (W) rates. Implementing non-traditional grading schemes has been proposed as one possible solution. Non-traditional grading schemes provide students more flexibility and opportunities to succeed, such as exam retakes or dropping lowest grades. Previous studies have found that non-traditional grading schemes lead to enhanced performance and less student anxiety compared to courses with traditional grading schemes, but little research has been done comparing non-traditional grading schemes to each other. This mixed method study begins to fill this gap by exploring how student perceptions and grade outcomes vary across three different non-traditional grading schemes in introductory biology courses at a large public university. The grading schemes in the three courses included an optional test retake (Introductory Biology I course), dropping of the lowest exam score (Introductory Biology II course), or the reduction in weight of the lowest exam score (Introduction to Genetics course). Survey data (n=114) indicate that students feel decreased anxiety and increased understanding of course content in each of the three courses. On average, students in the courses that offered an optional exam retake and dropped the lowest exam score were more likely to agree/strongly agree that their anxiety decreased and that they felt confident in their knowledge of the course material compared to the course where the weight of the lowest exam score was reduced. Semi-structured interviews with students helped explain and extend quantitative survey results. In the final stage of this ongoing study, we will determine the extent to which the different grading schemes improve final grade outcomes. These findings provide critical insight into how most effectively design introductory biology courses to maximize the benefits of non-traditional grading schemes.

Nyoko Stringer

MD - Bowie State University

Discipline: Physics and Astronomy

Authors:

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Isaiah Shelton

Abstract Name: Demonstration of Hooke's Law: Laser diffraction imaging of helical structure

Diffraction imaging is an important topic that spans across multiple educational fields. Biologists use macromolecular crystallography – a diffraction-based technique similar to coherent diffraction imaging to obtain the structure of proteins and use phase retrieval programs to reconstruct the image [1]. In physics, diffraction imaging is used in x-ray crystallography [2]. Perhaps the most famous example of the application of these principles to a biological problem is the use of x-ray crystallography to study the structure of DNA. Since technical challenges make it impractical to study crystalline DNA in introductory physics, the helical structures can be approached by substituting an optical laser source for x-rays and a ballpoint pen spring for DNA molecules [3]. In this work, we introduce an advanced methodological strategy to demonstrate Hooke's Law by using helical structure through the benefit of a laser diffraction imaging technique.

Nyoko Stringer

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Discipline: Physics and Astronomy

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Abstract Name: Demonstration of Hooke's Law: Laser diffraction imaging of helical structure

Diffraction imaging is an important topic that spans across multiple educational fields. Biologists use macromolecular crystallography – a diffraction-based technique similar to coherent diffraction imaging to obtain the structure of proteins and use phase retrieval programs to reconstruct the image [1]. In physics, diffraction imaging is used in x-ray crystallography [2]. Perhaps the most famous example of the application of these principles to a biological problem is the use of x-ray crystallography to study the structure of DNA. Since technical challenges make it impractical to study crystalline DNA in introductory physics, the helical

structures can be approached by substituting an optical laser source for x-rays and a ballpoint pen spring for DNA molecules [3]. In this work, we introduce an advanced methodological strategy to demonstrate Hooke's Law by using helical structure through the benefit of a laser diffraction imaging technique.

Sofie Strompf

VA - George Mason University

Discipline: Biology

Authors:

#1 Marissa Howard

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Abstract Name: Exploration of the Molecular Controls of Secretory Mitophagy

Tumor metabolic reprogramming is a hallmark of cancer progression, survival, and therapeutic resistance. A targetable class of cancer metabolic adaptation exploits mitophagy, a specialized autophagy pathway known to be linked to the cancer phenotype. Mitophagy selectively eliminates dysfunctional mitochondria by targeting them, via autophagosome shuttling, to the lysosome for degradation. Cancer cell mitophagy is triggered by elevated oxidative stress and mitochondria DNA damage caused by hypoxia, radiotherapy, molecular therapy, and immunotherapy. A high mitophagy demand can overwhelm the lysosome capacity resulting in accumulated damaged mitochondria that is harmful to the cell. We hypothesize that the newly discovered process of secretory mitophagy exports damaged mitochondrial fission-released segments to reduce the overload pressure on the lysosomal system, and thereby sustains cancer cell survival in the face of therapeutic mitochondrial stress. We discovered a form of secretory mitophagy occurring in vivo in a growing solid tumor. Our molecular analysis of the full repertoire of extracellular vesicles (EV) shed into the resident tumor interstitial fluid (IF) in vivo yielded a rich set of information about the functional state of mitochondria within the tumor cells and host cells. Within tumor IF, and the culture media of cancer cells undergoing oxidative stress, we identified an EV-packaged full set of mitochondria molecules comprising the peripheral fission pinched-off segment of the mitochondrial organelle. It has recently been found that peripheral mitophagy fission, regulated by mitochondrial fission 1 protein (FIS1), is a key essential regulator of mitophagy, distinct from mid-zone mitochondria biogenesis. We also found that mitophagy inducer PTEN induced kinase 1 (PINK1) cleavage status is prominently reflected in the set of mitochondrial proteins exported within IF EVs. This may constitute a new quantitative measurement tool to monitor the real-time state of tumor intracellular mitophagy. Our findings raise important mechanistic questions regarding molecular controls of secretory mitophagy.

Kalen Strunk

OK - Oklahoma State University

Discipline: Biology

Authors:

Abstract Name: Apoid Wasp Digitization Initiative: Argentine Species Checklist

Apoid wasps, a cosmopolitan group within the order Hymenoptera, encompass nearly 10,000 species across

four families, showcasing remarkable diversity in morphology, habitat, and behavior. Commonly referred to as hunting wasps, they play essential roles in ecosystems. Despite their fascinating life histories and ecological importance, apoid wasps remain understudied, with a limited number of experts researching them and scarce digitized museum collections. Consequently, global databases such as GBIF and iNaturalist exhibit a pronounced bias toward North American and European data, failing to accurately reflect the true biodiversity of this group, especially in regions such as Argentina. The main objective of our project is to address this gap by leveraging historical collection records from the American Museum of Natural History (AMNH), particularly utilizing the extensive work of the late entomologist Dr. Manfredo Fritz. We focus on the apoid wasps of Argentina, a region that harbors significant potential diversity, as Dr. Fritz conducted the vast majority of his collections within his home country. To measure the biodiversity of apoid wasps, we meticulously combed through the apoid wasp collection, sampling one male and one female representative of each species. This process includes recording identification data, taking photographs, and compiling the information into a comprehensive database, which will then be integrated into an open-source platform. Our efforts on this project have led to a tenfold increase in the AMNH's recorded data on Argentine apoid wasps, significantly enhancing the available information for this understudied group. Our study has stimulated further investigation into the ecological roles and conservation needs of these wasps, raising awareness of their biological importance. Our aim is to promote future collaboration among researchers and contribute to a better representation of these species, as well as to repatriate the wasp collection by making its data openly available worldwide.

Brooke Struyk

VA - Virginia Tech

Discipline: Engineering

Authors:

#1 Navneet Krishna

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#5 Bucky Brand

Bucky Brand

Navneet Krishna

Abstract Name: Mya's Tricycle: A Better Form of Mobility

Last year our group was hit with a challenge. A woman named Mya who had dyspraxia and her family in the local community were looking for a group of engineers to repair her push bike. The bike had been made specifically for her by a private company, but there were flaws with the bike and as the summers drew on, Mya eventually grew out of the bike. The bike not only allowed Mya to enjoy her time outside, it also was used by her therapist to continuously move the muscles in her legs by pedaling. Dyspraxia is a condition that affects a person's coordination. In Mya's case, she was also non-verbal. The question we were left with was how can we design and develop tools to assist someone with dyspraxia and is nonverbal to be able to ride a bike safely. Last year we were able to elongate the bike, 3D print new pedals to fit her shoe size, create calf and ankle support braces, 3D print a mount to keep front handlebars fixed axially, add a new brake cable, and add tricycle wheels to help with steering. This year after Mya was able to use the bike over the summer, our group was able to receive feedback from the family. We learned that the ankle brace that was 3D printed had broken and was uncomfortable and the pedals should be printed an inch thicker. We also were informed by the family of extra ideas to add to the bike to make it easier for Mya. This year we will be adding a sunshade, creating a button system for Mya, fixing the issues Mya's family previously brought up, adding a dead man's brake, and potentially motorizing the bike.

Sarah Stygler

PA - California University of Pennsylvania

Discipline: Biology

Authors:

#1 Sarah Stygler

#2 Louise Nicholson

Abstract Name: Understanding the Effects of Alprazolam on Planarian Regeneration

Wound healing is an important and complex cellular and molecular process that can be influenced by a variety of extrinsic factors. These include age, underlying disease, infection, stress, and certain medications. To understand how one commonly prescribed medication, Alprazolam, a generic form of the benzodiazepine Xanax that is used to treat anxiety disorders, affects the wound healing process, we chose study its effects in planaria. As wound response mechanisms are widely conserved, planaria provide a simple model system for examining how Alprazolam affects wound healing. We first established that Alprazolam could influence anxiety-like responses in planaria, using a light/dark test. Next, we exposed regenerating planaria to various physiologically relevant doses of Alprazolam and compared the results to control regenerating planaria. These results suggested that Alprazolam causes regeneration to proceed more slowly. As some medications are known to cause epigenetic changes, we hypothesized that alprazolam might be exerting its effects on regeneration by epigenetically influencing transcription. One common epigenetic modification is DNA methylation. To test whether changes in DNA methylation are responsible for the slower regeneration, DNA was extracted from regenerating planaria after 1, 4, 6, 24, or 48 hours, and the amount of 5-methylcytosine present was quantified using a colorimetric ELISA assay. DNA methylation was also quantified from planaria that had been allowed to regenerate for two weeks. Preliminary results suggest that DNA methylation levels are higher in Alprazolam-exposed planaria than in controls during the initial stages of regeneration. As methylation is frequently associated with repression of transcription, this might indicate decreased gene expression is occurring during early stages of regeneration. As wound response mechanisms are widely conserved, this research could help us to understand how a commonly prescribed anxiety medication influences wound healing in humans.

Harsheni Sudakar

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

#1 Jacob Whitman

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Abstract Name: Hospice Ownership Type and Access to Quality Hospice Care

This study investigates the variation in hospice care quality across the United States by geography and hospice provider ownership type. Hospice is designed to provide palliative (symptom relieving) and supportive end of life care for terminally ill patients. Over the past few decades, the hospice system has become increasingly reliant on for-profit providers, often incentivized to enroll patients with less complicated diagnoses. Previous studies have shown a correlation between for-profit status and lower quality of care. This study is aimed at identifying how access to high quality hospice care has changed across the US in recent years, differentiating between for-profit and not-for-profit providers. The Provider Consumer Assessment of Healthcare Providers and Systems (CAHPS) Hospice Survey data contain quality information for each

hospice certified by Medicare meeting eligibility criteria (some do not have reported data due to small size). The star rating system used allows for comparison of care quality between hospice providers, with 1 being the lowest quality and 5 the highest. We define “high quality” hospices as those with a star rating of 4 or greater. We examine 9 waves of hospice survey data from 2022 to 2024, to assess changes in access to high quality care by region and ownership type. From 2022 to 2024, the mean star rating increased by almost 0.2 points. 60.3% of not-for-profit providers were rated high quality whereas only 42.2% of for-profit providers were high quality. Data from February 2024 showed high-quality hospices are predominantly concentrated in the East Coast, West Coast and Midwest. There are substantial gaps in access to high quality care in the Mountain West and the Northern Great Plains. This is critical in understanding what regions of the country still lack access to high quality hospice care and how this varies by ownership type.

Gautham Sudhakar

MO - Washington University in St. Louis

Discipline: Biology

Authors:

Abstract Name: Optimizing Near-Infrared Fluorescent Proteins for Enhanced Noninvasive Deep-Tissue Imaging

Noninvasive, deep-tissue imaging techniques are critical for advancing our understanding of neural circuits across various areas of neuroscience. Among these, near-infrared (NIR) wavelengths have emerged as promising tools, offering deeper tissue penetration due to reduced light absorption and scattering, while minimizing tissue damage. However, the limited brightness of NIR fluorescent proteins remains a major challenge for their effective application in in vivo imaging. This study addresses this challenge by focusing on optimizing the brightness of NIR fluorescent proteins, while preserving their essential spectral properties. A key obstacle, the limited binding affinity of biliverdin (cofactor with NIR fluorescent proteins) in mammalian tissues, has further complicated the development of NIR sensors. To overcome this, we performed a quantitative analysis of several novel NIR fluorescent proteins, evaluating their fluorescence intensity and spectral characteristics. Through this analysis, we identified several top-performing candidates that demonstrated significant potential to enhance noninvasive deep-tissue imaging. These findings highlight the promise of NIR fluorescent proteins, especially when paired with selective labeling strategies, such as cell-type-specific promoters or organelle-targeting sequences. The improved brightness of these proteins paves the way for further refinement, potentially leading to more precise and efficient methods for deep-tissue imaging and related neurological research and beyond.

Kayleen Sugianto

OK - Oklahoma State University

Discipline: Biology

Authors:

#1 Michael Reichert

#2 Kaleb Banks

#3 Owen Edwards

Abstract Name: Picture-perfect Success in Digital Photography Identification System for Crawfish Frog Individuals

Identification of individual animals is important to estimate population numbers, identify environmental threats, and study behavior; however, traditional marking methods for amphibians relied on marking the animal in invasive ways. The objective in this study is to determine if photographs can be used to identify individual crawfish frogs (*Lithobates areolatus*) through either their dorsal or tympanum patterns. The species has experienced a decline in its populations, and photographic identification would eliminate the need for any kind of marking. Improvements in the species' welfare through limiting use of invasive techniques as well as allowing them to be studied easier will be of benefit through this method. We monitored a population of crawfish frogs over its entire breeding season and photographed both the dorsal pattern and the tympanum of each frog captured on each night. We used the photo ID software, Wild-ID, to process the images and identify matches, which were confirmed manually. The software correctly identified individuals in almost all cases and the combination of software and user identification was 100% successful in correctly identifying matches for images of both the dorsum and the tympanum. Because photographic identification was highly accurate, this method could be used exclusively to identify individual crawfish frogs, which has important implications for monitoring populations of this species of conservation concern.

Ghavita Sugrim

NY - CUNY Medgar Evers College

Discipline: Psychology

Authors:

Abstract Name: Racial Bias in Education: A Case Study for African Americans

This study examines how African American adolescents experience gender and racial discrimination within the educational system. Critical Race Theory illuminates how race is a social construct and highlights the ways in which people are unfairly judged and marginalized based on their perceived internal and external characteristics. Laws and policies often perpetuate this oppression. This study hypothesizes that there would be a gender difference in the frequency with which African American female and male students reported experiencing racially motivated unfair treatment in school. Data from the CDC's 2021 Adolescent Behaviors and Experiences Survey (ABES) was analyzed ($n = 7,676$) using a t-test to assess statistical significance. Findings indicate that both genders rarely reported feeling mistreated due to their race. However, female respondents reported experiencing more discrimination than males. These results underscore the need for interventions such as ethnic-racial socialization, fostering ethnic pride, and restorative justice practices that promote inclusivity and positive learning environments.

Mary "Maya" Sukala

PA - Point Park University

Discipline: English and Literature

Authors:

Abstract Name: Reframing Abolitionism: Linguistic Reform in Mainstream and Academic Rhetoric Addressing Modern Sex Trafficking

Anti-trafficking nonprofits like End Slavery Tennessee and Operation Underground Railroad claim to combat "modern-day slavery." While "modern-day slavery" is often used interchangeably with "modern sex trafficking," progressive researchers in this field such as Lorelei Lee and Lyndsey P. Beutin suggest that present-day human trafficking deviates so significantly from the triangular trade, a system backed by

legislation that stripped masses of kidnapped African people in America of their human rights in the imperial and colonial eras, that the discourse in this movement needs to shift to reflect that distinction. Beginning with figures like Frederick Douglass and Harriet Jacobs, social activists with lived experience in organized oppression in America demonstrate a long history of pursuing accurate terms for their disenfranchising experiences. As Douglass said, "Education is emancipation." Therefore, those in the anti-trafficking field must better shape our terminology to inform others about the qualities that distinguish modern sex trafficking from the triangular trade and help current victims liberate themselves from the chains of silence. This presentation will compare firsthand accounts written by formerly enslaved people with present-day accounts written by those with lived experience in modern-day human trafficking. Through this comparison, I hope to answer the following questions: "What are the gaps in current discourse and research in the anti-trafficking movement? How has the rhetoric surrounding modern human trafficking in current discourse inaccurately represented the experiences of enslaved peoples of the past? How can that rhetoric be revised?" In this careful analysis, I hope to uncover the parallels between 18th- and 19th-century rhetoric on enslavement and current trends in the cultural conversation on human trafficking. Ultimately, these findings will demonstrate the necessity of utilizing primary sources to ensure accurate portrayals of trafficking-related issues in the humanities.

McKenzie Sullivan

WI - University of Wisconsin-La Crosse

Discipline: Business

Authors:
Brett Lubetski

Abstract Name: Pricing Under Pressure: Student Comprehension of Fairness and Price Gouging

While standard economic theory posits that the priority of a firm is to maximize profits, behavioral economic theory suggests that firms will engage in behavior that limits profits to avoid being considered unfair. The purpose of our study is to determine when it is acceptable for firms to raise prices and to examine how violations of price fairness translate into legislation. Inflation and the rising cost of living continuously caused concern among the electorate and proved to be common topics in the 2024 election. Some explain the rising prices as leftover consequences of pandemic supply shocks while others claim firms exploit market power through price gouging and other unfair pricing practices. Research indicates that people have an inherent sense of fairness guided by implicit rules and are often willing to penalize those who act unfairly. As a result, anti-price-gouging legislation tends to be a popular response in inflationary times. To better understand undergraduate students' comprehension of price fairness, we conducted a survey of scenario-based questions regarding prices, inflation, and price gouging. Our findings reveal that business students and men respond differently to price fairness, adding complexity to the overall reaction to price gouging.

Jon Sullivan

FL - Florida Atlantic University

Discipline: Biology

Authors:
#1 De-fen Mou
#2 Jon Sullivan

Abstract Name: Analysis of Antibiosis in Capsicum Annuum Varieties Against Thrips parvispinus

Thrips parvispinus is an invasive and polyphagous insect that feeds on many commercially important food and ornamental crops. This species of thrips is native to Southeast Asia and was introduced to Florida in 2020. In 2023, T. parvispinus caused total crop losses of pepper in southern Florida, with losses up to \$1 million. Due to its economic importance, an accurate understanding of T. parvispinus' relationship with host plants is needed. There is limited information regarding plant resistance in peppers to thrips infestation. Therefore, the goal of this research project is to assess the antibiotic properties of commercial Capsicum annuum varieties against T. parvispinus. Five pepper varieties will be evaluated based on the survival rate, reproductive rate, and feeding damage of T. parvispinus females on leaf samples of each pepper variety. Understanding the differences of susceptibility in C. Annuum varieties to T. parvispinus infestation will provide valuable insight into identifying varieties with plant resistance to thrips. Specifically, the results will provide local growers with information on varieties which are more tolerant of or resistant to T. parvispinus enabling informed pest management strategies and planting decisions.

Kailee Sullivan

VA - James Madison University

Discipline: Biology

Authors:

#1 Kailee Sullivan

Abstract Name: Reducing Antibiotic Necessity by Using Chlorine Based Agents on Resilient Bacteria and Endospores in Turkey Houses

Aggressive bacterial and endospore growth in industrial turkey houses causes heavy mortality in high-investment birds, driving farmers to choose between extraneous antibiotic use or crippling financial loss. Current treatments using dilute ammonia at industry standard practice wipe out the majority of bacterial loads to negligible levels but resilient volatile bacteria, like Clostridium difficile an endospore bacteria, remain. This grade of bacteria is inhabitable in the lab setting, but in industrial turkey houses with livestock, the only current solution is swathing each house in antibiotics. Turkeys require more antibiotics per kilogram of body mass than any other livestock and, as per USDA regulations, flocks must exceed 2% total flock mortality per week to qualify for antibiotic treatment. FDA-approved antibiotics are applied at the minimum dose and require a specified withdrawal period prior to shipping, to flush antibiotics from their systems. The use of an antibiotic is an expensive investment and broad application solution due to the potency required and nonspecific target. This reactive protocol is limited to moderating flock loss after bacteria levels have become intolerable. Targeting the source with a chlorine complex, entailing a chlorine-based product combined with an acid solution and bleach-based sprays that are tilled through layers of windrow litter, directly combats escalating levels of encapsulated endospores without harm to livestock birds. These more aggressive treatments remove the stores of resilient bacteria from infected turkey houses and prevent pathogen levels from reaching levels necessary for antibiotic intervention, keeping the birds healthier, protecting antibiotic stewardship and the turkey industry.

Advika Sumit

OH - University of Cincinnati Main Campus

Discipline: Health and Human Development

Authors:

#1 Alexander Karabachev

#2 Antonio Dekhou

#3 Priscilla Pichardo
#4 Alice Tang
#5 Chad Zender
Advika Sumit

Abstract Name: Preliminary Validation of a Novel Survey to Measure Complicated Living Grief in Head and Neck Cancer Patients

Complicated living grief (CLG) is a persistent and distressing emotional response to non-bereavement-related loss, often characterized by maladaptive thoughts and behaviors. For head and neck cancer (HNC) patients, the disease's physical and emotional impacts—such as loss of speech, altered appearance, and diminished social functioning—make them especially vulnerable to CLG. Unlike anxiety and depression, no standardized screening tool exists to measure CLG, leaving this critical mental health challenge underdiagnosed and undertreated. This ongoing study aims to validate a novel screening tool, the CLG Assessment, specifically designed to measure CLG in HNC patients. The questionnaire builds on the Inventory of Complicated Grief, with modifications to capture losses associated with cancer diagnosis and treatment. Recruitment is underway at a tertiary care medical center, targeting adult HNC patients across the treatment spectrum to ensure diverse representation. To date, over 80 participants have completed the 16-item survey, which evaluates yearning, emotional response to loss, and daily life impact. Data analysis to establish reliability and validity is ongoing. This research addresses a significant gap in psychosocial oncology by developing a tool to identify HNC patients experiencing CLG. Although final results are pending, preliminary observations suggest CLG is prevalent among this population and correlates with poorer quality of life, increased anxiety, and depression. Once validated, this survey will enable clinicians to systematically assess CLG, guiding tailored interventions such as early palliative care and grief-directed therapies. By capturing the unique grief experiences of cancer patients, this study represents a critical step toward addressing the hidden psychological burdens of living grief. Its innovative approach equips clinicians with actionable insights to develop personalized interventions, ultimately empowering patients to navigate their cancer journey with greater resilience. This tool not only enhances survivorship care, but also lays the groundwork for broader applications in oncology and other chronic illnesses.

Zoe Sun

GA - Kennesaw State University

Discipline: Engineering

Authors:

#1 Ryan Bonus
#2 Charlie Freeman
#3 Christopher Garretson
#4 Zack Slutsky
#5 Razvan Voicu
#6 Muhammad Hassan Tanveer
#7 Yannique Tello

Abstract Name: DEVELOPMENTATION OF LOWER EXTREMITIES EXOSKELETON ATTACHED TO A WHEELCHAIR FOR REHABILITATION

Approximately 75 million people worldwide rely on wheelchairs due to lower limb disabilities, yet rehabilitation options promoting mobility and independence for seated individuals remain limited. Existing exoskeleton technologies focus on enabling upright walking, neglecting the needs of those who require assistance while seated. Addressing this critical gap, we are developing a lower-extremity exoskeleton attachment for wheelchairs designed to enhance rehabilitation and encourage regular movement for both permanently and temporarily disabled individuals. The proposed exoskeleton features a multi-jointed system

including the knee, ankle, and other joints, enabling controlled and safe movements while seated. Safety is a top priority in the design. By incorporating advanced actuation mechanisms and modern bracing techniques, the system provides stability and self-centering capabilities at the joints, ensuring user comfort and safety. Rigorous testing of mechanical design and software controls is conducted to prevent any risk of injury during operation, emphasizing the importance of precise control in the system's performance. Preliminary evaluations indicate that the exoskeleton can significantly improve muscle engagement and joint mobility, potentially accelerating rehabilitation outcomes. By facilitating dynamic lower-limb movement without standing, this innovation offers a transformative approach to rehabilitation for wheelchair users. The anticipated benefits include enhanced muscle strength, increased joint flexibility, and improved circulation, all contributing to a better quality of life and greater user independence. This research is a significant advancement in the field of assistive technologies. The novel exoskeleton attachment for seated rehabilitation fills a significant void in exoskeleton applications. By addressing the unique needs of wheelchair users, this exoskeleton has the potential to impact millions globally, redefining rehabilitation practices and supporting faster recovery for patients

Zhijian Sun

PA - Carnegie Mellon University

Discipline: Linguistics and World Languages

Authors:

#1 Christina Bjorndahl

Abstract Name: Investigating the Effectiveness of Visual Feedback in Mandarin Tone Acquisition for Second Language Learners

This study examines the potential of visual feedback to improve Mandarin tone acquisition among second language learners. It focuses on a custom-built mobile application designed to provide real-time feedback on pronunciation through pitch contour analysis. At the time of writing, the app includes a foundational module that introduces all four Chinese tones and enables users to visualize their pronunciation performance. Unlike popular language-learning platforms such as Duolingo or Rosetta Stone, which do not provide real-time pitch contour analysis or vowel feedback for tonal languages, this app fills a critical gap in existing tools by offering a novel approach to feedback. The study evaluates the effectiveness of visual feedback through A/B testing. Both experimental and control groups will use the app; however, the experimental group will receive both visual and textual feedback, while the control group will interact only with textual feedback. The key metric for evaluation include pronunciation accuracy, and I hypothesize that learners who use visual feedback will achieve better accuracy than learners who only have textual feedback. The app development will be completed in Fall 2024, and the study will be carried out in Spring 2025. By integrating linguistic theory with technology, this research contributes to the field of second language acquisition by incorporating advanced visual feedback mechanisms into the learning process. Additionally, it seeks to understand how interactive, feedback-driven approaches can address persistent challenges in learning tonal languages like Mandarin.

Sowmya Suresh

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Emma Graffice

#2 Derek Moates

#3 Sixto Leal

#4 Megan Amerson-Brown
#5 Juan Calix

Abstract Name: Comparative genomic and antimicrobial susceptibility analysis of *Acinetobacter baumannii* clinical isolates in a large U.S. Deep South hospital system

Background: The U.S. Center for Diseases Control and the World Health Organization list *Acinetobacter baumannii* (Ab) as a critical-priority pathogen for urgent therapeutic development. However, as a species, Ab harbors diverse multidrug resistance (MDR) mechanisms. Previous studies have shown that an Ab isolate's phylogenetic lineage is linked to unique resistance phenotypes. We report an update to the investigation of lineage-dependent resistance features among clinical isolates obtained in the University of Alabama at Birmingham healthcare system. **Methods:** 21 Ab isolates identified from May 2024 to July 2024, were compared to previously characterized, contemporary isolates. All isolates underwent whole genome sequencing (WGS), comparative genomic analysis, and Kirby-Bauer antimicrobial susceptibility tests (AST).

Results: MDR isolates belonged to multiple, unrelated phylogenetic clonal groups (CGs). Antimicrobial resistance gene content was overall predictive of each isolate's AST results. The degree of non-susceptibility to beta-lactam antibiotics differed between prevailing MDR lineages, which correlated with lactamase and non-lactamase genetic determinants conserved among strains in each lineage. CG108 and CG499 isolates displayed lineage-exclusive heteroresistance to sulbactam or trimethoprim/sulfamethoxazole, respectively.

Conclusions: Various canonical and non-canonical determinants were responsible for MDR Ab isolate in our single region, highlighting the value of molecular surveillance in determining therapeutic challenges specific to the region. We must further investigate the factors that determine the different degrees of beta-lactam resistance and the drug-specific heteroresistance observed in these emergent lineages.

Shreya Suresh

PA - Lafayette College

Discipline: Nursing and Public Health

Authors:

Abstract Name: An Exploration of Youth Community Mental Health and the Democratization of Mental Well-being in Chennai, Tamil Nadu

One in seven Indians, which is approximately 200 million people, experience a mental health disorder at any given time, and over 60% of these people go untreated. Despite the high prevalence of mental health challenges, less than 1% of India's national health budget is allocated to mental health services, and only 10% of individuals with mental health needs utilize available care. This study, which was carried out during a semester abroad through the School for International Training (SIT), aimed to explore the necessary steps to democratize mental health and well-being in India through an examination of youth community mental health. Fifteen semi-structured interviews were conducted with psychiatrists, psychologists, social workers, community health workers, and patients at two mental health non-governmental organizations in Chennai, Tamil Nadu: Schizophrenia Research Foundation (SCARF) and The Banyan. Key themes that emerged from the interviews included community engagement, collaboration, and ownership. The findings of this study emphasize the importance of promoting a holistic understanding of mental well-being across India. Youth community mental health practitioners highlighted the value young people place on agency and having a platform to voice their opinions. Collaboration with non-mental health organizations and sectors was identified as a means to expand access to mental health education and care. Empowering people with responsibility and autonomy over the mental well-being of themselves and their communities was found to be effective in increasing awareness, access to care, and the utilization of mental health services.

Jasmine Swaby

PA - Point Park University

Discipline: Dance

Authors:

Abstract Name: Cognitive synchrony among dance spectators: Through a compositional lens

The article by Orgs et al. al titled “Movement synchrony among dance performers predicts brain synchrony among dance spectators”. After reading and presenting this article during lecture, I found myself very enamored and intrigued by not only the thesis behind this study, but the methodology used. Seeing that I was so fascinated with this study, I chose to pivot the direction of my honors project, and mimic this study on a much smaller scale. The movement used for observation for this study will be the compositional work I presented at the Fall Student Choreography Project titled ‘Kin’. I consulted the professor of my Critical Analysis of Literature for advice on forming a survey to analyze cognitive synchrony. Due to the lack of brain mapping, I chose to focus on cognitive rather than brain synchrony. We came to the conclusion that a self-completed questionnaire evaluating the spectator's enjoyment throughout the video performance would provide adequate data on the cognitive engagement experienced. The video was sectioned into segments ranging between 35-40 seconds, to allow insight as to what about each segment is correlated to the most cognitive engagement. As in the study, some questions were geared toward finding out what characteristics brought about cognitive engagement. The hypotheses posed for this study include: Hypothesis 1: That the highest measure of cognitive synchrony within a study group will be within the experienced dancers. and Hypothesis 2: Synchrony will provide the most cognitive engagement among all study groups. This data reinforced the data found in the original study, with small variance which is to be expected when working with a smaller sample group, as well as less advanced screening. Knowing what engages audiences of all dance experiences, and understanding which compositional tools work among different groups, is an invaluable asset to a choreographer.

Sidharth Swaminathan

CA - Valley Christian High School

Discipline: Engineering

Authors:

Priyanka Santhosh

Abstract Name: Optimizing EMG Sensor Locations on the Leg Muscles to Obtain an Optimum Signal to Activate a Rehabilitation Exoskeleton Device

A cost-effective rehabilitation technology is required that may help millions of patients who need rehab exercises to regain their mobility. Expensive traditional remedies, including surgeries and mechanical exoskeletons, often lack adaptability. The Assistive Bionic Joint (ABJ) has been developed at SJSU to address these issues. The leg rehabilitation device surpasses traditional exoskeletons by incorporating various sensors such as electromyography (EMG) sensors (DFRobot Gravity and Delsys Trigno sensors) and adaptive control systems for its fluidic muscles. EMG sensors are crucial to the ABJ's success, enabling precise tracking of muscle activity to initiate a human walking sequence. This is executed via a control system, consisting of an Enfield LS-V15S proportional directional valve, a D1 Bi-directional proportional PWM valve driver, and an Omega PX309 Transducer. Through further tuning, the ABJ will respond more precisely to EMG data initiation. After extensive trials, it is determined that the sensors placed on the Biceps Femoris, Gastrocnemius Lateralis, and Tibialis Anterior provide the muscle data most precisely. In this work, attempts are made to optimize the EMG sensors' signals, as they are placed along the leg muscle. This is achieved by

varying EMG triplets' locations along the leg that produce electrical signals as a function of the muscles' tension. After obtaining an optimized signal, a filtering system is employed through the Arduino microcontroller to eliminate noise from the signal, which is subsequently used to trigger the main controller. The EMG sensors are placed on a human leg, whereas the ABJ is mounted on a mannequin leg that moves via a control system activated by the EMG signal. Through the integration of these sensors with the ABJ's fluidic muscle system, the prototype is capable of providing users with effective knee rehabilitation. Full details of EMG and ABJ performance will be presented at the conference.

Drayeson Swanegan

OK - University of Central Oklahoma

Discipline: Art History

Authors:

Abstract Name: Reclaiming Couture & Culture: Patrick Kelly and Willi Smith's Impact on Fashion, Blackness, and Queer Identity

In the fashion industry, it's no surprise that two equally visionaries achieve similar levels of influence and success. But what if both of these individuals were black and queer and tackled issues involving racial, sexual, and gender identity. Patrick Kelly and Willi Smith are exceptional figures who redefined the boundaries of race and design in 20th-century fashion, creating the foundations of modern streetwear culture. Through vibrant artistry, Kelly was an African American fashion designer who became the first Black designer inducted into the Chambre Syndicale de la Mode in Paris. Willi Smith was another trailblazing fashion designer who co-founded WilliWear Limited, a street couture brand that blended highly stylish fashion with streetwear made for everyone. Known for his bold designs and cultural collaborations, his legacy influences contemporary fashion. Sadly, both men passed away from AIDS, but the significance lives on through inclusive and exciting approaches to life and creativity. Blending narratives of black culture and queer identity ultimately creates bold artistic statements that design rarely gets a glimpse of. Through design, we see how sophisticated and playful groups of people are, especially when both groups are under fire and misrepresented. Their work challenged how we see stereotypes and what is considered design through storytelling and elevated concepts. By closely examining their groundbreaking achievements and tribulations, we can explore the fascinating and dynamic interactions between fashion and graphic design. The relationship between fashion and graphic design are equivalent disciplines that merge to convey powerful voices of social commentary, artistic innovation, and personality intersections.

Bailey Swart

KY - University of Kentucky

Discipline: Health and Human Development

Authors:

#1 Eva Goellner

Abstract Name: Effects of Climate Change on Genome Stability of *Saccharomyces cerevisiae*.

Climate change has been gradually deteriorating our environment. The Earth's rising temperature has profound implications for biodiversity, human health, and ecosystems. Most organisms have numerous pathways to maintain genome stability, however genome stability comes with the tradeoff of reduced evolutionary chances. Previous data in the Goellner lab shows that the heat shock protein 70 (Hsp70)

interacts with the genome stability protein, MLH1, and inhibition of Hsp70 in human cells prevents MLH1 degradation through lysosomal pathways. This suggests an interesting scenario in which increased temperature could lead to programmed downregulation of genome stability through increased Hsp70 and downregulation of MLH1. This could potentially provide a mechanism for tuning evolutionary ability in climate change scenarios. Heat shock proteins and mismatch repair systems have been well conserved through evolution. We used a budding yeast model system, *Saccharomyces cerevisiae* to test this hypothesis. Budding yeast grow optimally in the laboratory at 30C. We grew our cultures at various temperatures, either 30C, 34C, or 37C for two overnight periods (roughly 16 generations) then measured overall growth rate and DNA mismatch repair capacity using a frameshift reversion assay. Our preliminary data shows a roughly 10-fold reduction in growth rate at 34C and 1000-fold reduction in growth at 37C as measured through qualitative assay. Our preliminary data also suggests a qualitative increase in mutation rate in yeast that have grown at increased temperatures. We are now following this data with quantitative measurements of growth rate and quantitative mutation rate through fluctuation analysis. Together this data supports the hypothesis that increased ambient temperature during climate change could lead to increased genetic variability in lower organisms including fungi.

Heidi Swartley

PA - Messiah University

Discipline: Psychology

Authors:

#1 Valerie Lemmon

Abstract Name: Got God? When Spirituality Meets Behaviorism

Practitioners of Applied Behavior Analysis (ABA) identify and modify environmental events in order to increase or decrease target behaviors. Practitioners use the principles of classical conditioning, operant conditioning, and modeling as therapeutic interventions. However, ABA has recently come under increased scrutiny for dismissing the individuality and agency of its clients. For counselors who identify as spiritual or religious, these concerns may be especially unsettling because if the concerns are accurate, conducting ABA may violate the practitioner's values. How can integrating religious beliefs and practices into a theoretical framework of ABA aid practitioners in conducting therapeutic interventions consistent with their values? This literature review examines and critiques existing models of Christian integration in therapeutic intervention with particular emphasis on how Christian belief can inform the practice of ABA. Although existing models of Christian integration in psychotherapy are also theoretically integrative or evaluate theoretical frameworks based on Christian beliefs, this literature review is unique in providing practical suggestions on how to integrate Christian belief with practices in ABA. For example, Christian integration encourages practitioners to focus on increasing a client's range of adaptive behaviors and their agency to choose between those behaviors. In this way, Christian integration prioritizes cultivating behavioral freedom over enforcing compliance with a specific behavior. This is one example of how spiritual and religious integration can benefit practitioners of ABA who identify as spiritual or religious and provides an area for further study.

Reagan Swayze

FL - Stetson University

Discipline: Art History

Authors:

Abstract Name: Art and Identity in the Temple Beth Jacob

Identity is at the heart of Jewish art and architecture. Since the destruction of the Second Temple in 70 C.E under Roman rule, the characteristics of synagogal architecture have often conformed to the dominant culture the Jewish diaspora lived within. Preserving Jewish tradition through the principle of “living memory” is reflected in the structure of synagogues, from the act of praying towards the Holy Land to the inner mimesis of Temple features. However, despite the synagogue's constant function as a place of worship, the question of how to visually express the abstract in Judaism has been probed since antiquity. Scholars have historically characterized Judaism as an aniconic religion, implying a lack of concrete artistic expression. The reoccurring instance of architectural acquiescence did little to negate this notion. It is within this tension—between the pressures of cultural assimilation and the Jewish commitment to preservation—that my exploration lies. Using the Temple Beth Jacob in Miami as a specific case-study, I analyze these themes through its architecture and evolving purpose. The synagogue, comprised of two buildings constructed in 1929 and 1936, blended into the Art Deco aesthetic that would come to define Miami Beach. Due to a decline in Jewish population in the 70s and 80s, Beth Jacob was slated for demolition when it was rescued by MOSAIC, an organization dedicated to collecting Floridian Jewish history. Transformed into the Jewish Museum of Florida, the synagogue now embodies a revitalized purpose, exploring and renewing the use of traditional Jewish symbolism. This transformation highlights how Beth Jacob reflects Judaism's connection to memory, merging ancient tradition with modern adaptation and encapsulating the dynamic essence of the contemporary Jewish experience.

Chloe Sweet

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: Facility for Educating Children and Parents on the Importance of Nutrition and Physical Activity

Parents and children are increasingly concerned about physical and mental health due to the growing isolation caused by technology use. Many children lack physical fitness, outdoor activity, and proper nutrition, making it essential for parents to foster habits that promote lifelong wellness. This project aims to design a space where children can unplug from technology and learn key health and well-being skills. Findings from a one-on-one interview, case studies of elementary schools, and design theory reviews highlighted child obesity and its link to mental health issues. The interview provided insight from a mother's perspective on what safety measures would bring her comfort as well as how to create an environment that would engage her children. Therefore, creating an enjoyable environment can encourage children to adopt and sustain healthy habits. Programmatic design concepts tailored to the needs of children were integrated into the facility, such as visual access, safety, engagement, inclusivity, comfort, and flexibility. These principles are reflected in elements like material selection, adherence to WELL Standards, furniture placement, and floor plan design. For example, activity rooms include retreat spaces where children can decompress if overstimulated. This is based on prospect and refuge theory, which balances open, engaging spaces with private, calming areas to support emotional well-being. Color theory influences the facility's atmosphere, using calming blues and greens in spaces like the sensory room and library, and energizing reds, yellows, and oranges in active areas like the indoor playground. A sensory design approach is integrated to offer calming, interactive features that encourage exploration, creativity, and problem-solving. In conclusion, this project designs a space that promotes health and well-being for children, addressing issues like obesity and mental health. Through thoughtful design, the facility encourages healthy habits, sensory engagement, and emotional support, aiming to inspire lifelong wellness for children.

Silas Switzer

PA - University of Pittsburgh

Discipline: History

Authors:

Abstract Name: Bars, Flyers, and Memory: Exploring Queer Technologies and Archival Silences in the Papers of Donny Thinnies

This research explores the ethics of archival extractiveness and the reconstruction of Pittsburgh's queer past through the papers of Donny Thinnies, a former local gay bar owner, which document the city's LGBTQ+ social atmosphere from the 1970s to the early 2000s. It aims to explore how archives can ethically preserve and represent queer histories while highlighting the social tools and technologies — such as bar flyers, organizational meeting minutes, and paraphernalia — that shaped and recorded community life. By focusing on the ways in which queer people communicated and identified, this research seeks to contribute to a more nuanced understanding of how queer pasts are remembered and represented. This research contributes to broader discussions in archival studies and queer theory by interrogating the ethics of archival interaction. It critiques the extractive tendencies of traditional archival practices, which often prioritize historical reconstruction over individual autonomy. By foregrounding the tools and spaces that structured queer life, this research reframes these materials as "queer technologies" that mediated identity, memory, and community cohesion. The methodology involves a close reading of Thinnies' archival materials, supported by comparative analysis of LGBTQ+ archives like those at Gerber/Hart in Chicago. This approach situates Pittsburgh's queer history within broader archival and cultural frameworks while highlighting the challenges of navigating archival silences and omissions. Preliminary findings underscore the ethical complexities of rebuilding queer pasts, particularly regarding the tension between historical preservation and respecting the wishes of those who sought privacy. These findings will be discussed within the context of evolving queer identities, the politics of inclusion and omission, and the ethical imperatives of archivists. This thesis seeks to contribute to archival and queer studies by proposing strategies for engaging archives in ways that honor the complexities and lived realities of queer communities while fostering a more inclusive historical record.

Numa Syed

IL - Elmhurst University

Discipline: Chemistry

Authors:

#1 Colleen Munro-Leighton

#2 Sameer Khan

Abstract Name: Polylactic Acid (PLA): Chemical Breakdown of a Plant-Based Plastic to Enable More Effective Recycling Efforts

Plastics are an indispensable factor of daily living—toothbrushes, water bottles, etc. are only a few examples. While plastics ease everyday activities, they, in turn, cause environmental turmoil with regards to recycling. Scientists estimate that only around 9% of all plastics get recycled globally, while around 80% end up in landfills or the environment. This is a direct result of ineffective recycling methods such as the unsuccessful chemical breakdown of traditional plastics due to 99% of them being made from crude oil. Recycling centers then resort to other recycling methods such as, 'downcycling,' where plastic items are reused at a lower quality for other applications. To resolve these issues, one alternative is polymerizing plant-based lactic acid (LA) into polylactic acid (PLA), which is a renewable resource and not tied to petroleum reserves. In addition, PLA is more readily broken down into monomer units which could promote more effective

recycling efforts. PLA conversion occurs in a single step, followed by an experimentally optimized isolation process of the target LA from other reagents and byproducts. Infrared and NMR spectroscopy were used to determine that the sample was indeed LA based upon comparison to known samples. LA oligomers, or larger monomer units, may be present and hence will be further investigated. Another avenue of future research includes the conversion of LA to PLA. This reverse reaction would form a closed-loop system that will be advantageous for economical and industrial purposes due to minimization of waste and optimized resource efficiency; furthermore this reaction will allow for PLA to become more widely used in the plastics industry.

Madiha Syeda

TN - University of Memphis

Discipline: Psychology

Authors:

#1 Rebecca Crenshaw

#2 Deranda Lester

#3 Larry Young

Abstract Name: Oxytocin Receptor Activation in the Nucleus Accumbens Differentially Mediates Phasic Dopamine Release

Oxytocin is being researched as a new treatment option for substance use disorder. Oxytocin likely alters the rewarding properties of stimuli by altering their effects on mesolimbic dopamine release. Our lab has previously shown that oxytocin infused directly into the nucleus accumbens (NAc) reduces stimulation-evoked phasic dopamine release. The current study expands on these findings using in vivo fixed potential amperometry with carbon fiber recording electrodes in the NAc of anesthetized C57Bl/6J mice. Given that oxytocin can act on multiple types of receptors, we infused the selective oxytocin receptor agonist [Thr4, Gly7]-oxytocin (TGOT) (25 ng in 1 μ l volume over 1 min) into the NAc during dopamine recordings. Dopamine release was elicited with electrical stimulations in parameters set to mimic phasic (20 pulses at 50Hz) and tonic (4 pulses at 5 Hz) activity patterns. We found that intra-NAc TGOT reduced dopamine release elicited by phasic stimulations (-22.5%) with no significant differences observed between males and females; however, intra-NAc TGOT infusions did not significantly alter dopamine release elicited by tonic stimulations (-3.5%). Phasic dopamine release in the NAc is classically thought to drive drug-related reward and learning, with phasic firing highlighting salient environmental stimuli. Oxytocin has previously shown to reduce the rewarding effects of drugs but promote the salience of social stimuli. Although more research is needed, the present findings lend support to the hypothesis that oxytocin's opposing influence on drug vs social reward may be related to its differential mediation of phasic vs tonic dopamine release.

Sophia Symalla

WI - University of Wisconsin-River Falls

Discipline: Psychology

Authors:

Emma Van Oss

Desirea Laurie-Szabla

Abstract Name: Congenital Prosopagnosia in a University Setting

Prosopagnosia is a neurodevelopmental condition where an individual has difficulties with recognizing faces

(Shah et al., 2015). Prosopagnosia is called developmental prosopagnosia (DP), or congenital prosopagnosia, when the condition is present at birth (Cook & Biotti, 2016). It is not widely known, so many do not know they even have this disorder. Because DP is a condition from birth, prosopagnosics tend to believe that everyone else struggles like they do (Yardley et al., 2008) or that they are just lazy and do not care enough. For those who do know about prosopagnosia, there is a lack of standardized self-report instruments which prevents comparison across samples and creates heterogeneous testing (Shah et al., 2015). This study aims to bring attention to developmental prosopagnosia as well as look at the sociobehavioral implications on lack of facial recognition. Participants will fill out four surveys online (General Belongingness Scale; Friendship Network Satisfaction Scale; Prosopagnosia Index Scale (PI20); SQ9) and then come in person to take a facial recognition test. The four surveys will be assessed on Qualtrics. The computer experiment will be run to assess an individual's ability to recognize faces without contextual information such as hair, eyebrows, background, and makeup. The first thing to be assessed is the validity of the computer program by looking at the correlation of the score with the score of the PI20. We hypothesize there will be a negative correlation- the lower the score of the facial recognition test, the higher the score of the PI20. We will also be looking at if lack of facial recognition negatively impacts relationship satisfaction and feelings of belongingness in communities. Third, we will assess if there is a positive correlation between uncomfortable experiences and poor facial recognition via the SQ9, a questionnaire that collects both quantitative and qualitative data.

Piper Szabo

MI - University of Michigan - Ann Arbor

Discipline: Psychology

Authors:

#1 Allison LaMonica

Abstract Name: Investigating Reward-Related Neural Activity and Antisocial Behavior

Antisocial behavior, (ASB) is a broad term describing a range of behaviors, including rule-breaking, violence, aggression, risk-taking, and illegal actions. The persistence of ASB is partially related to differences in responding and learning from reward and loss, as individuals may continue a certain behavior even after receiving negative feedback or outcomes. Furthermore, past studies have also linked ASB to dysfunction in frontostriatal reward circuitry, which is involved in reward and goal-directed decision-making. This study aims to investigate neural activity in individuals who exhibit ASB. Participants were acquired through the Michigan Twin Neurogenetics Study, (MTwiNS) where data was collected through interviews, questionnaires, biological samples, and a functional magnetic resonance imaging (fMRI) session. During the fMRI session, participants would complete a card game task, measuring reward-seeking and responses. Expected results may show individuals who exhibit ASB may have differences in neural activity during the reward task when compared to individuals who do not exhibit ASB. The study aims to contribute to understanding of the neural processes underlying ASB and reward, as well as guide more specific interventions, such as those focused on reward-related decision-making and judgment, for individuals who are at risk or who exhibit ASB.

John Szeghy

PA - Villanova University

Discipline: Engineering

Authors:

#1 Stephen McGill

Abstract Name: Usage of Event Based Cameras in High Frequency Dynamic Systems

The primary purpose of this study was to understand the practical application of neuromorphic event-based cameras in various dynamic environments. Neuromorphic event-based cameras use a biology-inspired sensor to detect both movement and changes in light. The year-long project analyzed the abilities of the camera as well as the tracking methods used to recognize and trace events. Studying both egocentric and exocentric motion, the camera was put through a variety of tests to find its ideal use environment. The camera was tested in various light conditions, focuses, and temporal resolutions. Peak performance was seen when the camera was stationary, tightly focused, at a mid-to-high temporal resolution, and in an indirectly lit environment. Tests were run in a controlled environment using pendulum motion. The algorithms used to trace motion were based on a Kalman filter. Using the location and velocity of previous events, the algorithm predicted the location of future events. After new events occur, the algorithm uses the measured states from the camera to enhance its propagated state. The result is a frame-by-frame recap of actual events with an overlaid predicted state. The project concludes that neuromorphic event-based cameras are capable tools that work well in stationary, consistently lit environments. While they offer a dense data stream, use in dynamic applications is not practical. Dynamic systems drown out useful data with noise and egocentric events. Performance is at its peak when egocentric motion is minimized.

Mollie Taft

MN - Gustavus Adolphus College

Discipline: Exercise Science and Nutrition

Authors:

#1 Madeline Ziegler

#2 Abby Elliott

#3 Ella Godfredson

#4 Maddie Wishart

Abstract Name: THE EFFECT OF MULTITASKING ON REACTION TIME AND BALANCE IN DIFFERENT AGE POPULATION

As individuals age, how they process stimuli is affected (Hardwick, R. M. et al., 2022). According to Konard et al, 1999, aging reduces our ability to process motor commands and translate those into musculoskeletal function. When a multitasking piece is added to a motor skill, performance is decreased (Hemond et al., 2010). There is less knowledge on how cognitive function affects multitasking as age increases. PURPOSE: This study aims to investigate the effects of multitasking on reaction time and balance among different age populations. METHODS: This study will include males and females from a college population aged 18-75. Subjects will perform a ruler drop test to determine reaction time and the Romberg balance test to establish balance. Participants will be randomly assigned to either complete both tests with a multitasking component or without it. Participants completing the multitasking element will count even numbers backwards from seventy-four. Each test will be performed three times and averaged. The researchers will randomize the order of the assessments. A two-way ANOVA analysis will be used to decide if there is an interaction between age

groups and multitasking or no multitasking. Significance will be determined at the $p < .05$ level. Anticipated RESULTS may reveal that participants below the age of twenty-eight will have a quicker reaction time and fewer errors during the balance test whether multitasking or not. CONCLUSION: In conclusion, this study may show that multitasking has a greater effect on reaction time and balance in older populations but no differences are anticipated among a younger population. Future research might examine how music affects reaction time and balance rather than multitasking. Data is currently being collected. IRB # 464551

Symia Taimuty-Loomis

PA - Indiana University of Pennsylvania

Discipline: Psychology

Authors:

Abstract Name: Evaluating the effects of psilocybin on mental health disorder symptoms in recreational settings

Currently, there is a high frequency of mental health disorders; 19.86% of adults are suffering from mental illness in the United States. Of those who seek medication as treatment, between 20-60% show treatment resistance. Psilocybin has reemerged as a possible alternative treatment for psychological disorders. Recent clinical studies (employing trained therapists, in controlled environments, with screened participants) have shown exceptional promise. Psilocybin as a clinical treatment has led to 54% of participants meeting remission criteria for depression and an 80% anxiolytic response rate in participants with anxiety. The frequency and efficacy of psilocybin use for addressing psychological disorders outside clinical confines remains unknown, though public and professional awareness of its use for these purposes has been growing. The purpose of this study is to evaluate the self-reported use of psilocybin for self-treatment of depression, anxiety, and traumatic symptoms in recreational settings. One hundred fifty-seven reports were randomly selected from Erowid.org's vault of psilocybin experiences anonymously reported by users. Reports were evaluated through qualitative methods based on frequency of use for treatment of psychological disorders (depression, anxiety, and PTSD), frequency of individual symptoms, efficacy of treatment, length of efficacy, and other relevant variables. Results showed 15.3% of all randomly selected recreational user reports highlighted medical purpose as the reason for their use. All users who reported using psilocybin for depression, anxiety, and PTSD symptoms reported beneficial and often long-lasting effects. Results suggest the presence of a therapist in clinical settings may be valuable in limiting negative effects.

Wenona Taiping-Moccia

NC - Elon University

Discipline: Psychology

Authors:

#1 Wenona Taiping-Moccia

Abstract Name: Alibi Believability: Corroborator Cooperativeness with Police and Consistency of Corroborator Certainty

An alibi is a statement that places a defendant elsewhere at the time of a crime (Nolan & Nolan-Haley, 1990). Alibis are studied empirically due to the number of innocent people who had alibis but were wrongfully convicted (Heath et al., 2021). Person alibi evidence is evidence involving a corroborator, and it is frequently used in actual cases (Dysart & Strange, 2012). This study investigated two alibi corroborator

characteristics: certainty and cooperativeness. Only one study has empirically studied alibi corroborator cooperativeness, and the authors found that when a corroborator was cooperative with police (versus uncooperative) the alibi was more believable (Allison & Kollar, 2023). 320 participants recruited from CloudResearch read a description of a theft, police investigation, and trial. They were randomly assigned to one of eight conditions in a 2 x 4 between-subject design. Half of the participants read a police investigation in which the alibi corroborator was cooperative with police by returning their calls and half read one in which the corroborator was uncooperative with police. Participants then read that the corroborator was questioned twice about how certain he was about being with the defendant. The corroborator's certainty was maintained either high (100%-100%) or low (75%-75%), strengthened (75%-100%), or weakened (100%-75%). Next, participants completed a questionnaire where they rated the alibi's believability, the defendant's character, and the likelihood of guilt. Alibis were more believable when the corroborator cooperated with police than when he did not. Alibis also were more believable when the corroborator's certainty was maintained and high than when it was maintained and low. The defendant was seen as more likely to be guilty when the corroborator did not cooperate with police than when he did cooperate. Lastly, the defendant was viewed more positively when the corroborator cooperated versus when he did not.

Dane Talbott Settle

WI - University of Wisconsin-Stout

Discipline: Visual Arts

Authors:

Abstract Name: Hungry: Alternative to Touchscreens in Toys

This toy design project presents Hungry, an innovative toy nightstand, or desk clock designed for Kidrobot, reflecting the brand's playful, colorful, and minimalistic design language. In response to a paradigm shift among Generation Z—marked by increasing resistance to touchscreens—Hungry reimagines digital interaction through tactile, engaging design. Shaped like a friendly monster, Hungry features posable arms and horns, with an open mouth housing a screen. Users interact with the clock by placing collectible fruit- or vegetable-shaped figures on its tongue. Each figure, distinguished by its unique color, activates embedded recognition technology that dynamically alters the screen's display. This tactile interface bridges the physical and digital, introducing an intuitive way to engage with technology. Beyond its functional role as a clock, Hungry inspires exploration and imaginative play. Users can discover a variety of interactive features beyond the time, including photo of the day, fun facts, word of the day, date, and weather, displayed in full-screen or split-screen formats. While basic settings—such as location, language, and user age—are adjustable through a simple companion app, the device itself maintains a hands-on approach. Its durable design and playful features make it appealing to both children and young adults, while aligning with the vibrant, minimalist aesthetic appreciated by Kidrobot collectors. Hungry transforms everyday clocks into sources of play.

Olivia Tambrini

IN - Valparaiso University

Discipline: History

Authors:

Abstract Name: The New American Mother and Coeducation: the Story of the Valparaiso Male and Female College

Against the backdrop of civil war threatening the United States and the rise of the Republican Party, a push for patriotism and virtue surged throughout the North. Educating Americans, especially Northern white women, became the ultimate solution for both the social and economic gain of the United States. Americans realized that a mother was a child's first teacher, so women needed to be educated themselves in order to pass on that learning to their children. This movement stemmed from the ideology of Republican Motherhood, the 18th century belief that motherhood was a civic virtue and responsible for creating the next generation of upstanding citizens. In the mid-to-late 19th century, this new kind of Republican Motherhood ushered white American women into the classroom, and collegiate institutions began to address this new need. The most innovative of these being coeducational colleges. Accordingly, the Northwest Indiana Conference of the Methodist-Episcopal Church formed a college that invited not only men but also women to take part in a complete, thorough educational and intellectual experience. Henceforth, the Valparaiso Male and Female College (1859-1871) came to fruition. Scholarship, however, fails to include the Midwestern coeducational institutions that made these radical strides in women's educational experience, focusing more on Northeastern women's colleges. This paper braves a new path into the study of women's education by uplifting the stories of Midwestern women in a coeducational institution. Moreover, this paper dissects the cultural context of women at the Valparaiso Male and Female College; and, in doing so, it explores how this new opportunity gave women a voice in the social and political machine. The late 19th century Republican Mother, educated at a coeducational college, was indeed a woman rearing children for their success, her own success, and the success of future women.

Manasvini Tammineedi

CA - Evergreen Valley High School

Discipline: Computer Science

Authors:

Sandhya Kumar

Devi Nair

Abstract Name: Global Obesity Prediction: Worldwide Key Factors Identified Through IBM Watson Machine Learning Models

Obesity is a chronic disease that affects a significant portion of the population; in the United States, 4 in 10 adults suffer from this condition, with a high prevalence, particularly among Black, Hispanic, and caucasian communities. Similarly, countries like Mexico and Saudi Arabia face escalating obesity rates due to dietary shifts, while nations like Japan and South Korea report significantly lower rates. Environmental factors such as urbanization and industrialized agriculture exacerbate obesity rates by promoting unhealthy lifestyles and imbalanced diets. Obesity is also a precursor to numerous fatal diseases, including diabetes and cardiovascular diseases. Our hypothesis states that preemptive diagnostics can address obesity through early intervention by employing machine learning-based predictive models to identify health and environmental factors contributing to the condition. The obesity data was collected from 2,112 patients from Mexico, Columbia, and Peru, including key factors such as age, gender, alcohol consumption, smoking habits, dietary patterns, physical activity, and caloric intake. We used the IBM Watson platform to implement three algorithms (LGBM, Snap Random Forest, and Snap SVM classifier) with and without enhancements (HPO-1, FE, HPO-2). Notably, the model accuracies ranged from 90.9% to 96.9% in predicting outcomes. In order to incorporate factors of patients' environments on their obesity levels, a worldwide dataset related to individuals' demographics and lifestyle habits was also obtained in an attempt to compare these factors with the ones from data acquired from Mexico, Columbia, and Peru. While the inclusion of enhancements yielded marginal improvements, the significant features identified across algorithms were largely consistent, with only slight variations. This dataset analyzed key factors such as age, gender, height, weight, BMI, and physical activity levels. The confusion matrices generated by each algorithm indicate that these predictive models are robust and ready for future applications. Further details will be presented at the conference.

Zhuohao Tan

NC - Elon University

Discipline: Computer Science

Authors:

#1 Zhuohao Tan

#2 Scott Spurlock

Abstract Name: Learning to generate realistic medical images to improve pancreatic cancer segmentation and detection

Pancreatic cancer is a disease with a high mortality rate due to a lack of early symptoms and data scarcity. Recent research has focused on improving AI models to produce more accurate diagnoses given medical images such as CT scans. Existing AI diagnosis models, trained on publicly available medical image datasets, often struggle with diagnosis because of limited training data. Our research provides an innovative approach to improving training data, which can be used to make existing diagnosis models better. We seek to train a model to generate realistic synthetic CT scans, which can then be used to improve the performance of pancreas segmentation and classification models. Our research investigates multiple generative models, including GAN (Generative Adversarial Network) and VAE (Variational Autoencoder). After training the generative models with real CT scans, the models generate synthetic CT scan datasets that mimic realistic pancreatic cancer CT scans; these realistic CT scans contain small tumors that doctors easily miss. To evaluate the performance of different synthetic datasets, multiple model training experiments combine various ratios of synthetic and real data. Two common metrics, Dice value and Binary Cross Entropy (BCE) are used to understand how realistic the synthetic images are, as well as their correlation with real pancreas annotations. Overall, our anticipated result is to generate realistic CT scans that can help train more accurate pancreatic cancer diagnosis models in the future.

Ella Tang

IL - University of Chicago

Discipline: Environmental Science and Sustainability

Authors:

Abstract Name: Scarcely A Stone Stands: Natural Disaster Resilience and the Impact of Post-Earthquake Housing Policies on Housing Affordability in 20th-Century San Francisco and Tokyo

This thesis examines how historic earthquakes have shaped urban planning and housing policies in San Francisco and Tokyo, with a focus on affordability, resilience, and sustainability. Beginning with the 1906 Earthquake in San Francisco and the 1923 Kanto earthquake in Tokyo, this study uses these seismic events as starting points for analyzing modern policy development and urban resilience, arguing that earthquakes have played a large role in shaping urban planning through the creation of reactionary resilience policies. However, these reactions have led to divergent outcomes. Tokyo's zoning flexibility and encouragement of high-density construction have allowed it to maintain a steady housing supply despite frequent rebuilding demands. In contrast, San Francisco's emphasis on preservation, combined with restrictive zoning regulations, has led to a shortage of affordable housing. By comparing these two global cities, this thesis explores how differing responses to earthquakes influences planning priorities and, subsequently, housing affordability. Using a comparative case study framework, this research draws from urban planning and housing policies, newspaper archives, and government housing data to assess the impacts of these historic seismic events on present-day realities. Diverging from existing scholarship, this project draws an explicit link between historic earthquakes and the subsequent policy to contemporary housing affordability issues. There is already scholarship that

discusses Tokyo's unique housing system compared to the United States, but this project provides a historic lens as to why these policies exist today and how they have been informed and forced from natural disasters. This thesis is significant because we live in an era where natural disasters are becoming increasingly common. Furthermore, both Tokyo and San Francisco are likely to experience a large earthquake within the next few decades.

Samantha Tang

FL - Miami Dade College

Discipline: Biology

Authors:

#1 Jaeson Clayborn

Abstract Name: Butterfly World 3.0: Virtual Reality as a Tool for Exploring Imperiled Butterflies in the Florida Keys and Caribbean

Butterfly World 3.0 is an interactive, bilingual desktop and virtual reality (VR) serious game designed to immerse players in a coastal dry forest ecosystem. The game focuses on imperiled and common butterfly species, as well as native and invasive plant species, with particular emphasis on the federally endangered Schaus' swallowtail butterfly (*Heraclides aristodemus ponceanus*). This butterfly also has subspecies in the Lucayan Archipelago and the Caribbean (island biogeography). VR immersion offers several educational advantages, including access to diverse ecosystems, opportunities to interact with species that are difficult to encounter in real life, and fostering empathy for wildlife and the environment. To assess the cognitive impact of Butterfly World 3.0, we conducted an experiment with biology students, dividing them into two groups: one receiving VR-based lessons and the other engaging in traditional lessons. Both groups completed pre- and post-exams to evaluate knowledge gains. Afterward, the groups swapped lesson formats. Surveys comparing the two lesson types revealed that students in the VR-based lesson group showed significantly greater increases in content knowledge compared to the traditional lesson group. Most students expressed a preference for the VR lessons, although both groups identified the learning curve associated with VR technology as a major barrier without instructor assistance. These findings suggest that VR-based lessons can significantly enhance cognitive learning in subjects such as butterfly and plant ecology. By integrating VR gamification, Butterfly World 3.0 offers a novel approach to teaching complex ecological concepts. Conference attendees will have the opportunity to experience the latest version of our desktop and VR game firsthand.

Sriya Tangutur

MI - University of Michigan - Ann Arbor

Discipline: Health and Human Development

Authors:

#1 Chandan Kumar-Sinha

#2 Radha Paturu

Abstract Name: Genome Instability in Cancers

Cancer is a phenotype that occurs as a result of genomic instability in cells. Genomic instability increases the chances of advantageous mutations (which promotes cancer growth) which causes further genomic instability, creating a positive feedback loop. Genome instability can take many forms: this research focuses on

researching a type of genomic instability that results in aneuploid cells (cells with an abnormal number of chromosomes). Dr. Chinnayan's lab is working to artificially induce genomic instability in lung cancer cells by treating euploid cells (cells with the appropriate number of chromosomes) with drugs that induce aneuploidy. Preliminary research suggests that certain candidate biomarkers (such as IGF2BP3, IGFBP1, PYCR 1 and UCHL1) are positively correlated with genome instability in some cells; that is, some cancerous cells were found to have higher levels of these biomarkers when their genomes were relatively more unstable (Cho et al., 2024)¹. Thus, Dr. Chinnayan's lab is working to corroborate this hypothesis: drug-treated aneuploid cell lines are being tested for biomarker levels; one method for doing this is PCR. PCR is being used to amplify the genes that code for these biomarkers, which makes it possible to measure relative amounts of pre-existing mRNA within the cell via amplification curves and critical values/cycle thresholds. Correlation is to be tested further through knockdown experiments, in which candidate biomarker proteins are destroyed from cell lines and resulting genome stability is measured. Establishing a strong association between these biomarkers and genomic instability may allow for medical professionals to determine cancer aggressiveness and possible resistance to treatment. Cancers with excessively unstable genomes that survive treatment are likely to become treatment resistant; therefore, having markers indicative of increasing instability may prove to be important information for medical professionals when treating cancers.

Riko Tanimoto

JPN - Musashino University

Discipline: Engineering

Authors:

#1 Riko Tanimoto

Abstract Name: Patient response system using SNS

To reduce the burden on nurses and improve work efficiency, we developed a patient-response system that uses SNS. There are various issues in Japanese society, but the high overtime rate owing to a shortage of nurses is a serious problem. Although nurses are required to work 72 h less for night shifts, 34.3% of the nurses work more than 72 h. This shows the seriousness of labor shortages. Given this context, we developed a patient response system that uses LINE Bot to reduce the burden on nurses, improve work efficiency, and provide desirable responses to patients. The patient response system operates as follows: First, the patient sends a nurse call to an SNS. Thereafter, the LINE Bot receives a nurse call, and it sends a notification requesting the nurse to respond. When the nurse sees the message and completes the patient's response, the series of steps concludes with the nurse replying "OK." The original point is that the nurse receives a reminder message every three minutes, allowing her to respond to patient calls quickly and reliably. This reminder function prevents delayed and missed responses and supports nurses' work. To build the system, we used the SNS app "LINE," which is widely used in Japan. We developed a LINE Bot program by combining LINE's "Messaging API" with "ngrok," a tool for exposing local servers to the outside. The implementation method involved obtaining a LINE business ID, registering with LINE Developers, creating a channel to enable the Messaging API, and connecting to ngrok on a PC to run the Bot program created in Python. In this study, we built a chatbot that benefits both nurses and patients, reducing the workload on nurses and making it easier for them to contact nurses.

Bridgette Tanner

KY - University of Kentucky

Discipline: Political Science

Authors:

Abstract Name: The Blue Scare: How Cuban Voters Impact the Hispanic Electorate in Florida

The accuracy of forecasting models has been under increased scrutiny due to unpredictable outcomes in two out of the last three presidential election cycles. One potential cause of instability is the difficulty faced when trying to sample racial/ethnic minorities, populations that historically have given heavy support to the Democratic party but that are not always reliable. Understanding the variation in Hispanic voting behaviors has become especially important as Hispanics become a larger portion of the active electorate. Past analysis of Hispanic voting behavior has led scholars to observe that partisan differences in the Hispanic electorate are more tied to nationality than race. Cuban voters in Florida have historically been an example of a population that diverges from the trends in the voting behavior of their group. This project examines voting by the Floridian Cuban population in recent Florida elections and explores some of the mechanisms leading to divergence in their voting behavior, particularly in the Miami metro area. We will estimate Hispanic voting behavior in both Cuban and non-Cuban Census tracts to trace the growth in Hispanic Republican voting heading into the 2024 election.

Masa Tantawy

EGY - The American University in Cairo

Discipline: Computer Science

Authors:

#1 Sally Elghamrawy

Farida Simaika

Malak Gaballa

Abstract Name: Vehicle Price Prediction using H2O-AutoML and Spark based on Feature Engineering

In the automotive industry, the estimation of vehicle prices is critical for dealerships, consumers and manufacturers. Traditional methods struggle to capture the complexity of pricing factors. This paper proposes a framework for vehicle price prediction using big data technologies (H2O AutoML and Spark) and machine learning (ML) models. H2O AutoML automates model selection and tuning, and Spark facilitates efficient processing of large datasets. The proposed framework consisted of phase 1: EDA and Preprocessing, phase 2: Modeling, phase 3: Evaluation. The selected ML models are linear regression, Adaboost, Gradient Boosted Regression (GBR), random forest, and XGBoost, and are evaluated based on R2, Mean Squared Error (MSE), and Mean Absolute Error (MAE). The results indicate that the models consistently achieved higher R-squared (R2) values compared to benchmark studies with the best performing model being GBR, achieving an R2 value of 98.1% and exceeding previously reported values of 90%. These results suggest that manufacturers can use this framework to set competitive prices. Dealerships can then optimize their pricing strategies, and consumers can make more informed purchasing decisions. Big data and machine learning techniques have the potential to revolutionize vehicle pricing strategies and enhance the car-buying experience.

Masa Tantawy

EGY - The American University in Cairo

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Gender and Social Media: Delving into Young Adults' Daily Participation on Facebook

With the prevalence of social networking platforms, it is crucial to study the role that gender plays in its use, for gender, which is continuously shaped by society, plays a critical role in our identities and daily lives. This paper explores how the social construction of gender affects and is affected by social media through discussing the usage of Facebook by young adults, especially Middle Eastern cisgender males and females, and women's limited freedom on this social networking site in the Arab countries. It is argued that despite individuals having some freedom online compared to offline, their choices, specifically that of women, is constrained within the borders set by societal gender norms. The main focus of this paper is on young adults since they are the dominant age group of users and on the use of Facebook due to its popularity and multi-functionality that allows an offering of tailored user experience. It is concluded that gender differences play a significant role in how social media is used since women tend to use social media for emotional interpersonal purposes while men use them in task-oriented individual manners alongside multiple other dissimilarities. Additionally, users tend to present an edited version of themselves online due to societal pressures and norms, and particularly women in the middle-east struggle to have complete liberty in their online behaviour.

Chloe Taylor

GA - Fort Valley State University

Discipline: Chemistry

Authors:

#1 Kareen Blue

#2 Eric Mintz

Abstract Name: Preparation and Characterization of Polyhydroxybutyrate (PHB)/Polylactic acid Cellulose Nanocrystal (CNCs) Nanocomposites

The mass production of single-use synthetic polymers and their improper disposal have negatively impacted our environment. According to the U. S. EPA, of the approximately 35 million tons of plastic waste collected in 2018, 75% was dumped into landfills. The anaerobic degradation of this waste in landfills generates methane and other greenhouse gases, contributing to climate change. The plastic waste includes polyethylene terephthalate (PET), high-density polyethylene (HDPE), and low-density polyethylene (LDPE), which all have recyclable properties but 90% fail to be recycled. We aim to develop biobased biodegradable polymer blends and composites with thermomechanical properties that will allow them to replace petroleum-based polymers. We have prepared polylactic acid (PLA)/polyhydroxybutyrate (PHB) polymer blends incorporating lignin and cellulose nanocrystals (CNCs). Lignin/CNCs (0.3 wt.%, 0.6 wt.%) were incorporated into 50:50 and 70:30 PLA/PHB PLA/PHB polymer blends by high torque melt mixing. Differential Scanning Calorimetry (DSC), Thermogravimetric Analysis TGA, rheology, and optical microscopy were used to characterize these new materials. The lignin/CNCs were found to serve as nucleating agents and improved the thermomechanical properties of the polymer blends. The results of this research will be described.

McRee Taylor

VA - Virginia Commonwealth University

Discipline: Environmental Science and Sustainability

Authors:

Abstract Name: Bioremediation in the Chesapeake Bay: Anthropogenic Ocean Acidification Mitigation in an

Interactive Multi-Tropic Ecosystem

Zostera marina is a species of marine macrophyte that has been largely prioritized in past submerged aquatic vegetation (SAV) restoration initiatives within the Chesapeake Bay because of its 1) previous abundance, 2) demonstrated carbon burial abilities, and 3) observed ability for meadows of *Z. marina* to ameliorate low pH conditions. Due to the temperature variability and poor water quality in the Chesapeake Bay, *Z. Marina* beds have experienced several die-off events with limited capacity for regrowth. *Ruppia maritima*, an opportunistic species with tolerance to temperature shifts within the bay, may have the potential to maintain SAV coverage in areas experiencing *Z. marina* die-off. The potential benefits of calcium carbonate production via calcifying organisms such as *Thalassia testudinum* and *Crassostrea virginica* are also investigated. By considering the environmental needs of each organism in the location of SAV and bivalve restoration efforts, both species might experience an enhanced ability to perform essential biological functions including photosynthesis and calcification. This synergistic interaction benefits from the support provided by other organisms within the bay's ecosystem. Given the recent shifts in environmental qualities of the bay, this systematic review may have implications that could assist the formation of a more effective ocean acidification management strategy with a potential for increased longevity. Evidence from this review suggested that future SAV research initiatives in the Chesapeake Bay could investigate how biodiverse and traditional *Z. marina* beds compare in terms of pH modulation abilities, as well as how the strategic placement of calcifying organisms nearby restored SAV beds may impact the bed's ecosystem services.

Liberty Taylor

TX - Southwestern University

Discipline: Music

Authors:

#1 David Asbury

#2 Zachary Logan

Maeve McCarthy Mccarthy

Raúl Nájera

Abstract Name: The Southwestern University Guitar Tutorials

The Southwestern Guitar Tutorials are a series of videos that serve the world-wide musical community through the creation of pedagogical videos that focus on best practices for instructional content in the medium. These works are deemed to be “green videos” as the content does not become outdated, and highlights works that are widely available and in the public domain. This on-going project represents critical next steps in thinking through the process of delivering instructional digital video as an aid to applied music studies. The strength and depth of the cohort of current student collaborators showcased their talents in performance and scholarship. The videos we created were comprised of sections that a.) demonstrate a slow tempo performance with close-up split screen shots of the player's hands and animated scores, b.) offer contextual pedagogical and/or historical information in the form of a lesson-demonstration, and c.) present a regular tempo performance of the selected repertoire. Student performer teachers Zachary Logan, Maeve McCarthy, Raul Najera, and Liberty Taylor acted as a collaborative team of researchers, writers, editors, and technicians. We aimed think critically and speak cogently about technical elements of video production and editing, audio engineering through the lens of guitar pedagogy and performance. We discussed the role that video resources currently occupy in instrumental music pedagogy, and sought to continue to create content that maximizes the potential of the medium. We reviewed and reflected on our previous works in initial production meetings. We gained an increased awareness of sound and video recording techniques, and refined our skills in guitar performance and pedagogy through this unique and deliberate process of creation, and enhanced our knowledge of and practical familiarity with the software programs that were used in the project's production. We look forward to presenting this work.

Izabella Taylor

OK - University of Central Oklahoma

Discipline: Dance

Authors:

Abstract Name: Flow and Stagnation: Integrating the Fluid Systems into Movement

Somatic practices are rooted in strengthening the mind-body connection, an aspect of deep awareness that all dancers and performers must have. Bartenieff FundamentalsSM emphasizes breath support, harmony, and efficient movement patterns, and facilitates expressive, functional movement (Bartenieff FundamentalsSM). As an extension of the world of Bartenieff FundamentalsSM, Bonnie Bainbridge Cohen's Body-Mind Centering is an "experimental study that provides body re-patterning and movement re-education" (Bainbridge Cohen). The topic being explored through Bainbridge Cohen's program is the fluid systems- blood, lymph, cerebrospinal fluid, and more. These fluids are essential to life because fluids carry nutrients and oxygen to cells, flush out waste products, regulate body temperature, and much more (Wergin). Each of these fluids has its rhythm to be examined. Inspired by Bonnie Bainbridge Cohen's work, I am developing warm-ups and improvisational prompts to get each specific fluid system flowing in their dancers' bodies. These prompts will explore how movement differs when we bring awareness to different parts of the body and we can sense a change when we focus on "moving from" the bones, muscles, organs, and fluid systems. During the creation of the piece I am choreographing, I am investigating ideas of flow and stagnation in relationship to our fluid systems. An example is using the contrast of interrupted and continuous movement phrases. The adaptability of fluid informs the dancer's formations and spatial patterns while the rhythms of each fluid inform the movement quality. For example, cerebrospinal fluid moves slowly versus lymph moving taut and directly. The purpose of this project is to create a visual representation of the human fluid systems through a collaborative choreographic process with dancers from my university. It is bringing the fields of dance, somatics, and anatomy together to guide the dancers and myself through a journey to strengthen the mind-body connection.

Nevaeh Taylor

OK - University of Central Oklahoma

Discipline: Art History

Authors:

Abstract Name: Political Spectacles: Royal Ceremonies in The Contemporary United Kingdom Versus The Qing Dynasty

This study compares and contrasts depictions of royal ceremonies in the contemporary United Kingdom and the Qing Dynasty. I will study art associated with royal coronations as a part of a royal spectacle which supports the royal ideology of power. I will demonstrate that while art produced in royal ceremonies were aesthetically different, the notion of coronation ceremonies shared certain characteristics: the sameness of place, time, spectacle, and objects. First, I will provide a brief introduction to the coronation as a political spectacle. Second, I will discuss the coronation of contemporary royals in the United Kingdom, followed by a discussion of the coronation of Yongzheng (1678-1735), the fifth emperor of the Qing Dynasty. A comparative conclusion will emphasize the similarities of their respective ceremonies, in likeness to their use of ceremonial clothing, processions of power, and use of religious ideology to support political power. This study is grounded in art historical research and primary sources, including formal and cultural meanings of artwork. The information provided within the study is vital because it emphasizes cross-cultural similarities as opposed to differences which are given the most attention in scholarship.

Maeva Tchouaffe

MN - Carleton College

Discipline: Engineering

Authors:

#1 Khalid K. Osman

#2 Allisa Hastie

Abstract Name: The Perception of Tap Water Signals to Lack of Equity in the Water Sector Field

Despite popular belief that higher-income households produce higher bottled water consumption, research has shown that the opposite is true. Due to several varying factors, lower-income minority groups, specifically lower-income Latino groups, often reject their tap water and opt for bottled beverages instead. This has several negative impacts on these communities like increased spending, obesity, and inadequate fluoride access. This project aimed to determine if the perception of tap water amongst East Palo Alto residents, a majority low-income Latino community, signals issues with the quality of their tap water, creating tap water rejection. Using Python Pandas and Seaborn, we cleaned and analyzed survey data from 50 households to produce results about their tap water perception. Although the results signaled no correlation between their perception and tap water quality, they did signal the effects of an alarming lack of equity in the water sector field. To conclude, we proposed changes geared towards including equity in the water sector field, which we hope will encourage lower-income Latino groups and other marginalized groups to trust their tap water in the future.

Ritvik Teegavarapu

CA - California Institute of Technology

Discipline: Mathematics

Authors:

#1 Dohyeon Kim

Abstract Name: Convergence Guarantees for Particle Swarm Optimization

Particle swarm optimization (PSO) is a popular algorithm commonly used in state-of-the-art optimization toolboxes to tackle high-dimensional and non-convex problems, for which obtaining gradient information can be costly or infeasible. Meta-heuristics like PSO offer a powerful alternative to gradient-based methods and often converge to a global minimizer quite fast. However, since these meta-heuristics make very few assumptions on the function, they are difficult to prove convergence results for. In this work, we prove a novel convergence guarantee for PSO, enabling users to adaptively select optimal parameters in the algorithm. Systems involving ensembles of communicating agents, such as neurons in the brain or birds in a flock, are often modeled using differential equations that govern particle dynamics under mutual influences. For large numbers of particles, a mean-field approach is commonly employed to study average behaviors. While the standard PSO equations are not amenable to mean-field analysis, a related meta-heuristic, consensus-based optimization (CBO), allows for such an analysis and exhibits proven convergence. We present an equivalent convergence result for a modified PSO setting and demonstrate exponential convergence through numerical simulations, with tradeoffs in parameters of the initial distribution, the algorithm parameters, and the objective function itself. These results not only provide the first-ever

theoretical guarantees for PSO but also offer practical insights for parameter selection, supported by detailed numerical evidence for a variety of test functions.

Brian Teeter

PA - Villanova University

Discipline: Nursing and Public Health

Authors:

#1 Elizabeth Dowdell

Erika "Sophia" Gensley

Abstract Name: Managing Hospital-Acquired Infections in Older Adults: A Case Study Highlighting Nursing Interventions and Best Practices

IntroductionIn the United States, Hospital Acquired Infections (HAI) are a major cause of morbidity and mortality, leading to serious emotional, financial, and health repercussions. HAI are preventable infections that affect 1 in 31 patients with adults aged 65 years or older being at higher risk when compared to the general population.**Methods**This study employed a case study methodology to explore the dynamics and contextual conditions pertinent to HAI, nurse actions, and interventions. Using a case study involving an older adult who was discharged to home with three HAI and a narrative literature review, this paper describes and discusses the complexities associated with managing such infections in a vulnerable population. Literature from the past 14 years (2010 - 2024) from multidisciplinary databases was used and included studies focused on HAI and/or cross infections, older adults, and nurse(s) and/or nursing interventions.**Discussion**The use of a single case is not generalizable however, by employing this method, this study provides a nuanced understanding of HAI, nurse actions, and interventions specific to an older adult hospitalization.**Conclusion**HAIs are viewed as preventable patient events that stem from a variety of healthcare procedures that expose patients to infectious agents. In the case study, the HAI directly impacted the patient's discharge and led to admission at a long-term care facility. Nurses are distinctively positioned as providers of person-centered care to identify, assess, intervene with clear procedures, and outcomes monitoring to ensure that patients are protected from HAI. Promoting communication between all care providers, re-education on important prevention strategies, and following detailed care regimens are ways nurses may help lower the prevalence of HAI. Working together, nurses and healthcare staff can lead the way in the design and implementation of policies with procedures that allow for reduction and potential elimination of risk for HAI.

Anum Tehseen

NY - Siena College

Discipline: Health and Human Development

Authors:

Abstract Name: Integrating Nutrition and Healthcare: Assessing the Implementation of Food as Medicine Programs

Chronic diseases, often exacerbated by poor nutrition and food insecurity, pose a growing public health challenge (Brown et al., 2019). Food as Medicine (FAM) programs address a patient's chronic health conditions and food needs through a holistic perspective of medicine. However, several research gaps remain in assessing the implementation of the FAM programs. This project evaluates the implementation of the FAM

programs, with a focus on participation retention, accessibility of medically tailored food packages through delivery services, and health-related outcomes. Program data, including clinical biometrics, participant testimonials, and feedback from healthcare partners and staff were collected on multiple cohorts. The project also reviewed key program components, including medically tailored groceries, mandatory medical nutrition therapy sessions, and weekly check-ins to assess their influence on participant engagement and retention. Preliminary observations suggest improved retention rates in recent cohorts, attributed to program modifications such as the introduction of in-person pickup experiences and enhanced communication strategies, suggesting that target modifications can improve effectiveness of the program. As chronic disease rates rise, integrating programs like FAM into healthcare can drive systemic change, highlighting the need for policy support and sustainable funding to expand nutrition-based healthcare interventions.

Jennifer Teibowei

IL - Eastern Illinois University

Discipline: Biochemistry

Authors:

#1 Chinenyenwa Okolie

#2 Tyler Hanlan

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Abstract Name: Non-polar amino acids as cellular uptake moieties for peroxisome targeting fluorophores

Peroxisome Targeting Signals (PTS) are amino acid sequences that facilitate the import of molecules into peroxisomes. Given the inherently polar nature of PTSs, small molecule peroxisome fluorescent probes delivered to the peroxisome in live cells are limited to those which have nonpolar fluorophores. To address this issue, a less polar PTS is being synthesized to improve cell permeability. Presently, efforts are focused on modifying an amide with a medium length carbon chain. It is hypothesized that coupling the more hydrophobic amine to a PTS will improve enhance permeability while maintaining peroxisomal import. Current synthetic efforts to make these molecules will be presented including chemical characterization of products. Overall, this new approach should allow for the delivery of polar molecules into cells while maintaining the ability of the molecule to interact with biological targets.

Mikaela Aprille Tejada

MD - University of Maryland College Park

Discipline: Education

Authors:

#1 Sehrish Shikarpurya

#2 Diamond Williams

#3 Ruhma Raza

Abstract Name: PREP for Transition: Evaluating a Transition Training with Ethiopian and Eritrean Parents of Children with IDD

As the diagnosis of special needs increases over time, so does the necessity for future planning. While many parents want to prepare for their child's future, a majority lack knowledge to navigate complex support systems. PREP for Transition was conducted to provide Ethiopian and Eritrean parents with information and resources their children need as they transition into adulthood by enhancing advocacy skills to develop

appropriate goals tailored to their child's specialized needs. This four-week culturally adapted intervention program was designed to increase parents' transition knowledge, advocacy skills, and social belonging for children with IDD. Partnering with a community organization, we created evaluation measures through recruitment procedures, curriculum adaptation, and interview protocols. Training sessions were conducted weekly for an hour, including the following topics: IEP goals in transition planning, postsecondary education opportunities, employment and living arrangements into adulthood, and reliable resources in the community. One month after completing PREP, parents were invited to share their experiences in hour-long interviews via Zoom. We will complete the interview analysis by March 2025 using grounded theory and thematic analysis. Of the 28 parents registered, an average of 21 parents attended each session with increasing attendance and registrations occurring. Post-session surveys indicate high levels of satisfaction with training on a week-to-week basis, reflecting an increased sense of "transition" community and strong advocacy skills to navigate the adult service system. PREP demonstrates the impact of mentor and peer support for parents of children with IDD. The feedback garnered provided insight into the persistent needs of the targeted communities through deep investigation that this research-practice partnership offered. Findings suggest while attendance and engagement were evident, more work needs to be done for parents to transition these skills into the educational systems for their children.

Owen Tekelenburg

OH - Denison University

Discipline: Biology

Authors:

#1 My Tien Duong

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My Tien Duong

Abstract Name: Caste-specific Gene Expression in Eusocial Shrimp with Comparative Insights from Honeybees

Eusociality is a highly specialized social system offering significant insights into the mechanisms of evolutionary biology. Snapping shrimps, including *Synalpheus elizabethae*, exhibit complex eusocial structures, making them an ideal model for studying the ecological and genetic factors underlying eusociality. Their relatively recent evolutionary divergence from other non-eusocial species provides a unique opportunity to investigate the genetic mechanisms of eusocial behavior in aquatic environments. Here, we aimed to explore potential genetic differences between queen and worker *Synalpheus elizabethae* to better understand the genomic basis of eusocial behavior. The experiment utilized Differential Expression (DE) analysis to compare gene expression profiles between queens and workers. A comparative analysis of the Gene Ontology (GO) terms was performed, comparing *S. elizabethae* to GO terms that are enriched in queens in a well-studied eusocial species, *Apis mellifera* (western honeybee). We found that *S. elizabethae* queens had a higher expression on a distinct set of genes linked to reproductive processes, suggesting a genetic specialization that supports their role in colony reproduction. Conversely, the *S. elizabethae* workers expressed a different gene set related to the maintenance and non-reproductive roles held within the colony structure. *S. elizabethae* and *A. mellifera* queens exhibited no significant overlap in GO terms between differentially expressed genes except for the decreased expression in normal cellular function. This suggests that while both species share the complex social structure characteristic of eusocial organisms, the genetic underpinnings of their social behavior differ significantly. This study highlights the potential for significant evolutionary divergence in the genetic mechanisms that support eusocial behavior across different taxa.

Sarah Tepp

IN - Marian University

Discipline: Interdisciplinary

Authors:

#1 Sarah Tepp

Abstract Name: Alternative use of Animals-The Effect of Rabbit Manure and Urine

Agricultural researchers are investigating agronomic practices that lessen waste and prevent chemical runoff and pollution through organic methods. This project expands on research into the alternative use of animals by adding to the possible significance of the non-meat uses of rabbits. This research project evaluates rabbit manure as a fertilizer and fermented rabbit urine as a pesticide. As the rabbit urine in particular demonstrated control of squash borers, an alternative to synthetic insecticides, I argue that more in depth research should be taken along with some improvements that would help further research into the ethics of animal use and organic food production.

Aunalise Terreri

TN - Belmont University

Discipline: Environmental Science and Sustainability

Authors:

#1 Matthew Heard

Oliver Banks

Abstract Name: Examining how mosquito presence and abundance varies across an urban-rural gradient in Nashville, TN, USA

Mosquitoes pose a public health risk in many cities because they are important vectors of infectious disease. In addition, there are some mosquito species that benefit in urbanized areas from high human presence and alteration of land. Despite this awareness of the public health risk associated with mosquitoes, for many geographic areas there is often limited information about which species are present and how this variation in species presence may impact disease risk. In this study, we set out to examine how the presence and abundance of mosquito species varied in three city parks that span a rural to urban gradient in Nashville, TN, USA. This study is of particular importance because Nashville, TN is a city with more than 2 million residents in the greater metropolitan area. Using this approach, we identified more than 1,500 mosquitoes and determined that mosquito presence and abundance varied spatially across three parks. In addition, we also found that the highest levels of diversity were in the most urban park and that at all three of our parks mosquitoes that are disease vectors made up more than 75% of all individuals found. Collectively, our findings indicate that mosquito presence and abundance varies across an urban-rural gradient and that exposure to disease-carrying mosquito species also varies spatially across the city.

Stewart Thacker

TN - Lincoln Memorial University

Discipline: Environmental Science and Sustainability

Authors:

Abstract Name: Utilizing eDNA to survey the Powell River for presence of Blotchside Logperch (*Percina burtoni*) for endangered mussel conservation.

The Powell River has historically contained some of the highest freshwater mussel diversity in the United States. Over the last 100 years, anthropogenic impacts have negatively influenced many aquatic faunal groups including mussels. The Cumberlandian Combshell (*Epioblasma brevidens*) is a federally endangered mussel species that is being reintroduced at sites in the Powell River of southwestern Virginia and northeastern Tennessee by the Virginia Department of Game and Inland Fisheries (VDGIF). Like many other mussel species, the Cumberlandian Combshell depends on specific host fishes, such as the Blotchside Logperch, to complete their life cycle. The goal of this project is to collect water samples for eDNA analysis to confirm presence of the Blotchside Logperch at sites important for the establishment of populations of the Cumberlandian Combshell mussel. This knowledge will help VDGIF in their reintroduction efforts by focusing on sites that allow more reproductive success. The results of this study can provide insight on successful management of two aquatic faunal species in need of conservation focus.

Allison Thackery

NC - Western Carolina University

Discipline: Engineering

Authors:

#1 Martin Tanaka

Abstract Name: Analysis of Synthetic Biodegradable Polymers and Their Blends for Medical Device Applications

Synthetic biodegradable polymers are used to provide physical structure in medical devices, release drugs during healing, and disappear over time, thereby reducing possible long-term negative effects. There are many synthetic biodegradable polymers, each having different attributes and biocompatibility. The goal of evaluating these polymers and their copolymers is to be able to customize physical and degradation properties for a particular medical device application. Aliphatic polyesters such as polyglycolide (PGA) and polylactide (PLA) are commonly used in medical devices. PGA is highly crystalline but its hydrophilic nature causes it to lose its mechanical strength relatively quickly, typically around two to four weeks after implantation. PLA has a high molecular weight and is more hydrophobic and therefore maintains its mechanical strength for a longer period of time. In attempts to combine the positive attributes of these polymers, researchers have created poly(lactide-co-glycolide) (PLGA), a copolymer that combines PLA and PGA. Unfortunately, PLA and PGA structures don't combine well and cause PLGA to degrade very quickly. Studying these compatible or incompatible qualities can help create polymers and copolymers that could be combined with more desirable traits such as improved mechanical strength, less acidic degradation products, and prevent undesired biological responses. Peer-reviewed scientific studies and observations were compared and analyzed to create an organized reference of the structure, degradation products, rate of degradation, and attributes of biodegradable polymers. The most desirable polymers will have qualities of high mechanical strength, capability of drug delivery, degradation products that have low or no toxicity, and good biocompatibility.

Rikhav Thakkar

NE - Creighton University

Discipline: Mathematics

Authors:

Abstract Name: Under Pressure: The Impact of Game Score on Performance in Men's Collegiate Tennis

Tennis is a sport defined by its unique scoring system, introducing psychological and strategic complexities at different score intervals. This is especially relevant at the collegiate level, where player performance is more variable than in the pro circuit. This study explores how scoring conditions influence the performance of men's collegiate tennis players, focusing on variations in performance when players are ahead, behind, or tied during games. Professional players on the ATP tour have long had access to similar data. Collegiate players, however, haven't been studied this way, providing a potential tactical advantage. For example, a player's performance when trailing 0-30 may differ significantly from their performance when leading 40-0. From collegiate tennis matches, I collected data at each score interval and analyzed point outcomes at various game scores, evaluating factors such as first-serve success rates and break-point conversions. The results revealed notable trends: players trailing in the score often adopt a more aggressive and resilient style, while players in a leading position may display reduced focus or risk-averse strategies. These findings suggest that game score directly impacts players' mental and tactical approaches, ultimately shaping match dynamics. This research illuminates tennis's psychological and strategic components, offering valuable insights for players, coaches, and analysts aiming to optimize performance under different scoring pressures. Understanding these patterns could lead to developing targeted training strategies, helping players manage high-stakes moments more effectively.

Shaylen Thakrar

PA - University of Pittsburgh

Discipline: Health and Human Development

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Abstract Name: Rescuing sustained attention capability in aged rats using a combined therapy of nicotinic acetylcholine receptor allosteric modulation and environmental enrichment after experimental brain trauma

Traumatic brain injury (TBI) is a leading cause of death and poses significant challenges for elderly populations, often exacerbating existing cognitive decline. Empirical evidence suggests disruptions in cholinergic neurotransmission following TBI may contribute to cognitive deficits. We predicted that parietal injury in aged (15-16 months old) male rats will augment sustained attention deficits compared to young adults. We then hypothesized that chronic NS-1738, a novel positive allosteric modulator (PAM) of the $\alpha 7$ nicotinic ACh receptor ($\alpha 7$ -NACHR) will improve sustained attention post-TBI in aged rats, alone and in combination with environmental enrichment (EE). Aged male rats were trained in the 3-choice serial reaction time task (3-CSRT) prior to injury and required more sessions to reach criterion than young adults. Following

a controlled cortical impact (CCI) of moderate severity to the right parietal lobe or sham injury, rats were randomized to daily NS-1738 (5 mg/kg) or vehicle, as well as daily EE (24h) or standard housing starting post-injury day (PID) 1. 3-CSRT retrials occurred on PID 17-27. Anxiety-like behavior was assessed via the open field test (OFT) on PID 28. Cortical lesion volumes were assessed post-sacrifice. Statistical analysis utilized repeated measures ANOVAs with Newman-Keuls post hoc tests. TBI-induced cognitive deficits were pronounced in aged rats ($p < 0.05$) and were rescued by chronic NS-1738 ($p < 0.05$). NS-1738+EE rendered an additive effect on restoring accuracy and lowering omissions ($p < 0.05$). TBI reduced OFT center exploration without reductions in ambulation ($p < 0.05$). NS-1738 and EE housing individually restored center exploration ($p < 0.05$). While both NS-1738 and EE rendered trends in reducing the extent of cavitation, the combined therapy was ineffective at promoting tissue preservation. Our findings reflect the vulnerability of the elderly following TBI and support benefits of $\alpha 7$ -NACHR PAM and/or EE treatment after experimental brain trauma on sustained attention through cholinergic neurotransmission.

Ryan Thalwitzer

NJ - The College of New Jersey

Discipline: Economics

Authors:

#1 Donka Brodersen

Abstract Name: Wealth, Well-being, and Crisis: The Impact of Income on Mental Health Before and During the COVID-19 Pandemic in the U.S.

This study analyzes the relationship between income and mental health in the United States before and during the COVID-19 pandemic, which was characterized as both a health and economic crisis. During the pandemic, real GDP contracted by 32.9% in Q2 of 2020 and unemployment surged from 3.6% in late 2019 to 13.0% in mid 2020. Non-essential workers were required to stay home, and many were unable to contribute due to the inability to work remotely. Financial instability and social isolation during the pandemic exacerbated stress levels, uncertainty, and loneliness, adversely impacting mental health. Utilizing data from the 2019 and 2021 Panel Study of Income Dynamics (PSID), this study examines the link between family income across quintiles and mental health diagnoses, controlling for individual and household demographics. Additionally, state-level data on pandemic stringency measures in 2021 were incorporated to account for lockdown effects, which may have influenced mental health outcomes related to the pandemic and isolation. Preliminary findings show an increase in the percentage of individuals with mental health diagnoses from 12% in 2019 to 14% in 2021. While average income generally increased, the lowest quintile did not experience this improvement. In the zero-order model, all income groups exhibited significantly lower rates of mental health diagnoses than those in the lowest quintile. However, in the full model, only individuals in the top two income quintiles had significantly lower mental health diagnoses than those in the lowest quintile. Additionally, factors such as being female, white, non-Hispanic, young, unmarried, unemployed, non-religious, having higher than a bachelor's degree, being in an interreligious marriage, and living in urban areas were associated with a higher likelihood of mental health diagnoses. These findings can inform policymakers and healthcare professionals in addressing disparities in mental health during times of health and economic crises.

Ananya Theneti

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

#1 Gabrielle Prince
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Abstract Name: Role of chemical neurotransmission on post-embryonic neuronal maturation in *Caenorhabditis elegans*

During postnatal nervous system development, neuronal circuits are strengthened and further refined, leading to various molecular and functional processes that elicit diverse behavioral outputs. Disruptions to these molecular and functional changes during postnatal neuronal development can lead to neurodevelopmental disorders during early development and neurodegenerative disorders during adulthood. Even so, much is unknown regarding what regulates these temporal changes during critical periods of postnatal neuronal maturation. One potential mechanism of regulation is through neuron-neuron communication, specifically chemical neurotransmission. Previous research has indicated that chemical neurotransmission is involved in development and that disruption in early development leads to behavioral impairments. However, the manner in which chemical neurotransmission plays a role in regulating postnatal nervous system development remains unclear, as well as the critical time period during postnatal maturation in which it acts. Considering this, we aimed to further understand the regulation of post-embryonic nervous system maturation in *Caenorhabditis elegans* by examining the effects of neuron-neuron communication. We utilized spatiotemporal neurogenetic tools, such as the Auxin Inducible Degradation (AID), that allow us to impair and restore protein function. We specifically targeted the UNC-13 protein, which plays a key role in the process of chemical neurotransmission, allowing for vesicle docking and fusion at the synaptic membrane. Worms were then recovered by the adulthood stage, and assessed for locomotive impairments using an automated, high-resolution worm-tracking system. We expect that inhibition of UNC-13 during post-embryonic development will result in locomotive behavioral defects during adulthood, indicating an impairment of post-embryonic neuronal maturation. Future directions for this research include narrowing down the critical time period of altered neurotransmission to finer developmental time periods as well as identifying specific molecular pathways that are activated by altered neurotransmission due to environmental changes.

Apoorv Thite

PA - Pennsylvania State University

Discipline: Computer Science

Authors:

#1 Dr. Mahfuza Farooque
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Abstract Name: Machine Learning for Early Detection of Parkinson's Disease: Combining Speech and Motor Data to Develop Accurate, Multimodal Diagnostic Tools for Enhanced Healthcare Outcomes and Advancements in Neurodegenerative Disease Research

Introduction: Parkinson's disease is a progressive neurodegenerative disorder often diagnosed at advanced stages, limiting treatment effectiveness. Early detection is critical for improving patient outcomes, as it enables timely therapeutic strategies and slows disease progression. This research addresses a significant gap in healthcare diagnostics by employing machine learning to develop accurate, early-stage detection tools, integrating speech and motor features as predictive indicators. Objective: The study aims to develop and validate ML models capable of detecting Parkinson's disease in its early stages. The central research question is: Can machine learning effectively combine multimodal data, including speech and motor assessments, to improve early detection of Parkinson's disease? Methodology: The research utilized a dataset containing speech metrics (e.g., pause intervals, respiratory patterns) and motor assessments (e.g., tremor severity). Exploratory Data Analysis identified significant predictors, such as pause intervals and loudness, with dimensionality reduction techniques refining features to enhance model performance. Various ML

classification algorithms were evaluated using metrics like accuracy, sensitivity and ROC-AUC. Results: Preliminary results indicate ML models achieved sensitivity and specificity rates exceeding 90%, highlighting their reliability for early detection. Speech features such as pause intervals and respiratory patterns were the strongest predictors, while motor assessments showed moderate correlations. Combining multimodal data significantly improved accuracy over single-modality approaches. Dimensionality reduction reduced noise, enhancing robustness and focus on key features. Additionally, dimensionality reduction through PCA reduced noise and improved robustness, highlighting the importance of key features. These findings suggest that ML-driven multimodal diagnostics can capture subtle early symptoms, enabling earlier and more precise detection. Conclusion: The study demonstrates the transformative potential of ML-driven multimodal diagnostics for early detection of Parkinson's disease. These findings provide actionable insights for clinical applications and establish a foundation for integrating personalized monitoring systems. This research contributes to predictive healthcare, offering opportunities for advancements in neurodegenerative disease diagnostics and treatment strategies.

Valerie Thomas

GA - Kennesaw State University

Discipline: Business

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Abstract Name: Drivers of Firm Financial Performance among U.S. Restaurant Chains: The Role of Business Experience and Marketing Inputs

Franchising is an important business form that accounts for an estimated 806,270 franchise outlets and, in 2024, is expected to employ about 8.9 million people. Franchising is very prominent in the restaurant industry, being represented by 132,687 franchise restaurant chains across the United States. The existing literature demonstrates that degree of franchising, measured as the proportion of franchised units to total units, is positively related to financial performance, where more franchising is better for firm financial performance (Madanoglu et al., 2011). However, there is a scarcity of studies that investigate factors that influence chain-level success in terms of profitability, strength in franchising network, customer, and employee satisfaction. To fill one of these gaps, this project aims to examine the relationship between chain-specific characteristics and chain financial performance. The sample of this study consists of 73 restaurant franchising chains listed in FRANDATA, a major franchising data source in the United States. The observation period encompasses the 4-year period between 2016 and 2019, which makes up 274 firm-year observations. Proprietary data on chains such as system size, profitability, franchise fees, revenue etc. is obtained from FRANDATA, through an exclusive agreement. The dependent variable in this study is 3-year sales growth. Potential predictors are marketing inputs per store (marketing expense to number of stores) and business experience (years of experience before launching franchising). Both factors are expected to have a positive relationship with chain financial performance. The study controls system size, franchising proportion, and geographic dispersion as common determinants of firm financial performance. Multiple regression will be used to analyze data. This research study expects to determine which chain-specific factors influence financial performance. Findings can offer some insights to franchising firm executives in their efforts to understand how some controllable factors such as marketing inputs can impact financial performance.

Sterling Thomas

AR - University of Arkansas

Discipline: Nursing and Public Health

Authors:

#1 Marilou Shreve

Abstract Name: The Analysis of Marshallese Perceptions of Health and Weight in Adolescents

Purpose: The purpose of the research is to analyze and understand the perceptions of Marshallese adolescents on the topic of health and weight, in order to provide guidance for interventions and public health efforts. The United States has the largest Marshallese population outside the Marshall Islands. Perceptions of weight and health is under researched for minority communities and from the insight of adolescents. Pacific Islanders such as the Marshallese are often categorized as part of the larger Asian American ethnic population, which is not always accurate in certain aspects where public health could provide support areas of concern. **Design:** Focus groups of adolescents who identified as Marshallese from the ages of 10-17 were arranged into 2 groups based on age, 10-13 and 14-17 respectively. Respective groups participated in focus group discussion interviews (n=32) and then completing a survey (n=32) based on questions regarding health and obesity. Focus group discussion interviews were recorded and analyzed for themes. The survey results were recorded and analyzed. The interview and survey themes were compared and examined for correlations. **Results:** Common themes for an individual considered healthy included balanced diet and physical activity. Majority of adolescents that participated in the survey concluded they believed they were healthy (66%). When asked to categorize themselves, most participants (59%) categorized themselves as “slightly overweight”. The participants contributed many of the same factors to why an individual would be considered unhealthy to why an individual would be overweight. **Discussion:** Adolescents in the Marshallese community view weight as a proponent of overall health. Overall health was recognized as fluid due to many proponents such as exercise, diet, and hygiene effect health outcomes. To understand at what value of the BMI scale constitutes as unhealthy would further promote education.

Hudson Thomas

MI - University of Michigan - Ann Arbor

Discipline: Environmental Science and Sustainability

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#1 Mallory Armstrong

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#6 Jenan Kharbush

#7 Gregory Dick

Abstract Name: Using stable isotopes to examine nutrient uptake in harmful algal blooms

Harmful algal blooms (HABs) populate 160 countries and nearly every continent, where they wreak havoc on aquatic ecosystems and pose serious threats to human populations. HABs are a particularly persistent issue in western Lake Erie, where they are dominated by a strain of cyanobacteria, *Microcystis*. *Microcystis* produces

the toxin microcystin, which is responsible for turning these algal blooms into HABs. Microcystin is a nitrogen molecule. Excess nitrogen is carried into Lake Erie by runoff along the Maumee River. The river runs through long stretches of farmland where it accumulates nitrogen from fertilizer. This project aims to determine which forms of nitrogen Microcystis takes up most efficiently, in order to better understand the impact of the fertilizers that farmers employ. To do this, our lab grew whole water communities, containing Microcystis, from Lake Erie with different concentrations of various forms of nitrogen, ammonia, nitrate, and urea. NanoSIMS is then used to reveal how much nitrogen of each form the community members took up. Preliminary results indicate that Microcystis may modify their uptake of nitrogen depending on the bloom stage.

Emily Thomas

PA - University of Pittsburgh

Discipline: Social Work and Human Services

Authors:

#1 Chloe Hudson

#2 Ektha Parchuri

#3 Jason Colditz

Abstract Name: A Lyrical Analysis of Addiction and Recovery Narratives in Popular Music

Background: Music has been recognized as a powerful tool in addressing substance use disorders and facilitating addiction recovery. Music therapy and music-based interventions are gaining traction as complementary approaches to traditional treatment modalities, reflecting the potential of music to resonate deeply with individuals' emotional and social experiences. This study examines how the addiction and recovery processes are portrayed in the lyrics of popular songs about addiction, exploring their potential influence on both public perception and individual recovery journeys. Objective: To identify recurring themes, patterns, and emotional tones within the lyrics of popular songs purported to be about addiction and recovery. By analyzing these narratives, the study seeks to understand their messages and their implications for addiction treatment and recovery support. Methods: We compiled a list of the most commonly indicated songs about addiction and recovery, based on systematic web searches including eighty-seven relevant websites. The top song was listed on thirty sites and the 51st song was listed on six sites. 316 lower-ranking songs were excluded to ensure feasibility of analysis. Two raters conducted a lyrical analysis using a codebook inductively developed to guide the evaluation of recurring themes. Inter-rater reliability checks ensured consistency in analysis. Results: Among the identified songs, 82% referenced mental health symptoms, 80% addressed social issues, 65% alluded to a specific substance, and approximately half mentioned physical symptoms associated with use or withdrawal. Nineteen (37%) referenced recovery or reducing substance use. Conclusions: Popular music often portrays addiction through a biopsychosocial lens, highlighting commonly relatable mental health and social issues. However, a notable gap exists in the representation of recovery processes, which may limit the utility of these songs as recovery aids. These findings suggest potential areas for enhancing the role of music in addiction treatment, including increased emphasis on recovery themes in music therapy contexts.

Kwame' Thomas

NC - North Carolina A&T State University

Discipline: Psychology

Authors:

#1 Kwame' Thomas
#2 Karissa Pelichet
#3 Breanna Spinks
#4 Georgina Chigwerewe
#5 Camryn Murray
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Karissa Pelichet

Abstract Name: Exploring the Association between Race-Related Vigilance and Anxiety

A heightened sense of vigilance is common during periods of intense anxiety and stress, and an established symptom for anxiety disorders including acute and post-traumatic stress disorder. A growing literature has explored race-related vigilance, the stress response to anticipated racial encounters. However, little research has explored the overlap between RRV and broader anxiety symptoms. In the present study we examined the relationship between race-related vigilance assessed using a measure developed by David Williams and trait anxiety and physiological symptoms as measured by the Spielberger Trait Anxiety Inventory and Beck Anxiety Inventory (BAI), respectively. Utilizing archival data, descriptive statistics and Pearson correlations were computed to assess the initial associations among study variables in, $n=149$ self-identified African American college students (60% women, $Mage = 19.95$, $SD=3.182$) recruited across three distinct institutional types (Historically Black Colleges and Universities, PWI, MSI). Race-related vigilance was positively associated with physiological symptoms of anxiety ($r = .187$, $p = .022$), but not trait anxiety ($r = .083$, $p = .310$). Institution 1 had the highest Race-Related vigilance ($M= 20.140$, $SD=4.494$), Institution 2 had the highest trait anxiety ($M= 49.93$, $SD=9.104$), and Institution 3 had the highest physiological symptoms ($M= 13.31$, $SD=9.039$). Notably, there is a stronger association between physiological symptoms of anxiety and race-related vigilance. These findings underscore the complex interplay between race-related vigilance, anxiety, and physical activity, highlighting the need for further research in this understudied population, particularly as African Americans are more likely to underreport symptoms in national surveys.

Jillian Thomas

NC - Elon University

Discipline: Mathematics

Authors:

#1 Jillian Thomas

Abstract Name: Numerical Simulation of Jellyfish Swimming

Jellyfish are considered the most energetically efficient swimmers to have ever existed, so their propulsion method can be researched to improve our own underwater vehicle designs. These unique animals need to be very efficient because of their untraditional bodily components, and because most consume limited food as they prey passively while swimming. Jellyfish accomplish their efficiency through vortex propulsion. The contraction of a jellyfish's bell generates a vortex ring as it swims, which due to its axial symmetry we will simplify into two dimensions using two point vortices. We model these vortices using a system of differential equations, for which parameters can be selected to adjust their strength, location, and direction of rotation. To numerically solve the system, we use the fourth order Runge-Kutta method in MATLAB. The first goal of the project is to examine the jellyfish's propulsion and maneuvering mechanism, which involves creating simulations for various parameter values in the system of differential equations. Secondly, we study the material transport in the vicinity of jellyfish and its implication on food acquisition. Massless particles are inserted into the fluid flow to observe how the jellyfish and particles around it move through the water as affected by the vortices. To work towards these goals, we have implemented bell shapes to represent moon jellyfish, Pacific sea nettles, cannonball jellyfish, and lion's mane jellyfish to provide a breadth of bell shapes and sizes. Each of these bell shapes serve as a barrier to material transport, so the jellyfish can capture

particles from the surrounding environment. These results have significant implications for fields such as biomimetic engineering, such as improvements to sub-aquatic vehicle efficiency and reliability, especially in cases when speed is not a priority.

William Thomas

VA - Virginia Commonwealth University

Discipline: Biochemistry

Authors:

#1 Martin Safo

Abstract Name: Polymorph Characterization of the Antisickling Compound ILX-002

Sickle cell disease (SCD) is a genetic disorder arising from a single point mutation of glutamic acid to valine in the oxygen-carrying protein hemoglobin (Hb), leading to the formation of sickle Hb (HbS). Upon release of oxygen to tissue, the deoxygenated HbS polymerizes, resulting in sickling and hemolysis of red blood cells (RBC), inflammation, vaso-occlusive crisis, and multiple organ damage. Only the FDA-approved drug, hydroxyurea appears to be effective for treating SCD. The recently approved gene therapies for SCD, Casgevy and Lyfgenia are costly and inaccessible. Dr. Safo's group is developing a promising drug, ILX-002, that could potentially lead to a "functional cure" of SCD. This study was undertaken to obtain the best polymorph of ILX-002 for the upcoming clinical studies. ILX-002 was crystallized at either room temperature or 0oC using dichloromethane (DCM), ethyl acetate (EtOAc), methanol (MetOH), ethanol (EtOH), tetrahydrofuran (THF), and acetone. The crystal structures and melting points of the crystals were determined. The DCM, EtOAc, MetOH, and EtOH crystals obtained in RT resulted in one polymorph having the same space group (P21/n), cell parameters, and crystal packings. The acetone and THF crystals, also obtained in RT resulted in a second polymorph having the same space group (P21/c), cell parameters, and crystal packings. The crystals obtained at 0oC with EtOAc and EtOH resulted in the same polymorph as the corresponding RT crystals. All crystals showed similar melting point values (123.5-124.5oC). Interestingly, the two polymorphs showed notable similarities in their crystal packings, explaining the similarities in their melting points. Our results indicate that ILX-002 likely exists in two polymorphs. Still, irrespective of the solvents or crystallization temperature, the polymorphs appear to have similar chemical and physical stabilities, suggesting that any of the solvents can be used to prepare the final drug for clinical studies.

Sarah Thomaschefsky

WI - University of Wisconsin-Madison

Discipline: Chemistry

Authors:

#1 Sarah Thomaschefsky

#2 Amanda Buchberger

Abstract Name: Investigating the Effect of pH on Alpha Acid Isomerization Rates in Beer: An Inquiry-Based Analytical Chemistry Approach

Inquiry-based projects in analytical chemistry courses at UW-Madison simulate the research experience. Fall 2024 semester's research project focused on determining the isomerization rate and order of alpha acids for controlling the bitterness of beer and understanding the brewing process. Using a recent literature article as reference, students developed a modified control procedure that accounted for the alpha acid source,

equipment available and proposed a variable to introduce or change to test a hypothesis. Our group hypothesized that a more basic pH (5.5 vs. 5.2) would increase the isomerization rate. Ultra-high-performance liquid chromatography (uHPLC) was used to determine the iso-alpha acid concentrations and monitor changes over time. A filtered (n=7) control data set (i.e., replicates from other groups completing the control procedure) was compared to data from the literature article for statistical analysis of alpha acids cohumulone and N-adhumulone. Cohumulone (0.098 ± 0.018 mg) and N-adhumulone (0.0064 ± 0.0020 mg) were both found to be statistically different from what was found in the literature (0.01141, $t_{calc} > t_{table}$ at 95% confidence level). The rate order for cohumulone was consistent with the literature (first-order), while N-adhumulone showed an inconsistent result, a zero-order rate constant. For the variable data, the cohumulone (0.09897 ± 0.01952 mg, first order) showed no statistical change in their rate constant, but N-adhumulone (0.005694 ± 0.003124 mg, zeroth order) was observed to be statistically different due to pH change. We concluded that the hypothesis that a more basic pH (5.5) increases the isomerization rate was supported for cohumulone but not N-adhumulone. This suggests that pH affects the isomerization rate for some, but not all, alpha acids. Future research could explore a broader range of pH values, and consider additional factors such as temperature and time, to determine optimal conditions for isomerization in beer.

Lily Thompson

TX - Midwestern State University

Discipline: Exercise Science and Nutrition

Authors:

#1 Brett Crossland

Abstract Name: Comparison of Lactate Response to Perceived Stress

Lactate is an acid produced as a byproduct of anaerobic glycolysis, and is used as an energy source for metabolism in the oxidative system. Initially classified as a waste product of cellular metabolism and a primary source of fatigue during exercise, lactate has recently been shown to play a large role in a number of vital physiological processes. Clinically, lactate has now been shown to interact with autonomic nervous system (ANS), and may be a valuable measure in diagnosing severity of disease. Commonly measured during exercise testing, lactate levels can provide vital information into an individual's exercise capacity. Currently, no research has been conducted examining the relationship between resting blood lactate (BL) and ANS activity relating to exercise. The purpose of this study is to 1) determine the relationship between resting BL levels and ANS activity, and 2) investigate potential differences in resting BL measures between sedentary and well-trained individuals following a stressor. A minimum of twenty participants (10 sedentary and 10 well-trained) will complete 2 trials separated by a minimum of 24-hours. On the first visit participants will be informed they will not be performing exercise and will only be measured for resting values of heart rate variability (HRV) and BL. On the second trial participants will incur a stressor by being made to believe they will be performing a maximal graded exercise test. Following the perceived stressor, researchers will collect resting HRV and BL measures. Statistical analysis will be used to determine differences between the groups and trials. Data collection will be complete prior to the NCUR 2025. Results of this study may serve to inform researchers of the mechanism responsible for potential differences in resting BL levels as well as determine if resting BL may be able to serve as an accurate indicator of ANS activity.

Sophie Thompson

MA - Massachusetts Institute of Technology

Discipline: Nursing and Public Health

Authors:

#1 Francesca Riccio-Ackerman

#2 Hugh Herr

A Betancourt

Abstract Name: Optimization of Natural Fiber Prosthetic Socket Manufacturing Method for Sierra Leone

Less than 10% of patients globally have access to orthotic and prosthetic medical care, and thus have barriers to managing the effects of their disability and to maximizing their mobility. For prosthesis users, the prosthetic socket, the interface between the residual and prosthetic limb, is the most critical component of the device to maintain. The socket requires frequent adjustments and replacement to ensure the health of the residual limb and painless ambulation. Sockets are typically made from carbon-fiber mesh, supported by acrylic resins. Acquiring materials to fabricate carbon-fiber sockets— “the gold standard of care”—is logistically difficult and prohibitively expensive in locations like Sierra Leone, West Africa. Research studies by Nigerian scientists proved the feasibility of using natural fibers from locally-grown plants, like banana trees, as carbon-fiber alternatives to produce natural fiber prosthetic sockets for use in similar environments. However, data on clinical safety of these sockets and guides informing fabrication processes for clinicians are limited. Therefore, this project aims to optimize a step-by-step manufacturing method for fabricating natural fiber sockets including material testing, fabrication, and mechanical testing at MIT, in a simulated tropical environment, and in Sierra Leone, followed by clinical trials. Chemical and manual extraction methods were tested, with a combination of water retting and 5% NaOH solution providing the optimal result. Mechanical testing has ensured that the natural fibers equate to carbon fiber in terms of characteristics like tensile strength and bendability. The preliminary results are promising and indicate the potential for adoption in numerous limited resource environments, thus improving the prosthetic management of care post-amputation and enabling mobility for patients who benefit from this innovation.

Joseph Thompson

NC - University of North Carolina at Charlotte

Discipline: Psychology

Authors:

#1 Jennifer Webb

Abstract Name: Comparing the Effects of Human Fitspiration, Anime-themed Fitspiration, and Body Image Flexibility Quotes on State Body Image, Mood, and Exercise Motivation in Young Adult Men

Social media is recognized as a risk factor for body image disturbances for women, while men remain understudied yet are increasingly recognized as impacted by body image concerns, particularly with growing research surrounding the muscular ideal. Beyond gender, body image is nuanced by sexuality, hence gay and bisexual men tend to have greater body image disturbances, including muscularity concerns relative to their heterosexual counterparts. Fitspiration has become a popular trend on social media, whose creators often claim to be promoting exercise motivation but has been empirically found to pose health risks in the context of body image. A primary mechanism for conferring this risk is appearance comparisons, especially to idealized bodies often seen in fitspiration. Within fitspiration, anime characters have recently emerged as contemporary mainstream media targets for comparison, often in the form of physical appearance goals. The proliferation of anime fitspiration content raises new public health concerns given characters are often portrayed with exaggerated, cartoonish physiques, performing impossible feats of strength. Alternatively, body image flexibility may represent a possible strategy to motivate exercise that does not simultaneously confer a detrimental impact on body image and mood relative to both traditional human fitspiration and modern anime fitspiration social media content. This is because body image flexibility encourages individuals to openly accept challenges to their body image, without trying to change the thoughts or feelings that arise in

the service of moving in valued life directions. The present study will expose young adult men to one of four image conditions: human-based fitspiration, anime fitspiration, body image flexibility quotes, or a control condition to examine the differential effects of viewing this content on body image satisfaction, mood, and exercise motivation. An exploratory aim is to provide a preliminary evaluation of whether sexual orientation further moderates the hypothesized effects.

Jagger Thompson

MN - University of Minnesota - Duluth

Discipline: Psychology

Authors:

#1 Rebecca Gilbertson

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#4 Reanne Dwyer

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#10 Cayden Kleffman

#11 Cayden Kleffman

Abstract Name: The Effects of Alcohol-Related Scenes on Driving Performance and Attention

PURPOSE: The combination of distracted driving and alcohol administration can dramatically impair one's driving performance (Van Dyke & Fillmore, 2015). These distractions can be greatly influenced by our attentional bias; alcoholic cues and stimuli capture more attention and can be an inhibitor of cognitive performance (Qureshi et. al, 2018; Weafer & Fillmore, 2012). The aim of the study is to investigate if alcohol-related scenes affect driving performance. **PROCEDURE:** Preliminary participants (ages 18-22, N=48; 54% male, 87.5% Caucasian) have completed the study. Self-reported measures of quantity and frequency of alcohol use, and problematic consumption (DDQ-R, Collins, Marks & Marlat, 1985, AUDIT-C, Suanders et al., 1993, SIP-R, Kiluk et al., 2013) were assessed. Participants completed a behavioral cued go/no-go task, and a driving simulator task which utilizes eye-tracking equipment.

RESULTS: Preliminary data analysis on self-report measures did show a positive relationship between SIP-R and AUDIT-C, N=48, $r=.295$, $p<.05$. Participants took 12 minutes to complete the driving simulator task and on average went under the given speed limit 6.86 times (SD=3.98, and range of 0-18) and over the given speed limit 4.28 times (SD=3.37, and range of 0-14). Further analysis on the preliminary data shows that there's no significant relationship between AUDIT-C and driving performance at $p=.68$. **IMPLICATIONS:** Preliminary findings of this ongoing study support the possibility of data collection during multi-method use of driving simulation and eye tracking. Further analyses of this ongoing study will further address the effects of self-reported alcohol use and driving performance in alcohol versus control scenes. Preference for alcohol related scenes via eye tracking and effect on driving performance will also be assessed.

Cameran Thompson

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Anthony Kontos
#2 Christy Sheehy
#3 Ethan Rossi
#4 Richard Johnston

Abstract Name: Sex Differences in Fixational Eye Movements following Concussion

Fixational eye movements (FEMS), small ($\leq 1^\circ$) motions of the eye that occur during periods of stable fixation, have shown promise for detecting ocular dysfunction post-concussion. However, the diagnostic and prognostic utility of FEMS for concussion has not been systematically investigated between males and females. Here, we investigated if FEMS differ between the sexes in a group of patients in the acute-to-subacute period following concussion (≤ 21 days) and age- and sex-matched healthy controls. Eye movements were recorded using a retinal image-based eye tracking device: a tracking scanning laser ophthalmoscope (TSLO). Participants performed two fixation tasks for 30s: 1) a center task in which they fixated on the center of the imaging raster and 2) a corner task in which they fixated on the corner of the raster. On the center task, concussion patients made significantly larger amplitude fixational saccades than controls, consistent with previous studies. However, we also found that females made significantly larger fixational saccades than males on this task. No significant difference in fixational saccade amplitude was found between concussion patients and controls or between males and females on the corner task. Finally, no significant between-group differences in fixational saccade direction were found on the center task. However, on the corner task, females made a higher proportion of oblique fixational saccades and a lower proportion of horizontal fixational saccades than males. Although these findings support previous work showing that FEMS may provide an objective measure of ocular dysfunction following concussion, they suggest that care needs to be taken to control for sex-specific differences. Future research is needed to investigate if the diagnostic and prognostic utility of FEMS can be improved by establishing pre-season FEMS measurements and allowing athletes to serve as their own controls.

Emery Thul

MN - Hamline University

Discipline: Education

Authors:

#1 Antara Bhattacharyay
#2 Bridget Jacques-Fricke

Abstract Name: "I was able to see what science was": Assessing the Impact of Course-based Undergraduate Research Experiences on First-Generation and Low-Income Students

Undergraduate research is lauded as one of the most impactful experiences for students across different fields. Research indicates that undergraduate research participation increases retention within STEM, increases graduation rates, and decreases equity gaps. Unfortunately, students from various backgrounds and with different identities have unequal access to these educational experiences outside of the classroom. In the past 20 years, course-based undergraduate research experiences (CUREs) have emerged as one of the leading solutions to increase access to undergraduate research in the sciences. However, it is not well-known what impacts CUREs may have on first-generation and low-income (FGLI) students, though they are among the most impacted by financial and personal barriers to participation in traditional undergraduate research. This is due in part to the difficulty of ascertaining socioeconomic status for students. To address this gap, we have designed a pre- and post-survey to assess student gains in relation to their identities. In our analysis, we look at both the traditional measure of low-income status, Pell grant eligible students, as well as students working more than 20 hours per week during the academic year. Student gains are self-reported on Likert scales. Demographics were collected at the pre-survey and matched with post-survey responses ($n = 142$ paired responses). We use paired t-tests to assess within group gains and two-sample t-tests to assess between group

differences at the pre- and post-survey. We find that all students, regardless of demographic, reported significant gains across measures of cognitive and affective skills necessary for performing authentic, novel research. This suggests that CUREs are equally effective in promoting positive outcomes for FGLI students as they are for their non-FGLI peers, reaffirming the utility of CUREs in leveling the playing field in undergraduate research opportunities.

Adithi Thumuluru

VA - Virginia Commonwealth University

Discipline: Sociology

Authors:

#1 Adithi Thumuluru

Abstract Name: Threads of Empowerment: Fashion Autonomy in Transforming Emotions and Social Dynamics Across Social Classes

Fashion autonomy plays a significant role in stimulating positive emotions across different social classes by serving as a powerful medium of self-expression, identity formation, and emotional resilience. Once primarily functional, clothing has evolved into a sophisticated tool for conveying individuality, beliefs, and emotional states. This transformation underscores the ways autonomy in fashion fosters positive emotions and shapes its role within the broader social scene, thus highlighting the deeper inquiry of how autonomy within fashion amongst different social classes stimulates positive emotions, and what role they essentially play across the social scene? The democratization of fashion—bolstered by the rise of social media—has granted people from various socioeconomic backgrounds greater access to trends and the freedom to assert their individuality. This shift challenges traditional class-based fashion norms, encouraging the creation of unique styles that transcend social hierarchies. Fashion autonomy is especially meaningful for women, who have historically been constrained by societal expectations surrounding appearance. By leveraging fashion as a means of self-expression, women across social classes were able to redefine boundaries, build confidence, and achieve emotional empowerment. Additionally, social media platforms have provided marginalized groups with opportunities to celebrate individuality, fostering inclusive digital spaces that recognize and support diverse identities. These platforms amplify the emotional rewards of fashion autonomy by enabling connection, style sharing, and solidarity, ultimately nurturing collective pride, hope, and resilience. Ultimately, the role of fashion autonomy in bridging social divides, promoting individual empowerment, and enhancing emotional well-being is essential in understanding how clothing choices shape identities, influence social dynamics, and contribute to the overall emotional landscape of society.

Mang Hnem Tial

AL - University of Alabama at Birmingham

Discipline: Biology

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#1 Liou Sun

#2 Soe Maung Maung Phone Myint

Abstract Name: High Fat Diet Alters Gut Microbiota Composition in Transgenic F344-AD Female Rats: Insights from Microbiome Analysis

Alzheimer's disease (AD) is a neurodegenerative disease that causes a progressive decline in memory, thought, language, and behavior in patients. The risk factors for AD include age, obesity, and diabetes which alter how AD progresses in the brain. Diet plays an important role in inducing obesity and generating diabetic effects that promote neuropathologies. Our lab explores the effects of High Fat Diet (HFD) on the microbiome of transgenic (Tg) rats that were co-injected with two human genes known to cause early-onset AD when mutated: amyloid precursor protein (APP) and presenilins 1 (PS1). The Western diet consists of approximately 40% fat from sources such as red meat and processed food which emphasize the significance of HFD related research on the progression of diseases like AD. The gut-brain axis, a network of nerves and

signals that allow the gut and brain to communicate bidirectionally, explains how diet might influence the microbiota in the gut and how that will impact cognitive health and motor function. Our lab used 16s rRNA sequencing data from the UAB Microbiome Resource as well as QIIME to measure metrics related to the microbiome: alpha and beta diversity. While there were no differences in the Alpha diversity between the samples, the Beta diversity was significantly different between them. ANCOM-BC analysis showed an enrichment of phylum Firmicutes, order RF32, and family Lachnospiraceae in Tg female rats. Tg rats had depleted levels of the bacteria order Clostridiales, family GZKB119, and family Alcaligenaceae. Through an analysis of the microbiome of wildtype (Wt) and Tg female rat models, we aim to define the role microbiome plays in the development of neuropathologies, particularly with regards to AD progression.

Ansley Tice

TN - Trevecca Nazarene University

Discipline: Psychology

Authors:

Kiara Cortes

Abstract Name: The Correlation Between Perfectionism, Social Anxiety, and Fear of Failure in College Students

This study investigated the relationship between perfectionism, social anxiety, and fear of failure in college students. Previous literature revealed positive correlations between these three variables. For example, a significant relationship between perfectionism and social anxiety has been found; specifically a positive correlation between the two. Furthermore, perfectionism has been found to have a positive correlation between fear of failure. Previous literature has also revealed a positive correlation between fear of failure and social anxiety. Based on this previous literature, the following hypotheses were proposed. There is a positive correlation between perfectionism and social anxiety; there is a positive correlation between perfectionism and fear of failure; and there is a positive correlation between social anxiety and fear of failure. To test these hypotheses, the Frost Multidimensional Perfectionism Scale (FMPS), the Social Anxiety Scale for Adolescents (SAS-A), and the Performance Failure Appraisal Inventory – Revised (PFAI) were administered. Eighty-nine (N = 89) undergraduate students participated in this study. The participants were students of all classifications from fine arts, science, and psychology classes. Upon IRB approval and permission from the professor, instrument packets and consent forms were administered in classrooms. Participation was voluntary and confidential. The collected data was analyzed by a correlational analysis using SPSS software. It was found that perfectionism and social anxiety were positively correlated at a significant level ($r = .394, p \leq .001$ one-tailed), perfectionism and fear of failure were positively correlated at a significant level ($r = .549, p \leq .001$ one-tailed.), and fear of failure and social anxiety were positively correlated at a significant level ($r = .576, p \leq .001$ one-tailed). One limitation to the study was a lack of gender diversity.

Grace Tietz

MN - Minnesota State University - Mankato

Discipline: Education

Authors:

#1 Grace Tietz

#2 Margo Wood

Margo Wood

Abstract Name: The Qualitative Study to Explore the Foundations of Teacher Self-Efficacy Reported by the Education Majors at a Mid-size Midwestern University

Self-efficacy is a sense of an individual's ability to complete a task proficiently and successfully. High self-efficacy also contributes to teachers' approaches to instruction, resulting in positive attitudes towards inclusion, better work attitudes, and more effective student-related decision-making. Studies show that higher self-efficacy among educators is associated with better student outcomes; however, quantitative studies on students' self-efficacy are subject to the criticism on their inconsistent measures of self-efficacy across the studies; as a result, such developmental mechanisms are often analyzed in silos, lacking the comprehensive thematic connections to synthesize on how individuals build their foundation in self-efficacy in education setting. This research project attempts to explore how graduate students within education majors foster their personal self-efficacy as it relates to their teaching career. The subjects will include graduate students who are enrolled in the graduate-level teacher licensure programs at Minnesota State University, Mankato. Qualtrics survey will be used to collect responses on open-ended questions which ask their foundation of self-efficacy relating to their teaching. The thematic analysis will be conducted through the steps including: familiarization with data, initial coding, theme generation, focused code creation, and data organization. The research will show roles of external and internal factors contributing to the development of self-efficacy among education graduate students, positively or negatively. The findings from this inductive research will inform professionals in the field on the significance of self-efficacy among teachers and suggest specific implementation of policies and plans to redesign the teacher education curriculum. After analysis, professionals can use the information given on how educators within the educational system fostered their self-efficacy to be able to recreate that for their students within the classroom. This may also allow professionals to reflect on their own self-efficacy and their journey on how their self-efficacy has been fostered.

Javiera Tiggelaar

IL - Northern Illinois University

Discipline: Engineering

Authors:

#1 Boluwatife Efunkoya

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Abstract Name: Enhancing Microneedle Drug Delivery Efficiency Through the Inclusion of Microchannels: A 3D-Printed Design Approach

Efficient and precise drug delivery is crucial for improving treatment outcomes in skin cancer and other localized therapies. Traditional methods often face challenges like imprecise dosing, uneven distribution, and patient discomfort. Advances in 3D printing offer a transformative solution, enabling intricate drug delivery system designs with precise control over features like size and geometry. Microneedle arrays have demonstrated success in drug delivery, but there is still a lack of data on how design modifications impact the efficiency and distribution of therapeutic agents. This study investigates the feasibility of 3D-printed microneedle array designs with integrated microchannels. By evaluating the fidelity of these designs and analyzing their impact on factors like release speed and drug mass loss, we aim to reveal how variations in features such as channel curvature and surface area affect drug uptake, release, and diffusivity. Microneedle array-based devices were fabricated using high-resolution stereolithography. Twelve designs were compared based on characteristics like connectivity and channel tortuosity. Drug delivery performance was tested in an in vitro model to validate administration efficiency. We hypothesize that the addition of microchannels and feature variations will improve drug release rates. However, we recognize that these features may introduce challenges, like unintended drug loss. Expected results will provide insights into whether microchannel incorporation optimizes localized drug delivery while identifying strategies to address any potential

drawbacks, offering a pathway for improvement. This study will help improve microneedle-based drug delivery systems for targeted medical treatments. Through design changes, we hope to improve the effectiveness and usability of the microneedle-based platforms. Furthermore, the study highlights 3D printing as a precise manufacturing method capable of producing intricate microfeatures, enabling complex designs that are otherwise difficult to achieve with traditional manufacturing methods.

Elizabeth Tillman

GA - Kennesaw State University

Discipline: Interdisciplinary

Authors:

Abstract Name: Weaponizing motherhood to further fascism: the Nazi party and modern far-right in Germany

This presentation analyzes propaganda from the National Socialist German Workers party (NSDAP), known as the Nazi party. Visual propaganda also is analyzed from the Alternative für Deutschland party (AfD). Specially, the purpose of this research is to compare the depictions of motherhood in the propaganda and how that further the beliefs of both parties. For this presentation, 25 resources were studied – which includes written articles and published propaganda from both parties. However, none of the resources focus on motherhood in propaganda, which this research does. The propaganda published by the NSDAP comes from illustrations in the party's magazine and mostly from the late 1930s. The propaganda for the modern far right AfD comes from campaign posters from the 2017 parliament election in Germany. To compare the propaganda, similar propaganda from both parties will be placed and compared visually. When looking at the illustrations published by the NSDAP, which was mostly viewed by members of the party, there is a specific picture of family. Every example of NSDAP propaganda depicts a healthy looking all white family with a mother and father. This is because of the Nazi belief that there should be one white German race. Also, the researched articles state motherhood was the highest role for women in Nazi Germany. The campaign posters published by the AfD, which in public have the same physical image of family as the NSDAP. Also, the AfD is known for having a fear of Germany becoming "more Muslim". This demonstrates how both parties fear demographic change which is rooted in white supremacy. This presentation argues that when looking at propaganda, motherhood is important concept to look for, this can be demonstrated by the Nazi party and AfD having similar depictions of motherhood to further white nationalism by valuing the childbearing of white women.

Jordan Timbeross

WI - University of Wisconsin-Madison

Discipline: Biology

Authors:

#1 Ei Terasawa

Abstract Name: Effects of Opioid Antagonist, Naloxone, on GnRH Release in Prepubertal and Pubertal Monkeys

Gonadotropin-releasing hormone (GnRH) in the hypothalamus plays a crucial role in reproductive function by regulating the release of luteinizing hormone (LH) and follicle-stimulating hormone (FSH) from the anterior pituitary gland. In adult animals, the removal of the gonads (gonadectomy) leads to an increase in GnRH, LH, and FSH, as gonadal steroid hormones suppress the release of these hormones. However, in

prepubertal animals which are known to have the capability of GnRH, LH, and FSH release, gonadectomy does not cause an increase in GnRH, LH, and FSH release. This suggests the presence of an inhibitory mechanism in the hypothalamus at the prepubertal stage of animals. In the study, we investigated the possible role of opioid neurons in regulation of GnRH release during the prepubertal period by performing in vivo microdialysis experiments. To block the activity of opioid neurons, we infused naloxone, an opioid antagonist, at 10nM concentration, to the median eminence of the hypothalamus every 3 hours, while microdialysates were continuously collected for 12 hours at 20 minute intervals. GnRH levels in microdialysate samples were measured by radioimmunoassay. Results indicated that the prepubertal monkeys had a baseline level of 2.5 ± 1.6 pg/mL (Mean $\pm$ SEM, n=4) GnRH concentration, significantly increased to 8.0 ± 3.1 pg/mL after naloxone infusion ($p < 0.05$), and returning to 2.1 ± 1.2 pg/mL during recovery after challenge. In contrast, the pubertal primates had baseline levels of 7.3 ± 3.3 pg/mL (n=7) GnRH concentration, decreased to 5.8 ± 2.3 pg/mL after naloxone, and then returned to 4.2 ± 1.9 pg/mL during recovery. These results indicate naloxone significantly stimulated GnRH release in prepubertal monkeys, but not in pubertal monkeys, suggesting that opioid neurotransmitters may contribute to the suppression of GnRH release before puberty.

Tecora Tisdale

PA - Duquesne University

Discipline: Biology

Authors:

#1 Michael Jensen-Seaman

Abstract Name: A polymorphic dinucleotide repeat in the human relaxin (RLN2) promoter affects transcription levels in vitro

One in ten infants born in the United States is affected by preterm birth, which is also the leading cause of infant mortality and morbidity worldwide. Several factors contribute to susceptibility, but higher levels of the relaxin peptide hormone later in pregnancy may contribute to the premature rupture of the membrane that occurs prior to preterm birth. Relaxin's primary function is to loosen ligaments in the pelvis and soften cervical tissue in preparation for labor. Previous studies identified an association between alleles at a single nucleotide polymorphism in the promoter region of the relaxin gene (RLN2) and serum levels of relaxin. We hypothesize that variation in the length/composition of a (CT) n (GT) m compound microsatellite within the RLN2 promoter will affect levels of relaxin. To test our hypothesis, we amplified the ~1kb upstream promoter region from four different genotyped human DNA samples, ligated the products into a luciferase reporter vector, and transfected them into a human placental cell line and an ovarian cell line to quantify transcription in vitro. DNA sequencing confirmed the promoter alleles contained 23, 28, 33, and 36 dinucleotide repeat units. Additional controls included a promoterless luciferase reporter vector and the RLN2 promoter with the dinucleotide repeats excised by site-directed mutagenesis. Luciferase reporter assays indicated that all human alleles drove transcription greater than the promoterless control. One-way ANOVA testing identified significant differences in transcription levels among human alleles, with the 33-repeat allele consistently showing the lowest expression levels in both cell lines. These results will be discussed in light of human genetic variation at RLN2 and susceptibility to preterm birth.

Andrew Tiu

WV - West Liberty University

Discipline: Biology

Authors:

#1 Jacob Feldmann
#2 Aminata Coulibaly
#3 Farrah McGinnis
#4 Nurullah Sati
#5 Clara Woods

Abstract Name: Modulating Neutrophil JAK/STAT Pathways: Impacts on Brain Anatomy in a 3xTg Alzheimer's Disease Model

Alzheimer's disease (AD) is a progressive neurodegenerative disorder affecting approximately seven million Americans. It is marked by hyperphosphorylated-Tau, amyloid-beta aggregation, and cognitive decline. As the disease progresses, changes are observed in the brain, including brain volume, cortical thickness reduction, and ventricular enlargement. Recent evidence has implicated the role of the peripheral immune system in AD pathology. Neutrophils are the most abundant peripheral immune cell. In this project, various studies show that neutrophils infiltration in AD leads to poor cognitive performance. In our lab, we are interested in understanding how neutrophil activity and recruitment, through JAK/STAT activation, contribute to this pathology. Our preliminary data show that JAK2 activation plays a role in neutrophil migration. Therefore, we hypothesize that changing JAK2 activity, upregulation and downregulation, in neutrophils will change (increase and decrease, respectively) brain morphological changes associated with AD pathology. To test this hypothesis, we generated AD mice with overactive JAK2 or non-functional STAT3 (intracellular effector of JAK2) in neutrophils. Monthly whole brain, cortex, and ventricle volume were assessed using a small animal MRI. Preliminary findings show that JAK2 overactivation in neutrophils alters brain anatomy in a sex-specific manner. AD female mice with either overactive JAK2 or deficient STAT3 neutrophils maintain their whole brain volumes through disease progression. Specifically, volumes stay similar to wildtype controls and never decrease as observed in AD controls. These results suggest neutrophil activation, through JAK2 signaling, influences AD pathology in a sex-dependent manner.

Kaitlin To

CA - University of California - Irvine

Discipline: Biology

Authors:

Abstract Name: Effects of Tributyltin Exposure on Expression of Insulin-Degrading Enzyme and Amyloid Precursor Protein in a Transgenerational Mouse Model

Type 2 diabetes, which is linked to a downregulation in insulin-degrading enzyme (Ide), and Alzheimer's disease, which is characterized by increased expression of amyloid precursor protein (App) in the brain, have increased significantly over the last few decades and have become some of the most salient diseases worldwide. This project attempts to answer the question "Is there an association between TBT exposure and expression of Ide and amyloid precursor protein?", by first assessing beta-amyloid plaque formation in the brains of transgenerational mice with chronically decreased levels of Ide in their livers due to long-term consumption of a high-fat diet. The brains of these transgenerational mice were stained with an anti-amyloid beta antibody and with Thioflavin S to visualize amyloid beta plaques, both of which resulted in no visible signal. qPCR was performed on these brains and showed no significance in gene expression of Ide between male control and TBT mice as well as an increase in App expression in TBT mice. There was no significant difference in Ide or App between female DMSO and female TBT mice or for App in male mice between diet conditions. This project suggests that TBT exposure is associated with the upregulation of App in the brains of transgenerationally exposed mice, although a possible mechanism for this upregulation, downregulation of Ide, cannot be argued.

Emalynn Tobias

FL - Nova Southeastern University

Discipline: Biochemistry

Authors:

#1 Emalynn Tobias

#2 Michael Egozi

#3 Jenna Handal

#4 Paul Lup

#5 Navi Gill Dhillon

Abstract Name: Conserved domains in promoters of differentially expressed genes: How to find them and what can they tell us?

The complex process of regulating gene expression involves a large number of cis- and trans-acting components. The cis elements also referred to as cis regulatory elements (CREs) are highly conserved across species, and are often referred to as conserved domains mainly located in the promoters of genes. The trans acting sequences such as enhancers, moderators and insulators are also crucial in the regulation of gene expression. With an increased influx of genomic and transcriptomic data, study of differentially expressed genes (DEGs) is highly effective in understanding genes that are either up- or down-regulated in response to a given treatment or stress condition as compared to the controls. In this case, a key step in understanding gene regulation involves identification of CREs in promoters of differentially expressed genes (DEGs) and examine shared patterns among those genes. In this paper, we will discuss the use of probing promoter regions of DEGs for conserved domains and their use in regulation of gene expression.

Emalynn Tobias

FL - Nova Southeastern University

Discipline: Biochemistry

Authors:

#1 Jenna Handal

#2 Emalynn Tobias

#3 Navi Gill-Dhillon

#4 Andy Pereira

Abstract Name: Identification of Regulatory Roles for Stress Responsive Transposable Elements in Rice

Transposable elements (TEs) are widely known for their structural and functional roles in the rice genome. They can be activated in response to various biotic and abiotic stresses. As the global temperatures rise, heat stress threatens crop production worldwide by affecting grain quality and yield. Concern for food security amidst a growing population warrants development of novel methods to study regulation of gene expression in response to heat stress. Two japonica rice varieties, Cypress and LaGrue, perform well and poorly, respectively, under high night temperatures (HNT) based on their ability to withstand heat stress during growth and development. Using these contrasting genotypes and their varied response to HNT conditions, we designed this study with an objective to understand how transcriptionally active TEs affect gene expression. Total RNA was sequenced from caryopsis tissues at R6 stage under HNT ($82.4 \pm 1^\circ\text{F}$) and control ($72 \pm 1^\circ\text{F}$) conditions. The data was analyzed to identify Differentially Expressed Transposable Elements (DETs) at $\log_2\text{FC} \geq 1$ and $\text{padj} \leq 0.05$. We identified 139 transposons that are differentially expressed (up- or down-regulated) between the HNT and control conditions in Cypress and LaGrue, of which 77 were differentially expressed in a Genotype x Environment manner, suggesting a genotype-dependent response to

stress. Additionally, we identified 91 GaTEs (Genes Associated with Transposable Elements) based on their genomic locations. A comprehensive genomic analysis is underway to determine the regulatory roles of DETs in gene function, and to explore the epigenetic regulation of TEs and its effect on neighboring genes.

Emalynn Tobias

FL - Nova Southeastern University

Discipline: Biology

Authors:

#1 Jenna Handal

#2 Emalynn Tobias

Abstract Name: Domain knowledge synthesis for AI-based predictive modeling in rice cultivation

As the population increases and global temperatures are on the rise, farmers are facing an agricultural crisis. It is, therefore, critical that today's agricultural practices are efficient, reliable, and sustainable. Rice, the foundation of the international diet, is negatively impacted by heat stress resulting in poor grain quality and declined yield. Research has pointed to Artificial Intelligence (AI) as a plausible solution to lessen the threat of food insecurity by implementing AI-based predictive modeling in the cultivation of rice. Precision Agriculture is the practice of agriculture using AI such as automation and predictive analytics to increase crop production and facilitate disease detection and diagnostics. This study compiles and curates a comprehensive and exhaustive list of features that will synthesize domain knowledge to facilitate predictive model development. These features include but are not limited to the availability of heterogeneous datasets such as phenotypic and genotypic data, data on agronomic practices, multi-omics data integration, epigenetic modifications, regulatory elements, Gene Regulatory Networks (GRNs) etc. This will help in feature engineering, data transformation and guide questions on the cost-benefit assessment of each added feature, with the objective to develop predictive algorithms with enhanced accuracy and applicability in agriculture. Additionally, AI coupled with the state-of-the-art genomics and sequencing technologies enables a well-informed choice of algorithm for predictive modeling of agricultural data. This allows the models to make informed and effective decisions about agricultural processes, such as gene regulation, yield prediction, forecasting of pest infestation, irrigation needs, and disease detection.

Olivia Tobin

MN - Hamline University

Discipline: Exercise Science and Nutrition

Authors:

#1 Laurel Raymond

#2 Divya Bhaskaran

Abstract Name: Determining the Effects of Ankle Fatigue on Gymnasts with Varying Levels of Chronic Ankle Instability

Ankle sprains in gymnasts are an extremely common injury, given the extreme load placed on them during various movements. Up to seventy percent of gymnasts who have experienced prior ankle sprains have developed chronic ankle instability (CAI). The objective of this study was to assess how gymnasts with varying levels of CAI react to fatigue. The study participants consisted of fifteen female Division III gymnasts at Hamline University in St. Paul, Minnesota. Participants engaged in an ankle fatigue protocol that

involved multiple rounds of running, shuffling, lateral hopping and landing from various heights. Fatigue responses were evaluated through the use of electromyography (EMG) sensors on the medial gastrocnemius, peroneal longus, and tibialis anterior muscles. Center of pressure (COP) measurements were assessed through the use of a force plate. Pre and Post fatigue tests were conducted that included single leg hopping and landing. CAI was self-reported using the Cumberland Ankle Instability Tool (CAIT). Results: Single leg hopping and drop landing produced significantly lower muscle activation in all three tested muscles post-fatigue. Postural sway, measured by COP area, significantly increased post fatigue. Participants with higher levels of CAI had higher activation of peroneal longus during pre-fatigue single leg hopping. These findings demonstrate a relationship between CAI and gymnast's muscle activation. We also observed that gymnasts responded to fatigue with lower muscle activation. Findings from this study can help inform and design gymnast-specific ankle rehabilitation protocols.

Ana Tobón Vélez

COL - EAFIT University

Discipline: English and Literature

Authors:

- #1 Matilda Lara Viana
- #2 Estefania Roncancio
- #3 Estefanía Cardona
- #4 Gladys Perea Lemos
- #5 Alejandra Gonzalez

Abstract Name: Imaginaries of Happiness in Medellín: Distant Reading of 65,000 Short Stories About the Aburrá Valley

This research aims to identify, using tools from the digital humanities, the social imaginaries of happiness and unhappiness present in the short stories submitted to the Medellín en 100 Palabras contest between 2018 and 2023. The corpus consists of approximately 65,000 micro-stories focused on life in the Metropolitan Area of the Aburrá Valley. Given the size of the dataset, this study will employ distant reading methods and tools, such as Orange Data Mining, to extract, analyze, and interpret the statistically significant literary representations of the region's inhabitants regarding the good life and its opposites. The research seeks to address questions such as: Which themes are associated to positive and negative experiences? Which places are connected to fortune and misfortune? What differences can be observed in the representations across different age groups? These social imaginaries offer a way to understand the subjective universe of individuals and provide insights into society as a whole. Beyond their value as new knowledge, this information can be operationalized to support a wide range of initiatives (political, cultural, pedagogical, etc.) aimed at promoting collective well-being. As outcomes, we will develop a protocol for tracing social imaginaries in literary databases, a scientific paper where we will present our theoretical and methodological findings, and a series of digital visualizations designed to communicate the results in different scenarios.

Elizabeth Toflinski

NC - Wingate University

Discipline: Biochemistry

Authors:

- #1 Brett Schofield
- Andrea Urrutia

Abstract Name: Discovery of a Functional Nuclear Localization Sequence in the N-Terminus of Satb2

All cells possess the ability to regulate their genes. Eukaryotic cells do so in a number of ways including the reorganization of their DNA into regions of hetero- and euchromatin. Heterochromatin is tightly condensed and contains silent genes, while euchromatin is loosely arranged and contains active genes. These structures are created by chromatin architectural proteins such as Satb2, which plays an essential role in osteogenesis by activating the RUNX2 transcription factor gene. Mutation of Satb2 can lead to Satb2-associated syndrome, which is characterized by craniofacial bone defects in humans. Satb2 is located in the nucleus, and the protein contains a predicted Nuclear Localization Sequence between amino acids 613-616. However, the functionality of this region has not been tested. Here, we use truncation analysis and fluorescence microscopy to demonstrate that this region is not functional. Instead, we show that the N-terminus of Satb2 is necessary for nuclear import, and amino acids 21-40 are sufficient to direct the nuclear import of cytoplasmic cargo proteins.

Abigail Toledo Gallardo

NY - Brooklyn College

Discipline: Psychology

Authors:

#1 Hyun Hannah Nam

Abstract Name: Framing the Narrative: Analysis of How Intersectional Impacts of Racialized Language Affects Downstream Attitudes and Healthcare Inequities

Socio-political narratives play a critical role in the American healthcare system, both in determining who has the ability to access care and how it is delivered. Awareness of the ongoing issues affecting various minority communities across New York City highlights the interplay of social, economic, and environmental injustices, alongside disparities in accessible healthcare. These intersecting elements shape the lives of many, forcing them to navigate inequitable systemic barriers that restrict accessibility to essential quality care and resources. The language used in healthcare discourse, specifically in racial or genetic narratives, influences the perception of women and minority groups, leading to institutionalized inequalities that may contribute to profound physical and psychological consequences. In NYC, these narratives fuel distrust in healthcare professionals and worsen health outcomes for marginalized populations, addressing these issues is crucial in fostering equity in healthcare and enhancing community well-being. My project investigates how the framing of language and racialized narratives shape downstream attitudes, perpetuating systemic inequities in healthcare accessibility and patient outcomes. With a particular focus on the experiences of women of color, the study aims to understand how the dissemination of racialized narratives exacerbates biases in healthcare and medical language used in institutions. To examine these dynamics, this research will draw on narratives rooted in historical perceptions of race and gender, media representations, and statistical findings from psychological experimental surveys. By analyzing how such language plays a critical role in the psychological and physical health of minority women, this research will analyze the impact of these biases in the perception and treatment of women of color in clinical settings. This biased framing of language, reinforced by the media and medical education, contributes to both physical and psychological harm, as it often leads to the dehumanization or dismissal of minority patients' concerns.

Evan Toler

AL - University of Alabama at Birmingham

Discipline: Biochemistry

Authors:
#1 Michael Russell

Abstract Name: Observing effects in longer lived worms when supplemented with serine

Serine, a non-essential amino acid, plays critical roles in cellular metabolism, protein synthesis, and stress response. Deficiency in serine can impair various physiological processes, including cellular function, growth, reproduction, and sensory nerve functions. Previous studies have shown that serine supplementation promotes longevity, but little is known if this same effect is observed in long lived models. Using aging models provide information related to genes and pathways that could help organisms delay disease progression or atrophy. To determine if serine supplementation during adulthood affects lifespan in other long lived models we, and physiology, we used the nematode model *Caenorhabditis elegans* (*C. elegans*) *daf-2* mutant to determine the effects (Kenyon et al 1993). This model is also used to study insulin signaling which is critical to the normal development, and homeostasis of animals. Wild-type and the long-lived model *daf-2* were supplemented with various concentrations of serine (0mM, 1mM, 10mM, and 15mM), which were incorporated into nematode growth media. Lifespan analysis revealed a dose-dependent effect, with higher concentrations of serine significantly extending mean and maximum lifespans. Other assays were used as well to measure physiological aspects of the worm via (egg-laying, locomotion, and muscle strength). This extension is likely attributed to serine's involvement in metabolic pathways, including protein synthesis and cellular repair, which help mitigate oxidative stress and support cellular homeostasis. These findings suggest that serine modulates metabolic pathways, offering insight into its potential as a dietary intervention for aging and health maintenance in *C. elegans*. Further investigations may clarify conserved mechanisms of serine's role in longevity and reproduction across species.

David Tolman

CA - Los Angeles City College

Discipline: Psychology

Authors:
#1 David Tolman

Abstract Name: Visualizing Futures: Aphantasia and Vocational Outcomes

Aphantasia, or the inability to form mental images, has primarily been studied for its effects on perception, memory, and cognition. Aside from a study at the University of Exeter, the impact of sensory imagery on educational and career pathways, particularly in fields that rely heavily on visual imagery, remains largely unexplored. This study investigates the likelihood of individuals with aphantasia pursuing degrees in visual arts disciplines such as architecture and design. Using convenience sampling, the study assessed 329 students from five fields (architecture, design, music, STEM, and humanities) with the Vividness of Visual Imagery Questionnaire (VVIQ). Participants were categorized into one of three groups based on their total score: aphantasic, low-intermediate visual imagery, or high-intermediate visual imagery. Among 127 architecture students, 1 reported aphantasia and 7 exhibited low-intermediate imagery. None of the 10 design students reported aphantasia or reduced vividness. Of 64 music students, 1 reported aphantasia and 4 had low-intermediate vividness. Among 95 STEM students, 6 exhibited aphantasia and 14 showed low-intermediate vividness. Of 33 humanities students, 1 experienced aphantasia and 5 had low-intermediate vividness. Chi-square analysis revealed significant underrepresentation of aphantasic students in visual arts fields (architecture and design) compared to non-visual fields, $\chi^2 (1, N = 329) = 7.17, p = 0.007$. Further, a one-way ANOVA revealed a significant difference in VVIQ scores based on degree choice (visual vs. non-visual), $F(1,327) = 23.75, p \leq 0.001$. These findings suggest that differences in mental imagery capabilities influence career choices, with students lacking strong visual imagery more likely to gravitate toward non-visual disciplines. This research contributes to our understanding of how differences in visual imagery ability

shape educational and professional pathways and warrants further study. With a deeper understanding of how sensory imagery shapes our decisions, we may better establish its role in human development, creativity, and perception.

Tatiana Tolson

OH - Walsh University

Discipline: Chemistry

Authors:

#1 Amy Heston

#2 Neil Walsh

Abstract Name: Assessment of Student Achievement in Chemistry: Driving Academic Innovation Through Quality Matters Implementation

In an effort toward continuous improvement of the chemistry program, this research project focused on the assessment of student achievement in Principles of Chemistry I Laboratory (CHEM 101L). The selected Program Student Learning Outcomes (PSLOs) were using critical thinking to solve problems and demonstrating knowledge in core laboratory skills. Student achievement was evaluated for two labs: Sodium on a Pretzel and Volumetric Analysis of Vinegar. Assessment data, based on a 3-point scale, indicated that students (N=47) were meeting or exceeding the standard of 2.0. A total of 376 artifacts were evaluated in this study and revealed the mean values for the pretzel lab (2.11) and vinegar lab (2.18). Results indicated that the majority of students were meeting or exceeding the standard (2.0-3.0) for explaining the processes of sodium analysis and titration techniques. Conversely, some responses showed that learners were not quite meeting the standard of 2.0. Some examples included chemical measurement, explaining the purpose of an indicator, and writing formulas. Therefore, a plan was created to enhance learning in these areas including adding new instructional materials into the lesson such as video content for visual learners. This content was analyzed for accuracy, effectiveness, and accessibility and then implemented into the course in alignment with Quality Matters (QM) standards. These efforts will enhance the learning experience for future CHEM 101L students. Furthermore, this project allowed for student partnership in chemistry assessment and connected to the institution's mission by developing student leadership as the first student to pioneer QM initiatives. Another unique result of this project was student leadership in quality assurance, an institutional strategic goal for ensuring the quality of program offerings.

Edward Tomlinson

VA - James Madison University

Discipline: History

Authors:

#1 Edward Tomlinson

Abstract Name: Julius Caesar and His Exploitation of Britain: Research Concerning the Accuracy of Caesar's View of Britain in the 50s B.C.E.

My research explores the extent to which Julius Caesar's written account in the Gallic Wars accurately observed Britain during his invasions of 55 and 54 B.C.E. In addition to his primary text, I observe modern secondary sources by experts on Romano-British history and archaeological records to observe the validity of Caesar's depiction of Britain, both the events that occurred and customs of local tribes. My exploration of this

time period also accounts for Caesar's dynamic aspiration to attain absolute power in Rome as the Roman Republic decayed. Furthermore, my analysis concludes that the narrative Caesar presented established his status as a Roman conqueror to enforce a vision of dominance in Rome by distorting the Roman perspective of the Britons. The propagandistic narrative Caesar told emphasized the military triumphs he won over foreign peoples. However, despite their importance, his invasions of Britain are rarely observed as important factors in his quest for dictatorial authority, ignoring both the events and legacy of such ambition instead for developments in Rome. Events on mainland Europe are thought to be more significant and contributing to Caesar's ascension to doctoral rule. The contemporary mythical status of Britain and Caesar's ambition are both just as significant as Roman affairs in continental Europe. As I argue, the depiction of Caesar in his invasions of Britain greatly contributed to his later legacy and influence. Through my historical analysis, Caesar's perspective of Britain can be emphasized within the larger historical context of this transformative era.

Lane Tompkins

NC - University of North Carolina at Wilmington

Discipline: Biology

Authors:

#1 Lane Tompkins

Abstract Name: Laser-Targeted Bacterial Inhibition: Exploring Light-Based Therapies for Acne Management

This study explores the potential of light-based therapies to inhibit bacterial growth, with potential implications in acne treatment. Laser treatments are widely recognized for their ability to promote cellular turnover and reduce sebum production, both of which assist in acne management. This research aimed to directly examine the effects of various laser therapies on bacterial colonies. The experiment focused on two bacterial species, *Serratia marcescens* (Sma), Gram-negative, and *Kocuria rhizophila* (Krh), Gram-positive. Cultures (~70 CFU) were suspended on membranes and treated using three laser types. The PiQo laser, wavelengths of 1064 nm and 532 nm, is a picosecond laser used for pigment correction and resurfacing. The Vbeam laser, at 595 nm, is a pulse dye laser designed for vascular lesions. Lastly, the CO2 laser, at 10,600 nm, is an ablative laser known for its resurfacing capabilities. Following laser application, samples were incubated, and colony numbers were quantified and compared to untreated controls. The study determined these laser therapies could effectively reduce bacterial growth and may have the same potential in skin layers where bacteria thrive. This preliminary research provides insight into the direct effects of lasers on bacteria, laying the groundwork for future acne treatment innovations.

Andrea Torres

FL - Miami Dade College

Discipline: Physics and Astronomy

Authors:

#1 Andrea Torres

#2 Adolfo L. Mendez

Abstract Name: Sudden reductions and pulsations in solar radio emission: May 11th, 2001, major flare

Radio emission from solar flares offer a powerful diagnostic tool to address long-standing questions about different energy storage and release mechanisms, plasma heating, particle acceleration, and particle transport

in magnetized plasmas as well as a physical picture of the associated active region at different levels of the solar atmosphere. The present work describes the radio emission associated with the May 11th, 2001, major flare at 237 MHz. The data was recorded with the solar radio polarimeter at the Basovizza Observing Station-Trieste Astronomical Observatory. Specifically, we analyze the evolution of radio emission during its maximum stage. Contrary to expectations, this major event appears to have no other counterparts associated with it, which is unusual for an event of such magnitude. Some possible generating mechanisms are discussed.

Cheyenne Torres

WV - West Virginia University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Children's Toys and the Idea of a Women

Historically children's toys have been the main targets for lining up with specific gender roles children eventually grow to uphold. When young girls are told that they need to play with dolls and kitchen sets because it's "what a girl does," it gives them a narrow idea of what choices they have in life, leading them to feel stuck in an endless cycle. This enforced stigma has allowed for the strict gender roles to continue to be confirmed through media advertisements that tell young kids "This is what you're meant to be." The purpose of my study is to see if children's toys and the idea of what it means to be a woman are in fact, correlated. To achieve this answer, some important questions that I came up with were, how does advertising on packaging differ between toys for girls, boys, and gender neutral? What are some of the words being put on these packages? How are the aisles labeled in toy store layouts? What types of toys are in each section? Finally these all go to answering the important question of, what do the toys promote? My goal is to show that the kinds of products being put on display will affect children's cognitive habits. After figuring out those habits and creating tables of data, it led me to the conclusion that the traditional idea of what a women's role should be is not dead, even in 2024, and children are picking up what that means for them.

Isha Touray

WI - University of Wisconsin-Madison

Discipline: Health and Human Development

Authors:

#1 Anthony Garcia-Prats

Fatima Badjo

Abstract Name: Health Literacy and Its Influence on Healthcare Access and Medication Adherence in African Children and Caregivers

Under-5 mortality remains high in many resource-limited settings, with an estimated 4.9 million deaths among children under five in 2022 alone, many of which are preventable; one contributing factor is suboptimal health literacy in many continents, and Africa is no different. Health literacy may be especially problematic for children who are more vulnerable and often require more complex drug treatments while having to rely on their parents to get the care they need. Our research focuses on health literacy, including medication literacy for children under the age of 15 and their caregivers, exploring impacts on health care access, treatment adherence, and health outcomes. We will undertake a scoping review to identify currently

available evidence on how health literacy, including medication literacy, affects children under 15 years and their caregivers in Africa, including the impact on healthcare access, medication adherence, and health outcomes. Through this systematic assessment of the literature on health and medication literacy among African children and their caregivers, we will identify critical evidence gaps that can be addressed in future research. We aim to bring attention to the importance of health and medication literacy to improve the health and well-being of children in Africa.

Luke Toussaint

WI - University of Wisconsin-Whitewater

Discipline: Biology

Authors:

Abstract Name: Coyote and red fox competition in a southeastern Wisconsin forest

Food web complexity and stability in an ecosystem is determined by various factors, including the number of predators and their interactions. Coyotes (*Canis latrans*) and red foxes (*Vulpes vulpes*) are two prominent and key predators of many North American forests. We will test if there is resource partitioning or competition occurring between coyotes and red foxes by combining fieldwork and previous data from the University of Wisconsin-Whitewater's Nature Preserve. We will set out 10 trail cameras to collect data for 2024 in the Nature Preserve and use five previous years of data from this area to assess resource partitioning by comparing the proportion and timing of fox and coyote sightings each year. Our expected results are that there will be fewer fox captures in areas and years where there are more coyote captures, because of their size difference. This information will give us insight into the types of communities present in the Nature Preserve and help us make decisions about its management.

Perla Tovar

TX - Stephen F. Austin State University

Discipline: Biochemistry

Authors:

#1 Nkeiruka Aziekwu

#2 Grace Murray

#3 Tess Corbett

#4 Bidisha Sengupta

Abstract Name: Influence of Phytochemicals Present in Mint Extract in Preventing Oxidative Stress in Human Serum Albumin

Human beings are continuously exposed to harmful pollutants which can be damaging in absence of antioxidants. Phytochemicals are plant products which are known to have antioxidant properties by reducing oxidative stress in the physiological system. They have important therapeutic applications against a wide spectrum of diseases including cancer, neurodegenerative disorders, cardiovascular disease, hypertension and diabetes. In this study, the antioxidant effects of phytochemicals found in *Mentha piperita* (mint) were examined on human serum albumin (HSA) protein before and after inducing oxidative stress with damaging hydroxyl radicals. HSA is the primary natural carrier of drugs in the human body, transporting various medications throughout the bloodstream due to its high abundance in plasma and ability to bind to a wide range of molecules including drugs. Phytochemicals from mint leaves were extracted in water and ethanol

solvents. High-performance liquid chromatography (HPLC) on mint extracts indicated presence of various phytochemicals which belong to mostly plant flavonoid and phenolic acid families. Native HSA protein under oxidative stress displayed significant structural damage as observed in the studies conducted by UV-Vis, fluorescence, circular dichroism (CD) spectroscopy, HPLC and SDS polyacrylamide gel electrophoresis. In the presence of mint extracts and under similar oxidative stress conditions, however, the protein retained its native structural conformation to a significant extent. Comparable effects but to a lesser extent were also observed when the protein was bound with the individual flavonoids and phenolic acids. Molecular docking studies using AutoDock Vina indicated the binding sites of the flavonoids and phenolic acids in the protein HSA to be close to the single tryptophan 214 amino acid. Our ongoing studies include exploration of the synergistic effects of *Mentha piperita* extract with flavonoids and phenolic acids against oxidative stress in HSA using both experimental and computational approaches.

Marisha Towner

GA - Fort Valley State University

Discipline: Environmental Science and Sustainability

Authors:

#1 Marisha Towner

Abstract Name: Evaluating Growth Responses and Nutrient Sufficiency Ranges in Lettuce Cultivators

This research was conducted to determine the growth rate and nutrient sufficiency ranges of three lettuce (*Lactuca sativa* L.) cultivars. The main goal is to determine the target concentration and mixture of minerals and fertilizers needed to maximize absorption, growth, and production with the least impact on the surrounding environment. This information will also be used to generate a SAP report. SAP reports are vital for future time management, product selection, treatments and adjustments, and management. The Random Complete Block Design (RCBD) was used to control variation and reduce biases in results. In the (RCBD), each treatment must occur in every block to obtain reliable results. In this design: we placed three rows of nine trays each, nine plants in each tray, eighty-one plants in each row with a total number of 243 plants. Twenty-seven units of nitrogen were applied in three different concentrations (50, 100, and 200 mg/L). The pH was kept between 5.5 and 6.5, and pH and Electrical Current (EC) was recorded three times a week. After harvesting; measured parameters including leaf area, fresh and dry weight, leaf count, chlorophyll, light absorption, and anthocyanin count were recorded for analysis. Two-way ANOVA indicated significant cultivar effects on leaf area ($p=0.0375$) and anthocyanin content ($p<0.001$), with no significant impact from fertilizer concentration. Turkey's HSD test identified significant leaf area differences between Chicarita and Cherokee, and anthocyanin content differences among all cultivars. These findings highlight the importance of cultivator selection in the optimization of lettuce growth. Based on the data analysis, the maximum absorption, usage, and production target was achieved at 140-150 mg/L of nitrogen.

Shade Townsend

GA - Clark Atlanta University

Discipline: Psychology

Authors:

#1 ShaDé Townsend

Abstract Name: Ready For Success? Exploring the Academic Preparedness of First Year HBCU Students

This quantitative study examines the academic preparedness of first-year students at historically Black colleges and universities (HBCUs), focusing on whether they feel equipped with the skills necessary for college success. Academic preparedness is defined as possessing foundational skills, such as writing, time management, and mathematics, critical for higher education. The research seeks to answer: What do HBCU second-semester students report about their academic preparation for college? Prior studies highlight that many HBCU students feel underprepared due to deficiencies in essential academic skills, often stemming from inadequate high school preparation and systemic inequities (Lamidi et al., 2019; Harper et al., 2020). Challenges in writing, critical thinking, and time management are frequently reported, with effective support programs shown to improve outcomes (Gearns et al., 2022). This study aims to gather direct feedback on students' perceptions of preparedness and the impact of high school and first-year programs on their college readiness. Participants will include 100 male and female first-year students, aged 18-20, from Clark Atlanta University. Data will be collected through a 38-question survey combining scales for Academic Support, College Readiness, Academic Self-Efficacy, and Growth Mindset. The survey includes yes/no questions (e.g., "Do you have a system for taking notes?") and open-ended responses (e.g., "What academic task gives you the most difficulty?"). Insights from this study will inform interventions to better support first-year HBCU students in developing essential academic skills.

Ellie Townsend

VA - Virginia Tech

Discipline: Psychology

Authors:

#1 Ellie Townsend

#2 Emily Gundel

#3 Alexandra Probst

#4 Phillip Cates

#5 E. Scott Geller

Abstract Name: Determinants of Gratitude Expression at Dining Facilities: A naturalistic behavioral observation study

Interpersonal gratitude refers to expressions of thankfulness and appreciation toward another person. Research has demonstrated that expressions of interpersonal gratitude increase the overall wellbeing of those who express and receive that gratitude. With advancements in technology over the past decade, the use of headphones has increased dramatically, leading to a decrease in interpersonal conversations. This decline in sociability could decrease instances when interpersonal gratitude is expressed, leading to an overall reduction in individual wellbeing and life satisfaction. This naturalistic field study of behavior was designed to observe the potential impact of headphone use on interpersonal expressions of gratitude. At two university dining facilities, trained research students systematically observed and recorded whether customers thanked their cashier when checking out, and whether the customer was wearing headphones. More specifically, the observers recorded whether the customer had none, one, or two headphones/earbuds covering/in their ears. The two specific Virginia Tech dining halls were chosen for data collection because they provided the opportunity for customers to express gratitude towards their cashiers. Frequencies of wearing no headphones (55% of 6,173 customers) on expressions of gratitude were substantially larger than the one headphone (8% of 6,173 customers) and two headphones (12% of 6,173 customers) conditions. This suggests that the use of headphones influenced fewer expressions of gratitude. The two different locations also revealed substantial differences in expressions of gratitude, suggesting the impact of environmental conditions on gratitude expression. At the first location, which is a "Student Center," 49% of 6,173 customers expressed gratitude, while at the second location, located on the academic side of campus, only 25% of 6,173 customers expressed gratitude when paying for their food. The low percentage of gratitude expression at the academic location was likely because customers, in a hurry, viewed it as an inconvenience to remove their headphones.

Vivian Trach

WI - University of Wisconsin-Madison

Discipline: Biology

Authors:

#1 Andrew Tak

#2 Rupa Sridharan

Abstract Name: Identifying Transposable Elements Across Different Ages and Cellular Reprogramming Timepoints

Aging is a fundamental biological process marked by increasing vulnerability to disease and declining physiological function. At the molecular level, this decline manifests through distinct cellular hallmarks. However, a groundbreaking discovery has shown that these aging markers can be reversed: when somatic cells are reprogrammed towards induced pluripotent stem cells (iPSCs) using specific transcription factors, they exhibit remarkable cellular rejuvenation. Through analysis of molecular markers, including γ H2AX and H3K9me2/3, we observed age-related changes in DNA damage response pathways and heterochromatin status. To investigate the complex causal role of reprogramming-mediated cellular rejuvenation, we performed single-cell multiome sequencing of mouse fibroblasts at various ages and reprogramming stages. We then utilized a computational pipeline to track the expression dynamics of transposable elements (TEs) and their neighboring genes. This study profiles aging-associated markers across multiple cellular ages, combining both molecular and computational approaches to evaluate their potential rejuvenation during cellular reprogramming to provide insights into the mechanisms of aging.

Whitney Tracy

VA - Virginia Military Institute

Discipline: Biology

Authors:

#1 Julie Lozier

#2 Mary Elizabeth Manjerovic

#3 Paul Moosman

Alyssa Cacace

Abstract Name: Presence of the Fungus that Causes White-nose Syndrome in Aboveground Rock Formations Used by Bats in Virginia.

North American bat populations are being impacted by the introduced disease white-nose syndrome (WNS), caused by the fungus *Pseudogymnoascus destructans* (Pd). The impacts of WNS have primarily been studied on bats hibernating in belowground sites such as caves and mines, where conditions are known to be suitable for Pd growth. We studied prevalence of Pd in aboveground rock formations used by Eastern Small-footed bats (*Myotis leibii*) and Big Brown Bats (*Eptesicus fuscus*) to investigate the potential role they play in the spread of WNS. We sampled for Pd genetic material in talus slopes and cliff formations used by bats in summer and winter, respectively. From 2020-2024, we sampled genetic material from surfaces of rock-roosts and nearby random crevices, guano found in roosts, and from bat skin surfaces. Presence of Pd DNA was assessed using Polymerase Chain Reaction followed by gel electrophoresis, with positive and negative controls. We detected Pd in roosts of both bat species including at cliffs used for overwintering and in talus used during summer. Pd was most prevalent in winter crevices, with 8.14% of cliff crevices testing positive. At talus slopes, Pd was detected in only 0.5% of crevices tested but was found in 6.4% of guano samples in summer. Our data suggests that aboveground rock formations could play a role in the spread of WNS. This

possibility is especially relevant in western North America, where many species of bats roost in rocks, and should be further investigated.

Abigail Trainor

WI - Carthage College

Discipline: Communications

Authors:

Abstract Name: The Power of Nostalgia: An Analysis of Companies Advertising Techniques to Maintain Customer Loyalty

Using the tool of nostalgia can be powerful and beneficial in building relationships with customers in Public Relations. Companies using nostalgic references in their advertisements attract both consistent and new customers. This can only be accomplished if a company can execute the nostalgic ad correctly by appealing to target audiences. The researcher frequently uses Chili's as the main example of achieving customer loyalty through nostalgia by appealing to older generations while at the same time recognizing Generation Z's particular needs. Social media can play a big role in creating the narrative of nostalgia for today's audiences. When companies are able to touch on emotions that a person is familiar with, they will comment, share it, like it, or save it. Posts that generate high engagement from all demographics of customers make marketing efforts successful, and nostalgia is an important tool used to make customers feel connected with that brand.

Trang Tran

WI - Beloit College

Discipline: Psychology

Authors:

Abstract Name: Humanizing AI: The Impact of Anthropomorphic Chatbots on User Experience in Hospitality

The development of advanced technology to improve users' experience across various industries saw the adoption of artificial intelligence (AI) and AI-based tools, such as chatbots. In customer service, particularly within the hospitality field, there has been a growing trend toward humanizing chatbots through anthropomorphic features. These anthropomorphic features include visual cues like avatars or appearances, as well as communication styles that implement gendered pronouns, personalized names, and message interactivity. In order to examine the impact of anthropomorphic chatbot features on customer perceptions and behavioral outcomes, a comprehensive literature review was conducted, including both empirical studies (both quantitative and qualitative) and theoretical groundwork. These studies mostly investigated restaurants, hotels, and retail context. Based on cross-cultural and global approaches, there were observations of positive impact from integrating anthropomorphic features in chatbots on users' behaviors. When being introduced to more human-like chatbots which had names, gender, pronouns or being interacted with in a more interactive and conversational way such as including small talk or emoticons, there were generally more positive perceptions from customers, regarding both psychological and behavioral outcomes. These positive responses were found in increased customer satisfaction, trust, loyalty, and likelihood of recommendation. In addition, this research highlighted customer demographics with a diverse range of studies on not only university students, millennials, but also older adults and even hospitality employees. Collectively, the studies' findings offered valuable insights into both the bright and dark sides of AI-based chatbots. As businesses increasingly adopt AI-based solutions, understanding factors that impact consumer behaviors could contribute to user-

centered approaches. These findings not only widen understanding of how chatbots function but also provide practical guidance for better chatbot designing in order to improve user experience over the long term.

Mia Trani

PA - Lafayette College

Discipline: English and Literature

Authors:

#1 Christopher Phillips

Abstract Name: Monolith: The Agency of Landscape in Literature

This research explores the concepts of agency and personification of nature in literature, arguing that these elements actively participate in narrative development and character interactions. By examining literary and artistic works from 1800 to the early 20th century, this study aims to highlight how nature and landscape influence human emotions, relationships, and decisions, asserting agency within their respective plots. The first chapter analyzes James Fenimore Cooper's *The Last of the Mohicans* and *The Deerslayer*, alongside Thomas Cole's artwork for *The Last of the Mohicans*. The section will explore how Cooper personifies the American wilderness as a powerful force, impacting the character's identities and moral choices, reflecting early American ideals and the complex relationship between settlers and indigenous landscapes. The second chapter will focus on German Romantic literature and Nathaniel Hawthorne's *The Scarlet Letter*. Human emotions and natural elements will be highlighted, showcasing how Romantic tradition personifies nature as a mirror to the human experience. Themes of guilt, the sublime, and redemption illustrate nature's role as an active participant in the character's journeys. The third chapter will explore Emily Dickinson's poetry and Henry David Thoreau's journals, emphasizing their intimate relationships with nature. This section will investigate how Dickinson's imagery and Thoreau's sketches personify the natural world, suggesting that these interactions demonstrate a deeper understanding of the self and existence. Finally, the fourth chapter will examine John Muir's Yosemite diary and Eadweard Muybridge's photography of Yosemite, analyzing how Muir's writings and Muybridge's visuals convey the grandeur and agency of the natural landscape, emphasizing environmental consciousness. Through these analyses, the project seeks to establish nature as an influential force within literary narratives, encouraging a reevaluation of human connections with the natural world.

Madyson Treharne

PA - Westminster College

Discipline: Film/Photography Studies

Authors:

Abstract Name: "Awesome Mix, Vol. 2 Cassette": A Study on Soundtrack Dissonance

The perfect film score has the unique capability to accompany an image and heighten the viewing experience, activating neural regions associated with pleasant emotional states. When synchronized and punctuated alongside the climax, tension, visual rhythm, leitmotifs, or on-screen action, the brain is able to combine the auditory and visual inputs of the film into a neurologically calming and satisfactory experience, but not a particularly memorable one. However, with the initiation of the 20th century, experimentation with contrapuntal music arose. This method of presenting music contrary to the mood of a scene proves as a psychological technique that inflicts upon audiences a type of mental shock- creating a more memorable and

infuriating dissonance between auditory and visual processing centers; therefore proving Eisenstein's "thesis-antithesis-synthesis" montage method as indeed more beneficial in terms of viewership recollection than simple coherent soundtracking.

Joselin Trejo

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: Rehabilitation Center for Girls Healing from Human Sex Trafficking

The purpose of this research is to regain the patient's psychological well-being and confidence after experiencing the dreadful and daunting consequences associated with human sex trafficking. The design of the rehabilitation center is intended to cater to the psychological needs of these young girls and women ages 12-22 who have experienced these types of traumas without causing more harm or making them feel uncomfortable through the use of natural elements to enhance and communicate the beauty and delicacy of a female. This facility will incorporate the appropriate safety, security, and healing measures and resources for every single girl and woman who steps into the rehabilitation center with the desperate need to heal and overcome their current unimaginable situation. Therefore, the rehabilitation center is intended to help these young girls and women regain a "sense of self" that they once had but was secretly ripped from them without their consent. Most importantly, it is imperative to conduct a thorough and rigorous evaluation of current rehabilitation facilities through literature review, case studies, interviews, and field study, working with human sex trafficking patients to ensure that they are executing their responsibilities with utmost efficiency, making necessary improvements, and augmenting their capacities. It is important to empower these girls and women with the essential tools and resources to successfully transition from living in a trapped mindset to transitioning back into the world without fear of the future. Therefore, the design of the rehabilitation center integrates natural elements, calming colors, and personalized spaces to promote healing and security for survivors of human sex trafficking. It includes therapeutic areas, community zones, and sustainable materials, focusing on cultural sensitivity and safety to empower residents and help them regain self-confidence.

Karina Trevino

OK - Southeastern Oklahoma State University

Discipline: Psychology

Authors:

#1 Amy N. Madewell

Abstract Name: Endurance through History: Examining Resilience and Grit

Historical trauma theory proposes that individuals belonging to minority populations that have endured systemic oppression—such as war, slavery, and colonialism—are more susceptible to physical and psychological illnesses. While this theory has been extensively studied in Native American and African American communities, there is a notable gap in research exploring its relevance to Hispanic populations, who have also faced significant historical trauma. This research focuses on the prevalence of trauma susceptibility and comparisons of resilience and grit within the Hispanic population relative to other groups. Upon IRB approval, I collected data from 100 Hispanic students to examine the link between historical trauma and trauma susceptibility in rural U.S. Hispanic communities. Additionally, as I am still collecting

data, I plan to utilize a sample of 300 diverse students to investigate the relationship between resilience and grit, comparing these traits across a sample of Hispanic (n = 100), Native American (100), and White (non-Hispanic; 100) low-income college students. This study employs a mixed-methods approach, integrating qualitative and quantitative data collection through validated survey instruments such as the Scale of Protective Factors, the Life Stressor Checklist-Revised, and the Grit Scale. It is hypothesized that Hispanic students will exhibit significantly higher susceptibility to trauma as measured by the Life Stressor Checklist-Revised. This will correspond with lower levels of grit and resilience, by the Grit Scale and the Scale of Protective Factors compared to White (non-Hispanic) students. Furthermore, among Hispanic students, those demonstrating a greater stage of acculturation, based on the United States Acculturation Scale, are expected to display lower grit scores but higher resilience ratings on the Grit Scale and Scale of Protective Factors. The findings aim to expand research on the Hispanic population, highlighting the impact of trauma and informing strategies to strengthen resilience in vulnerable populations.

Haley Trippel

PA - University of Pittsburgh

Discipline: Chemistry

Authors:

#1 Lingfeng Liu

Remy Short

Abstract Name: Purification and Isolation of Potential Antimicrobial Compounds in *Janthinobacterium lividum* CO

The discovery of penicillin in 1928 revolutionized medicine, dramatically reducing mortality from bacterial infections. However, bacteria continue to evolve resistance to antibiotics, threatening to outpace the development of new treatments. *Janthinobacterium lividum*, a gram-negative bacterium with distinctive purple pigmentation, produces several organic compounds with promising antimicrobial activity. Commonly found in soil, glaciers, and freshwater, this bacterium's potential for novel therapeutics remains underexplored. Our research aims to isolate and purify the antimicrobial compounds produced by *Janthinobacterium lividum* as a step toward addressing the growing antibiotic resistance crisis. The isolation of organic compounds started with a liquid-liquid extraction. The organic material went through several rounds of chromatography, followed by a paper-disc assay to detect antibiotic activity. Samples that were active against a lawn of *Bacillus subtilis* were characterized using nuclear magnetic resonance and mass spectroscopy. As a preliminary step, we applied our isolation and purification techniques to *Lysobacter antibioticus*, which is known to produce the antibiotic 4-hydroxyphenylacetic acid, to refine our methods. The results determined that *Janthinobacterium lividum* contains antibiotic compounds that can be isolated and characterized. These antibiotic compounds have the potential to contribute to future research aimed at combating antibiotic resistance.

Austin Trotter

KY - University of Kentucky

Discipline: Psychology

Authors:

#1 Anjana Subramoniam

#2 Lauren Whitehurst

Osswaah Fariduddin

Abstract Name: Effects of Transcutaneous Vagal Nerve Stimulation on Objective and Subjective Sleep: Insights from an Overnight Laboratory Study

Americans are sleepy. A recent 2023 Gallup poll suggested that 73% of American adults report getting less than the recommended eight hours of sleep per night. Non-invasive interventions that can improve sleep are needed. Transcutaneous vagal nerve stimulation (tVNS) can improve subjective and objective sleep for healthy adults when administered before sleep. We examined the impact of administering tVNS during sleep on objective and subjective sleep measures in a sample of healthy adults. The University of Kentucky Institutional Review Board approved all testing procedures. Fifty-one healthy participants [Age=18-65 [Mean $\pm$ SD = 23.16 $\pm$ 4.70, 26 Males] were included in the study. Each participant completed two nights of polysomnographic recordings with active tVNS and sham stimulation – which were counterbalanced across participants' visits. Each participant was titrated to a stimulation frequency and amplitude (i.e., intensity) during orientation. On visit nights, active or sham stimulation began once participants entered non-rapid eye movement Stage 2 sleep and continued for the first 90 minutes of the 8-hour sleep period. Morning subjective sleepiness ratings were obtained using the Karolinska Sleepiness Scale (9-point Likert scale with 1 = extremely alert and 9 = extremely sleepy). Paired t-tests were used to examine differences between objective and subjective sleep outcomes on stimulation and sham nights. Bivariate correlations examined the relationship between objective and subjective sleep outcomes within sham and stimulation nights. No differences in sleep architecture were detected on sham vs stimulation nights ($p>0.30$). KSS scores also did not differ the morning after sham or stimulation ($p=0.37$). On stimulation nights, higher stimulation intensities were associated with lower KSS scores or greater feelings of restoration in the morning ($r = -0.306$, $p=0.03$). These data suggest that tVNS administered during sleep may reduce next-day feelings of sleepiness.

Carsen Troub

MI - Wayne State University

Discipline: History

Authors:

Abstract Name: Rethinking the rise of the Revolutionary Union Movements in Detroit through the effects of anti-communist sentiment in the UAW

This paper seeks to historicize the rise of anti-communist sentiment in the UAW to isolate significant correlations between the UAW's reactionary shift towards anti-communism, and the rise of Revolutionary Union Movements in Detroit with reference to the League of Revolutionary Black Workers. To answer the question, did the UAW's move towards prioritizing reform over revolution play a role in the formation of the Revolutionary Union Movements of the late 1960s? A thorough investigation into multiple archival sources such as the Dodge Revolutionary Union Movement Records and the Black Workers in the Labor Movement Oral History Project both found in the Walter P. Reuther Library, Archives of Labor and Urban Affairs, located on the campus of Wayne State University in Detroit, Michigan. This paper argues that while this perception of the events of 1967 being a catalyst to the foundation of the Revolutionary Union Movements is true, it remains limited. Identifying that long-standing problems within the UAW and the labor movement originating with the UAW's shift towards reformist policymaking play a more significant role when recognizing the shift in attitudes within workers that precipitated the formation of Revolutionary Union Movements. Historians have, for many decades debated the environment in which revolutionary ideas occur, this paper seeks to provide a unique perspective through the lens of labor history. Historians should look to apply these findings to other examples of revolutionary movements in history to further contextualize what conditions have to be met in society for the people to turn to revolution.

Alexis Troy

PA - Duquesne University

Discipline: Nursing and Public Health

Authors:

#1 Theresa Stujenski

#2 Lauren Sugden

#3 Sara Kelemen

Abstract Name: Analysis of Pre-Screening Techniques for PCOS Using Data from MIRA (a fertility app)

Hormone fluctuations over the course of the menstrual cycle are critical predictors of ovulation and indicators of cycle regularity and fertility. Our research aims to better understand these patterns, deepening our understanding of the menstrual cycle and its relationship to reproductive disorders, and building tools to help individuals manage their own reproductive health. Our study uses data from the MIRA fertility app, a digital health tool designed to empower individuals in managing their reproductive health. The app logs quantitative urine hormone data collected through the MIRA Fertility Tracker, a device that provides precise hormone measurements. MIRA's primary goal is to help users predict ovulation and gain insights into their menstrual cycles. For this study, we focus on individuals with Polycystic Ovary Syndrome (PCOS), a condition characterized by irregular, infrequent, or prolonged menstrual cycles and difficulties in ovulation, which can impair fertility. To model individual menstrual cycles, we employ a Hidden Markov Model (HMM). This statistical approach maps cycle days to corresponding phases based on hormone levels, particularly estrogen, progesterone, and LH. The HMM allows us to capture the temporal dynamics of hormonal changes and classify phases with precision, even in irregular cycles. Our analysis includes an evaluation of cycle consistency within individuals and correlations between hormone fluctuations and observed cycle irregularities. By comparing these patterns across the subgroups, we aim to identify distinctive features of PCOS cycles relative to healthy cycles. The insights gained from this research will contribute to a more nuanced understanding of the diversity in menstrual cycle patterns. This knowledge could ultimately enhance personalized healthcare approaches, empowering individuals with PCOS and other reproductive challenges with insights about their health and fertility.

Ian Tsai

WA - University of Washington - Seattle

Discipline: Interdisciplinary

Authors:

Abstract Name: Birdsong in the Machine: An Auditory Re-Imagination and Realization in Spreading Wildlife Awareness and Technological Advancement

Birdsong in the Machine is a soundscape composition that explores the evolving relationship between natural and artificial worlds through the story of the Streaked Horned Lark (*Eremophila alpestris strigata*), a threatened coastal songbird native to the Pacific Northwest. The central research question is: How can artificial intelligence (AI) and machine learning (ML) enhance environmental storytelling to amplify the voices of endangered species and reimagine human-nature-technology relations? By integrating AI-generated audio, wildlife recordings, and digital sound processing, this project critically examines the paradoxical role of technology as both a disruptor and preserver of ecological systems. Inspired by my lifelong connection to technology and deep appreciation for the natural world, Birdsong in the Machine reflects on the impacts of technological progress on the Streaked Horned Lark. The project draws from Donna Haraway's *A Cyborg Manifesto* and the works of Bernie Krause and Thom van Dooren, challenging the perceived divide between

the natural and artificial. It envisions a future where these realms coexist harmoniously, fostering collaboration rather than conflict. This composition combines recordings of the lark's song and habitat with AI-generated audio, using machine learning models to emulate and predict natural soundscapes. Digital audio processing techniques integrate these elements into a cohesive narrative. Bibliographic, archival, and ethnographic research reinforce the ecological and artistic focus of the composition. Through its juxtaposition of organic and AI-generated sounds, *Birdsong in the Machine* illuminates the paradox of technology's role in ecological degradation and preservation. The soundscape fosters empathy and awareness for endangered species while reimagining relationships between humans, nature, and technology. Future directions will explore the ethical implications of using AI in ecological art and expand collaborations with scientists and digital artists. Ultimately, this piece stands as both environmental advocacy and an artistic experiment, challenging audiences to rethink their place in the interconnected natural and artificial worlds.

Emma Tsai

LA - Louisiana State University, Baton Rouge

Discipline: Biology

Authors:

#1 Melanie Wilson

#2 Mohamed Ateia

#3 Ahmed Abdelmoneim

Abstract Name: Assessing Developmental and Behavioral Changes in Larval Zebrafish (*Danio rerio*) Exposed to Microplastic Leachates

Commercial microplastics (MPs) end up in aquatic environments and contain additives such as heavy metals and disinfection byproducts. These additives leach into the surrounding environment, raising concerns about their potential toxicity to developing organisms. Currently, many studies on MP leachates rely on either one type of commercial MP or pure polymers, which lack additives, both of which may provide unrepresentative assessments of leachate effects. This study investigates the impacts of early exposure to leachates from various commercial MPs on the development and behavior of larval zebrafish. Plastics, acrylonitrile butadiene styrene (ABS), polyethylene terephthalate (PET), polyamide 66 (PA66), polystyrene (PS), and reinforced glass fiber (MIX), were collected from a recycling facility, frozen in liquid nitrogen, and crushed to form MPs. Leachates were made by suspending 2 g of MPs in 50 mL of zebrafish embryo-rearing media and exposed to UV-C light, heat, and agitation for 24 hours to simulate environmental weathering before filtering out the MPs. Fluorescence and UV spectroscopy were used to identify dissolved organic matter content in MP leachates. Zebrafish embryos were exposed to leachates between 6- and 120-hours post-fertilization (hpf). At 120-hpf, effects on larval survival, overall development, prevalence of developmental defects, background activity, and motor responses to acute stressors and peripheral irritants were evaluated. Spectroscopic investigations indicated the presence of DOM in the collected leachates. Our findings indicated that exposure to MIX resulted in an increase in mortality. Exposure to the leachates did not alter the prevalence of developmental defects. However, overall larval growth was reduced in zebrafish exposed to PET. Larval baseline activity and behavioral response to acute stressors were significantly altered in ABS, PA66, and PET exposures. This study provides valuable insight with significant translational relevance into the potential adverse effects of developmental exposure to various commercial MP leachates on development and behavior.

Liansu Tucker

MN - University of Minnesota - Rochester

Discipline: Health and Human Development

Authors:

#1 Jessica Ha

#2 Monsour Diop

#3 Yassin Kolley

Monsour Diop

Abstract Name: Bacteriophages found in Rochester, MN

Bacteriophages (phages) are a type of virus that infects bacteria. Like human viruses, phages use their host cells for replication and reassembly. Phages are present where there is bacterial contamination, so one can determine and quantify bacterial presence by analyzing environments for phages, whether in water or soil. Harmful bacteria in water and soil can be present because of fecal contamination from animals in the region. These fecal-borne bacteria can be pathogenic to humans, like *E. coli*. The natural replication of phages allows testing to determine the presence of these fecal-borne bacteria in bodies of water. Previous investigations into finding and extracting bacteriophage from Zumbro River and Silver Lake have shown inconclusive results, producing uncertainty in whether we have bacteriophage in our waterways. Zumbro River and Silver Lake were chosen due to signs of fecal contamination populating the water with bacteria that serve as a host cell for bacteriophage replication. Chloroform was used to isolate the phage from water and soil samples from both locations. To ensure we only have bacteriophage, a filter allowed the phage to travel to a sterile microcentrifuge tube before inoculating it with an *E. coli* broth. Our results showed positive for bacteriophage within soil surrounding fecal-contaminated waterways using Silver Lake samples. Zumbro River samples produced negative results for bacteriophage prevalence. Due to the widespread presence of fecal contamination in Rochester waterways, further analysis of bacteriophage presence using these methods is warranted to further understand our overall water quality.

Riley Tucker

WI - University of Wisconsin-Parkside

Discipline: Physics and Astronomy

Authors:

#1 Chang-Beom Eom

#2 Zhongrui Li

Abstract Name: Growth and experimental measurements on superconducting thin films and heterostructures

Our research delves into the growth, experimental measurements, and analysis of high-temperature superconductor YBCO-based thin film-heterostructures for their integration into a wide array of superconducting electronic devices. These devices include sandwich-type Josephson junction devices, superconductor quantum interference device (SQUID) magnetometers, rapid single flux quantum (RSFQ) circuits, and terahertz (THz) frequency devices. The structural and electrical transport properties of the heterostructures were investigated through Raman Scattering and various types of x-ray diffraction techniques such as x-ray profile, x-ray reflectivity, pole figure, and reciprocal mapping. The structural investigations showed (110)-oriented epitaxial growth with a preferred c-axis-in-plane orientation, while the electrical resistivity measurements showed superconducting critical temperature (T_c) above 77 K and a minimal proximity effect due to the interfacial contact of the YBCO superconducting layers with the middle insulating layer of the heterostructure. Here we present our recent results that demonstrated the possibility of integrating these heterostructures into various types of superconducting electronic devices to provide them with a higher performance and efficiency.

Alena Tucker

CO - University of Colorado at Boulder

Discipline: Engineering

Authors:

#1 Adiba Ashrafee

#2 Debanjan Mukherjee

Abstract Name: In Vitro Model of the Human Circle of Willis to Investigate Drug Delivery in the Brain

Stroke is one of the leading causes of death world-wide and ischemic stroke accounts for 87% of these cases, occurring when an artery leading to the brain is occluded. Intravenous drug delivery of tissue plasminogen activator can be used to break up clotting but only has a 50% success rate in reperfusion. In order to improve this drug delivery process, a better understanding of the underlying flow physics in cerebral arteries is required. The main arterial network in the brain is the Circle of Willis (CoW), which includes a proximal connection of supplying vessels, and distal collateral vessels that are important for rerouting flow in the event of an occlusion. Cerebral hemodynamics are difficult to study using in vivo and clinical imaging because of the small vessel size, and complex network structure. Our project presents an in vitro method to investigate flow through cerebrovascular networks. The setup includes a 3D-printed planar phantom model of the CoW in series with a peristaltic pump that drives distilled water through the system. Our procedure includes injecting a set concentration of dye into the network and measuring the volume of fluid and concentration of dye at each outlet. We also use a high-speed camera and image subtraction to track intensity profiles of CoW vessels over time. We conducted a set of experiments with a 3D-printed occlusion introduced in the RMCA vessel to represent a stroke case with varying distal collateral configurations and compare flow and concentration for cases without stroke. By comparing these cases we can investigate how cerebral flow physics change in the event of a clot as well as the role of the distal collaterals in rerouting flow around the occluded vessel. Ultimately, we plan to use these findings to help illuminate the mechanics of drug delivery in stroke patients.

Ally Turner

VA - James Madison University

Discipline: Biology

Authors:

#1 Ally Turner

#2 Jaylan Garcia Martinez

#3 Bisi Velayudhan, PhD

Jaylan Garcia Martinez

Abstract Name: Impact of Dietary Sodium Benzoate on Gut Microbiome and Behavior in Mice: Exploring the Gut-Brain Axis Over 9 Months Feeding Trial

Sodium benzoate (SB) is a widely used preservative in various food and beverage products such as sodas, condiments, fruit juices, and more. While the FDA approved rate of consumption of SB is at 0.1% of food weight, many food products have been found to exceed this level. There is strong evidence in the literature establishing the dietary influence on the gut microbiome and the gut-brain axis mediating metabolic, immune, and neurological functions, however not much is known about the chronic effects SB has on these functions. This study aims to investigate the potential implications of prolonged exposure to SB, particularly focusing on its impact on the gut microbiome and associated behavioral changes in mice. Our previous studies showed morphological changes in the gut wall, decreased mucus production, and inflammatory changes in response

to long-term SB consumption in mice. In this study, female C57BL/6 mice after weaning were maintained on a standard rodent chow with or without 1% SB diet for nine months. Behavioral data were collected using the BORIS software for home cage test, open-field test, novel object test, as well as forced swim test for assessing overall activity, social interaction, and short-term memory. Gut microbiome from fecal and cecal samples were analyzed by 16S Illumina sequencing. The differences in microbial population between treatment groups were determined by QIIME2 metabarcoding bioinformatics analysis. Unique to the SB-treated mice were higher amounts of Firmicutes and Proteobacteria while the control group had higher amounts of Bacteroidetes. There was no difference in behavior between treatment groups for the small data set we analyzed thus far. Our data suggests that long-term SB consumption could alter the gut microbiome and hence potentially impact gut health and communication through the gut-brain axis.

Charlotte Turner

NC - Elon University

Discipline: Communications

Authors:

#1 Charlotte Turner

Abstract Name: Reading Between the Lines: An Eye-Tracking Experiment of Design Effects on Data Privacy Policy Comprehension

This study investigates how the use of icons affects user engagement and comprehension of online data privacy policies through a between-subjects experiment. Leveraging eye-tracking technology, the research compares how data privacy policies with and without icons (i.e., text only vs. text + icons) influence users' information processing as demonstrated through gaze patterns and fixation durations. In addition to eye-tracking metrics, memory of policy information and self-reported attention allocation are also measured. The results revealed that on average, the data privacy policy with icons received 41% more fixations and led to 43% longer fixation duration than the text-only data privacy policy without icons. Additionally, the participants interacting with the data privacy policy with icons demonstrated a higher level of memory of policy information than those who interacted with the text-only version without icons. This research also uncovered variations in individual reading behaviors, suggesting that personal habits and prior familiarity with digital interfaces could contribute to participants' engagement with the data privacy policy. These findings highlight the potential for user-centered design to improve the accessibility and effectiveness of data privacy policy. By integrating thoughtful visual elements, organizations can enhance user comprehension while maintaining the necessary legal integrity of data privacy policy documents. As digital agreements continue to play a critical role in online interactions, this study provides actionable insights into how design strategies can make these essential yet often overlooked documents more user-friendly, helping bridge the gap between legal content and user understanding.

Siegrid Tuttle

WV - West Virginia University

Discipline: History

Authors:

#1 James Siekmeier

Abstract Name: The Rise and Fall of C.I.A. Support for Operation Condor

Operation Condor (Condor) was a transnational terror network set up by six military dictatorships in South America with the support of the United States' Central Intelligence Agency (CIA) in order to kill and silence dissidents in the nineteen seventies. Condor involved surveillance of dissidents, coups, and assassinations across international borders. While research on Operation Condor tends to focus on the individual dictatorships involved, the relationship between those dictatorships and the United States has been comparatively understudied. The human rights violations committed by the Operation Condor dictatorships eventually resulted in Congress investigating the CIA and tying human rights requirements to U.S. foreign assistance to the nations involved. Unlike in many Cold War battlegrounds, human rights violations in South America resulted in a reshaping of United States foreign policy towards the region. The relationship between the United States and the Conder dictatorships broke down as U.S. foreign policymakers began to criticize the increasingly brazen and brutal tactics of Condor. In the 1980s, international pressure and internal activism forced Argentina's military government to hold elections, and the other Condor nations followed.

Lexi Twaddle

OH - Walsh University

Discipline: Biology

Authors:

#1 Amy Heston

#2 Neil Walsh

Maria Purcell

Daniel Palanceanu

Abstract Name: AI Innovation for Biological Research: Creating a Strategic Model for Researchers

In alignment with the institution's mission to develop leaders in service, this project explored the possibilities of student leadership in AI innovation for biological research. A student team analyzed the effectiveness of AI that led to a successful strategic model for applying AI to real-life applications and also served as a learning tool for fellow student researchers. Through the analysis of several trials, key insights were identified related to the use of AI technologies. Data revealed several trends including AI navigation (12.5%), visual representation of information (12.5%), application with collaboration (37.5%), experience level (25.0%), and focus on future application (12.5%). Further trials showed more depth to the ability of AI such as success rates (100%) in usage for the realistic applications for medical research, personalization of AI-generated content, and the importance and application of AI ethics in scientific content. Additional trials indicated that AI served as a starting point for biological research project design, while other experiments showed its usefulness as a comprehensive tool to support the entire research process. Overall, this work demonstrated that Gemini and ResearchRabbit were the most effective followed by ChatGPT and Connected Papers. Therefore, these findings served as the framework of the model for utilizing AI in biological research. Special features of the model included its usefulness in successfully creating student projects with realistic biological applications including healthcare, but it can also be applied to any discipline across campus. Interestingly, student researchers benefited from the project through high-impact practices such as collaboration in undergraduate research and the investigation of AI through a common intellectual experience. Overall, this model showcased student-driven AI innovation in biological research, thereby highlighting the students' leadership in serving the common good.

Nana Kwasi Tweneboah

AL - Auburn University

Discipline: Engineering

Authors:

#1 Konstantin Klyukin

#2 Valentina Nesterova

Abstract Name: Discovery of Novel 2D Materials from High-throughput Computational Etching of Experimentally Known Compounds

There is a great need for 2D materials and their extraordinary properties. Most of these materials discovered so far are synthesized from 3D Van Der Waals crystals. However, the small number of such parenting structures limits the discovery of novel ones. Another option is the selective electrochemical etching of 3D layered structures with intercalated atoms. Thus, this project seeks to find, among existing stable crystal structures, the ones that are layered and contain weakly bonded atoms that can be etched selectively. This was inspired by the work of Jonas Bjork et al in a paper published in the Science academic journal and that of

Goowon Cheon et al. in a paper published in the ACS journal. First, 144,191 stable material structures are drawn from the Materials Project database with the MPRester Python library. Next, the resulting data was screened for their dimensionalities with different tolerance factors. This was done by implementing the open-source algorithm developed by Cheon G. et al, that was modified to return the types of intercalated atoms between the layers. The resulting structures were analyzed to determine the proportion of layered 3D structures present that are suitable candidates for selective electrochemical etching. We also provide statistics about the interlayer atomic species to suggest etching agents for 2D material creation. This dataset can be next used for Density Functional Theory calculations to evaluate exfoliation energies and define 3D structures that can be etched, that will lead to the creation of a database with prospective parenting materials for novel 2D materials. Calculations were conducted utilizing AU Easley high-performance computer accessed through a Linux-based terminal.

Dr. Andrea Tyler

TN - Tennessee State University

Discipline:

Authors:

#1 Dr. Andrea Tyler

Abstract Name: The Mentor-Mentee Dynamics: Increasing Research Curiosity Through Collaboration, Guidance, and Support

Mentoring takes many forms and can significantly impact individual matriculation, career choices, and professional trajectories. In STEM contexts, particularly for underrepresented students, mentoring is an integral component of the socialization process. Mentoring offers students access to social and cultural capital while increasing their likelihood of continuing in STEM fields after graduation. This qualitative research study aims to advocate for more research on mentoring relationships in postsecondary milieus that encourage implementing new mentoring experiences. Using an anti-deficit and socialization framework, the authors show how undergraduate students from different disciplines conduct interdisciplinary research and provide varying forms of mentorship. The researchers employed Interpretative Phenomenological Analysis (IPA) to critically evaluate the impact of mentoring on eradicating the Impostor Phenomenon among undergraduate researchers at an HBCU. This study explored the structure and essence of the experiences of student researchers who engage with the Impostor Phenomenon and how mentoring serves as a ready tool for eradicating the phony feeling. Personal interviews were conducted to explore the perceptions of the same respondents regarding impostor feelings and the impact of mentoring on their self-esteem development and eradication of the impostor phenomenon. For many undergraduate researchers, especially those at an HBCU, the impostor phenomenon is prevalent, especially when conducting research, writing, and publishing. The findings show that the academic demands on students require a higher level of mentoring to ensure persistence, completion, and research exposure. The findings will help inform current research on the routes and processes necessary to succeed against all odds while navigating their degree programs and research experiences. The study will also inform higher education administration and faculty of the unique needs and attention required of undergraduate researchers and how these needs can be adequately met through mentoring to foster retention, persistence, and scholarly activities such as publishing, conference presentations, and teaching.

Jayita Ujjaini

AR - University of Arkansas

Discipline: Biology

Authors:
#1 Abbey Stokes
#2 Alexis Ivy
#3 Christopher Nelson

Abstract Name: Analyzing Transcriptional Control of IL-10 in Macrophages using CRISPR-Cas9

Macrophages are known to have a plastic nature as they can change from M1 to M2 states and vice versa. M1 and M2 states are partially characterized by their pro-inflammatory and anti-inflammatory cytokines, respectively. Notable examples of anti-inflammatory cytokines that can be efficiently used for regenerative medicine include IL-10 and IL-4. This study focuses on the possibilities of manipulating macrophages to optimize immune responses. IL-10 promotes healing by preventing uncontrolled immune responses. In diseases such as diabetes, this process gets dysregulated and macrophages struggle to induce the M2 state. The catalytically inactive CRISPR-Cas9 system, known as dCas9, can help to upregulate or downregulate cytokines to promote an anti-inflammatory phenotype. In this study, we aim to promote the upregulation of IL-10 in RAW 264.7 macrophage lines. Previously, using VP64, a virally derived transcriptional activator, we were able to induce IL-10 activation. In this study, we will compare P300, a human-derived histone acetyltransferase, against VP64 to analyze if one has a higher efficiency. The RAW 264.7 cells will be transduced with lentiviruses encoding dCas9-P300 and undergo antibiotic selection. We will transduce CRISPR guide RNAs targeting IL-10 in each macrophage line- RAW 264.7 with dCas9-VP64 and RAW 264.7 with dCas9-P300 and perform a second selection using cell sorting. RT-qPCR will be done to confirm both the presence of dCas9-P300 and IL-10 gRNAs. Then IL-10 expression will be analyzed using RT-qPCR. We will normalize against GAPDH, a constitutive gene, and compare the IL-10 levels to when RAW264.7 cells are in a pro-inflammatory and unstimulated state. These results will show which transcriptional activator, VP64 or P300, is more likely to induce an anti-inflammatory state through IL-10 activation. This technology can then be analyzed in the context of wound healing and immunotherapy to improve patient outcomes.

Hannah Ullah

IA - Luther College

Discipline: Art History

Authors:
#1 Hannah Ullah

Abstract Name: How New Orleans Became a Sound: An Exploration of the Birthplace of Jazz

As a jazz musician it is not uncommon to be told to “sound like New Orleans,” in order to develop an authentic replication of early jazz charts. No other U.S. city shares a similarly distinctive musical identity. How, then, did New Orleans develop a musical culture distinct from the rest of the United States? As a port city, New Orleans stands out as historically culturally diverse, bringing together European, Caribbean, and African cultures through migration and the transatlantic slave trade. To understand the debated question of how jazz developed during its formative years in New Orleans, I have studied the development of jazz, New Orleans history, and examined the pioneering musicians “Papa” Jack Laine (1873-1966) and Joseph “King” Oliver (1881-1938). My research has been guided by a combination of academic publications, travel to New Orleans, and primary sources collected through collaboration with the New Orleans Jazz Museum curators and archival work at Tulane University. While many scholars place their conclusions purely on Congo Square, brass band traditions, or set jazz aside as purely unique, I have concluded that New Orleans formed a unique musical culture through the intersection of the American brass band tradition and diverse African musical traditions shared at Congo Square. In my presentation, I will provide evidence that intersecting musical traditions led to the genesis of jazz through musical examples to present the “sound of New Orleans”

as defined by pioneers of New Orleans jazz, historical accounts, and the contextual history that combines Congo Square and the American brass band into a united musical culture.

Andrew Ullman

TX - San Jacinto College

Discipline: Chemistry

Authors:

#1 Phuong Doan

Abstract Name: Applying Machine Learning to Find Pricing Patterns in Chemicals

The cost of chemicals is an important factor for every chemistry research laboratory. Machine learning has been crucial in understanding chemical datasets and analyzing complex chemical structures. This study focuses on using Principal Component Analysis (PCA), an unsupervised machine learning algorithm, to analyze the structures of molecules and help determine what components of chemical structure significantly affect price. The algorithm takes a textual representation of the 3-dimensional chemical structure of a molecule as input. It organizes the dataset based on the chemical structures and determines the pricing and organizational patterns within the PCA. The research focuses on three main datasets which are primary cluster (the largest dataset), "Ring" cluster, and "Cef" cluster. PCA evaluated the chemical structures of 226 points in my dataset and I personally analyzed 20 points in the primary cluster and 5 points in the other two smaller clusters. Since the experimental dataset is small, future work will be extended to a larger data set to potentially produce clearer patterns data. The experiment will also be improved by using a clustering algorithm instead of manually clustering the PCA. I believe that unsupervised machine learning algorithms will create an effective organization based on structure and will demonstrate a correlation between more complex chemical structures and higher prices. It will have a significant impact on research laboratories as scientists can make informed decisions on buying chemicals and find alternatives to replace expensive ones.

Elmira Umarova

TN - University of Memphis

Discipline: Biology

Authors:

#1 Mira Umarova

#2 Clarence Cathey

#3 Philip Kohlmeier

Abstract Name: Co-option of Two N-alkanes as a Brood Pheromone Modulating Foraging Preferences in *Temnothorax* Ant Workers

In social insects, specialized foragers fulfill the nutritional needs of all colony members. This study investigates the chemical cues used by *Temnothorax longispinosus* ant larvae to increase protein-foraging in foragers. Based on previous chemical analyses, we tested whether two larva-biased n-alkanes function as brood pheromones. Colonies lacking brood were exposed to synthetic versions of n-C27 and n-C29, which are more abundant in larvae than in workers. A combination of n-C27 and n-C29 increased protein-foraging to the same level as full larval Cuticular hydrocarbon extracts, while n-C27 and n-C29 individually did not elicit the same response. n-alkanes can be found across insects and are involved in waterproofing the cuticle. Our findings provide the first evidence that a combination of two specific n-alkanes has been co-opted to

additionally function as a brood pheromone in ants, influencing worker behavior to meet larval nutritional needs. This suggests a quantitative mechanism where the relative abundance of these compounds plays a key role. Understanding these chemical communications offers insights into colony homeostasis and social behavior evolution in ants. Our findings contribute to a broader understanding of how chemical signals mediate complex social interactions in eusocial organisms, providing a foundation for future studies on chemical communication.

Avery Underwood

NC - Elon University

Discipline: Biology

Authors:

#1 Andrea Perreault

Abstract Name: Comparing the 3D chromatin organization of breast cancer subtypes through Hi-C analysis

With breast cancer affecting a large portion of the population, finding effective methods of treatment is an increasingly strong demand. Cancer is a result of incorrect gene expression resulting from abnormal 3D chromatin organization. Through breast cancer research, specific targets have been identified to strengthen prognosis and efficacy of treatment. This project aims to find differences between breast cancer subtypes to aid in identification of specific genetic structures and expression for cancer treatments. Through Hi-C analysis, comparisons can be made between the different subtypes to find unique features of genome organization in each subtype. Hi-C is an experiment that identifies interactions between regions of DNA, allowing us to analyze 3D structures and chromatin organization. This data can be used to make contact maps that show where the chromatin interactions are occurring. This can show unique structural elements in the subtypes such as TADs and chromatin loops. This research will identify and explore how the chromatin interactions are similar and different in 2 breast cancer subtypes (ER-positive and TNBC). Contact heat maps will be used to visualize contact frequency from Hi-C datasets and find chromatin loops and interactions. Then, combining this data with RNA-seq data, we can see the expression of genes and what the structure looks like at those areas. Both breast cancer subtypes will be compared against each other to find similarities and differences. The expected results will suggest that TNBC has the most variability compared to normal-like cells. Based on previous results in the lab, we expect that 3D organization of ER+ and TNBC samples will be the most different, contributing to the vast differences in gene expression profiles. Investigating breast cancer subtypes will provide insights for more effective precision medicine therapies for breast cancer patients.

Abigail Unger

AR - University of Arkansas

Discipline: Geography/Geology

Authors:

#1 Brad Peter

Abstract Name: Integrating Hydrodynamics and Socioeconomic Data to Address Flood Vulnerability and Environmental Justice in Arkansas

In Arkansas, flooding is a frequent hazard that affects both urban and agricultural areas. In this study, a geospatial cyberinfrastructure (GCI) framework is developed to analyze flood hazards and socioeconomic

vulnerability throughout the state. We simulate flood depths and quantify how it intersects with land use, infrastructure, and socioeconomic characteristics using remote sensing-based terrain data and demographic markers. The study results show notable disparities, with minority and low-income populations, particularly in the Mississippi Alluvial Plain, at higher risk of flooding. Clusters of vulnerability are spatially identified using high-resolution mapping and Bivariate Local Moran's I analysis, indicating the intersection of economic and racial inequality with flood risk. When used with Google Earth Engine, the GCI combines several datasets to provide detailed and easily navigable interactive maps and visualizations. Stakeholders, including legislators and urban planners, are empowered by these tools to assess flood risks and develop focused, well-informed mitigation plans. The study reveals the value of integrating geospatial technologies to address environmental justice challenges and the importance of equitable flood management policy. Its ultimate goal is to enhance flood preparedness decision-making in Arkansas and add to the larger discussion on socio-environmental justice.

Ejemen Unuakhalu

KY - University of Kentucky

Discipline: Biology

Authors:

#1 Patrick Sullivan

Abstract Name: Sex Differences in Mitochondrial Protein Expression Following a Traumatic Brain Injury

Traumatic brain injuries (TBI) disrupt normal brain function and cognitive impairments ranging from mild to severe. Primarily, TBI studies focus on males as the research subject, but recent reviews observed females have better outcomes following TBI. Mitochondrial dysfunction is a key driver of secondary injury after TBI and has been well-established in male animal models of injury. However, research in females has found little to no mitochondrial impairment after TBI. Synaptic mitochondria within the neuronal synapse are more susceptible to dysfunction due to heightened bioenergetic demand following TBI than non-synaptic mitochondria. A recent study has shown that both synaptic and non-synaptic mitochondria from male mice were bioenergetically impaired following severe controlled cortical impact (CCI) while only synaptic mitochondria from female mice were impaired. To investigate potential causes for this apparent sex difference, we measured expression of proteins involved in the Oxidative Phosphorylation (OXPHOS) system in the total, synaptic, and non-synaptic mitochondrial populations. We hypothesized mitochondrial OXPHOS protein expression in females will be greater than in males. Age-matched male and female mice received sham or severe CCI followed by mitochondrial isolation 24h post-injury. OXPHOS protein expression was measured using western blot analysis. Results showcased a significant increase in OXPHOS expression in both total and non-synaptic mitochondria from sham females compared to sham males. Synaptic mitochondria from males and females showed decreases in protein expression following injury. Previous functional bioenergetic analysis observed a similar injury pattern, suggesting spared non-synaptic mitochondrial function in females is masking impaired synaptic function through increased protein expression. These studies highlight the importance of assessing both sexes and mitochondrial fractions following a severe TBI-induced injury to prevent spared functioning of one fraction from masking impaired dysfunction of the other fraction. Ongoing experiments are exploring sex differences in glial cell expression following severe CCI.

Trinity Updike

KY - University of Kentucky

Discipline: Social Work and Human Services

Authors:

Abstract Name: Helping Out the Hollers: Exploring Homelessness in Eastern Kentucky

Prior to the 1970s, homelessness in America rose and fell according to the financial markets. Later governmental policies allowed homelessness to increase and become entrenched in society. Today, over 4,000 Kentuckians face homelessness. The Appalachian areas of eastern Kentucky hold some of the poorest counties in the U.S. with up to 36% living below the poverty line. This research aims to look back at the root causes of homelessness and how they were addressed in the 1970s to the 1980s. Using the collection of Tenant Services and Organization Assistance, Inc. records, 1970-1981, at the University of Kentucky Special Collections Research Center, this research will explore how Kentucky service organizations, governmental policies, and other social services worked to combat homelessness in the era when it was becoming entrenched in society. The collection contains newspapers, meeting minutes, and photographs from the time when Kentucky experienced a rise in homelessness and established programs to relieve the problem. Research will compare how initiatives differed in urban Kentucky areas versus rural eastern Kentucky areas of Appalachia, and also how these programs evolved over the past 50 years. Today's homelessness crisis is being met with extreme measures, such as cities like Lexington banning outdoor sleeping and homeless encampments. Looking into the history of homelessness in Kentucky—and the efforts to combat it—will hopefully shine light on those who are often left behind by society.

Natalia Useche Paredes

MN - University of Minnesota - Rochester

Discipline: Health and Human Development

Authors:

#1 Natalia Tretyakova

#2 Erik Moran

#3 Yuliet Monatukwa

Abstract Name: Presence of Hemoglobin-Acrylamide Adducts in Smokers and Non-Smokers

Background Acrylamide is a reactive organic compound and a carcinogen produced in cigarette smoke. It can also be produced in food through the Maillard Reaction. All humans, but especially smokers are exposed to acrylamide. When the body is exposed to this compound, it binds to different biomolecules and creates a covalent adduct, which in turn can interfere with their function. A highly abundant biomolecule that forms these adducts is Hemoglobin which demonstrates a dose-dependent response of adduct formation to blood-acrylamide concentration. We propose to analyze smokers and non-smokers hemoglobin-acrylamide adducts. In order to do this, the Globin must be separated from the whole blood, and then the Globin must be digested with the use of a protease—Trypsin. Purpose To observe differences in hemoglobin-acrylamide adducts between smokers and non-smokers. Methods Whole blood from both smokers and nonsmokers (n=25) was taken, and the globin was isolated. Then it was digested using immobilized Trypsin. Finally, the digested samples were analyzed by a Q-Exactive, to evaluate the amount of the adducts on both smokers and non-smokers. Results A t-test was performed on the difference of the percentage of acrylamide-hemoglobin adducts for both smokers and non-smokers ($p < 0.0001$). Discussion There is a significant difference between the percentage of acrylamide-hemoglobin adducts between smokers and non-smokers. Demonstrating that the excessive consumption of acrylamide can lead to more adducts. Additionally, this also shows that the method developed could be used to find other adducts.

Natalia Useche Paredes

MN - University of Minnesota - Rochester

Discipline: Psychology

Authors:

#1 Robert Dunbar

#2 James Winchip

Abstract Name: Perception of Knowledge and Comfort Level When Discussing Controversial Topics in the Classroom

Previous studies have examined the relationship between students' perception of knowledge and their classroom participation, suggesting that students are more likely to engage in discussions when they perceive themselves as knowledgeable about the topic. To explore how this dynamic applies to controversial topics related to politics, gender, and religion. The Campus Expression Heterodox Academy survey was distributed to students enrolled in an Introduction to Psychology course. Two survey questions were analyzed: one asking students to rate their knowledge on these topics and another assessing their comfort level in expressing their views during discussions on controversial issues. A Chi-squared test showed a connection indicating that students who reported most-to full understanding about gender, politics, and religion felt more comfortable sharing their opinions when it came to controversial topics related to the previous categories compared to those who reported little to no understanding. Future research could investigate how demographic factors influence perceived knowledge and comfort levels in voicing opinions during classroom discussions.

Andreas Uudmae

FL - Florida Atlantic University

Discipline: Business

Authors:

Abstract Name: Monetary Incentives in Public Health

The U.S. is facing a growing health crisis and struggling to deal with it effectively. Most attention is on treating the different health issues that arise from obesity, less has been done to address the root cause: unhealthy lifestyle habits. Economics could show us how to deal with this issue effectively. Monetary incentives could promote healthier behaviors in people and bring down the obesity rate. The purpose of my research is to investigate public opinion on offering monetary incentives to improve public health. I wrote a 20 question survey, distributed it through Amazon MTurk, and received 164 completed surveys. The data was analyzed using IBM's SPSS to assess public opinion on the effectiveness of monetary incentives for leading a healthier life. Specifically I'm testing to see if there is a statistically significant difference in opinions of men and women on these incentives being offered. Most notably, there was a statistically significant gender difference in opinions of the government providing positive monetary benefits for participating in fitness challenges. All surveyed women answered yes on this question while only 88.6% of men believed this to be a good idea. These results were statistically significant at the 1% level of significance. By incorporating gender differences into health policies, there may be new approaches to improve public health, especially when utilizing monetary incentives to create change.

Seyedeh Parnian Vakili

WI - University of Wisconsin-Milwaukee

Discipline: Biology

Authors:

#1 Priyanga Jayakrishnan

#2 Nikki K. Lytle

Abstract Name: The Role of Midkine in Pancreatic Cancer Liver Metastasis

Pancreatic cancer is the third leading cause of cancer deaths in the United States, with metastasis, the spread of cancer cells beyond the original tumor, being the primary cause of mortality. Patients with advanced metastatic disease have a 5-year survival rate below 5%. Studies show that the metastatic tumor microenvironment, which includes surrounding non-cancerous cells, blood vessels, immune cells, and signaling molecules, plays a key role in the progression of metastasis. Midkine (MDK) is a protein involved in various cellular processes and has been studied for its potential involvement in cancer progression. Our lab demonstrated that in a mouse model with accelerated pancreatic metastasis in the liver, MDK expression is increased in liver cells. It remains unknown if MDK contributes to pancreatic cancer metastasis. To address this gap, we aimed to determine whether liver-derived MDK influences tumor cell behavior. Since MDK can bind to several receptors, we assessed which receptors are expressed by human and mouse pancreatic cancer cell lines, as well as whether the cancer cells themselves express MDK. We show that pancreatic cancer cells express and secrete MDK and also express its associated receptors SDC1 and PRKCZ. Further, analysis of publicly available datasets from pancreatic cancer patients reveals that high MDK expression is associated with more aggressive pancreatic cancer, and MDK levels are elevated in liver metastases compared to primary cancer sites. These findings suggest a potential pathway for therapeutic intervention, as we aim to test whether targeting MDK may effectively prevent metastatic progression and improve patient outcomes.

Angelina Valdes

TX - The University of Texas at El Paso

Discipline: Health and Human Development

Authors:

#1 Angelina Valdes

#2 Shakira Tewasmetaw

#3 Desiree Meza

#4 Manuel Eloy Morales

Desiree Meza

Abstract Name: Impact of Art & Crafts on Social Interaction Amongst the Elderly

Social isolation represents a persistent and critical public health challenge among the elderly populations, frequently showcasing declines in mental and physical well-being. This service-learning intervention explored the transformative potential of arts and crafts as a strategic mechanism for mitigating social isolation and enhancing community engagement. Over a meticulously structured five-week period, weekly 2.5-hour creative sessions were implemented at the Bartlett Assisted Living Center, encompassing activities such as polymer clay molding, sculpture painting, pinecone birdfeeder construction, wood canvas painting, and snowflake canvas painting. These interventions were designed to create different craft opportunities outside of their consistent routine for meaningful connection, storytelling, and skill exchange. Impact evaluation surveys were provided to the director and caregivers during the period to assess mood, connections, and the program's success in reducing isolation. Notably, the program showed to have challenged preconceived notions about aging and creative potential, demonstrating that artistic engagement is not confined by chronological age or perceived limitations. Residents, including those with mobility challenges, who were initially reluctant to participate, showed significant increases in engagement. Survey responses indicated

notable improvements in emotional well-being, with many residents expressing feelings of joy and fulfillment, alongside visible improvements in social interactions. The project demonstrated that creative, collaborative approaches represent a powerful and replicable model for combating loneliness, offering valuable insights into innovative strategies for promoting social connectedness and psychological resilience in aging populations. Underscores the importance of different creative and inclusive interventions in promoting connection and well-being in the elderly community.

Asiel Valdes Diaz

FL - Miami Dade College

Discipline: Engineering

Authors:

#1 Asiel Valdes Diaz

#2 Mayte Alvarez Trimino

Mayte Alvarez Trimino

Abstract Name: Sharky: An Interactive Robot for Campus Sustainability

This research focuses on developing an autonomous robot designed to promote recycling on campus by interacting with individuals and navigating its environment. Inspired by the MDC shark, the robot integrates hardware and software technologies to raise awareness about environmental issues. Powered by 12W DC motors and controlled by an Arduino R4 Wi-Fi module, the robot uses ultrasonic sensors to detect obstacles and walls. An OpenMV H7 microcontroller camera, programmed in Python, enables visual recognition of obstacles and human presence, allowing for autonomous navigation and effective interaction. The chassis, 3D-printed with PLA material and designed in Fusion 360, ensures structural integrity and lightweight mobility. Calculations of weight, wheel resistance, and movement dynamics were conducted to optimize performance. The robot's free-roaming capability allows it to autonomously traverse campus spaces, avoid obstacles, and engage individuals through a speaker system that delivers messages about recycling and environmental conservation. By integrating robotics with community engagement, this project offers an innovative approach to sustainability and environmental education. The robot combines autonomous navigation with meaningful interactions to inspire action and promote sustainable practices on campus. The anticipated outcome is heightened awareness of recycling and sustainability within the campus community, showcasing the potential of robotics to advance educational and environmental objectives. This research also contributes to the broader field of robotics by demonstrating its application in addressing environmental challenges through interactive and impactful solutions.

Lexi Valeri

WI - University of Wisconsin-La Crosse

Discipline: Biology

Authors:

#1 Lexi Valeri

#2 Lauren Broman

#3 Sumei Liu

Abstract Name: Role of Mast Cells in Stress-Induced Increase in Intestinal Permeability

This research explored what chemical mediators are released by the intestinal mast cells under stress situation

and whether they influence epithelial permeability in the mouse colon. Mast cells are a type of immune cell that release chemical granules that contain histamine, proteases, cytokines, etc. when stimulated by neuronal, hormonal, or paracrine signals. It has been demonstrated that mast cell deficient animals show no increased intestinal permeability after exposure to stress, suggesting that mast cells may play a crucial role in stress-induced disruption of the intestinal epithelial barrier. There is little research on the specific chemical mediators released by mast cells during stress and their roles in intestinal barrier function. Mice were divided into four groups (5/group): control male, control female, stress male, stress female. Stress animals were restrained for one hour/day for five consecutive days. Control animals were kept in their home cages and did not experience restraint. Following the final restraint/control session, the proximal colon was removed and dissected. The mucosa/submucosa of each preparation was mounted to an Ussing Chamber. Corticotropin-releasing factor (CRF) was added to the basolateral side of the chamber to stimulate mast cell degranulation and samples were taken before and 30-min after adding CRF. The levels of mast cell mediators (histamine, mast cell tryptase, tumor necrosis factor- α) were measured using enzyme-linked immunoassay (ELISA). The results for histamine release showed no significant difference in either the baseline histamine release or CRF-induced histamine release between control and stressed mice. Release of mast cell tryptase and tumor necrosis factor- α will be analyzed in the next few months. Our research has the potential to identify the key chemical mediators released by mast cells during stress. This could lead to further research to identify treatments that selectively target the mast mediators that increase intestinal permeability.

Anthony Valletta

PA - Duquesne University

Discipline: Biology

Authors:

#1 Sadhana Srinivasa

#2 Wook Kim

Abstract Name: Identification of cyclic-di-GMP regulated biofilm matrix genes in *Pseudomonas fluorescens* by transposon mutagenesis

Cyclic-di-GMP (cGMP) is a ubiquitous second messenger in bacteria that regulates biofilm formation primarily by activating extracellular matrix genes. Biofilms are responsible for most chronic human infections due to their extracellular matrix conferring resistance against chemical and immunological interventions. Therefore, understanding extracellular matrix components' spatial function and organization is crucial for developing new therapeutic strategies. In *Pseudomonas fluorescens*, increased cGMP levels result in a dry-wrinkly colony morphology and non-motile behavior. These phenotypes likely manifest through increased production of matrix components that collectively act as extracellular glue to hold individual cells together and turn off motility genes. This study aimed to identify the matrix genes responsible for the dry-wrinkly morphology by mutagenizing a high-cGMP-producing *P. fluorescens* strain with a Tn5 transposon containing a kanamycin resistance gene from *Escherichia coli*. This transposon randomly inserts into the host genome, disrupting gene function while conferring kanamycin resistance. To target genes responsible for producing extracellular matrix components, kanamycin-resistant colonies that no longer produce the dry-wrinkly phenotype were isolated and screened for positive motility to filter out mutations that reduce cGMP production. The genomes of selected mutants were analyzed to identify specific biosynthetic genes associated with the extracellular matrix components.

Nicolina Valore

OH - University of Dayton

Discipline: Biology

Authors:

#1 Yvonne Sun

#2 Maggie Hantak

Abstract Name: Diverse bacteria from the skin of the Eastern Red-backed Salamander

Amphibians are facing a significant biodiversity crisis. In the last few decades, these animals have been decimated by two fungal pathogens, *Batrachochytrium dendrobatidis* (Bd), and *Batrachochytrium salamandrivorans* (Bsal). Curiously, the most common amphibian species in the northeastern United States, the Eastern Red-backed Salamander, (*Plethodon cinereus*), appears to be largely resistant to Bd infections and also does not appear to be greatly affected by Bsal. The factors that contribute to this resistance are not fully understood. In this study, we collected *P. cinereus* skin swab samples from a total of three locations (Caesars Creek, Hills and Dales, and Taylorsville) surrounding Dayton, Ohio. Suspensions from the swab samples were plated to isolate bacteria. From a total of 27 skin swab samples, we obtained a total of 107 bacterial isolates. Many of the isolates are identified as bacteria commonly found in soil. Interestingly, some isolates are closely related to environmental clones where no cultivation of the organisms has been reported. In a preliminary test, the antimicrobial activity of the bacterial isolates was tested against *Listeria monocytogenes*, *E. coli*, *Salmonella enterica*, and *Saccharomyces cerevisiae*. Findings from this study will help elucidate the role of skin microbes in the protection against pathogens for *P. cinereus* and ultimately provide insight into amphibian conservation.

Isaac Van Beek

IA - University of Northern Iowa

Discipline: Communications

Authors:

Abstract Name: Tattoos and Fear Factors: Perceptions and Presentations of Tattoos of the College Students

Tattoos due to a long association with deviant individuals, gangsters, and prisoners, had long been perceived as scary presentations. However, the popularity of tattoos among the general public in recent decades has changed the perceptions as well as the presentations of tattoos. Instead of having tattoos of high-fear designs (such as skulls and guns), many had elected to have tattoos with low-fear designs (such as hearts and stars). The purpose of this study is to examine (1) how high-fear tattoos, and low-fear tattoos are perceived respectively, (2) if having tattoos changes that view, and (3) how gender plays a role in the selection of high-fear tattoos or low-fear tattoos, as well as in the placements of the tattoos, by the college students. This study utilizes the study of the presentation of self in symbolic interactionism as a theoretical framework. More specifically, Mindy Fenske's work, *Tattoos in American Visual Culture*, as well as Clinton Sanders and D. Angus Vail's *Customizing the Body: The Art and Culture of Tattooing*, provide the theoretical foundation for this study. Margo DeMello's work, "The Convict Body: Tattooing Among Male American Prisoners," in *Anthropology Today* also informs the research questions in this study. The researcher hypothesizes that (1) high-fear tattoos and low-fear tattoos would generate different perceptions among the college students, and (2) gender would impact on the selection of high-fear or low-fear tattoo designs, as well as the placements of tattoos on one's body, by the college students in this study. A survey, designed to ascertain the perceptions of high-fear tattoos and low-fear tattoos, as well as the selections and the placements of tattoos, was administered to students in a midwestern university who served as volunteers in this study. The data collection is underway, with the research findings to become available in the near future.

Rosemary van der Net

PA - Duquesne University

Discipline: Biology

Authors:

#1 Rosemary van der Net

#2 Joshua Robinson

#3 Jan Janecka

Abstract Name: A New Method of DNA Extraction for Fieldwork Application

Noninvasive genetic sampling is a method for collecting genetic data from wildlife without capturing, handling, or physically restraining animals. This approach is especially valuable for obtaining genetic information while minimizing disruption to the animals and their habitats. One common noninvasive sample is scat, which often contains low DNA quantities, making extraction challenging. Traditional DNA extraction kits, like those used for scat, typically require centrifugation, significant time, and are limited in their ability to process multiple samples simultaneously, making them impractical for field use. The aim of this study was to develop an efficient, field-friendly DNA extraction protocol for scat samples that could be applied across various species, require minimal supplies, and be completed quickly while processing multiple samples at once. The protocol developed utilizes Axygen paramagnetic beads to successfully bind DNA from scat. Samples, collected between 2018 and 2024 from species including snow leopards, deer, and wolves, were dissolved in either Tris HCl or water, with both yielding comparable results. The resulting protocol proves to be highly effective and efficient for field use. It requires only the chemical Tris HCl, eliminates the need for centrifugation, and can process multiple samples within an hour. This method offers significant advantages over traditional kits in terms of time, cost, and practicality. It is ideal for wildlife genetic studies, especially in conservation efforts that involve large-scale, noninvasive sampling. This protocol represents a substantial improvement in DNA extraction for scat samples, making it an excellent tool for researchers and wildlife managers working in the field.

Kaylee van der Steeg

VA - Roanoke College

Discipline: History

Authors:

#1 Kaylee van der Steeg

Abstract Name: The War of Liberation in Britain's First and Last Colony

The Troubles of Northern Ireland was a complex and multifaceted conflict which is typically thought of as being between the Protestant Unionists and Catholic Nationalists. This simplistic categorization of the clashing sides deprives the Troubles of their complicated nature and intricate socio-political issue rooted in centuries of British imperial policies and cultural suppression. The traditional timeline of events points to a thirty-year conflict but based on political violence and the loss of children, the timeline is closer to forty years ending in 2007. The Troubles were marked by military raids, political violence, and significant human rights violations. The project further explores the impact on families, especially children, and underscores the ongoing struggles for peace and reconciliation in the aftermath of the Good Friday Agreement. My research drew from newly declassified documents from the British government which are held in the British National Archives in Kew. I completed this archival research in March 2024 and these military and governmental documents provided the basis for the project. I supplemented the use of primary sources with secondary sources pertaining to the loss of children and political violence seen in Northern Ireland.

Kaylee van der Steeg

VA - Roanoke College

Discipline: History

Authors:

#1 Kaylee van der Steeg

Abstract Name: Children: Humans or Threats?

Children: Humans or Threats? Can children be both human and threats? For the 732 children that were deemed as threats by the Nazi government and survived the Holocaust, the answer is yes. These children survived the Holocaust and were sent to England in an effort to become rehumanized. To their childhood governments, they were threats to the racial, nationalist, and antisemitic ideas. At the heart of the Nazi ideology lay the mass killing of 'undesirable' children. They survived the horrible six years of the Holocaust, where they were repeatedly dehumanized and degraded. When they were sent to England, they were taken pity on and were rehumanized by largely the Jewish community. This project pulls stories from a few of the children's lives to show what it was like to be children of genocide... to be children labeled as threats. My research drew from the oral histories from the children as well as the few secondary sources produced on the subject. As children tend to be underrepresented in the literature surrounding the Holocaust and genocide in general, this project aims to put children into the narrative and fill the holes in the field of study. This project not only adds to the field of Holocaust study, but also challenges the reader to think critically about conflict and genocide in both the past and into today.

Brenden Van Duzer

TX - The University of Texas - Permian Basin

Discipline: Engineering

Authors:

#1 Seyed Ghiaasiaan

Jose Ruiz

Leigha Grijalva

Abstract Name: Golf Putter Design Optimization

This research investigates the influence of varying insert materials, infill densities, and patterns on the performance of golf putters, emphasizing the role of additive manufacturing (3D printing) in enhancing customization for individual golfers. While traditional putter designs typically feature metal or polyurethane inserts, additive manufacturing enables precise control over the internal structure, allowing for the optimization of weight distribution, feel, and acoustics. This study explores different infill densities (low, medium, and high) and patterns to evaluate their effects on critical performance metrics such as putting accuracy, consistency, and player preference. Prototypes are produced using 3D printing, and their performance is benchmarked against conventional putters in both simulation modules and field trials. Results indicate that custom-designed internal structures significantly influence a putter's responsiveness, providing a more personalized and refined experience tailored to individual golfers. The ability to manipulate these internal characteristics allows for more precise adjustments in feel, sound, and overall performance. This research highlights the potential of additive manufacturing to revolutionize golf club design by offering unparalleled customization, paving the way for a new generation of putters that better suit the unique needs of

each golfer. Ultimately, this approach could lead to improved putting performance and a more individualized, player-centric product.

Kaylee Van Handel

NE - Creighton University

Discipline: Computer Science

Authors:

#1 Kaylee Van Handel

#2 Rachel Malander

#3 Lindsay Iverson

#4 Steven Fernandes

Rachel Malander

Abstract Name: Navigating Difficult Conversations in Healthcare: The Use of AI Chatbots in Training Undergraduate and Graduate Nursing Students

Nursing students at both undergraduate and graduate levels require practical opportunities to develop their skills in managing difficult conversations with patients and families—a critical component of patient care that is often challenging to simulate adequately in traditional educational settings. To address this gap, we are developing a tiered experiential learning approach that incorporates an AI-based communication tool leveraging Dante-AI, which utilizes Retrieval-Augmented Generation (RAG) to build custom large language models (LLMs). By adapting and piloting this tool, we aim to enable approximately 80 nursing students to practice difficult conversations in a controlled, yet realistic environment before interacting with real-life standardized patients matched to their competency levels. Using Dante-AI's platform, we have fine-tuned a custom LLM with domain-specific data, integrating nursing communication protocols, ethical guidelines, and patient scenarios into its knowledge base. The RAG framework enhances the model's ability to retrieve relevant information during interactions, ensuring contextually appropriate and pedagogically valuable responses. Students will engage with the AI chatbot to simulate challenging dialogues, after which they will be evaluated using established rubrics aligned with course outcomes. A post-activity survey will assess their perceptions of the tool's usability and efficacy in enhancing their communication skills. By focusing on building a custom LLM using Dante-AI and RAG, this initiative not only provides a scalable and personalized learning platform but also enriches the educational experience by offering context-rich simulations that prepare nursing students more effectively for real-world patient interactions. The anticipated outcomes include improved communication competencies among nursing students and valuable insights into the integration of advanced AI technologies like Dante-AI in nursing education.

Riley Van Heukelum

NY - Houghton College

Discipline: Computer Science

Authors:

#1 Katrina Koehler

Abstract Name: Reception of Video Games over the Past Forty Years

In just forty years, video games have quickly grown from a niche hobby into a multibillion-dollar industry and a major shaping force in Western culture. Previous research into the evolution of the gaming industry has

shown interesting relationships between big publishers and indie developers, differences between genres, and more. However, this has become somewhat outdated considering how rapidly the market evolves with the emergence of new technologies and shifts in consumer demands. This research investigates how the current state of the gaming industry compares to previous findings and expands upon previous research by focusing on review scores and critical reception to different types of games. This was done using a dataset containing information on video games from the 1980s through 2023, created by scraping the video game collection website Backloggd. Using python, the dataset was processed, split into an exploration and testing set, and explored using linear regression and clustering algorithms, and statistical tests. Findings revealed that in addition to an exponential increase in game releases over time, game reviews are also increasing. Genre-specific analysis showed that Multiplayer Online Battle Arena (MOBA) games attract the largest player bases but receive the most unfavorable reviews, while Indie games are part of a recent and swiftly growing genre that is well-reviewed but reaches smaller audiences. Lastly, Nintendo's significant influence in the industry was highlighted through its connections with many of the largest game development teams. This data both confirms results of previous research and expands upon it to provide a better understanding of critical reception to different games and to the industry across time.

Avery Van Scoy

AR - University of Arkansas

Discipline: Political Science

Authors:

#1 Avery Van Scoy

Abstract Name: Italianità and the Italian Response to Migration from 2014 to 2024

As unprecedented waves of irregular migration came to the shores of Italy from Africa in 2014 the EU and Italy had to respond to what was then a crisis. Ten years later, this crisis has turned into a new reality, and migration policy has changed in response to be more hostile towards asylum seekers. It is not only important to examine this issue from a political lens, but also a cultural one. Today's Italy is still affected by the narratives created by the Fascist government to unite the peninsula under a common identity of Good People, or in Italian – Brava Gente, and to legitimize Italy's colonial desires. This shared national memory hinders Italy's ability to critically reflect on its history and current migration policy. The myth of the Italian Brava Gente molds xenophobic policy and state violence against minority groups. The right to seek asylum has been protected internationally since 1951 with the Refugee Convention, but since then there have been numerous ways in which its safe guards have been circumvented. In 2017, Italy struck a deal with Libya to provide their 'so-called coast guard' with technical and financial support. The Libyan Coast Guard is actively intercepting migrants crossing the Mediterranean in hopes of reaching Europe, and returning them to deadly, and abusive environments, that the UN finds may constitute crimes against humanity. Italy has outsourced its efforts to block "undesirable" asylum seekers to Libya, aiming to keep its hands clean and uphold the moral superiority associated with the Brava Gente narrative.

Emma Van Steertegem

IL - University of Chicago

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

Abstract Name: Subordination or State Socialism: A Marxian Interpretation of the Russian Revolution

This paper will argue that Russia's 1917-28 economic policies affirm the conclusions of the Marxian theory of history. To do this, it will first interpret the war communism of 1918-21 and the New Economic Policy (NEP) of 1921-28 through the paradigm of so-called "dependency theory," which argues that countries peripheral to global capitalism are systemically economically de-developed by those countries core to it. Through this argument, I will provide an understanding of war communism and NEP as attempts to avoid "de-development" of the Russian economy by advanced capitalist nations of Western Europe and the United States. This understanding will disrupt narratives of the Russian Revolution as subverting global capitalism which would have otherwise encroached upon it, reframing it as a project to develop capitalistic conditions competitive with the global economy--albeit, under the title of state socialism. My paper will, secondly, define the Marxian theory of history with reference to the necessity that it accords to the predating of socialism by capitalism. With these two interpretations established--first, of the Russian Revolution, and second, of the Marxian theory of history--my paper will argue that the conditions within which peripheral impulses for socialism are formed are necessarily exclusive from those within which those efforts would succeed. That is, peripheral impulsions towards socialism presuppose the entrenchment of global capitalism, and this entrenchment necessitates the essentially capitalistic nature of any socialism achieved by the peripheral. Correspondently, I will claim not that capitalism is unconditionally necessary for socialism, but that the dynamics of global capitalism reduce the possibilities through which socialism might be achieved without an antecedent stage of capitalism. In this way, empirical reality has produced conditions that are unlikely to disprove the Marxian theory of history. This reality, specifically, causes the socialist aspirations of the periphery to necessarily stem from and resolve in capitalism.

Kerryann Van Velzen

NY - York College

Discipline: Biology

Authors:

#1 Virginia Garcia- Marin

Virginia Garcia- Marin

Abstract Name: Quantification of neurons in Macaque A1 region

Quantitative studies of brain anatomy are crucial for elucidating the relationship between neural function and structure. Our research, of significant importance, aims to determine neuronal density in the macaque primary auditory cortex (A1), spanning from layer 1 to the white matter region. A1, which receives direct input from the thalamus, serves as a key area for initial auditory processing. The difference in total neuronal density between A1 and V1 may contribute to variations in information processing capacities. The consistent proportion of PV cells across these primary sensory areas suggests preservation of the excitation/inhibition ratio. Our meticulous approach, employing large-scale confocal imaging combined with automated segmentation methods, has emerged as an effective approach for accurately quantifying neuronal density across diverse brain regions. We employed confocal imaging and automated neuronal quantification analysis. Neurons were labeled with: 1. NeuN (pan-neuronal marker) 2. Parvalbumin (PV) to identify a subpopulation of inhibitory neurons 3. DAPI (counterstain for later sections) Our current dataset, derived from two columns of two macaques' A1 region, revealed: - Average total neuronal density: 115,680 neurons/mm³ - Parvalbumin (PV) neuron density: 6,941 neurons/mm³ - PV neurons constitute 6% of the overall neuronal population Comparative Analysis Compared to previous data from macaque primary visual cortex (V1): - A1 neuronal density is approximately half that of V1 - The percentage of PV cells is comparable between A1 and V1 Implications. We are preparing to administer additional staining, specifically calretinin, for cross-referencing and further characterization of neuronal subtypes. This study, with its potential to provide valuable insights into the neuronal architecture of macaque A1, is eagerly anticipated for its contribution to our understanding of auditory processing and sensory cortex organization. The comparative analysis with V1 highlights both

similarities and differences in primary sensory cortices, opening avenues for further investigation into sensory information processing.

Matthew Vanden Berk

PA - Saint Vincent College

Discipline: Physics and Astronomy

Authors:

#1 Coty Walters

#2 Daniel Vanden Berk

#3 Michael Antonacci

#4 David Grumbine

Abstract Name: Monitoring Radon Washout/Rainout Events with Modified CosmicWatch Radiation Detectors

Gamma-ray intensity variations were monitored for precipitation events over several months, including the remnants of two tropical cyclones, using a set of modified CosmicWatch radiation detectors. Clear signatures of radon washout/rainout were recorded for each event with > 1 mm of precipitation, with gamma-ray count rates in excess of 50% above normal in some cases. All of the washout/rainout events were verified by measurements from an on-site rain gauge. The results demonstrate that low-cost CosmicWatch systems can be used for sensitive atmospheric radon monitoring.

Mia Vandersommen

OH - Baldwin Wallace University

Discipline: Biology

Authors:

#1 Mia Vandersommen

#2 Blake D. Petersen

Abstract Name: Genetically Engineering *Vibrio campbellii* with Chromoproteins for Multispecies Assays

Chromoproteins are proteins that produce bright, distinguishable pigments under the visible light spectrum when expressed by organisms, and have the potential to serve as novel reporters for studying gene expression in bacteria. *Escherichia coli* has previously been engineered to express a palette of chromoproteins encoded on plasmids as an alternative to using fluorophores in research, which require sophisticated equipment to excite and detect expression. However, limited work has been done to use these chromoproteins in other bacterial species, or in the use of studying multispecies bacterial behaviors such as bacterial motility, biofilm formation, and type VI secretion competition. In this project, we sought to engineer a chromoprotein-producing strain of *Vibrio campbellii*, a Gram-negative marine pathogen. We cloned the gene encoding the yellow chromoprotein gene (DasherGFP) from *E. coli* into a *V. campbellii*-compatible plasmid vector and introduced it to *V. campbellii* through conjugation, successfully producing visible yellow pigment in *V. campbellii* colonies distinguishable from the wild type. Using this plasmid backbone, we aim to expand our library of pigmented *V. campbellii* to construct strains corresponding to other colors in the rainbow for use in future multi-species studies. We plan to use these strains in competition assay between *V. campbellii* and *E. coli*, comparing *V. campbellii* mutants deficient in motility, biofilm formation, and type VI toxin secretion and their effect on each species when grown together. This project ultimately explores the potential for using

chromoproteins as a new genetic tool to expand existing microbiological assays for studying multi-species competition.

Jorge Vanegas

TX - The University of Texas at San Antonio

Discipline: Engineering

Authors:

#1 Gary Newman

#2 Gabriela Romero Uribe

#3 Nicolas Muzzio

Abstract Name: Effect of EDOT-Py Nanoparticles in the Viability of Brain Tissue Scaffolds

Organic bioelectric devices like scaffolds have recently made many breakthroughs in tissue engineering but a critical issue in modern medicine, brain tissue regeneration, remains relatively untouched. Scaffolds function to generate a tissue with a particular form but are limited by being too rigid to support various cell types. Since tissue cells should ideally be in a scaffold similar to the environment the tissue experiences in vivo, most scaffolds are not conducive to mimicking a brain environment for brain tissue regeneration. The creation of a new scaffold device with similar properties to the brain would allow for more exploration of brain tissue regeneration treatments. Biocompatible materials for brain tissue scaffolds would need to be soft and conductive. This may be achieved through using hydrogels functionalized with polymers with these properties. EDOT-Pyrrole nanoparticles (NPs) were selected due to their high sensitivity to bioelectrical signals while fibronectin was chosen for its pre-existing use in wound healing. A hydrogel with both materials could help encourage tissue regeneration. ND7/23 cells were cultured in the hydrogels then analyzed through fluorescent imaging. The implications of the results could allow functionalized hydrogels to be adapted into current bioelectric devices and create a new and safe method to regenerate brain tissue in patients that may need it. In doing so, this research works to further add to health literacy and understanding of neurological processes and provides a basis for future exploration of innovative medical treatments for tissue regeneration, be it in brain, skin, or heart tissue.

Pa Hok Vang

MN - Hamline University

Discipline: Biology

Authors:

Gaoshuapa Thor

Hermela Yemane

Abstract Name: Investigating the Genetic Architecture of Ion Intake in Plants

Climate change has become a complex series of issues in our world, impacting our ecosystems and vegetation land, including rising soil salinity due to increased evaporation. The elevation of salinity in our soils due to unsustainable agricultural practices such as excessive fertilizer use, improper irrigation, poor-quality water, and deforestation. These practices have negatively affected crop growth and yield by spiking soil salinity which disrupts water uptake and causes nutritional imbalances. Like many organisms, plants are able to resist and regulate their system during dire times such as droughts, floods and high salt levels due to runoffs. Plants have a limited capacity to endure extreme conditions, but identifying regulatory functions can help develop

salt-tolerant plants. The development of salt-tolerant crops is essential for combating climate change and harmful agricultural practices. Some *Arabidopsis thaliana* mutants have been shown to exhibit higher salt tolerance than their wild-type counterparts, suggesting that certain genetic factors may regulate ion uptake and metabolism. In our research, we conducted a lab which focused on three different gene mutations in the *Arabidopsis thaliana* plant predicted to be able to change the gene expression in response to changes in soil ion concentration. We evaluated the different gene mutations based on their phenotypic features such as seed size, root length and leaf size. Larger seed sizes have been shown in some case studies with salt-tolerant mutant plants to be more effective at regulating ion intake. In addition to this, longer root length has shown to be more tolerant to high salinity. The measurement of leaf sizes will be used to determine how well the mutant plants grow in comparison to the wild type. By understanding the mechanism behind how plants regulate ion intake and tolerance to high salinity soil, we can maintain agricultural productivity and food security.

David VanSlander

PA - Slippery Rock University of Pennsylvania

Discipline: Dance

Authors:

#1 Melissa Teodoro

Abstract Name: The Robot: From Dance Craze to Dance Partner

What is the state of artificial intelligence (AI) and machine learning in the performing arts today? How will such programs integrate into dance spheres, and at what level should that integration be? These questions arise when viewing the imminence of AI machinery in nearly every aspect of everyday life, with little restriction on its development. By comparing the origins of AI in dance to what it is currently capable of achieving, as well as examining current forerunners in the field, there may finally be answers. There will also be analysis of notable works partially created using AI by notable choreographers such as Merce Cunningham in order to better understand its contribution to an overall piece. Using this information, as well as the findings of engineers and artists Catie Cuan and Ken Goldberg, we can predict what it may be capable of in the future, allowing us to have more healthy and intelligent discussion about its trajectory. I have found a comfortable spot personally at the use of dance as a choreographic tool. Much like one would call upon choreographic techniques from composition classes to create unique movement, artificial intelligence would become an alternative methodology of creating inspiration or framework that the choreographer would be able to adjust and personalize. It is notable that this approach is not without flaws. It may be impossible to draw a definitive line, free of criticism, but opening this topic for discussion and inspection is likely one of the most important ideas for dance spaces to explore.

John Varghese

PA - University of Pittsburgh

Discipline: Chemistry

Authors:

#1 John Varghese

#2 Jack Donahue

Abstract Name: Isolation of Antifungal Compounds Deoxyviolacein and Violacein from *Janthinobacterium lividum* VT36D and CO Strains

Antibiotic resistance in various microbes is a growing problem. Throughout the last century, many antibiotics have been discovered and used for the treatment of infectious diseases. Unfortunately, the increased use of antibiotics leads to the microbes responsible for these infections developing drug resistance. In this context, finding novel antibiotics has become a research area of significant interest. Many microbes produce their own antibiotics. *Janthinobacterium lividum* bacteria is known to display antifungal activity, specifically inhibiting the growth of the *Batrachochytrium dendrobatidis* (Bd) fungus. This fungus is threatening global amphibian populations with an epidemic of the disease chytridiomycosis. Cutaneous amphibian bacteria such as *J. lividum* can aid in defense against fungal infections by producing compounds with antifungal properties. In collaboration with UMass Boston's CURE Microbiome course, we set out to test the effect of *J. lividum* bacteria cultured from frog skin on the Bd fungus. Our research focuses on isolating the organic compounds produced by two strains of *J. lividum* bacteria, *J. lividum* VT36D and *J. lividum* CO. We collected a similar purple crude extract from both of our strains, and using paper disk assays with Bd fungus, we observed significant growth inhibition. Using liquid-liquid extraction, high-performance liquid chromatography (HPLC), H-NMR, and mass spectroscopy, we isolated and identified the key antimicrobial compounds in these strains of bacteria. We detected deoxyviolacein from *J. lividum* VT36D, a visibly purple compound with antifungal properties. We also detected violacein from *J. lividum* CO, another purple antifungal compound with a similar molecular structure. During the isolation process, we used thin-layer chromatography (TLC) and found that Methanol-D4 was an effective solvent to dissolve these specific compounds. Finally, we used a new solvent, DMSO, to investigate the effects of the solvent on our structural analysis of these antimicrobial compounds, and we were able to further support the identity of violacein.

Julio Vasquez Jimenez

NY - Brooklyn College

Discipline: English and Literature

Authors:

Abstract Name: High Literature, Low Literature, and its Impact On Social Systems and Functions

My project examines the relationship between high and low literature, a classification that reflects themes of race, gender, and especially class. The explanation for this concept has proven itself through a myriad of changes to its supposed stagnant system. Renowned writers such as Daniel Defoe and William Shakespeare exemplify this evolution. Their works are now in academic spaces, studied by scholars and deemed the blueprint of high literature. However, in their time, they were deemed as low literature, their popularity seemingly proving their lack of highbrow status. This nature could refer to topics or themes discussed in their writing that were considered trash, cheap or taboo. Like in Defoe's *Roxana*, where the protagonist is a woman who indulges in affairs to attain status and wealth while abandoning the role of a mother, or Shakespeare's *Othello*, in terms of race, where *Othello* was depicted in blackface by male actors. My methodology focuses on the variety of high literature novels taught in English courses at the Brooklyn College campus, observing which novels or writers are known by the public and which are not. Aside from investigating what works are considered high literature or low literature, I look at the specific factors that ultimately play the role in determining this status, factors that include accessibility, level of literacy and mobility. High literature is essentially exclusive and can mostly be found in academic spaces where it is discussed in scholarly discourse, whereas low literature is popular and highly inclusive and features many voices in its discourse, though often with far less scholarly emphasis. Are these disparities between classifying high and low literature products of social issues and if so, can by solving or at least understanding that system help then, solve conflicts reflected in society?

Joshua Vaughan

Discipline: Biology

Authors:

#1 Zachary Stahlschmidt

#2 Clarice Yoon

#3 Austin Hoffman

Abstract Name: Rapid Changes in Coloration in Adult Field Crickets in Response to Climate Change

The animal kingdom displays a diverse array of colors. The ability to express different types of melanin-based coloration may be crucial for animals' adaptation to climate change. For example, insects can adopt lighter coloration to limit heat absorption from solar radiation ('thermal melanism hypothesis'). Other environmental factors, such as water availability and predation risk, may also affect melanism or dark coloration. Cuticular melanin plays a role in many adaptive responses in insects, such as reducing water permeability, so darker insects can exhibit reduced rates of water loss during drought ('water conservation hypothesis'). Insects also rely on crypsis or camouflage to reduce predation risk, with dark environments potentially increasing melanization and light environments reducing it ('crypsis hypothesis'). Here, we used a factorial design to manipulate temperature (20°C or 30°C), water availability (with or without drinking water), and environmental color (white or black background) during early adulthood in the variable field cricket (*Gryllus lineaticeps*), which naturally exhibits a range of coloration, from pale tan to red to black. We measured melanization in the crickets' wing pads to test the relative importance of temperature, water availability, and crypsis in the plasticity of coloration, as well as potential interactive effects between these factors. Preliminary results indicate strong support for the thermal melanin hypothesis, no support for the crypsis hypothesis, and contradictory support for the water conservation hypothesis. Our research will clarify how plasticity in coloration may respond to ongoing climate change and urbanization, which continue to alter temperature, water availability, and predation risk worldwide.

Bethany Vaught

CO - Regis University

Discipline: Biology

Authors:

#1 Sophia Siong

#2 Alexandra Walker

#3 Lauren Burns

Abstract Name: Using *C. Elegans* to elucidate the cellular mechanisms of Exercise-Induced Recovery from Methamphetamine Addiction

Methamphetamine (METH) is a highly addictive stimulant that inflicts detrimental effects on the central nervous system (CNS), leading to addiction and various neurotoxic consequences. Excessive dopamine and glutamate production caused by METH can contribute to oxidative stress and toxicity. These changes in neurotransmitter levels have been associated with decreased learning, cognition, and dopaminergic terminal neurodegeneration. Despite extensive research, the precise molecular and cellular mechanisms underlying METH's toxicity remain elusive. To address this, we employed *Caenorhabditis elegans* (*C. elegans*) as a model organism to gain valuable insights into the drug's impact on the CNS. Through behavioral assays and neurobiological investigations, we examined the effects of METH exposure on *C. elegans*, aiming to uncover the pathways responsible for behavioral and neurobiological alterations. Our results revealed that METH exposure induced a dose-dependent increase in nose touch behavior, indicating reduced learning ability in this model. Additionally, we observed a significant dose-dependent decrease in DAT expression, demonstrating

dopaminergic terminal neurodegeneration. Moreover, our investigation into oxidative stress via glutathione transferase expression highlighted potential targets for therapeutic intervention in METH-induced neurotoxicity. Overall, our study contributes valuable insights into the mechanisms through which METH affects the CNS in *C. elegans*. The conservation of key neurobiological pathways between *C. elegans* and mammals suggests that these findings may have implications for understanding the impact of METH on humans. This knowledge could potentially guide the development of targeted therapies to combat METH addiction and its associated neurological complications.

Karina Vazquez

VA - University of Richmond

Discipline:

Authors:

Karina Garcia Rivera Johavi Mendoza Meza

Abstract Name: Bridging the Gap: Students Translators and Interpreters within the Community

This presentation analyzes translation and interpretation projects carried out by university students. By taking real “clients” in the legal, medical, social services, and education fields, students enrolled in a Community Translation and Interpretation course delve into the complexities of providing language services with cultural awareness to diverse communities to guarantee their access to services in crucial areas such as housing, immigration, specialized medical attention, domestic and gender violence, food and education. In this presentation, as the Professor of the course and as a mentor for students conducting independent research in translation and interpretation, I will discuss aspects such as the use of Spanish inclusive language and the linguistic variations in translation, and ethical and cultural dilemmas student interpreters face, particularly in health care settings. As I have students who have submitted proposals to the NCUR to present their research on translation and interpretation, I foresee this as an opportunity to engage the audience in discussing the theory and praxis of translation and interpretation for the community and the impact of these types of courses in the language curriculum in higher education.

Fabiola Velasco

OK - University of Central Oklahoma

Discipline: Architecture, Construction Management, and Interior Design

Authors:

Abstract Name: Resort and Marina with Biophilic Elements

The goal of this themed resort was to evoke curiosity in guests by creating a themed environment for them to enjoy. The research conducted was survey questions about what any age group or demographic looks for in a resort, a field visit was also conducted. These themes will be El Dorado, which in myth is known as the city of gold. Taking inspiration from ancient Colombian culture and legends can cause people to be more curious about the resort and its aspects. A ceremony that was told was of precious jewels thrown into the lake to appease a god that lived underwater. By taking inspiration from some of these parts of the legends and the culture that was told they were in space, the resort uses some of these aspects in some detail, like bodies of water that may be placed in the resort. Plato told Atlantis that this land was half god and half human. Their homes were also concentric islands separated by wide moats and linked by canals. These lush islands contained gold, silver, and other precious metals, supporting abundant rare, exotic wildlife. This space can be

transitioned to the water, leading to the different themed legends in the common areas. The Hanging Gardens of Babylon are thought to be located near the royal palace in Babylon. However, some research says they might have been constructed in Nineveh, Assyrian. Research purposed that these gardens were rooftops created by Sennacherib, king of Assyria. By taking inspiration from the Hanging Gardens of Babylon and the rooftop gardens in the interior, guests feel a botanical paradise when visiting this resort.

Luis Velazquez Rodriguez

NJ - Kean University

Discipline: Computer Science

Authors:

#1 Luis Velazquez Rodriguez

#2 Daehan Kwak

Abstract Name: Leveraging Machine Learning for Rapid Response in Wildfire Management

A wildfire is described as an unwanted and uncontrolled burning of a natural area, such as forests or grasslands. Throughout history, various methods have been utilized to detect and prevent wildfires in a timely manner. However, with the rise in global warming, wildfires have become more frequent, highlighting the need for new and innovative solutions. Research from the Center for Climate and Energy Solutions indicates that a 1-degree Celsius rise in temperature could result in a median annual burned area increase of up to 600%. The goal of this research is to show how machine learning can help with the detection of wildfires through the use of developing technology. The research will implement machine learning through the use of convolutional neural networks (CNNs), long short-term memory networks (LSTMs), and the Random Forests algorithm. By leveraging the power of CNNs, LSTMs, and Random Forests, this research aims to improve the early detection of wildfires, ultimately providing faster response times and reducing the devastating impact of these disasters on both human life and the environment. Two datasets were used and combined into one dataset containing 500 images. The images were divided into training, testing, and validation sets. The training set had 200 images, and the test and validation sets had 50 images each. Each set was split evenly into 'fire' and 'no fire' labels. In addition to the image data, temporal information, such as weather patterns over time, was incorporated using LSTMs to analyze the progression of environmental changes. Furthermore, environmental factors such as temperature and wind speed were included in the model. As technology continues to evolve, integrating machine learning models with real-time data could significantly enhance early detection and response systems. The research aims to enhance wildfire prediction strategies, advancing the potential of machine learning in environmental monitoring.

Amogh Vellore

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

#1 Seán O'Rourke

#2 Nikhil Sharma

#3 Anthony Tang

#4 Samuel Adida

#5 Nicolas Kass

#6 Lucille Cheng

#7 Jeffrey Head

#8 Stephen Canton

#9 Arka Mallela
#10 Constantinos Hadjipanayis
#11 Constantinos Hadjipanayis
#12 Shovan Bhatia
#13 Michael Kann
#14 Regan Shanahan
#15 Jacob Biehl
#16 Edward Andrews

Abstract Name: Calvarial biopsy using augmented reality technology: a video case report and technical note

Background: Calvarial lesions are uncommonly encountered and are often slow, progressive processes. Biopsies of calvarial lesions can be uniquely challenging due to its proximity to critical structures. Augmented reality (AR) offers a potential alternative to CT guidance that reduces radiation exposure and provides hands-free intraoperative guidance through complex and challenging surgical approaches. Methods: Our patient is an 86-year-old female with significant past medical history of coronary heart disease. The patient underwent imaging which demonstrated a left parietal lytic skull lesion with extracranial extension. Using Surgical AR (Medivis, New York, NY), a trajectory was planned centered on the lesion. Surgical AR was registered using point-to-point registration reliant on four anatomic fiducials. We used a ground truth, which is a bi-faced adhesive tag that measures 2cm x 1cm, with a QR code on each side that the Surgical AR system recognizes. This ground truth was placed on the patient's forehead which linked to the registered holographic overlay. A small incision was made and after removal of a small portion of the overlying skull, multiple pieces of the lytic skull lesion were sampled. Results: A specimen was obtained for frozen sectioning. Intra-operative pathology was consistent with metastatic carcinoma. Total surgical time was 35 minutes from incision to closure. Conclusion: The frameless AR navigation system successfully allowed accurate location, visualization, and biopsy of a calvarial lesion that had minimal surface landmarks. More so, this was completed without obscuring the surgical field or requiring time-consuming setup or registration.

Amogh Vellore

PA - University of Pittsburgh

Discipline: Health and Human Development

Authors:

#1 Amogh Vellore
#2 Sohail Daulat
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#4 Nicolas Kass
#5 Regan Shanahan
#6 Shovan Bhatia
#7 Jacob Biehl
#8 Edward Andrews

Abstract Name: Visuospatial Reasoning Does Not Predict Ability in Mixed-Reality

Background: Existing literature has indicated a strong correlation between visuospatial abilities and video game experience with the performance in robotic surgery techniques. However, this performance ability is often attributed to the innate aptitude – not progressive skill improvement – of participants. We hypothesize that participants with greater visuospatial abilities and video game experience will perform Mixed-Reality (MR) tasks with improved speed, accuracy, and demonstrate more task improvement when compared to individuals with lower spatial reasoning skills and video game experience. Methods: Twenty-one participants with limited MR experience were selected. Visuospatial abilities were measured with a series of mental rotation tasks (MRT). Next, all participants were trained to perform a series of clinical and non-clinical tasks

in MR using Medivis SurgicalAR. Following testing, participants completed a survey evaluating mental demand. The data will undergo quantitative coding for accuracy, measured by slips, time for completion, and perceived difficulty. Normality is assessed by a Shapiro-Wilk test, and Pearson correlations assess whether MRT score predicts task completion time and accuracy. Additionally, a two-tailed paired t-test assesses if practice improved performance. A learning curve analysis is used to identify whether variations in MRT score and video game experience correlate with differences in learning ability. Early Results: Early analysis indicates that MRT score predicts clinically relevant placement time for the last of four physical landmarks, ($p=0.024$). There was also a statistical improvement in completion time and accuracy of non-clinically relevant MR tasks with time decreasing between trial 1 and 2 ($p=0.024$), trial 1 and 3 ($p=0.018$), and number of slips decreasing between trial 1 to 2 ($p=0.018$), and trial 2 and 3 ($p=0.002$). Conclusion: Early analysis of data indicates that the results observed with robotic-surgery techniques extend into MR. The presence of learning among participants also indicates that performance is highly susceptible to learning.

Alondra Vences

OK - Southern Nazarene University

Discipline: Biology

Authors:

#1 Daniel Rocha

Anna Coccoli

Abstract Name: Environmental and Anthropogenic Effects on Terrestrial Mammal in the Oklahoma City Metro Area

Urbanization is growing world-wide, particularly in North America, posing challenges for wildlife. In this study, we investigated factors that affect wildlife distribution in the highly urbanized Oklahoma City (OKC) Metro area to understand the relative importance of habitat quality, presence of domestic animals, and human activity intensity on wildlife, using medium-large terrestrial mammals as a model taxon. Here we report preliminary data on 21 camera trap sites (active for ~78 days during Summer of 2022 and 2023) combined with site covariates (summer and winter NDVI, road intensity and number of domestic records) collected in a 250 m radius buffer around the camera locations. We used Poisson Linear models (GLM) to test the effect of site covariates on mammal species richness. Except for larger predators (i.e., black bear, cougar), we detected most mammal species expected to occur in the region. Sites varied greatly in species richness (3-9), with the white-tailed deer and the skunk being the most and least detected species, respectively. The summer NDVI model was the top ranked, followed by the winter NDVI model, suggesting that habitat quality, expressed in higher vegetation cover, positively influences mammal distribution in the study area. Data collection in the 2024 summer and the inclusion of other covariates (e.g. habitat connectivity and human population density) will help us further understand the factors that influence mammal distribution in urban environments.

Sanjana Venkatesh

CA - University Preparatory Academy

Discipline: Engineering

Authors:

Tanishka Taware

Faizi Zaidi

Abstract Name: Helium DBD Plasma Power and Gas Temperatures Measurement

Dielectric Barrier Discharge (DBD) due to its non-thermal nature is attractive for applications in the medical field. Research now supports the fact that DBD plasma exposure on a wound can accelerate the healing process. Another important feature is about the plasma ability to mitigate bacteria that may assist the wound to heal quickly. Traditionally, the plasma DBD plasma jet needs a dielectric material that holds two electrodes across which an ac voltage (5–10kV/30-50kHz) is applied to ionize the working gas. Due to their ionization potential helium or argon is used as the working gas that passes through the dielectric tube at moderate flow rates (10-15slpm). One drawback of using the plasma jet on the wound surface is its higher gas temperature that may damage the cells. The plasma gas temperatures heavily depend on the input power that we intend to measure in this work. In addition, Plasma vibrational and rotational temperatures are also measured at identical operating conditions. The plasma input power was measured by measuring the current and the applied ac voltage (5kV-10kV at 30-50kHz) voltage before and after the plasma discharge. The V/I signals were measured across 100 Kohm Bellet resistor and were displayed on the oscilloscope before and after the plasma. Due to capacitive nature of the plasma, there was a phase lag around between the signals across the plasma that was used to estimate the input plasma power. Our result show that plasma input power varies between 20 W to 43 W for our operating conditions. Plasma gas temperatures were measured using a k-type thermocouple that was scanned along the plasma jet. The plasma jet tip temperatures were found around 25 C. The details of the electrical circuit, hardware, experimental set up, and the relevant calculations will be detailed in the coming presentation.

Hannah Verhaal

UT - Weber State University

Discipline: Chemistry

Authors:

#1 Demetrios Pagonis

#2 Jordan Krechmer

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#7 Jose Jimenez

Abstract Name: Deconvolution of Partitioning Delays from Time-Resolved Trace Gas Measurements

Time-resolved measurements of low-volatility gases are limited by the partitioning of analyte to instrument surfaces, resulting in what are known as partitioning delays. These delays slow instrument responses and affect the accuracy of subsequent analyses. In this work, a deconvolution algorithm is introduced for the purpose of correcting measurements affected by partitioning delays. The performance of the algorithm was evaluated using synthetic data and its success in correcting for partitioning delays was demonstrated in airborne nitric acid measurements. The effectiveness of deconvolution was compared to frequent subtraction of instrument background, which is the current best practice for correcting partitioning delays. Frequent background measurements are outperformed by the deconvolution algorithm when sample concentrations are changing rapidly. The deconvolution algorithm can be applied to time series that include frequent measurement of instrument backgrounds, enabling reanalysis of past data. Furthermore, the algorithm does not rely on any coincident data; it is effective without any external information about the true time series of an analyte. When applied to nitric acid measurements from a wildfire smoke plume, deconvolution increased the calculated normalized excess mixing ratio ($\Delta\text{HNO}_3/\Delta\text{CO}$) by 72%. This work demonstrates that the deconvolution algorithm is applicable to ground, airborne, and eddy flux covariance measurements of ‘sticky’ compounds.

Anurag Verma

IA - Iowa State University

Discipline: Engineering

Authors:

#1 Md Anwar Hossen

#2 Anuj Sharma

Abstract Name: Navigation System for Snowplow in Low Visibility

This research presents an advanced navigation system designed to support snowplow operators during low-visibility conditions in winter, addressing safety and efficiency challenges. Developed at the Real-Time Analytics of Transportation Data (REACTOR) Lab, Iowa State University, the system integrates GPS, radar, and lane departure algorithms to guide operators and prevent accidents caused by poor visibility. The system employs high-precision DURO GPS to accurately locate vehicles, detect lane positions, and calculate deviations from road boundaries. A Delphi ESR radar with a configurable 45° field of view identifies objects up to 60 meters ahead, categorizing hazards into green (50–100 feet) and red (0–50 feet) zones. These data streams feed into a lane departure algorithm that calculates a deviation threshold (2.5–3.5 feet) and alerts drivers via a user-friendly tablet interface. A key innovation is the generation of detailed road maps using GPS and Linear Referencing System (LRS) data. Maps were created for 70 miles of roads near Ames and Tama, Iowa, enabling precise navigation. Deployed at the Iowa Department of Transportation's Tama Garage, the system was tested on a snowplow for over 200 hours in real-world conditions, successfully detecting obstacles and ensuring road clearance. Integrating radar object detection, lane departure algorithms, and real-time GPS mapping, the system provides actionable insights to operators, enabling safer navigation in challenging winter conditions. This research enhances safety, mitigates risks, and ensures uninterrupted road maintenance during extreme weather events. It aligns with the broader mission of the Institute for Transportation at Iowa State University while fostering collaboration with the Iowa DOT.

Taleigh Verrault

NC - Western Carolina University

Discipline: History

Authors:

Abstract Name: The Role of Newspapers in U.S. History's Only Successful Coup D'etat: The Wilmington Insurrection of 1898

November 10, 1898, was one of the most harrowing days for Black citizens in North Carolina's history. The first and only successful coup d'état in United States history, the violent Wilmington Insurrection is perhaps one of the most overlooked racially motivated events following the Civil War and Reconstruction. In part started by a newspaper editorial and misreported in newspapers until memory became faulty, this event's history has largely been defined by newspapers from beginning to end, and still is today. At the time, Wilmington was the largest city in North Carolina, with a population of roughly 10,000 that was over 50% Black. Following the events of the day, dozens had been killed and over 2,000 Black citizens had been displaced from their homes in Wilmington. Launched due to a combination of the November 8 election results and tensions over a local newspaper editorial written by the Wilmington Daily Record's Black editor Alexander Manly, the local White Democrat party was able to force various Fusionist political leaders of Wilmington into resignation. Throughout the day, local and state papers rushed to report information, often publishing incorrect or politically biased editorials on the events, creating a cacophony of contradictory knowledge. Over time, memory and understanding of the events that took place have become no less

disorganized. The government made no effort to begin an investigation or issue an official report until 2006, 108 years after the event, leaving the narrative up to the newspapers who had published on it. Due to the long-term lack of official information, these newspapers were a key part of the way the Wilmington Insurrection is viewed publicly, even today. Viewed as a chaotic riot rather than a racially motivated coup d'état, newspapers play a key role in the distorted memory of the Wilmington Insurrection of 1898.

Sarah Vicchiollo

WI - University of Wisconsin-Stout

Discipline: Visual Arts

Authors:

Abstract Name: Growing The Garden Of Change: Sharing The Stories Of Those Affected By Alzheimer's And Dementia

I was inspired to research the impact of Alzheimer's and Dementia on families after a car accident left my grandma in the hospital, and my grandpa Jack with Dementia in the care of my family. Seeing the work and emotional toll it took on my family to care for him, I wanted to learn more about the disease and find support from those in the community with similar experiences. I connected with the local Alzheimer's Association Chapters to attend events as a volunteer photographer so I could take photos for my project while giving back to the organization and community members. It was inspiring to meet and talk to people who share similar experiences as my family and gain new perspectives from those who currently live with the disease or have lost someone to the disease. Being able to connect so deeply with members of my community encouraged me to put my all into this project as I wanted to share their stories candidly and bring awareness to Alzheimer's and Dementia in hopes to find a cure. This project helped me realize my passion for sharing stories and encouraged me to pursue journalism post graduation. Additionally, I received recognition from the community, the Alzheimer's Association, and in academia for my work. I made professional prints of my book and shared it with members of the local chapter and with the families of those I featured. Those families reached out to share how meaningful it was to have a physical reminder of their loved ones. My book was shared throughout the organization, making it all the way to their Chief Marketing Officer, Michael Reich, who was impressed with the depth of my research. I was chosen as an Honorable Mention for the 2024 CAHS Outstanding Undergraduate Researcher award.

Esmeralda Victor

TX - Texas Woman's University

Discipline: Biochemistry

Authors:

#1 Esmeralda Tanya Victor

#2 Abigail Penny

#3 Matthew Stankus

#4 Yunxiang Li

Abstract Name: Analyzing Energy Transference in the γ Subunit of Escherichia coli ATP Synthase through Terminus Extension

Adenosine Triphosphate (ATP) is recognized as the cell's energy resource that is primarily synthesized by the enzyme ATP synthase. This enzyme is composed of two multisubunit subcomplexes which form a rotating component and a stationary element. Energy transmission between these components is vital for the function of ATP synthase. As one of the rotary elements the γ subunit is the core component for energy conversion and the main focus of our research. Our research aims to determine whether addition of 4, 8, 12 or 14 alanines to the N or C terminus in the γ subunit would affect the enzyme's function and its energy conversion efficiency. We hypothesize that significant alterations, in this case, addition of alanine to the N and C terminus will reduce the enzyme's energy yield. This is hypothesized based on previous studies of the importance of the length of the γ subunit. We aim to evaluate the exact number of amino acid additions the γ subunit can tolerate without causing complete functional disruption.

Ryan Vidal

PA - University of Pittsburgh

Discipline: Engineering

Authors:

#1 Yiquan Wang

#2 Yue Zhang

Abstract Name: Effects of photoinhibition on material thickness using in-situ ultrasonic monitoring

Vat Photopolymerization (VPP) is an Additive Manufacturing (AM) process that applies light to cure a photopolymer resin in sequential layers. While common VPP methods utilize a single light source, our approach employs a dual light projector (DLP) that merges blue and Ultraviolet (UV) light for printing. In this system, the blue light initiates the photopolymerization curing reaction, while UV light acts as an inhibitor. This phenomenon is known as photoinhibition, where the ratio of blue light to UV light intensity is the inhibition ratio. Photoinhibition enables better control during the printing process, providing better print results and structural integrity. Past studies have explored photoinhibitions overall effects but lack focus on its effects on layer thickness and quality. To discover photoinhibition's effects on layer thickness we conducted three experiments printing samples with different inhibition ratios. We used In-situ ultrasonic monitoring (IUM) to collect data during printing and analyzed the data by looking at the time of flight (ToF) of each sample. The data from the ToF graphs and the quality of the three printed samples pointed towards a correlation between photoinhibition levels and material thickness.

Angela Vidal

NC - Western Carolina University

Discipline: History

Authors:

#1 Lori Oxford

Abstract Name: DISMANTLING MYTHS ABOUT LATINX IMMIGRATION AND THE U.S. ECONOMY

Abstract For centuries, immigrants from all different parts of the world have come to the United States looking for a better life. As seen through the Bracero Program and the use of Asian labor to construct railroad systems, the United States itself has exploited immigrants for its benefit and needed them to build this country. Despite this reality, there are many misconceptions about immigrants—as many American citizens tend to view them as a burden. Whether they are viewed as a burden because they “take jobs” or have difficulty assimilating—immigrants have always faced discrimination. In this research, I will analyze the realities that Latinx immigrants face in the United States and debunk the myths surrounding their role in the economy of modern-day America. Keywords: history, immigrants, jobs, assimilation, Latinx

Livia Vieira

FL - Florida Atlantic University

Discipline: Law and Legal Studies

Authors:

Abstract Name: What Do Americans Think About The Death Penalty?

The death penalty has long been a controversial topic and a major theme in ethical dilemmas. Because of its contentious nature, I decided to conduct a survey to better understand the American perspective on the death penalty as a form of legal punishment. Additionally, I believed there would be a difference in the levels of support for this form of legal punishment between men and women. To test this, I designed a questionnaire with 17 questions, collected data via Amazon Mechanical Turk, and received 147 completed surveys, which were analyzed using IBM's SPSS. My interest in this disparity was inspired by Hofstede's study of cultural dimensions. According to his theory, men tend to be more assertive and tough, whereas women are generally more nurturing and relationship oriented. Based on these assumptions, I hypothesized that women would be more likely than men to support the death penalty as a punishment for sexual crimes against children and rape crimes. Surprisingly, my research results showed that 14.7% of women opposed the death penalty for sexual crimes against children whereas 4.2% of male respondents opposed the death penalty in this instance. Furthermore, 43.7% of males supported the death penalty as a punishment for rape crimes, while 33.3% of women expressed support. These results were statistically significant differences at the 5% level and contradicted my initial prediction, for they showed that more men than women support the death penalty as a form of legal punishment for rape crimes and sexual crimes against children.

Alexis Vigil

UT - Weber State University

Discipline: Health and Human Development

Authors:

#1 Alexis Vigil
#2 Oakley James
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#4 Sorya Fouad
#5 Justin Rhees
Oakley James
Taylor Poulson

Abstract Name: Molecular Investigation of A2B Subtype, Partial c Antigen, And GATA-1 Mutation in an Individual of Egyptian Ancestry

A 21-year-old individual of Egyptian ancestry with a history of microcytic anemia due to iron deficiency demonstrated an ABO typing discrepancy, suggestive of a rare subtype. Serological, lectin, and genotype tests, including ABO subtyping and targeted next-generation sequencing (NGS), revealed the presence of the A2B subtype, unexpected anti-A1 antibodies, and partial c antigen expression. Genotyping confirmed ABOA2.01 / B.01 alleles and heterozygous FY01 / FY*02N.01. Further, we plan on identifying the isotype of the unexpected anti-A1 antibodies. These findings suggest implications for transfusion safety and alloimmunization risks. Blood group typing discrepancies, often due to rare subtypes or variant antigens, can complicate transfusion medicine. Individuals with the A2B subtype may produce anti-A1 antibodies, which pose clinical challenges. Additionally, partial c antigen increases alloimmunization risk, particularly in populations with limited allele frequency data. This study focuses on molecularly characterizing the A2B subtype and partial c antigen in an individual of Egyptian ancestry, where such variants are understudied. Combining serological methods and next-generation sequencing, this investigation explores the clinical significance of these findings.

Anoushka Vijay

CA - Aspiring Scholars Directed Research Program

Discipline: Interdisciplinary

Authors:

#1 Annabel Zheng
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#5 Claire Chien
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Anagha Sainath

Abstract Name: Comparative Genomic Analysis of Colorectal Cancer Microbiome Bacteria to Discover Novel Relationships

The National Cancer Institute (NIH) highlights the importance of microbiome research, offering grants to advance this critical field of research. Our work aligns with this mission, as the purpose of our research is to study the microorganisms/bacteria in the gut microbiome that are influential to the progression of colorectal cancer (CRC), which is uncontrolled tumor growth originating in the colon. Lifestyles, environments, and genetics, among other influences, affect the development of CRC. Our central research question focuses on finding differences in pathways/enzymes between cancerous and non-cancerous associated bacteria in the gut microbiome, as outlined by a recent cancer microbiome review. Our research methodology began with utilizing the Bacterial and Viral Bioinformatics Resource Center (BV-BRC), where we compiled our bacteria's genetic information into genome groups and used the comparative systems service to identify target pathways and construct phylogenetic trees. After focusing on genomes, we delved deeper into the enzymes.

The programming language R was used to narrow down four specific enzymes from the set of genomes: two from the pathways in non-cancerous bacteria and two in cancerous-associated bacteria. Our results were confirmed with a Multiple Sequence Alignment (MSA) run at the genome level, which identified the range of lowest entropy among the genes in the four enzymes — one of which had the lowest range of 30-40. Currently, we are using NCBI Blast and other bioinformatics methods to characterize/validate the four enzymes in our respective target bacteria with gene expression meta analysis. In conclusion, our end goal is to target/screen the unique pathways and enzymes (like enzyme 5.4.3.2) of the cancer-associated and non-cancerous associated bacteria to decrease the metastasis of CRC tumors. Our future steps include wet lab manipulation of these genes, which help create enzymes, in order to create a probiotic drink targeting CRC.

Janapriya Vijayakumar

FL - University of Central Florida

Discipline: Health and Human Development

Authors:

#1 Thomas Kean

Abstract Name: Development of a Rapid, Temporal, Cartilage Assay to Screen Novel Arthritis Therapeutics

Arthritis is costly (\$65 billion per year) and traumatic. Current therapies for arthritis primarily address symptoms rather than the underlying causes of disease progression. Therefore, identifying novel drugs that target the underlying mechanisms driving this disease is crucial. Traditional 2D adherent cell line based screens fail to recapitulate the 3D architecture of cartilage. High-throughput 3D cell-based drug screening offers an efficient and rapid method to screen potential compounds. However, a challenge in creating these assays is the loss of cell aggregates during testing due to their small size. To address this issue, we are investigating the optimization of cartilage aggregates to 384-well plates, compared to traditional 96-well plates, for compound screening. In this study, lubricin promoter-driven bioluminescent primary human chondrocyte reporter cells will be cultured, trypsinized, counted, and seeded into 384-well plates to form cell aggregates of 5,000 cells each. The bioluminescent reporter cells enable easy, non-destructive, cost-effective assessment of lubricin production - a key component of articular cartilage that reduces friction and damage. The Opentrons pipetting robot will test aggregates (16 per condition) with variations in pipette type (P20 vs. P300), flow rate (2 μ L/s to 50 μ L/s), and aspiration height (2mm to 3mm). The aggregates will be fed every other day over 14 days under physioxia (5% oxygen) conditions, simulating oxygen tension in the human joint. Plates will be imaged every feeding day to track aggregate growth and calculate the proportion of lost aggregates to determine the optimal protocol for compound screening. Ultimately, the goal is to discover a lubricin-stimulating drug that can prevent osteoarthritis progression, enabling individuals affected by sedentary lifestyles to return to active, healthy living. Achieving this requires optimizing the 3D high-throughput screening assay to minimize aggregate loss and improve overall screening efficiency.

Alex Villalba Gonzalez

PA - Lafayette College

Discipline: Computer Science

Authors:

#1 Alex Villalba Gonzalez

Abstract Name: Virtual Reality for Enhancing Spatial Visualization Skills

This work introduces a Virtual Reality application still under development, designed to enhance spatial visualization skills—an essential cognitive ability in STEM education. These skills, which involve mentally comprehending and manipulating 2D and 3D shapes, are closely linked to success in various STEM fields. However, many students struggle to develop these skills through traditional methods. The VR application immerses students in a 3D environment where they interact with virtual objects. The current version includes two core modes: a "free view" mode, which allows users to freely manipulate 3D objects and see their corresponding 2D projections, and an "orthographic view" mode, which presents multiple tasks aimed at reinforcing spatial concepts through structured activities and orthographic representation of 3D objects. This work showcases the development process, which utilizes the new XR toolkit to ensure compatibility across various VR headsets, although the application is currently being used with Oculus Quest. The use of the XR toolkit allows for future scalability and deployment on a wider range of devices, ensuring flexibility in educational settings. This presentation focuses on the work completed so far, detailing how these interactive features have been developed to enhance spatial visualization. Future developments will include more advanced features, such as the integration of reinforcement learning to provide adaptive challenges based on user performance, further refining the personalized learning experience. This ongoing work aims to create an innovative tool for improving spatial skills and expanding immersive educational experiences in STEM.

Kira Villarreal

CO - University of Northern Colorado

Discipline: Biology

Authors:

Abstract Name: Exploring Cannabigerol as an Agonist for PPAR γ in Metabolic Dysfunction-Associated Steatotic Liver Disease in Mice

Metabolic-Dysfunction Associated Steatotic Liver Disease (MASLD) is the leading chronic liver disease in America. MASLD progresses through a gradual build up of lipids in the hepatocytes (>5% of lipids). If not treated, MASLD can lead to more serious conditions, such as metabolic dysfunction steatohepatitis and cirrhosis. Obesity and metabolic syndrome are related to MASLD, with insulin resistance (IR) being a major risk factor associated with MASLD. Peroxisome proliferator-activated receptor gamma (PPAR γ) is a nuclear receptor with primary function in adipose tissue in the liver. PPAR γ has many biological effects, such as regulating adipogenesis and lipid metabolism. In the liver, PPAR γ promotes the expression adiponectin (ADN), a hormone that plays a role in increasing insulin sensitivity and inhibiting lipid accumulation. Cannabigerol (CBG) is a non-psychoactive minor constituent of the cannabis plant. CBG has been shown to have anti-inflammatory effects and a potential PPAR γ agonist. This project aims to investigate the effects of CBG, as the PPAR γ agonist, in modulating the progression of MASLD via PPAR γ -ADN axis. Male and female mice were fed a high-fat, high-sucrose diet for 16 weeks. From week 8 to week 16, mice were supplemented in the presence or absence of CBG. Liver tissues were harvested and proteins were extracted. Western blot protocol was used to detect the expression of PPAR γ . ELISA was employed to evaluate the serum level of ADN. The results showed that the expression of PPAR γ was increased in both male and female mice. Meanwhile, the ADN in serum increased during treatment of CBG in males but not females. Our results suggest that CBG could activate the expression of PPAR γ , but a gender differential response exists in regulating the ADN levels. With MASLD cases continuing to rise, it is vital to explore underlying mechanisms that are associated with MASLD in efforts to explore alleviating treatments.

Angel Villaseñor Gonzalez

CA - Glendale Community College

Discipline: Biology

Authors:

#1 Roberto Keli'ikoa Hernandez

#2 Evan Hoyle

#3 Michael Chhan

#4 Shelley N.M. Thai

Abstract Name: Random Tn5 Mutagenesis of *hns* has Different Effect on Motility in *Paraburkholderia unamae* and Expression of *flhDC*

Paraburkholderia unamae, a diazotrophic gram negative bacterium endemic to the American Southwest and Mexico, is a plant growth-promoting bacterium with multiple copies of the flagella master regulator *FlhDC*. To identify genes that affect motility in *P. unamae*, a genetic screen using Tn5 mutagenesis was used. Mutations within and surrounding the histone-like nucleoid-structuring (*hns*) gene were frequently identified and mutants showed different degrees of effect on motility. Mutations upstream of *hns* resulted in significant reduction in motility, suggesting potential regulatory regions. Two other mutations within *hns* also resulted in significant reduction in motility. H-NS protein is known to be involved in the positive regulation of the *flhDC* operon in other gram negative bacteria, such as *E. coli*. To determine if H-NS also has a positive regulatory effect on *flhDC* in *P. unamae*, RT-qPCR was performed on wildtype *P. unamae* and an *hns* mutant, TR3.50, to compare the relative transcription of *flhD1C1*. *flhD1C1* expression was reduced in TR3.50 relative to wildtype. In addition, in a motility assay, the TR3.50 mutant, showed a significant reduction in motility relative to wildtype, an 82% to 93% reduction. These findings show a positive regulatory relationship between *hns* and the *flhD1C1* operon in *P. unamae*. Additional studies are needed to determine the regulatory mechanism of H-NS on *flhD1C1*.

Dexter Vilt

KY - University of Kentucky

Discipline: Biology

Authors:

#1 David Westneat

Abstract Name: The Impact of Different Management Strategies for Invasive Honeysuckle on Nesting Success of a Common Songbird

Human activities such as climate change, fragmentation, and urbanization have led to the proliferation of invasive Amur Honeysuckle (*Lonicera maackii*) in urban areas. The management practices carried out to control this vegetation are important in determining the success of urban-adapted wildlife like the Northern Cardinal (*Cardinalis cardinalis*). Our study aimed to determine how management for honeysuckle affected nesting success demonstrated by nestling growth rates, fledging success, predation, and clutch size. We surveyed 3 sites differing in management practices and hence in abundance of honeysuckle as well as the diversity of other bushes and trees. We searched for Cardinal nests from early-May to early-August, finding a total of 235 nests. We recorded GPS coordinates, approximate nest height, and its contents (eggs or nestlings) and then revisited nests every other day. Eggs were weighed upon initial presence and nestlings were individually marked and weighed every other day. We found no difference between sites in clutch size, hatching success, or fledging success, as predation appeared similar across all three sites in contrast to our initial expectations based on the literature. Additionally, nestling growth rates were lower at the honeysuckle-dominated site than at the most similar site lacking honeysuckle, contradicting the expectation that higher insect abundance associated with honeysuckle would promote faster growth. We propose that differences in food supply for adults (seeds) versus nestlings (large insects) may explain these differences, with diverse woody vegetation supporting more of the latter. Given the feeding diversity of songbirds, how honeysuckle-dominated environments affect insect communities may affect the growth of nestlings of other species

differently. Future research should explore how management for invasive species affects the nesting success of different songbird species and further investigate invertebrate abundance and nestling diet.

Jessica Viola

PA - Susquehanna University

Discipline: Biology

Authors:

#1 Jessica Viola

#2 Sophie Charvet

Abstract Name: A Mixoplankton's Response to Low Light and Missing Prey

Mixoplankton are protists capable of two trophic modes, photoautotrophy and phagotrophy. They play a crucial role in marine ecosystems and have been observed to switch between trophic modes in response to differences in environmental resource availabilities. The factors influencing their switching capabilities remain poorly understood. We investigated the impact of resource availability on *Cymbomonas tetramitiformis*, a model mixoplankton species. Four treatment groups were established: (1) control (regular light, regular prey), (2) regular light and low prey, (3) low light and regular prey, and (4) low light and low prey. Growth was measured via cell counts using flow cytometry over five weeks. As expected, the control group exhibited the highest growth rate. Interestingly, the low light and low prey group displayed faster rates of growth and larger cell counts compared to the low light regular prey group, a result that warrants further investigation. These findings suggest that *C. tetramitiformis* may employ complex strategies to optimize resource utilization under different environmental conditions. Further research is needed to evaluate the underlying mechanisms driving these responses, including possible metabolic shifts and behavioral adaptations. Work will be continued in the development of fluorescently labelled bacteria (FLB) to observe the phagotrophic mechanism in hopes to understand why the low light and low prey treatment of *C. tetramitiformis* grew so well.

Nathan Vittitoe

KY - University of Kentucky

Discipline: Health and Human Development

Authors:

Abstract Name: Living with Age

Medical science has enabled longer but not necessarily better lives. Aging can be a demoralizing process as elders become increasingly dependent on others to perform activities of daily living (ADL). ADLs are rituals that define daily life, including bathing, walking, dressing, toileting, transferring, and eating. Dependence on others interrupts rituals that have been built over a lifetime. Without the proper resources to maintain ADLs, elders become unable to adjust to new rituals, and caregivers become overwhelmed with responsibility, resulting in families turning to care communities. According to the Center for Disease Control and Prevention (CDC), more than one million individuals live in residential care communities on any given day in the United States. 88% of residents need assistance performing ADLs, bathing being the most common, with 75% needing assistance. Why has bathing, a private ritual critical for physical and emotional health, been pushed out of the home? The physiological and psychological consequences of poor hygiene make it imperative that caregivers provide proper care. Homes are not currently built to accommodate the changes in bathing rituals.

Through primary research of elders, immediate caregivers, and professional caregivers as well as analysis of the product landscape for Durable Medical Equipment (DME) and Assistive Technologies (AT) I aim to develop a design innovation that enables caregivers to support elders' hygiene rituals in their homes.

Sandra Vo

CO - Regis University

Discipline: Biology

Authors:

#1 Sandra Vo

#2 Allyson Sterling

Abstract Name: Investigating the Impact of Vaccine Metaphors on Vaccine Attitudes in College Students

According to the World Health Organization, vaccine hesitancy, defined as an individual's delay or refusal to become vaccinated, is a top ten global health threat. College students are a particular category of interest because of their role as superspreaders during the COVID-19 pandemic and their relatively higher rates of vaccine hesitancy. Common reasons for vaccine hesitancy include mistrust in the scientific and medical community and low levels of health literacy. Both of these issues can be mitigated through effective scientific communication. One previous study demonstrated that culturally relevant metaphors are an effective way to explain clinical trials to women in rural areas, and another study tested the effect of vaccine metaphors on the general population. However, the effect of using culturally relevant vaccine metaphors when communicating vaccine information to college students has not yet been discerned. Participants in our study read either a passage presenting information about vaccines as college student-focused culturally relevant metaphors or as literal information. Participants completed the vaccine attitude measurement (VAM) questionnaire and accompanying questions about trust in scientists before and after reading one of the two passages. Our study recruited undergraduate college student participants which we randomly assigned to read one of the two passage types. Science confidence increased in both conditions as did VAM scores, indicating a more favorable attitude towards vaccines as a result of the intervention, though no additional impact of the metaphor passage was found to influence overall science confidence or VAM scores. VAM subscales including personal attitudes towards vaccines and speed of vaccine development, were increased in the metaphor and literal groups, respectively. Taken together, this intervention demonstrated that health messaging positively impacts vaccine attitudes and trust in science in college students, highlighting the importance of effective science communication in transforming public attitudes towards vaccines.

Christina Vo

PRI - University of Puerto Rico

Discipline: Chemistry

Authors:

#1 Suresh Manivel

#2 Torsten Stelzer

Abstract Name: Polymorphic Phase Transformation of Artemisinin in Polymer-Based Formulation Development for Pharmaceutical Applications

Hot-melt extrusion (HME) and additive manufacturing have gained recognition as innovative processing technologies for formulating crystalline solid dispersions in pharmaceuticals. These methods offer distinct

advantages over conventional techniques, including reduced unit operations, cost efficiency, solvent-free processing, and compatibility with continuous manufacturing. However, their broader application has been hindered by concerns about potential polymorphic phase transformations (PPT) of active pharmaceutical ingredients (APIs) during processing. To enhance their viability as alternative strategies for solid dosage formulations, it is essential to understand how critical process parameters (CPPs) such as temperature, pressure, and shear stress influence PPT. The solvent-mediated polymorphic phase transformation of artemisinin (ART) was employed to optimize the formulation and stability of its metastable state. ART, known for treating malaria, is an active pharmaceutical ingredient with two known polymorphic forms that influence its physicochemical properties. The metastable form, ART II, possesses higher bioavailability and solubility than the commercial form, ART I. However, ART II tends to transform into ART I due to the thermodynamic stability favoring the stable form. Incorporating a dispersant, specifically polyethylene glycol 4000, within the ART matrix optimized the favorability for the formation of the metastable state. Coupling these critical processing parameters accelerated the time required for the transformation from ART I to ART II. Temperature-stimulated extrusion (TS-E), temperature-pressure-stimulated extrusion (TPS-E), and temperature-pressure-shear stress-stimulated extrusion (TPSS-E) were performed with in situ polarized optical hot-stage microscopy and time-resolved powder X-ray diffraction to monitor the nucleation induction time and complete transformation. This approach effectively facilitated the transformation from the stable to the metastable state of ART. By controlling the selectivity of ART II through novel polymer-based formulations, there is potential for more effective and controlled production of solid dispersions on a large scale, ultimately improving drug stability and efficacy.

Henley Voeks

VA - Virginia Commonwealth University

Discipline: Art History

Authors:

Abstract Name: Goya's Black Paintings: Perpetuating the "Tortured Artist" Theory and the Romanticization of Mental Illness

This study examines Goya's Black Paintings within the context of the Tortured Artist theory to study the romanticization of mental illness within today's society. Artists today are notorious for perpetuating their struggle in order to justify their artistry and create 'authentic' work. Holistically, this research aims to explain how and why artists will emphasize their turmoil to create more emotional work, as it feeds into a negative mindset that can be observed and applied to famous artists from hundreds of years ago. This research synthesizes psychology studies, deep dives into artworks and their documentation, and experiments that seek answers from response time. It can be concluded that the Tortured Artist theory contributes to a heavily toxic mindset which can lead to a further unhealthy relationship with art, as well as a detrimental link between suffering and profits.

Molly Voit

PA - Seton Hill University

Discipline: Biology

Authors:

#1 Nicole McAllister

Abstract Name: Exploring the Dual Role of *Beauveria bassiana* as a Biofertilizer and Bioinsecticide for

Spotted Lanternfly Control

The spotted lanternfly (*Lycorma delicatula*), native to China, threatens U.S. plant health by feeding on the sap of over 70 plant species, including black walnuts, causing reduced crop yields, plant stress, and even death. With limited control mechanisms, this devastates agricultural and forestry industries, leading to this investigation of using a microbial inoculant on plants to inhibit spotted lanternfly activity. The objective of this study is to inoculate black walnut saplings (*Juglans nigra*), a plant species commonly targeted by the spotted lanternfly, with *Beauveria bassiana*. This entomopathogenic arthropod-pathogenic fungus grows naturally in soils. We hypothesize that *B. bassiana* will positively impact plant growth while killing the spotted lanternfly. Wisconsin fast plants (*Brassica rapa*) and black walnut saplings inoculated with *B. bassiana* had increased plant height and number of leaves compared to control groups. Additionally, *B. bassiana* was lethal to nymph and adult spotted lanternflies directly inoculated with the fungus. There is a current gap in knowledge about how *B. bassiana* influences insect-plant interactions, which this research also aimed to address by exploring the potential of *B. bassiana* to mediate these interactions and contribute to pest management strategies. To investigate whether *B. bassiana* inoculation would limit plant-insect interactions, black walnut saplings were inoculated with *B. bassiana* for 24 weeks. Plant-insect interaction trials presented spotted lanternflies with inoculated and control plants to observe insect behavior, including initial choice, interaction frequency with saplings, type of interaction, and duration of interaction. Across the 12 trials, results indicate that *B. bassiana* treatment does not alter plant choice by spotted lanternflies but is lethal to the spotted lanternfly while enhancing plant health. This suggests *B. bassiana* could serve as both a biofertilizer and bioinsecticide, offering a promising strategy to control spotted lanternfly populations while promoting plant vitality.

Keyan Vojdani

NJ - Princeton University

Discipline: History

Authors:

#1 Keyan Vojdani

Abstract Name: An Analysis of How James Monroe's Communication and Mannerisms on His National Tour Affected the Era of Good Feelings

This paper explores how President James Monroe's personality and communication style shaped the Era of Good Feelings (1817–1824), a period in U.S. history often associated with national unity and reduced political conflict. While this era is typically attributed to postwar nationalism following the War of 1812 and the decline of the Federalist Party, this study highlights Monroe's active role in fostering cohesion through his unprecedented national tours. Monroe's tours allowed him to connect directly with citizens, presenting himself as approachable and inclusive. These interactions, along with his adaptable leadership style, fostered a sense of shared purpose and reduced political tensions. Unlike his predecessors, who often maintained formal and rigid approaches to governance, Monroe's willingness to engage with citizens of differing political views positioned him as a "common man." This quality, along with his tolerance and affability, helped bridge ideological divides. Contemporary accounts, including speeches, newspaper articles, and citizens' reflections, reveal the widespread respect Monroe earned, even from political opponents. The study introduces the concept of the "formality-commonality complex," which contrasts Monroe's balance of personal connection and statesmanship with the more formal styles of Jefferson and Madison. The paper also addresses historical debates, challenging critiques that downplay Monroe's contributions to the era. By analyzing novel primary sources from historical archives - such as Monroe's speeches, newspaper articles, and firsthand accounts from citizens - it argues that Monroe's tours and personal interactions were crucial in defining the Era of Good Feelings as a reality rather than merely a retrospective label. Ultimately, this research highlights how individual leadership can shape broader social and political dynamics. Monroe's ability to foster unity through empathy, flexibility, and engagement provides valuable lessons for understanding leadership's role in reducing polarization and creating a cohesive national identity.

Samanvi Vootukuri

AL - University of Alabama at Birmingham

Discipline: Psychology

Authors:

#1 Paige Benlolo

#2 Asia Wiggins

#3 Sunil Suresh

#4 Nathaniel Goldfeiz

#5 Robert Sorge

#6 Tammie Quinn

#7 Shivraj Grewal

Abstract Name: Diet Impact on Knee Osteoarthritis Pain, Mental And Physical Health: A Holistic Approach to Medicine

Knee osteoarthritis (KOA) is a chronic pain condition that leads to a decrease in quality of life (QOL). The traditional treatments for KOA pain are pharmaceutical-based and focus on symptom management rather than finding a long-term solution. Previous research has shown that a low carbohydrate (LCD) diet can be effective at reducing pain in those with KOA. As an alternative to medication, this study is observing the impact of the LCD and the standard United States Department of Agriculture (USDA) diet on KOA pain as well as mental and physical health. Participants were between the ages of 45 and 85 and were enrolled in the study for 7 weeks. Six of those weeks consisted of the randomly assigned diet intervention. Participants returned five times during the course of the study to undergo mechanical and movement-evoked pain testing, and to complete questionnaires regarding mental health, physical health, and pain. DEXA scans and blood samples were obtained at baseline and the end of the diet. Preliminary results indicate significant reductions in pain severity and intensity after completion of both diets. A significant decrease in PHQ-9 scores as well as participant's weight in both diet groups suggests an improvement in mental and physical health. As further research is conducted, it is expected that this dietary intervention has the potential to start improving upon various facets of health and continue yielding significant results for the questionnaires and tests that are being conducted. The results of this study indicate that diet can affect the different aspects of health: mental, physical, and pain. Changes in diet pave the path to offering a holistic treatment to disorders rather than pure symptom management through medication; this method will hopefully have longer-lasting benefits.

Hang Vu

LA - Louisiana State University, Baton Rouge

Discipline: Chemistry

Authors:

#1 Alexandra Noel

Abstract Name: Effect on pH After Room Temperature Storage of E-liquids

Electronic cigarettes, often known as vapes, are now the most popular nicotine product among American youth. The most common vapes used by college students from brands like JUUL and Vuse utilize the form nicotine salt. Differing from the free-base form prevalent in previous generations of vapes, protonated salt has acid added to a nicotine base. While free-base e-liquid has a higher pH than nicotine salt e-liquid initially,

nicotine concentration and flavor may affect these values. To determine the pH of various e-liquids containing free base nicotine and nicotine salt at various concentrations, as well as flavoring chemicals, at two time points test whether storage at room temperature has an effect on e-liquid pH.

Ayati Vyas

CA - San Jose State University

Discipline: Engineering

Authors:

#1 Ayati Vyas

#2 Ambika Palleti

#3 Shreyas Ravada

Ambika Palleti

Shreyas Ravada

Abstract Name: Comparison of the Shape Memory Properties of 3D/4D Printing Materials

3D printing has many industrial applications due to its low cost and accessibility but is limited by durability, time, and rigid post-printing shapes. To address this, 4D printing has emerged, enabling printed objects to react to external stimuli and change shape. This is achieved using materials like TPU, which have shape-memory properties due to their glass transition temperature, allowing them to become soft and return to their original shape when heated. Interestingly, some common 3D printing materials, such as PLA, also exhibit glass transition temperatures, suggesting potential shape-memory properties. Our investigation explores whether PLA and other widely used filaments can serve as cost-effective alternatives to specialized materials like TPU for 4D printing. We hypothesized that many 3D materials possess limited shape-memory properties, but their effectiveness would vary based on factors like infill density and durability over multiple deformation cycles. To test this, we printed PLA, ABS, and TPU ASTM-D638-Type-1 standard dogbones at 20%, 60%, and 100% infill densities. We measured the time each sample took to return to its original shape and the number of cycles it could undergo before losing its shape-memory properties. Results for TPU showed a positive correlation between infill density and recovery time, with 100% infill samples taking 1.5 times longer to return to their original shape compared to 20% infill. Furthermore, lower-infill samples lost their shape-memory properties more quickly than higher-infill ones. A full analysis of and comparison will be presented at the conference.

Bhavya Vyas

KY - University of Kentucky

Discipline: Psychology

Authors:

#1 Pooja Sidney

#2 Hollie Clifton

Abstract Name: Perceptions of Health Risks of Nicotine Usage in Adolescents

In adolescents, nicotine use impairs brain development, for example, damaging the prefrontal cortex and the reward pathway. To educate adolescents about the health risks associated with nicotine use, it is important that web sources, such as the CDC website on nicotine effects, present information in a way that promotes understanding. Currently many sources do not present information in an evidence-based way. Past research

shows a combination of numeric, verbal, and visual is most effective (Lipkus, 2007). This study aims to establish the best way to communicate health risks to adolescents by testing their understanding of nicotine-related health statistics. Participants in introductory psychology classes at UK were randomly assigned to four visual aid conditions (text, graph, table, or picture) and reported on their beliefs and experiences with nicotine via Qualtrics. Participants viewed health information for 10 minutes in their assigned condition and answered interpretation questions. We also measured subjective numeracy and graph literacy. A logistic regression revealed a significant interaction effect between subjective numeracy and condition on redundant information accuracy. Among participants with high or average subjective numeracy, viewing information in a graph was more helpful than any other type of presentation. However, among participants with low subjective numeracy, there was no effect of condition. Furthermore, when information was presented in the text only, participants in the graph condition were less likely to accurately remember as compared to the text-only condition. These findings establish the need for health information presented by health sources to adjust and use a combination of visuals and texts to promote understanding of health risks in adolescents leading to the number of adolescents using nicotine to decrease.

Ayati Vyas

CA - American High School

Discipline: Engineering

Authors:

Arnav Biruduraju

Anyah Shah

Abstract Name: MATLAB-based Modeling to Predict the Performance of Heat Sink for Passive Cooling of a High-power LED Panel

High-power UV-LED panels are increasingly used for indoor plant growth, with immediate applications in space agriculture. UV light has shown potential to accelerate seed germination. However, a significant challenge in UV-LED operation is the heat generated during use, which necessitates effective thermal management. Both passive and active cooling techniques are commonly employed to mitigate panel surface temperatures. In this study, an aluminum heat sink with dimensions of 4"×6"×0.25" was used to investigate thermal performance. The fins had a fixed height of 4" and a thickness of 0.02", with the number of fins varied to optimize surface temperatures and heat transfer rates ($Q_{t-Q_{\dot{t}}}$) of the heat sink. Heat generation in the base plate was assumed to be 200 W. Conduction and convection heat transfer equations were applied to model the heat sink's performance and the base temperature as a function of fin count. MATLAB was employed for the analysis. As a first step, air properties—including density, Nusselt number, and Prandtl number—were calculated at an ambient temperature of 20 °C. Elenbaas's equations were then used to determine the Nusselt number, linear thermal transmittance (Ψ), and Rayleigh number as functions of fin count and spacing. These parameters enabled the estimation of convective heat transfer coefficients, fin efficiency, and heat sink efficiency. Preliminary results indicate that the heat sink's thermal conductance increased with fin count, reaching an optimized value of approximately 8 W/K with 28 fins. Optimal fin spacing was found to be around 0.8 inches. At a base plate temperature of approximately 100 °C, the addition of fins reduced the temperature to an optimized value of around 65 °C with 28 fins. Detailed results on heat transfer ($Q_{t-Q_{\dot{t}}}$), fin efficiency, and effectiveness will be presented in the final study.

Akinahom Wabella

MN - Minnesota State University - Mankato

Discipline: Computer Science

Authors:

Abstract Name: A Framework for Bias Detection and Mitigation in Machine Learning

As AI systems increasingly influence critical decisions in domains like hiring, salary prediction, and criminal justice, the lack of transparency in their predictions raises significant fairness concerns. This research addresses these challenges through a framework that combines Explainable AI (XAI) techniques—such as SHAP, LIME, and fairness metrics—with mitigation strategies like reweighing and adversarial adjustments to detect and reduce bias in machine learning models. The framework is applied to real-world datasets, including the COMPAS dataset for predicting criminal recidivism, the UCI Adult dataset for income classification, and a resume screening dataset focused on gender bias. Results demonstrate effective bias mitigation with minimal impact on model accuracy, as evaluated using fairness and performance metrics. This research contributes to responsible and transparent AI adoption by providing a practical, reusable toolkit for bias detection and mitigation.

Katelyn Waddell

AL - Auburn University

Discipline: Environmental Science and Sustainability

Authors:

#1 Matt Waters

Abstract Name: Human Impacts on the Water Quality of Lake Yojoa, Honduras through Time

Lake Yojoa is the largest tropical lake in Honduras and is a staple in the country for consumable fish exports. The lake has suffered from serious water quality degradation due to several human activities that have altered the hydrological flow. Influences such as hydrological changes, new mining operations, and intensive tilapia aquaculture have increased nutrient levels, heavy metal contamination, and changes in sedimentation processes that promote the growth of harmful algal blooms (HABs). These HABs threaten the ecological health of the lake which harms the fish in the farm as well as the water supply to local tourism. Lack of historical data on these tropical lake systems has inhibited the identification of the primary cause of degradation. This research attempts to fill this gap by reconstructing the historical impacts of human activities on the water quality of Lake Yojoa with the use of paleolimnological methods. Our sediment core that was collected in January 2023 will be analyzed for key nutrients (carbon, nitrogen, phosphorus), heavy metals (mercury, arsenic, lead), and photosynthetic pigments (chlorophylls, carotenoids) to track changes in primary productivity and pollutant levels over time. By linking these results to historical human influences, my research intends to point out the specific roles of aquaculture and mining in nutrient enrichment and heavy metal contamination. It will investigate if these inputs have served as the reason for the influx of HABs that are harming the nearby environments. The findings are expected to inform management strategies to mitigate further degradation, not only for Lake Yojoa but also for the conservation of lakes and waterways globally, providing insights that can help address similar environmental challenges worldwide.

Logan Waddle

AR - University of Arkansas

Discipline: Engineering

Authors:

Abstract Name: Intercellular Stress Generation During 1D Collective Migration of Cancer Cells

Physical forces drive many cellular processes such as migration and proliferation. A metastatic tumor will have invasive strands/chains that extend from the main tumor. These chains of cells collectively migrate away from the main tumor to establish new colonies elsewhere in the body. However, how physical forces drive this collective invasion and the required energy for this process is not well understood. Invasion of a metastatic tumor to surrounding tissues leads to a majority of cancer-associated death and is often a collective effort among cells, it is therefore important to fully understand the process behind collective cancer invasion. The goal of this project is to determine the forces that drive collective cell migration in a one-dimensional system of cells. Analyzing a single strand of migrating cells allows for an in vitro analysis of metastatic chains developed by a tumor. To confine migrating cells to a one-dimensional chain we engineered the extracellular environment via micropatterning such that cells only migrated along a thin line of extracellular matrix proteins patterned onto an elastic substrate. Once contained on a patterned elastic substrate with known physical properties, cell-matrix, and cell-cell forces were quantified via Traction Force Microscopy (TFM) by tracking substrate deformations. To connect these forces with cellular bioenergetics, we will quantify the energy level of these migrating cell chains by measuring the cellular ATP:ADP ratio with a genetically encoded molecular probe. Current results suggest that cells leading the collective migration experience greater forces, implying that these cells have greater bioenergetic needs. We predict that migrating cell chains experiencing higher forces will face additional strain and need to increase their energy output and therefore ATP:ADP ratio.

McKenzie Wagner

MN - Hamline University

Discipline: Physics and Astronomy

Authors:

#1 Lifeng Dong

Abstract Name: Exploring Eco-Friendly Deposition of Bismuth Thin Films for Lead Detection

The presence of heavy metals, such as lead, in drinking water is a growing concern in the United States. Traditional lead ion detection methods often involve toxic substances and complex techniques. This research aims to develop a simple and environmentally friendly method for preparing bismuth thin films to enhance lead ion detection in drinking water. We focused on the electrochemical deposition of bismuth onto a copper base using a non-toxic bismuth nitrate solution, as opposed to the more hazardous nitric acid and acetate buffer solutions commonly used. Bismuth was chosen for its accessibility and non-toxic properties. Our experiments explored various parameters, including voltage, concentration, and deposition time, resulting in a range of bismuth deposits with distinct nanoscale structures. Our results revealed three types of deposit morphologies: microscopic bismuth particles, shard-like deposits, and speckled textures. Deposits made with a concentration of ≥ 1.0 mM yielded bismuth nanoparticle clusters and nanowires. The optimal conditions for producing speckled morphology were found to be a concentration of 0.75 mM, a deposition time of 30 seconds, and a voltage of -1.4 V. This morphology was also observed at 0.16 mM under similar conditions. Time primarily affected the amount of bismuth deposited, often leading to overgrowth rather than desirable structures. These findings contribute to a better understanding of electrochemical deposition techniques and their application in preparing bismuth thin films for effective lead ion detection.

Timothy Wainscott

FL - Florida Institute of Technology

Discipline: Interdisciplinary

Authors:

Abstract Name: Deep Learning Models for Predicting Flight Rules using Weather Data

In aviation, weather is an important hazard factor with a potentially drastic impact on the safety of aircraft. One of the leading causes of fatal weather-related accidents was low cloud ceilings and/or visibility between 2008 and 2022, resulting in 41% of all fatal weather-related accidents for general aviation and 49% for Part 135 aviation. To reduce the weather-related accident rate, the FAA limits aircraft flight in instrument meteorological conditions (IMC) to instrument flight rule (IFR) certified pilots. Still, pilots who are only visual flight rule (VFR) certified or are on a VFR flight plan occasionally fly into IMC, known as "VFR into IMC" events. VFR into IMC events are the major cause of both weather-related accidents and fatal weather-related accidents. Available statistics validate the need to predict flight rules and flight categories (FCATs) in areas where VFR into IMC events are possible. In this study, a deep learning architecture is implemented for time series analysis of flight data for predicting flight rules. A long short-term memory (LSTM) architecture is utilized, and the predicted flight rules are compared with the outcomes obtained using a recurrence neural network (RNN) and a gated recurrent unit (GRU). These three models were trained using weather data from four equidistant airports and their known FCAT at the time of data recording. These models obtained comparable results for predicting flight rules, but the LSTM and GRU models performed slightly better than the RNN model for predicting FCATs. The results demonstrate that the proposed models have sufficient accuracy for predicting common-occurring FCATs, usually VFR and Marginal VFR (MVFR). However, they had poor performance in predicting rare-occurring FCATs, usually IFR and Low IFR (LIFR). The future research focuses on improving the accuracy of the models for prediction of IFR and LIFR.

Edwin Walck

TN - Middle Tennessee State University

Discipline: Geography/Geology

Authors:

#1 Jeremy Aber

Abstract Name: Natural and Anthropogenic Ecosystem Loss Following Establishment of Percy Priest Lake in Middle Tennessee

Worldwide, the construction of dams has provided large-scale hydroelectric power and flood control but is also responsible for extensive environmental disruption. One example was the damming of the Stones River in middle Tennessee in 1967, which produced the 5,747-hectare Percy Priest Lake. The objective of this study was to evaluate the extent of natural and anthropogenic ecosystems lost due to the formation of this lake. Using pre-lake aerial photographs, ecosystems that were covered by the lake were identified, mapped, and their area quantified using ArcGIS. The largest ecosystem lost was non-forested areas, which were mostly crop lands in the Stones River floodplain, and woodlands were the next highest ecosystem lost. Forests, the Stones River and its tributaries, and cedar glades represented <13% of area lost. In addition, at least 188 structures and four bridges were destroyed. The damming of Stones River represented an economic loss to farmers, which included their agricultural land and buildings, and a loss in important natural ecosystems, such as cedar glades and riverine environments. Similar losses likely occurred throughout the southeastern United States in the 20th Century as the Tennessee Valley Authority built many dams in the region.

Kendra Wales

PA - Grove City College

Discipline: Psychology

Authors:

Emma Roush

Abstract Name: Gratitude's Effect on Acute Stress and Cardiovascular Response

Gratitude has been described as the quintessential positive psychological trait. It has been linked with numerous aspects of physical and mental well-being, such as improved sleep, personal growth, higher quality relationships, optimism, and reduced rates of depression. Recent research suggests that gratitude can also mitigate the effects of acute stress on the cardiovascular response. The purpose of the present study was to test this relationship experimentally. Specifically, we hypothesized that individuals would show a diminished cardiovascular response to an acute stressor following a gratitude manipulation relative to a control manipulation. Using a within-subjects design, 21 undergraduate university students completed two sessions in consecutive weeks that included either a control prompt (asked participant to write about personal values) or gratitude prompt (asked participant to reflect on areas in their life they experience gratefulness). Immediately after the five-minute writing task, participants underwent two minutes of immersing their arm in ice water and two minutes of difficult mental math. Both these tasks have been shown to increase acute stress. Blood pressure, heart rate, and self-reported stress levels were measured. Consistent with expectations, participants' heart rate was less elevated in response to stress in the gratitude condition. Participants also reported lower stress following the gratitude writing task. However, no significant differences between blood pressure and self-rated stress were found after the stress induction. These results provide partial support for the idea that psychological factors such as gratitude can influence cardiovascular response to stress. Given the link between physical health and psychological health, further research is warranted to clearly support these results.

E. Aaron Walker

GA - Morehouse College

Discipline: Environmental Science and Sustainability

Authors:

#1 Ethell Vereen

Abstract Name: Investigating Interconnectedness of Water Quality and Social Equity in a Metropolitan Urban Stream Watershed

Reducing disparities in stream water quality is a state-level priority in Georgia, USA, yet targeting communities for assistance is hindered by the lack of empirical evidence regarding populations disproportionately affected. This study addresses this gap by analyzing stream water quality and social equity by identifying the types of communities disproportionately burdened by water contaminants. We hypothesized that watersheds with a majority of low-income communities and minority groups (Hispanics and non-Whites) face greater likelihood of poor water quality contamination. The study focused on an urban stream network of two creeks—Proctor Creek at Burbank Drive (AW-BB), Proctor Creek at Grove Park (AW-GP), and one River—the Chattahoochee River (AW-CHR) —representing communities with diverse socioeconomic backgrounds. Physicochemical water quality parameters were measured using a Horiba U-50 portable meter and microbial indicator testing following the IDEXX standard methods were conducted to assess water quality. Windshield survey observations explored visible differences in pollution levels among the creek environments, with affluent areas exhibiting cleaner environments compared to economically

disadvantaged neighborhoods. Laboratory microbial analysis revealed varying levels of microbial contamination, with higher counts of microbes observed in samples from low-income areas, particularly AW-GP. Interpretation of the results underscores the complex interplay between socioeconomic disparities and contemporary water quality challenges. The findings suggest a need for targeted interventions to address environmental justice concerns and ensure equitable access to clean water for all communities in Georgia. This research contributes to a broader understanding of the socio-environmental dynamics shaping water quality disparities, highlighting the importance of impact in addressing contemporary environmental challenges. By elucidating the connection between sociodemographic and environmental inequities, this study underscores the imperative for inclusive and equitable water management strategies to promote environmental justice and safeguards for public health.

Kevin Walker

PA - Westminster College

Discipline: Biochemistry

Authors:

#1 Jessica Sarver

Ethan Moore

Abstract Name: Probing Membrane Binding of Alpha-synuclein Using Double Histidine Cu(II) Labeling And Electron Spin Resonance Spectroscopy

Alpha-synuclein (α S) is a heavily expressed protein in the nervous system specifically in the presynaptic terminals and exhibits a natively unfolded state (intrinsically disordered) under normal physiological conditions. α S is responsible for synaptic transmission between neurons, assisting in signals within the brain, through its ability to bind to phospholipids and the surface of synaptic vesicles. Upon binding, α S undergoes structural reorganization from a dynamic and disordered state to a conformation consisting of a long-extended helix. Conditions can cause α S to form insoluble aggregates known as Lewy bodies, often associated with Parkinson's Disease and other synucleinopathies. This study attempts to mutate specific sites on α S to form a double histidine mutation, which will serve as an attachment point for a copper spin label and allow for electron spin resonance (ESR) analysis of protein dynamics. The experiments will improve understanding of α S binding affinity to membranes of differing curvature. Mutants of α S will be generated through site-directed mutagenesis on chosen sites. The DNA will be transformed in *E. coli* and sequenced to confirm successful mutagenesis. Up to this point, a successful double histidine has been confirmed, expressed, and purified. Attempts to attach the copper spin label can begin to perform an ESR analysis.

Dylan Walker

IL - Elmhurst University

Discipline: History

Authors:

Abstract Name: The Impact of Henry VI's Mental Illness on Politics and Religion in England

This paper examines the life of Henry VI of England (1421-1471) who suffered from catatonic schizophrenia, which is diagnosed by medical experts in a modern medical analysis of symptoms noted during his lifetime, and analyzes its impact on the political and religious life of fifteenth-century England. The life of Henry VI was filled with turmoil and instability. His reign saw defeat in France at the end of the Hundred Years' War,

and the beginning of a civil war in England known as the "Wars of the Roses." Henry suffered from a mental disability that contributed to the ineffective leadership he displayed, allowing rivals to seize power from him. Henry's physical and mental state was devastated by his battle with catatonic schizophrenia which forced him to be absent from the throne. As a result, this created a power vacuum within the kingdom and allowed many of his political rivals, such as Richard the Duke of York, to take advantage of Henry's suffering seize control of the kingdom, and start a civil war. Henry's disability drastically affected not only the political history of early modern England but its religious history as well; Henry became the subject of a religious cult after his death and was said to work miracles for believers.

Regan Walker

OK - University of Central Oklahoma

Discipline: Exercise Science and Nutrition

Authors:

#1 Regan Walker

#2 Meliisa Powers

Abstract Name: Cardiorespiratory Exercise Intensity and Perceived Stress Among College Students

The purpose of this study is to dive deeper into research on different intensities of cardiovascular activity and how it affects stress in the population of college students. Further, this study will examine if a single workout can impact perceived stress. Pursuing higher education may build up stress comprising multiple components, whether it is financials, time commitments, assignments, or external factors. The primary hypothesis is that exercise intensity will impact stress among college students. The secondary hypothesis is that a single workout will (increase, decrease, or not change) perceived stress. A convenience sample of college students attending a midwestern university were recruited by email and social media ($n = 7$). Participants completed a physical activity readiness questionnaire (PARQ+), a short demographic survey, an interview of qualitative questions, and then completed the perceived stress scale test. After the PSS they completed a 35-minute physical activity intervention including a five-minute warm up, three five-minute bouts at light, moderate, and vigorous intensity in random order with 5 minutes of cooldown in between, and then a five-minute recovery. During the fifth minute of each bout, participants were asked to rate their perceived stress and exertion on a scale from one to ten. The results indicate a significant difference in stress between the three intensities, $F(2,12) = 5.77$, $p = .02$. Stress was significantly higher during vigorous intensity exercise ($M = 4.14$) when compared to moderate intensity ($M = 2.86$) and light intensity ($M = 2.14$). Although perceived stress was lower following one workout, this change was not statistically significant, $t(6) = 0.72$, $p = .25$. The conclusions from this study are that stress is impacted by exercise intensity, with stress being higher at vigorous intensity than at moderate or light intensity, and that perceived stress is not changed significantly by a single workout.

Anthony Walker

MI - University of Michigan - Ann Arbor

Discipline: Computer Science

Authors:

#1 Shwetha Rajaram

Abstract Name: Project InSight: The Privacy Risks of AI Enhanced AR

We are experiencing the simultaneous rise of augmented reality (AR) and AI technologies, which are enabling promising new interactive experiences across domains such as education and healthcare. Advancements in large language models (LLMs) enhance daily activities by enabling personalized AR experiences, like task-specific guidance or context-aware reminders. However, as AI-enhanced AR devices become incorporated in daily life, they will collect extensive data, such as gaze patterns, spatial environments, and biometric details such as muscle movements and stress levels, consolidating this data into single repositories. This raises significant risks to users' privacy and autonomy, including inferences on biometric data that could reveal health conditions, manipulative visuals that exploit gaze tracking to influence purchasing decisions, and behavioral profiling used to create addictive experiences or target users with emotionally exploitative content. To address these concerns, this research develops and evaluates an AR Privacy Educational Assistant designed to raise end-users' awareness about privacy risks and encourage privacy-preserving behaviors. By processing AR sensor data, the Assistant generates inferences about users' physical surroundings and usage context, presenting users with clear explanations and depictions of potential privacy threats, from subtle to severe. To evaluate its effectiveness, end-users will participate in simulated AR usage scenarios, such as AR demo apps like Stadium360, which lets users watch live games from home in an immersive stadium. Their responses will be analyzed before and after showing the data the app collects and its uses to assess whether awareness impacts their willingness to adopt privacy measures. Ultimately, our work aims to contribute to the development of awareness and educational mechanisms for end-users and bystanders, informing future AR systems that prioritize privacy and security while enabling innovative applications. By fostering transparency and user empowerment, we hope to mitigate the risks posed by the growing convergence of AR and AI technologies.

Layla Wall

NY - Long Island University

Discipline: Environmental Science and Sustainability

Authors:

#1 Layla Wall

Abstract Name: Caring for Vanua: Exploring Community-Led Solutions for Plastic Waste Management in Waitabu, Fiji

Plastic pollution poses a serious threat globally, with an estimated 8.3 billion tonnes of plastic produced since the beginning of its industrial production (Horton & Blissett, 2021). This overproduction creates staggering waste levels, underscoring the urgent need for effective waste management strategies, especially in vulnerable regions like low-lying communities in small island developing states (SIDS). In remote villages that lack centralized waste management, plastic waste is often burned or buried. These methods of disposal not only harm the environment but also pose serious health risks to local populations and local ecosystems. This transdisciplinary qualitative case study research project explored the role of art, upcycling, and eco-brick-making in diverting plastic waste from entering the ocean and atmosphere in Waitabu village on Taveuni Island, Fiji. Carried out from September to November 2024, the study utilized a participatory action research framework that involved collaborating with community members to reconceptualize plastic waste collection, use, and reuse, especially through innovative, low-tech solutions such as making eco-bricks. Focusing initially on women, the research also encouraged children and other Waitabu community members to engage in the process of making eco-bricks. The teaching of this process was then further extended to some surrounding villages and the local state-run elementary school. Surveys, interviews, and group interviews were then utilized to ascertain the impacts of the project on the Waitabu community. The study found that the process of making eco-bricks was easy to teach and a time-efficient way to significantly reduce the amount of plastic waste entering the environment and provide a usable building resource. Participants reported increased awareness of plastic pollution and expressed a commitment to sustainable practices. The main finding was that eco-bricks and other upcycling techniques were simple and effective to teach and implement, with significant engagement from the community.

Whitney Wallace

GA - Mercer University

Discipline: Chemistry

Authors:

#1 Margaret Meadows

Sahithi Doddaka

Abstract Name: Progress Toward the Synthesis of a Color-Changing Molecular Sensor for Phthalate Esters

Phthalate esters are endocrine disrupting chemicals (EDCs), which are often used as plasticizers with both home and medical applications. Recent data show an association between phthalate esters and hypothyroidism, a deficiency in thyroid hormones, with broad neurological, cardiovascular, and developmental implications. Our research addresses this by developing a color-changing molecular sensor for detecting phthalates in aqueous solutions. Previous research has reported a sensor for carboxylate dianions, including phthalates, with moderate success. However, their synthetic approach uses harsh reagents and limits the sensor's potential applications. Using more accessible and safer techniques, we are exploring two synthetic routes to our target molecular sensor. Following the synthesis of our target, we plan to use it for the detection of hydrolyzed phthalate esters in aqueous solutions. This research can help develop reliable, safe sensors for a wide range of environmental and biological applications.

Rachel Wallace

OK - University of Central Oklahoma

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Artistic Response to the Demonization of Working Families in Contemporary US and Poland

By the people, for the people...is that right? Societies are built by workers, serviced by workers, and defended by workers. However, worker families are mostly excluded from the opportunity of social and economic advancement, especially in capitalist societies, due to the deregulation of the market, labor, and unions. This study demonstrates this exclusion and demonization of workers in the twenty-first-century US and Poland, by examining a photo-series, "The Notion of Family", and a sculpture "Janusz, Grażyna, and Sebik," respectively. First, the introduction to neo-liberal capitalism, supported by Christianity, and its notion of working class is provided. Second, the formal and cultural analysis of the photo series is provided, followed by the formal and cultural analysis of the sculpture. A comparative conclusion demonstrates egregious demonization of workers in both societies, although in Catholic Poland, neoliberal capitalism has been recently introduced while in Christian US, neoliberal capitalism emerged in the early 1980s. This study takes a qualitative approach to the analysis of neoliberal capitalism and working-class families through historical and secondary research while evaluating economic and social policies that target working groups, including minorities in both countries. This research was conducted by reviewing official government data and examining articles and books by European and American scholars who provide context on post socialist Poland, the advancement of neoliberalism, and the struggles of the working-class family. Keywords: America, Poland, neoliberal capitalism, working class, working-class families

Anamei Walli

KY - University of Kentucky

Discipline: Political Science

Authors:

#1 Michael Zilis

Abstract Name: Impact of Salient SCOTUS Case Decisions on American Voter Turnout

The Supreme Court is a powerful institution with remarkable influence over American governance, yet little research has investigated its impact on electoral behavior. This study seeks to address this gap by examining the relationship between the release of salient SCOTUS decisions and voter turnout. Utilizing 2012 data on the landmark healthcare ruling *National Federation of Independent Business v. Sebelius* (2012) from the American Panel Survey (TAPS), we employ a logistic regression model to assess the correlation between the release of a salient SCOTUS decision and an individual's intent to vote and actual voter turnout. We examine whether salient SCOTUS cases positively influence American voters' intent to participate in upcoming elections, and whether the release of these decisions effectively drive American voters to the polls. Through this analysis, we reveal important implications for the social influence wielded by the Supreme Court and the numerous facets of civic engagement within the American electoral process.

Ellie Walls

AL - University of Alabama at Birmingham

Discipline: Psychology

Authors:

#1 Pavithra A. Thomas

#2 Robert Sorge

Abstract Name: An Examination of the Relationships between Pain Catastrophizing, Pain Modulation, and Cognitive Function in Older Adults with Knee Osteoarthritis

Knee osteoarthritis (KOA) affects nearly one-third of Americans over 60, contributing to chronic pain, fatigue, and reduced physical function, with both physical and psychological factors impacting pain perception. This study explored how cognitive function influences the relationship between pain catastrophizing and endogenous pain modulation in adults with KOA. In a sample of 190 adults, pain catastrophizing was measured using the Pain Catastrophizing Scale (PCS), and cognitive function was assessed with the Montreal Cognitive Assessment (MoCA). Pain sensitivity was evaluated through Quantitative Sensory Testing (QST), including temporal summation (TS) and conditioned pain modulation (CPM). Results showed significant associations between PCS and both TS and CPM, with lower cognitive scores correlating with higher pain sensitivity. However, cognitive function did not significantly moderate the relationship between PCS and endogenous pain modulation. Despite this, the data indicated a trend suggesting that decreased cognitive function may strengthen the association between pain catastrophizing and pain facilitation, warranting further research. These findings suggest that cognitive function could indirectly influence pain modulation and should be considered in future studies. Clinically, incorporating cognitive and psychological evaluations may improve personalized treatment approaches for KOA-related pain.

Ashlea Walsh

Discipline: Psychology

Authors:

#1 Jarrod Hines

Emma Meek

Hannah Hjellming

Abstract Name: Is Prospective Aging Self-efficacy Predicted by Rurality and Income?

Age-related physical and mental health outcomes often differ between people in relation to factors like socioeconomic status, health care access, nutritional intake, socialization, environmental urbanization, etc. (e.g., Skoufalos et al., 2017). Additionally, an individual's endorsement of Western stereotypes regarding aging (that are both pervasive and, generally, negative, Hummert, 2011) may also relate to both expectations they have about their own aging and the eventual aging outcomes they experience. For example, one who believes that physical health declines during adulthood might be less likely to engage in activities intended to lessen any such declines. The current mixed methods study investigated aging self-efficacy, which is the belief that one has control over the way(s) in which they age, across a variety of domains, and this presentation will focus on cognitive and social components of aging. Self-efficacy has been studied in various adult populations, but generally in the sense of their current circumstances (e.g., Tovel, et al., 2017). Some longitudinal studies do exist, but these examinations usually pertain to relatively brief periods (e.g., McAvay et al., 1996, for a span of 3 years). Although this study is not longitudinal, we collected data about participants' beliefs about their current level of functioning in each domain as well as estimates of future functioning as they age. We collected quantitative data regarding perceptions of function along with qualitative data pertaining to the reasons people hold these beliefs. Key hypotheses include that aging self-efficacy will relate to (1) the degree of urbanization such that those from more rural environments will feel less able to age healthily compared to those from more urban environments and (2) the income level of participants such that those with higher current familial income and higher expected personal income at age 50 will expect to age more healthily than those with lower income.

Katelyn Walz

MN - Minnesota State University - Mankato

Discipline: Biology

Authors:

#1 Rebecca Moen

Abstract Name: Calmodulinopathy Disease Mutations at D131 and their Effect on Protein Stability and Folding

Calmodulinopathies are life-threatening syndromes that affect various parts of the heart rhythm and occur when there is a genetic mutation in various CALM genes that code for protein calmodulin. Calmodulin, abbreviated as CaM, is a calcium binding protein that interacts with many other proteins, ion transporters, and enzymes serving as the major intracellular calcium regulator in eukaryotic species. My research project focuses on genetic mutations that change an aspartic acid amino acid residue in calmodulin's primary amino acid sequence at position 131 to either a glutamic acid (D131E), valine (D131V), or histidine (D131H). CaM has 148 amino acids in its sequence with two distinct lobes termed the N-lobe and the C-lobe. Both lobes contain two calcium ion binding sites, called EF-hand motifs, allowing for CaM to bind up to four calcium ions at once. The D131 amino acid is in the C-lobe of CaM and directly binds to a calcium ion in EF hand IV motif, which in turn stabilizes the protein and allows for calcium transportation. These mutations have been shown to cause various cardiac arrhythmias including Long QT Syndrome (LQTS) and Catecholaminergic

polymorphic ventricular tachycardia (CPVT) in patients. Previous data has shown that these mutations have a significant effect on calcium binding affinity in calmodulin, but the mechanism and subsequent protein actions are not fully understood. Results of my research indicated that this mutation, both with and without calcium being present, affects the thermal stability and refolding capabilities of calmodulin, which could help explain at the molecular level why these disease mutations lead various different cardiac arrhythmias.

Yunru Wang

MD - Johns Hopkins University

Discipline: Psychology

Authors:

Abstract Name: Cultural Influences on the Impact of Parental Divorce: A Comparison of Chinese-American and Non-Chinese-American Children

This paper investigates cultural influences in the differences of negative impacts on the wellbeing of Chinese-American and Non-Chinese-American Children. This paper utilizes a simplified model of Amatto (2000)'s Divorce Stress Adjustment Perspective model that analyzes the effects of Chinese-American cultural moderation upon the effects of divorce on children's psychological and behavioral problems. Through a comprehensive quantitative survey analysis with test of significance, this paper presents with the following findings: 1) There is significant evidence ($p=0.02299$) that Chinese-American children experience more negative impacts on mental-well being than Non-Chinese-American children; 2) There is not significant evidence that there is significant difference in cultural influence between Chinese-American children and non-Chinese-American children; 3) There is not significant difference in negative academic impact between Chinese-American children and non-Chinese-American children; and 4) There is not significant difference in negative impacts on peer interaction between Chinese-American children and non-Chinese-American children. These findings highlight the complex interplay of culture and individual well-being in the context of parental divorce.

Sophia Wang

CA - University of California - Los Angeles

Discipline: Health and Human Development

Authors:

#1 Evelyn Blumenberg

Abstract Name: Sexual Harassment and Public Transit

Since the COVID-19 pandemic, over 4,000 incidents of harassment against Asian Americans have been reported nationwide, predominantly in public spaces like transit systems. Women and marginalized communities are disproportionately harassed but remain underreported and poorly understood. Based on existing data, incidents at bus stops are likely overrepresented in harassment events, especially among women, young adults, and people of color. Using Los Angeles Metro ridership experience data from 2014–2019 and 2022–2023, we analyze harassment rates by race to establish pre- and post-COVID baselines. We will also conduct qualitative interviews of residents who frequently ride the bus and metro, specifically from Asian ethnic hubs in Los Angeles. In early 2025, LA Metro will conduct its first survey on sexual harassment (the result of tireless efforts Asian American community organizers). This project will provide route-specific insights, filling gaps in understanding the racialized and gendered dynamics of harassment on public transit

and contributing to policy advocacy for safer transit environments. We will also discuss the need to protect Asian ethnic hubs and address systemic hate through community-centered solutions, advancing both local and national efforts to combat harassment and promote inclusivity in public spaces.

Brayden Ward

KY - University of Kentucky

Discipline: Nursing and Public Health

Authors:

#1 Brayden Ward

#2 Margaret McGladrey

#3 Thomas Ard

#4 Mason Taylor

Abstract Name: Resource Guides: Connecting Kentucky's Communities

Background: Resources within communities often hold barriers regarding accessibility, knowledge of resources, and stigmatization. Many communities lack a comprehensive report of all major resources available within and around their county. By targeting the base knowledge within the individual, it can increase participation of these resources and in turn can improve overall health outcomes in a specific area. Objective: Create a list of comprehensive resources within each Kentucky County that can be distributed via pamphlet handout or website linkage. These resource guides have the ability to serve as a crucial connecting point between academia and local health departments. Methods: Scan the internet, social media, and contact community resources to get a holistic understanding of resources. The standard operating procedure provides points such as logistic availability, requirements, contact information, and process of attainment within each guide. Resources are pulled from each county or if not applicable to a specific county, the nearest resource to that respective location. Within each resource guide, the following categories are included: behavioral health centers, domestic violence resources, food assistance, harm reduction/syringe program, health services, housing services, legal services, medication for opioid use disorder, meetings, naloxone location, social support services, support and treatment locators, and transportation services. Guides are provided to different partners such as county officials, local health departments (LHD's), or various non-profit organizations within the counties. Results: 52% of all Kentucky counties have been completed and are awaiting review/approval for distribution, with the remainder of counties to be completed in the future. Numerous guides have been used as a point of first connection between LHD and the University, along with being part of various community health improvement plans.

Jesse Wartnick

MN - Hamline University

Discipline: Biology

Authors:

Abstract Name: Evaluating the Combine Effects of Ginger and EGCG on Human HCT-116 Colon Cancer Cell Lines

In 2024, over 2 million new cases of cancer will be diagnosed in the United States, and over 600,000 people will die from the disease. Among these, 106,590 people will be diagnosed with colon cancer, resulting in 53,010 deaths. Currently, colon cancer is treated by surgical removal of cancerous tumors or by

chemotherapy. However, surgery is expensive and can lead to complications like bowel leakage, while chemotherapy targets healthy cells, leading to side effects such as hair loss and chronic fatigue. Natural therapeutics, such as ginger and EGCG, have been found to have individual anticancer properties, such as inducing apoptosis and inhibiting cell growth. This makes them candidates for less toxic and less invasive therapeutic approaches. This study aims to determine whether EGCG and ginger, when combined, have synergistic or antagonistic effects on cancer proliferation. HCT-116 colorectal cancer cells were plated at 8,000 cells/well and treated with various concentrations of ginger and EGCG, both individually and in combination. Cell viability was determined using an MTS assay. The preliminary results indicate that EGCG alone causes a dose-dependent increase in cancer cell metabolic activity, while ginger extract alone decreases metabolic activity at high concentrations. Interestingly, the combination of ginger and EGCG did not result in a dose-dependent decrease in cancer cell metabolic activity, but rather a dose-dependent increase in cell metabolic activity, which suggests that EGCG interferes with ginger's anti-cancer activity when the compounds are used together.

Samantha Watson

MD - Salisbury University

Discipline: Exercise Science and Nutrition

Authors:

#1 Nicholas Rolnick

#2 Victor de Quieros

#3 Tim Werner

Abstract Name: Effects of Different Blood Flow Restriction Cuffs on Performance and Perceptual Responses

The aim of this study was to investigate the effects of wall squats with single- and multi-chambered blood flow restriction cuff bladders on performance and perceptual responses. Twenty-seven physically active and otherwise healthy participants (11 females; age: 22.6 ± 5.7) underwent three randomized testing sessions (single-chamber, Delfi Personalized Tourniquet Device; multi-chamber, BStrong Cuffs; and no blood flow restriction cuffs, no cuffs), one week apart. Testing sessions consisted of 4 sets of wall squats using 20% of the 1-repetition maximum (1RM) with repetitions to failure and 1-minute rest intervals. Cuffs were simultaneously placed on the proximal portion of both thighs and inflated to 60% of limb occlusion pressure for single-chamber cuffs and 300 mmHg for the multi-chamber cuffs for the entire exercise duration including the rest period. Performance metrics including total repetitions and training volume, and perceptual responses including rating of perceived exertion (RPE), rating of perceived discomfort (RPD), and likelihood of performing the exercise again were assessed for all sessions. A higher RPD was reported during the single-chamber (7.6 ± 1.8 , $p < 0.001$) and multi-chamber (6.3 ± 2.1 , $p = 0.035$) compared to no cuffs (4.9 ± 2.3) testing sessions. No significant differences in RPE were reported between the single-chamber (8.8 ± 1.1), multi-chamber (8.6 ± 1.2), and no cuffs (8.6 ± 1.0) exercise sessions ($p = 0.176$). A lower number of total repetitions occurred in single-chamber compared to multi-chamber cuffs (60 ± 24 vs. 83 ± 41 , $p = 0.043$), respectively, and in single-chamber compared to no cuffs (60 ± 24 vs. 126 ± 53 , $p < 0.001$), respectively. Furthermore, a lower number of total repetitions was achieved in multi-chamber compared to no cuffs (83 ± 41 vs. 126 ± 53 , $p = 0.005$). The use of blood flow restriction cuffs appears to increase discomfort regardless of bladder design, while the single-chamber cuffs may reduce training volume more than multi-chamber cuffs.

Meredith Wawrzynski

PA - University of Pittsburgh School of Nursing

Discipline: Nursing and Public Health

Authors:

#1 Xueying Pei
#2 Youjia Wang
#3 Denise Charron-Prochownik
#4 Susan Sereika
#5 Heather Garrow
#6 Nancy O'Banion

Abstract Name: Mother and Daughter (M-D) Behavioral Randomize Control Trial to Reduce Risks of Gestational Diabetes (GDM) among Female American Indian/Alaska Native (AI/AN) Adolescents: Importance of Institutional Review Boards

Background/Purpose: Research requires Institutional Review Board (IRB) approval. Studies with AI/AN-communities usually require Indian Health Service (IHS) and/or Tribal IRB approvals. Federalwide Assurance (FWA) are principles governing insitutional responsibilities of protecting the rights/welfare of research subjects. Tribal IRBs without FWA, require both IHS and Tribal IRB approvals. These IRBs protect/promote the interests/health/safety of AI/AN-communities, while conducting ethically/culturally-appropriate research to prevent exploitation/misconduct. The Stopping-GDM Study required approval from five sites, two Tribal and two IHS IRBs. This methodological-abstract describes IHS/Tribal IRB process in obtaining approvals for our study. Methods: University, Tribal, and IHS IRBs were obtained prior to the study. As part of the IRB process, participants provided informed consents or assents (<18yrs). We recruited 149 AI/AN dyads: female adolescents/young adults (AYA) 12-24yrs at risk for GDM and their mothers; and randomized to an intervention to reduce AYA GDM risk or usual care. IHS/Tribal and academic institutional IRB approvals were renewed annually. Results: The frequency of IRB reports depends on individual IHS/Tribal IRB Councils, ranging from quarterly to yearly, including updates on findings/dissemination and monitoring participants' wellbeing/safety. Data and conclusions drawn from the study are required in reports and approved before researchers disseminate this information. Approvals must be obtained from IHS/Tribal IRBs prior to submitting: abstracts to conferences, manuscripts to journals, posters/PowerPoints to conferences. Tribes may require electronic and/or hard copies prior to meetings. Some Councils require investigator's attendance and presentation of the posters/presentation. The Stopping-GDM study had the following submitted/approved: abstracts (n=15), posters/presentations (n=15), and manuscripts (n=6). Implications & Conclusions: The IHS/Tribal IRB process protects research participants in AI/AN communities. It is the responsibility of researchers to abide by their regulations to assure the safety and rights of all study participants.

Bella Wayhs

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Bella Wayhs
#2 Arjuman Ghazi

Abstract Name: TCER-1 and its Target Lysosomal Lipid Coordinate Immunity and Reproduction Maintenance through Egg Integrity

The intricate balance between fertility and immune function is a well-documented phenomenon across various organisms. However, the mechanisms connecting these two crucial and energy-intensive processes remain poorly understood, particularly in complex, slow-reproducing animals. Our lab previously discovered that TCER-1, the homologue to the human Transcription Elongation & Splicing Factor 1 (TCERG1), links reproductive fitness to innate immunity in the nematode *Caenorhabditis elegans*. TCER-1 mutants show

reduced fertility but enhanced innate immunity against the human opportunistic pathogen *Pseudomonas aeruginosa* strain PA14 (PA14). This study aims to investigate the epigenetic modifications of TCER-1 and how its downstream lysosomal lipolysis pathway influences reproductive health, specifically egg integrity. Our preliminary studies suggest that TCER-1 modulates lipid metabolism to repress immunity and enhance reproductive health. Gas chromatography-mass spectrometry revealed that the absence of TCER-1, especially during maternal infection, leads to a deficiency in essential fatty acids in the embryos. These fatty acids are crucial for developing the permeability barrier of the eggshell. Using BODIPY dye exposure, we observed that eggshell defects predominantly occur in TCER-1-deficient mothers. This indicates that TCER-1 is vital for ensuring that essential fatty acids are available for eggshell development, particularly under stress conditions.

Peyton Weaver

OK - University of Central Oklahoma

Discipline: Economics

Authors:

Abstract Name: Suburbanization Biodiversity

The suburbanization of the United States in both urban and rural areas has depleted resources needed to support the biodiversity of native plant and animal life through habitat loss, air pollution, and disruption of the natural ecosystem in the area. The purpose of this research is to correlate the negative externalities of suburban sprawl to the diminishing biodiversity observed within these areas. To understand the impact of suburban growth, I use data on housing subsidies provided by the government, which led to the development of new single-family homes, and measure population decline and endangerment of pollinating species responsible for the fertilization of plant life in these affected areas. I find that there is a direct correlation between the horizontal expansion of suburban communities and the loss and migration of pollinating species that have, in turn, created an unsustainable environment for native plant life.

Jo Weaver-Douglas

CO - University of Northern Colorado

Discipline: Sociology

Authors:

Abstract Name: What are the determining factors that cause Black students to leave Universities?

Student attrition, while often discussed in the context of higher education retention efforts, remains underexplored when it comes to understanding the specific causes that drive students to leave their academic programs—particularly for students from marginalized communities. This research focuses on the issue of Black student attrition at a mid-sized Western university, where, during the 2022-2023 academic year, 9% of Black students did not continue their studies. Given the distinct stressors and barriers faced by Black students, this study seeks to understand the unique experiences contributing to the attrition of students who have attended the university within the last five years. This project adopts a qualitative action research approach, using narrative analysis to explore the lived experiences of former Black students. Through semi-structured, one-hour interviews with 10 participants, this study explores their reasons for leaving the university, focusing on how intersecting identities (e.g., race, class, gender) and a perceived lack of institutional support may shape their decisions. The core of the inquiry is rooted in understanding the specific barriers that hinder Black students' persistence and retention, moving beyond general attrition studies to address race-specific factors. The action-oriented nature of this research is designed to lead to a practical agenda for institutional change. The findings aim to identify key factors that deter Black students from completing their degree programs, with the ultimate goal of creating recommendations for policies and practices that foster an environment of support and inclusion. By centering the voices of Black students who have experienced attrition, this study will provide the university with critical insights that can guide future efforts toward improving retention, promoting persistence, and ensuring an equitable educational experience for all students.

Frank Weber

MN - University of Minnesota - Rochester

Discipline: Nursing and Public Health

Authors:

#1 Abraham Ayebo

Abstract Name: Efficacy of EMDR Therapy in Adolescents with PTSD: A Meta-Analysis

Eye Movement Desensitization and Reprocessing (EMDR) therapy is a relatively new psychological treatment with mechanisms of action that remain partially understood. While most EMDR research focuses on adults, evidence suggests it could benefit adolescents as well. This meta-analysis investigates the efficacy of EMDR in treating post-traumatic stress disorder (PTSD) symptoms in adolescents aged 12 to 18, addressing a significant gap in the existing literature. To frame the research, the PICO approach was employed: the Population is adolescents; the Intervention is EMDR therapy; there is no direct Comparison group; and the Outcome is the improvement of PTSD symptoms. Although EMDR research has predominantly targeted PTSD, emerging evidence suggests broader applications, including the treatment of test anxiety and phobias. A comprehensive meta-analysis conducted four years ago demonstrated the potential versatility of EMDR across various mental health conditions and age groups. However, that analysis revealed issues of bias, raising concerns about its influence on clinical decision-making. This study synthesizes existing data on EMDR for adolescents with PTSD, critically analyzing methodological quality to ensure robust conclusions. Results are expected to clarify whether EMDR is an effective treatment option for adolescent

PTSD and identify areas for improvement in study design. In the short term, this meta-analysis aims to assist mental health providers in making informed decisions about the use of EMDR therapy for adolescents. Long-term, it seeks to guide future research toward evaluating EMDR's potential applications for other mental health conditions in this population. By addressing existing research gaps and minimizing bias, this study will contribute to a clearer understanding of EMDR's role in adolescent mental health treatment and its broader implications.

Andrew Webster

DC - American University

Discipline: Political Science

Authors:

Abstract Name: How Exclusionary Nationalist Rhetoric Shapes Danish Immigration and Integration Policy

Denmark is broadly recognized for its restrictive immigration and refugee intake policies, as well as its harsh, government-enforced integration measures. This project examines how 'exclusionary nationalist' political rhetoric by the New Right style, Danish People's Party (DPP), shaped the current immigration and integration approach. This 'exclusionary nationalist' framework explains and examines a style of elite-crafted rhetoric where state actors conjure 'threats' around, and place 'problems' on, outsiders, or non-Western and Muslim immigrants in the Danish context. This fosters public support for strict policies, generates electoral success for New-Right politicians, and excludes individuals who do not meet the rigid, cultural criteria constructed through this rhetoric. This analysis challenges the assumption that increased immigration inflows strain Danish culture and the welfare state, which, as these New Right politicians posit, requires a strict approach. Moreover, these findings challenge the notion that these increased numbers lead to xenophobia and, subsequently, strict policies. Instead, this project asserts that Denmark's descent into a neo-fascistic immigration regime has emanated from an elite-crafted process wherein state actors rhetorically create 'threats' around welfare, security, crime, terrorism, and cultural differences. This rhetoric necessitates policy 'solutions' such as oppressive, unhumanitarian, and ultimately, temporary, asylum, immigration, and integration practices. This project utilizes a sentiment analysis, tracing the language of the Danish People's Party (DPP), the Venstre Party (V), and the Social Democratic Party (SDP) from 2001 onward, illustrating how the center-left, SDP, co-opted the platform of the DPP and became the face of the anti-asylum-seeker and anti-immigration front. This project also compares this rhetoric to relevant policy developments, demonstrating how far-right ideas have entered Denmark's political mainstream and how the current unhumanitarian temporary protection and repatriation-focused approach was actualized. This offers a valuable explanation for the global rise of the New Right and the normalization of anti-immigrant and exclusionary policy and messaging.

Shanice Weekes

MI - Wayne State University

Discipline: Linguistics and World Languages

Authors:

Abstract Name: On the Edge of Whiteness: A Historical Analysis of the Evolution of Italians' Relationship with Race from the 1900s to Contemporary Italy

This project examines Italians' relationship with race, tracing its evolution from the mass migration of Italians

to the United States in the late 19th and early 20th centuries through the post-war period to contemporary racial perceptions in Italy. This exploration is significant because it reveals how historical experiences shape the current realities faced by Black Italians and African migrants in Italy. Through a historical analysis, personal accounts, and surveys of Italians, I investigate the connections and parallels between the Italian immigrant experience in the U.S. and the Afro-Italian experience today. While Italians have been victimized by white supremacy, they have also, at times, weaponized this racial hierarchy for their own acceptance. I argue that Italians exist on the edge of whiteness; although their phenotype grants them access to this racial category, they have not always been fully accepted into it, particularly within the context of American whiteness. The Italian immigrant experience in the United States heightened Italians' awareness of race and racism, leading Italians to navigate these complexities to protect their identity as a white nation.

Sophia Wehle

FL - Nova Southeastern University

Discipline: Political Science

Authors:

#1 Sophia Wehle

Abstract Name: Arrested Development: Comparing the Impact of Colonial Heritage on the Development of Former Western European and Soviet Union Colonies

Why are some former colonies more developed than others? Is there a difference between Soviet colonization and Western Colonization? In today's age it is easy to forget that colonial efforts still have a massive impact on the development of former colonies, and that many colonies have completely different patterns of development based on their colonial heritage. But what is not known is exactly what factors lead to better development in a post-colonial nation. This paper will argue that the way in which the Soviet Union colonized was different from the way Western powers colonized and that the tenants of Soviet colonization led to a divergence in development outcomes once these colonies were independent. This research ultimately finds through the use of linear regressions and mean comparison analysis, as well as a small case study, that there is statistical significance to support the observation that former Soviet colonies are at the very least more politically developed than former western colonies due to the fact that the Soviet Union practiced indirect rule colonization, which led to the formation of stronger independent governments.

Annalie Wehmuller

OK - University of Central Oklahoma

Discipline: Art History

Authors:

#1 Teresa Pac

Abstract Name: Comparative Analysis of the Depiction of Saints in the 12th Century in Sicily and Southern India

The concept of "saint" exists in many cultures globally, but under this blanket term, the portrayal of saints is culturally specific. This cultural specificity is demonstrated through the comparison of two sculptures: Saint Clement Seated, by the Abruzzi School, made in Sicily, Italy in the 12th century, and Saint Sambandar, created in South India during the Chola Period, also in the 12th century. The former is a saint of Sicilian Catholicism compared, while the latter reflects South Indian Hinduism. The comparative examination is

supported by historical articles written by scholars on the context and events of both 12th-century Sicily and South India. First, I will provide a comparison of the defined meaning of saint within the two cultures. Second, the notion of Saint Clement Seated in Catholic Italy will be discussed, considering formal analysis within a historical framework, followed by a formal and historical analysis of Saint Sambandar. The comparative conclusion will establish the similarities and differences between the expectations, appearances, and behaviors of the two saints, emphasizing a higher value placed on dynamic motion, and bodily autonomy in Hindu saints. At the same time, stoicism, modesty, and minimal attention to the human figure characterized Catholic Sicily. Despite the contrasting elements, comparatively, both pieces reflect an emphasis on poignant facial features, detail in drapery, and dynamic hand positions relaying a gestural form of nonverbal communication.

Tryston Weiss

NC - Western Carolina University

Discipline: Economics

Authors:

#1 Sean Mullholand

Abstract Name: Trapped by Design: Redlining, Government Aid, and the Cycle of Poverty

Government aid has played a critical role in supporting low-income communities by providing essential resources such as food, housing, and medical care. These programs have benefited Black communities, as families have been lifted from poverty and these programs promote social mobility. Institutions such as the American Rescue Plan and the Minority Business Development Agency have done much to alleviate economic inequality, and the Inflation Reduction Act is intended to make housing more affordable for low-income families. Yet, alongside these advantages, government support has also had inadvertently harmful effects on upward mobility for many beneficiaries. This study compares the history of redlining with the institutional issues of government assistance. Redlining, an unjust act that effectively excluded minority communities from financial services, imposed long-term socioeconomic disadvantage. Likewise, government assistance, while providing short-term comforts, can prevent citizens in poverty from being able to escape their situation. Other big problems are dependence on aid, program inefficiencies, and incentives to work. The prospect of unemployment benefits or housing vouchers could be more attractive than finding low-wage work. Furthermore, stigmas surrounding government aid discourage beneficiaries from seeking to escape the reliance on aid. A significant challenge lies in the "welfare cliff" where little increases in income can mean instant loss of benefits and families can't even pay for their basic needs. This leads to a paradoxical situation where poverty seems more manageable than aspired mobility. Second, the poverty level doesn't reflect the regional cost of living or economic complexity and thus could be an inaccurate measurement of the extent of US poverty. While aid from governments can be essential short-term relief, their long-term architecture is likely to put recipients into a state of dependence. This research argues for solutions to these structural deficiencies that would bring economic self-sufficiency and justice to low-income and minority communities.

Abigail Weiss

PA - Moravian University

Discipline: Nursing and Public Health

Authors:

#1 Cathy Coyne

Abstract Name: Examining the Psychological Impact of Parental Substance Use on College Students in 2024

Background: Substance use disorders have lasting, significant effects on a family unit, especially children. The prevalence of substance use disorders (SUD) has been increasing since the 1990s, with 8.7 million children under the age of 17 residing at home with a parent who is diagnosed with a SUD. There is limited research conducted on the college undergraduate population concerning the effects of parental substance use. It is imperative to understand these effects in order to better grasp how parental substance use may have life-long effects on children, especially when they are entering a period of young adulthood. Study purpose: The purpose of this research is to determine whether a correlation exists between parental SUD and college student mental health and resilience. Methods: A cross-sectional study was conducted with 325 students at a small Mid-Atlantic liberal arts college. A 48-item e-survey that included the PHQ-2, GAD7, CD-RISC-10, and Ryff Psychological Well-Being Scale was used. The prevalence of parental substance use was calculated using participant reports of current and past substance use by parents. Using bivariate analyses, differences in scale scores between participants with and without parental substance use were examined. Results: Preliminary analyses indicate that 12% of college students have a parent with current substance use, and 10% indicate previous parental SUD. Among all participants, 21% are at risk of a major depressive disorder. Additionally, 21% of participants scored within the range suggesting moderate anxiety, while 17% scored within the range suggestive of severe anxiety. Additional analyses will be conducted to determine the correlation between the two populations on the variables of interest. Conclusion: It is anticipated that these results can be utilized to better understand the long-term effects of parental substance use on an understudied group - undergraduate students.

Katarina Weldy

NY - St. John Fisher College

Discipline: Biology

Authors:

#1 Daryl Hurd

Abstract Name: The Structure of Male Tail Sensory Cilia and CEM Cilia in the Absence of *tbb-4* in the Model C. elegans

Cilia are cellular cytoplasmic extensions made up of a microtubule based axoneme. The axoneme is composed of a ring of microtubules in either a 9+0 formation for stationary cilia or 9+2 for motile cilia. C. elegans has 60 ciliated sensory neurons and 16 genes that encode for tubulins. To understand the structure of cilia we are using tubulin mutations and tubulin fluorescent protein reporters. Our results show that one of the nine alpha-tubulin proteins, TBA-6, is exclusively expressed in ray neurons. TBA-6 is found in the dendrites at the end of the cilia. The beta-tubulin, TBB-4 has a sequence motif located in the ciliary beta-tubulins. Currently we are investigating the role of TBB-4 using the localization of TBA-6.

Kayla Welker

TN - Middle Tennessee State University

Discipline: Business

Authors:

#1 Gaia Rancati

Abstract Name: From Gaze to Belief: The Role of Eye-Tracking in Understanding Climate Messaging

Understanding attitudes and beliefs surrounding climate change is crucial for addressing today's increasing social and environmental challenges. This study explores the effects of message framing on visual attention and its ability to predict attitudes toward climate change and political beliefs. Employing a multidisciplinary approach, the research combines eye-tracking with a survey. Participants completed an online survey assessing participants' perceptions, political ideologies, and demographic information. Then, they were exposed to climate-related messages framed either positively (e.g., recycling decreases landfill mass) or negatively (e.g., non-reusable plastics end up in landfills), and their gaze location and fixation duration were monitored through eye-tracking. Results from the eye-tracking data revealed that negatively and positively framed messages elicit longer fixation times compared to neutral messaging, highlighting the influence of message valence on visual engagement. Survey results demonstrated a nuanced relationship between implicit visual attention patterns and explicit attitudes moderated by social desirability bias and political ideology. Liberal participants showed greater fixation durations for all message frames than conservative participants, who preferred positively framed messages over negatively framed ones. These findings underscore the value of integrating implicit and explicit measures to understand public attitudes toward climate messaging. By bridging psychological and political science perspectives, this study provides valuable insights for researchers and practitioners seeking to enhance the effectiveness of climate-related communication and foster greater environmental awareness.

Marshall Wentz

TX - Lubbock Christian University

Discipline: Environmental Science and Sustainability

Authors:

#1 Marshall Wentz

#2 Bart Durham

Abstract Name: Age Determination of Imperiled Fishes in the Red River of Texas and Oklahoma

Knowing how and where fishes obtain their energy is critical for understanding their ecology. Currently, it is unknown whether native fishes in the Red River of Texas and Oklahoma obtain their primary energy from allochthonous or autochthonous inputs, and how those inputs may change with respect to factors such as age, season, salinity, discharge, etc. The goal of my project is to determine the overall age structure of four target species: Red River shiner (*Notropis bairdi*), Red River pupfish (*Cyprinodon rubrofluviatilis*), plains minnow (*Hybognathus placitus*), and prairie chub (*Macrhybopsis australis*), to better inform a larger ongoing study of the diet habits of the study species. Sampling was conducted at six sites spanning 320 river kilometers during spring, summer, and fall of 2023. The lapillar otoliths were removed and annual growth rings deposited on these as they grow were enumerated. A total of 571 otoliths were analyzed for this study. Preliminary data indicates that individuals live a maximum of three years, with less than 3% reaching age 3. Age 1 and 2 individuals make up the remainder of the population in roughly equal proportions. Fall samples trended higher in Age 1 individuals, presumably because ages 2 and 3 individuals reached the end of their life cycle and senesced out of the population. Once all age data are fully analyzed, they can be integrated into the larger data set to get a broader picture of how age may influence diet and energy patterns for these species. The age data can also be used to compare age and growth data of similar species in adjacent river systems that is collected by other scientists. Gaining a better understanding of prairie stream fishes in the Red River of Texas and Oklahoma will better inform conservation and management of these and other imperiled prairie stream fishes.

Alexandra Wercinski

MD - Naval Academy

Discipline: Chemistry

Authors:

#1 Alex Wercinski

#2 Julia Pribyl Ham

Abstract Name: Cyclic vinyl polymers prepared in ionic liquids

A radical ring expansion polymerization of vinyl monomers to form cyclic polymers was recently reported by our group. Cyclic polymers were best produced when the polymerization was conducted at high reaction concentrations in a relatively viscous solvent under mild reaction conditions. Due to degenerative chain transfer during polymerization, cyclic multimers that varied in size were found in the final material. The goal of this work is to prepare cyclic unimers via light-driven ring expansion polymerization in highly viscous solvents known as ionic liquids. High viscosity solvents will limit polymer chain diffusion and therefore the oligomerization which formed multimers caused by chain transfer. Results detailing the control of molar mass and polymer architecture will be discussed.

Sarah Werner

MN - Minnesota State University - Mankato

Discipline: Health and Human Development

Authors:

#1 Sarah Werner

Abstract Name: The Experiences of Neurodivergent Individuals: Guidelines for Effective Neuro-Inclusive Patient Care

Within humanity, there are various ways of thinking that influence how people communicate with others. 'Neurodivergence' refers to the variation from what is considered typical. Examples include autism, ADHD, dyslexia, and various other conditions. In healthcare settings, earlier studies show that neurodivergent individuals may experience barriers because of the lack of understanding among healthcare providers. The gap in the knowledge among healthcare providers and underdeveloped practices are concerning; in fact, it is reported that major disparities between neurodivergent and neurotypical individuals continue in access to care and outcomes across populations. Furthermore, neurodivergent individuals often feel excluded in research environments designed for neurotypical individuals, and many neurotypical researchers are uncertain about how to engage with neurodivergent individuals. This inductive project aimed to discover the experiences of neurodivergent individuals in patient care. The studied population consisted of neurodivergent individuals over the age of 18, recruited from the campus of Minnesota State University, Mankato. The participants provided their consent to take part in an hour-long semi-structured interview. Topics covered within these interviews included participants' healthcare experiences, perceived barriers, and suggestions for improvement. The qualitative analysis was employed to analyze the interview transcripts, and the small sample size allowed us to explore the in-depth experiences of neurodivergent individuals. The findings highlight the necessity for enhanced resources and support within the healthcare system to better assist neurodivergent individuals. With the insights of the public, the findings also contribute to more neuro-inclusive practices that significantly help the wellbeing of neurodivergent individuals across the state.

Emma Werner

FL - The University of Tampa

Discipline: Chemistry

Authors:

#1 Emma Werner

Abstract Name: Characterization of New Molecular Tools to Detect Branched Ubiquitin Chains

Ubiquitin chains are key regulatory signals that control the stability, activity, and location of proteins in various ways. Recent studies have shown that ubiquitin chains can be branched and that branched chains regulate proteins through diverse mechanisms. Despite mounting evidence that branched chains have important biological functions, our understanding of these signals has been limited by a lack of accessible methods to detect them. In this study, we explored the effectiveness of two newly developed tools designed to detect branched K48/K63 chains. An engineered nanobody reported to bind branched K48/K63 chains with high affinity and specificity (Lange et al., 2024) was purified from *E. coli* and assayed for binding to ubiquitinated proteins containing branch points. Under the conditions tested, the nanobody did not show specificity for branched K48/K63 chains in complex mixtures of ubiquitinated proteins. We also tested the deubiquitinase, MINDY1, which has been reported to preferentially cleave K48 linkages within K48/K63 branch points, in addition to the K48 and K63-specific deubiquitinases, OTUB1* and AMSH*, for their ability to cleave branched K48/K63 chains attached to substrates. As expected based on the topology of the chains, MINDY1 and OTUB1* effectively removed distal K48 linkages from K48/K63 branch points, whereas AMSH* cleaved K63 linkages proximal to the branch points. We conclude that the nanobody may not be an effective tool for detecting branched K48/K63 chains in certain contexts. However, MINDY1, and potentially other deubiquitinases that have recently been shown to specifically target branch points, hold promise as new diagnostic tools to detect branched K48/K63 chains.

Maria Werner

PA - Duquesne University

Discipline: Biology

Authors:

#1 Joseph Heath

#2 Jill Dembowski, Ph.D.

Abstract Name: Investigating the role of host LSD1 during Herpes simplex virus type 1 infection

Herpes simplex virus type 1 (HSV-1) infects most of the global population, causing a variety of diseases including cold sores, encephalitis, and keratitis. Previous studies in our lab have identified that host lysine-specific demethylase 1 (LSD1) associates with HSV-1 replication forks and replicated viral DNA. In the absence of infection, LSD1 acts as a transcriptional repressor or activator to regulate host cellular gene expression. Previous studies found that LSD1 inhibition reduces HSV-1 DNA replication, late gene expression, and viral yield. However, the mechanism by which LSD1 is recruited to the viral genome and how LSD1 inhibition blocks infection is unknown. For this reason, we performed LSD1 immunoprecipitations to determine which cellular and viral proteins associate with LSD1 during HSV-1 infection. This revealed which host and viral factors interact with LSD1 and how LSD1 could be recruited to the viral genome. By western blotting, we confirmed that LSD1 immunoprecipitation was successful by identifying an association with histone deacetylase 2, a known interactor of LSD1. Mass spectrometry revealed novel interactions between LSD1 with both host and viral proteins, including viral protein UL54, an mRNA export factor essential for HSV-1 infection, and host tumor protein p53 binding protein 1 (TP53BP1). To determine whether an LSD1 knockdown would result in reduced viral yield, we performed an siRNA transfection, which resulted in reduced viral yield. In the future, we plan to further optimize these protocols and repeat for biological replicates.

Paige Westergaard

MI - Siena Heights University

Discipline: Health and Human Development

Authors:

#1 Jeffrey Lake

Abstract Name: The Effects of Blue Light on the Eyes and if Blue Light Filtering Lenses can Relieve Digital Eye Strain Symptoms

The constant use of digital devices like phones and laptops has caused excessive exposure to blue light. The blue light emitted by devices affects the health of the eyes and can cause symptoms such as eye strain, fatigue, and overall discomfort. With the growing awareness of the effects of blue light, new technology has been created, such as blue light filtering glasses. With new technology being created, more studies are being done on the effectiveness of blue light glasses and if they can relieve eye strain symptoms. While there are currently multiple studies on the effectiveness of blue light glasses, there is very little research done on the undergraduate population. This is important since university students are using computers, laptops, and phones for several hours every day, and experiencing digital eye strain symptoms daily. The goal of this research is to determine if blue light glasses can relieve digital eye strain symptoms among university students. The requirements for participants of the study include current undergraduate students who wear contacts or do not wear glasses. Participants will fill out a survey about their eye symptoms before and after using blue light glasses, and statistical analysis will be applied to the data. Each participant will wear either blue light filtering lenses or placebo clear lenses for a week, while using digital devices. The hypothesis of this study is that blue light glasses will relieve digital eye strain symptoms. Key terms: Blue light, Digital Eye Strain, Blue light filtering lenses/glasses

Isabella Westervelt

NJ - William Patterson University

Discipline: Health and Human Development

Authors:

#1 Isabella Westervelt

#2 Amanda Khoudary

#3 Jennifer Rodriguez

#4 Martin Gutierrez

#5 Chul Kim

#6 Irina Veystman

#7 Jennifer Wheeley

#8 Claire C. Conley

#9 Heather Derry-Vick

Abstract Name: Cancer Care Decision-making Preferences of Black Patients with Advanced Lung Cancer

Background Patients who take an active role in their healthcare decisions often experience benefits, such as higher satisfaction and better physical and psychological health. Black patients are less involved in shared decision-making (SDM) during appointments, which could contribute to health disparities. Yet, little is known about Black cancer patients' decision-making preferences. We sought to describe preferences among

Black patients with advanced lung cancer, and examine if preferences varied according to sociodemographic and clinical factors. **Methods**We analyzed data from Black patients with advanced lung cancer (N=29) who reported sociodemographic characteristics, clinical characteristics, and their preferred healthcare decision-making role on the Control Preferences Scale (CPS). Responses were categorized as active (prefer to make final treatment decisions), passive (prefer their doctor to make final treatment decisions), or collaborative. We used Chi-square and ANOVA tests to analyze relationships between characteristics and preferences. **Results**Participants were primarily female (62%), high-school level educated (38%), and were aged 48 to 81 years. On the CPS, most participants preferred collaborative (n=12, 41%) or passive (n=12, 41%) roles in cancer care decision-making; fewer (n=5, 17%) preferred an active role. Gender was associated with preferences (p=0.095), such that more women preferred a passive role than men (50% vs 27%). Patients receiving immunotherapy preferred a passive role (78%), whereas those not receiving immunotherapy preferred a collaborative role (55%, p=0.002). Age, education level, income, religion, marital status, and time since diagnosis were not associated with decision-making preferences (all p-values $\geq$ 0.40). **Conclusions**In this small sample, Black patients with advanced lung cancer preferred a collaborative or passive role in their cancer treatment. Preferences varied by treatment. To support patient-centered cancer care, further research with larger samples is needed to understand Black patients' preferences, factors influencing them, and ways to align communication with preferences.

Isabella Westervelt

NJ - William Patterson University

Discipline: Biology

Authors:

#1 Isabella Westervelt

#2 Torri Burghoffer

#3 Carey Waldburger

Abstract Name: Investigating mrp and pha Gene Expression in *Marinobacter adhaerens*

Studies in our lab focus on *Marinobacter adhaerens*, a marine bacteria that was isolated from laboratory cultures of the red-tide-causing dinoflagellate, *Karenia brevis*. *M. adhaerens* is a gram-negative aquatic bacterium that has been found in association with several harmful algal bloom-producing dinoflagellates. A previous bioinformatic study in our lab indicated a unique adjacent placement of two homologous multigene cation/proton antiporter clusters in the *M. adhaerens* genome: an mrp (Multiple Resistance and pH) gene cluster adjacent to a pha gene cluster. The mrp/pha family of cation/proton antiporters couple proton export with cation import and have been found to play roles in pH homeostasis, cation resistance, biofilm formation, and pathogenesis in other bacteria. This study uses Real Time qPCR and β -Galactosidase assays to investigate the relationship of mrp and pha gene cluster expression in varied external pH, [NaCl], and [KCl] conditions. RT-qPCR and β -Galactosidase assays provide complementary information regarding potential transcriptional and translational regulatory mechanisms for expression of these two antiporters. We found that the mrp expression and transcription profiles did not show parallel changes in increased [KCl] and pH. This indicates that post-transcriptional regulation may be used in these conditions. Further studies will be conducted to explore potential regulatory mechanisms.

Zola Westmoreland

TX - Stephen F. Austin State University

Discipline: Economics

Authors:

Abstract Name: Drivers of State Solar Electricity Generation

Solar energy is radiation from the sun that is capable of producing heat and generating electricity. There are environmental benefits to generating electricity using solar energy. It is a renewable resource, and if used for electricity generation, it reduces greenhouse gas emissions and pollutants associated with the electric power sector. Some states have been working towards implementing the use of solar energy. States evaluate their geographic, economic, and environmental conditions to achieve this. Previous research indicates that state unemployment rates, political ideology, and educational levels affect solar energy adoption. We are interested in understanding drivers of state solar electricity generation. Our analysis considers state population, state gross domestic product (SGDP), governor and state house political affiliation, educational attainment, state size, state unemployment rate, state incentives related to solar energy, and measures for sunshine. We measure state sunshine two ways – first, we utilize the average annual percent of time between sunrise and sunset that sunshine reaches the ground within a state (percent of sun); second, we use the average annual number of days when cloud covers at most thirty percent of the sky during daylight hours (clear days). To answer our research question, we use publicly available data and multiple linear regression analysis. We specifically look at which variables impact the amount of electricity generated by solar within a state. There are two main specifications, one for each variable that measures sunshine. Results indicate that SGDP, state size measured in square miles, number of state solar incentives, and percent of sun significantly increase state solar electricity generation. If a state has one additional state incentive for solar energy, state solar generation increases by 158 thousand megawatt hours on average, holding all other variables constant. Other results show increases in SGDP, percent of sun, and state size raise state solar generation.

Brianna Whalen

PA - Moravian University

Discipline: Biology

Authors:

#1 Natasha Woods

#2 Julie Zinnert

Abstract Name: The impact of disturbance on the growth of *Morella cerifera* at different life stages

The barrier islands off the coast of Virginia act as essential shields to mainland cities and ecosystems during major storm events. *Morella cerifera*, hereafter *Morella*, is a native shrub on these islands. Warmer winter temperatures have caused *Morella* to encroach into neighboring grasslands, resulting in a reduced ability of the island sediment to shift and rollover with the tides and wind, a feature known as island plasticity. Dunes can shield *Morella* from overwash events that deposit sediment and introduce salt spray. However, if dunes are destroyed by storms before they can be rebuilt, *Morella* may experience increased burial from storms and increased salinity from salt spray. The impact of the frequency of burial and salinity on *Morella* is currently unknown; however, seedling age may impact the tolerance to burial and salinity. The experiment aimed to investigate the extent to which the growth of *Morella* seedlings (7 week old and 1 year old) are differentially impacted by salinity only, burial only, and burial and salinity on the growth of *Morella*. The combination treatment is reflective of overwash events in the field. In order to simulate the natural microenvironment, each pot contained a single *Morella* surrounded by three *Sporobolus pumilus* grasses, and they were buried in sand from Hog Island, Virginia. Preliminary data shows that the seedlings treated with salinity and burial were the least successful, with three out of four replicates dying and the fourth growing by zero percent. The treatment group with the highest percent change (111 ± 1.4) was the year-old group treated with burial and salinity. These results suggest that the resilience of *Morella* to overwash stress conditions is partially dependent on the age of the seedling. Therefore, *Morella* must have time to establish and grow before it is able to withstand stress from overwash events.

Luke Wharton

GA - Kennesaw State University

Discipline: Computer Science

Authors:

#1 Sean Haque

Abstract Name: A Dynamic Framework for Standardized AI IQ Assessment

The rapid advancement of artificial intelligence (AI) has underscored an urgent necessity for standardized metrics capable of accurately measuring AI cognitive capacities. Existing AI performance assessments, such as the GSM8K benchmark, offer valuable insights into specific domains like mathematical reasoning. However, they fall short in providing a holistic evaluation of AI intelligence, lacking the breadth and consistency required to parallel human IQ standards. This limitation hinders the ability to comprehensively assess and compare AI systems across diverse cognitive functions. This research proposes the design and implementation of a comprehensive IQ test framework specifically tailored for AI systems. Unlike current benchmarks that rely on fixed datasets and often exhibit significant performance variability with minor input alterations, the proposed framework aims to establish a robust and standardized metric. It will encompass a wide range of cognitive abilities, including logical reasoning, verbal comprehension, memory retention, and complex problem-solving. To achieve this, the framework will utilize dynamically generated question sets that adapt in complexity and diversity, ensuring a more consistent and reliable assessment of AI capabilities. Additionally, the integration of symbolic templates and multi-domain tasks will enhance the framework's ability to evaluate AI reasoning processes and adaptability across different contexts. The expected outcome of this research is the development of a stable and objective metric for quantifying AI intelligence, facilitating more accurate comparisons between AI models and aligning AI assessment methodologies with established human intelligence standards. By addressing the shortcomings of current benchmarks, this framework will provide deeper insights into the cognitive strengths and weaknesses of AI systems, promoting the creation of more robust and versatile AI models. Ultimately, this standardized IQ test framework will serve as a pivotal tool in advancing AI research, guiding the development of intelligent systems that better mimic and complement human cognitive abilities.

Makyla Wheeler

PA - Westminster College

Discipline: Psychology

Authors:

#1 Makyla Wheeler

#2 Eric Fields

Abstract Name: Mental Imagery, Emotional Valence, and Item vs. Associative Effects on Memory

Mental imagery is involved in many functions, including being an important encoding tool for several forms of memory. Stimuli are also better remembered when they are emotional, especially negative stimuli. Memory can also differ when it is tested for items versus associative pairs. Mental imagery, emotional valence of stimuli, and item/associative memory have all been independently researched as having effects on memory. The present study set out to test the relationship of all three factors and their combined effects on memory in a single study. It was hypothesized that memory would be greatest in the negative-imagery-

associative condition. 22 undergraduate participants (aged 18-22) took part in a within-subjects, single session word-pair research design. Participants were exposed to 180 word pairs across two encoding conditions. In the semantic encoding condition, participants wrote a sentence using both words in the pair. In the imagery encoding condition, participants were asked to form a mental image involving both words and rate vividness. Memory was tested in a recognition memory task. For half the trials, memory was tested for a single word (item condition) and for half it was tested for a word pair (associative condition). A 2 (Emotion: neutral, negative) x 2 (Encoding: semantic, imagery) x 2 (Memory test: item, associative) ANOVA was used to test for effects on the memory metrics of hit rate, d' (memory discriminability), and criterion (response bias). Results suggested that memory was better for semantic encoding than imagery encoding and for associative memory vs. item memory. In addition, a marginally significant effect suggested that when associative memory was tested, pairs with a negative word were remembered better than neutral-neutral pairs in the imagery encoding condition. The reverse effect was seen in the semantic encoding condition, suggesting that imagery encoding might be particularly beneficial for associative memory with negative items.

Paris Wheeler

MI - Michigan State University

Discipline: Visual Arts

Authors:

#1 Paris Wheeler

Abstract Name: EMMADAZEY

This project is an exploration of memory, decay, and personal introspection through an audio-reactive visual composition built entirely in TouchDesigner. The centerpiece of the project is a guitar performance where the live input generates real-time particle-based visualizations, projected onto the exterior of a deeply personal and symbolic site: my great-grandmother's vacant home, untouched for nearly eight years. The house, with its weathered surfaces and storied past, mirrors the themes of the song I chose to cover—a track by Narrow Head that delves into struggles with addiction, decay, and a bittersweet nostalgia for places and moments long gone. By integrating the performance with the space, the work transforms both the visuals and the setting into extensions of the song's emotional depth. The decision to forego more overt flame effects for subtle particle systems was deliberate, aligning the visual language with understated representations of age, decay, and memory's erosion. The act of projecting onto my great-grandmother's house not only contextualizes these themes but also serves as a metaphor for revisiting formative sites and uncovering new dimensions of self-understanding through creative interaction. The lyrics of the song—centered on themes of clinging to past highs despite a pervasive numbness—are echoed in the comforting yet haunting visuals. This interplay between place, sound, and light invites viewers into a synesthetic experience, fostering reflection on how our physical and emotional landscapes intertwine. The project represents a confluence of art, technology, and personal narrative, demonstrating how digital tools can deepen our engagement with universal themes of loss, memory, and transformation. The development of this work will continue to be something I think about often to find out how to expand on these ideas and eventually make more pieces centered around this medium.

Caden Wheeler

UT - Weber State University

Discipline: Biology

Authors:

#1 Caden Wheeler
#2 Aidan Nielsen
#3 Ethan Carter
Aidan Nielsen
Ethan Carter

Abstract Name: Does Lactic Acid Bacteria Inhibit Biofilm Formation of Methicillin-Resistant *Staphylococcus aureus*?

Methicillin-resistant *Staphylococcus aureus* is a major cause of healthcare-associated infections, in part due to its ability to form resilient biofilms on medical devices such as catheters and implants. These biofilms help to protect the bacteria from the external environment and reduce antibiotic efficacy. This study investigates the potential of lactic acid bacteria, in particular, *Lactobacillus rhamnosus* and whether it can inhibit *S. aureus* biofilm formation. *L. rhamnosus* is a common probiotic found in dairy products and has been shown to exhibit antimicrobial activity against pathogens such as *Escherichia coli* and some strains of *Salmonella*. Using plating techniques and spectrophotometric analysis, we assessed the ability of *L. rhamnosus* to reduce *S. aureus* growth. Our results indicate that a co-culture with *L. rhamnosus* as well as a supernatant wash can reduce biofilm growth compared to sterile saline and sterile MRS controls.

Mattigan Wheelwright

UT - Westminister University

Discipline: Biology

Authors:

#1 Mattigan Wheelwright

Abstract Name: Hyperaccumulator *Salicornia* and The Current State of Mercury at the Great Salt Lake

Salicornia Utahensis and *Salicornia Pacifica* are halophiles, or salt loving, succulents that could help purify the land around the Great Salt Lake in Utah through the accumulation of dangerous compounds much like how these plants draw salt from their environment. Plants instinctive accumulation of compounds present in soil could help us understand possible solutions to mercury, its effects on the native plantlife, and ways to identify heavy metal sediments at Utah's Great Salt Lake. This project's main goal is to find whether or not *Salicornia*, otherwise known as Pickleweed, is absorbing mercury from shoreline and topsoil at Great Salt Lake. With the help of my mentor Doctor David Parrott at Westminister University, there has been sampling pickleweed at three separate Great Salt Lake locations and the consecutive use of a lab freeze dryer and a Direct Mercury Analyzer (DMA-80) to quantify the present mercury. It is currently hypothesized that trace amounts of mercury will be found, but not a significant amount as mercury is more common in deeper substrates than the shoreline soil. This project is currently underway with strong suggestions that there is a negligible amount of mercury in the surrounding shoreline soils, but more research is needed and underway. If there's mercury in the shoreline soil it tells us that it will be present in dust storms that would affect the populations across Utah, causing degenerative issues such as neural damage as well as harming lung tissue. This project will address environmental science issues and implications for future public health issues depending on results.

Briana Whetstone

OK - University of Central Oklahoma

Discipline: Psychology

Authors:

#1 Briana Whetstone

#2 Nora Gayzur

Abstract Name: What's Food Got to Do with It? An Exploration of Food Insecurity and Health Factors in College Students

The goal of this study is to identify how stress relates to an individual's sleep patterns and food insecurity (consistent lack of access to healthy food options). Studies have shown a complex interplay between stress, coping skills, and poor mental health outcomes (i.e., sleep disturbances and poor eating habits). Depending on an individual's coping skills, declines in mental health have shown to lower emotional well-being, increase emotional strain, and increase maladaptive behaviors (e.g., insomnia). One particular group of individuals who experience high levels of stress, changes in sleep patterns, and food insecurity are college students. In college, students experience numerous stressors related to classes and tend to have lower income. Limited time and lower income tend to lead to increases in stress and poor coping skills. College students report having chronic stress and it has an impact on their quality of life. In this study, we aimed to examine factors that can become impacted by increased stress. We predicted that increases in stress will lead to increased sleep disturbances and greater food insecurity. Participants will complete the Short Form of the Food Security Survey Model (USDA ERS), Food Insecurity Experience Scale model (FIES), Pittsburgh Sleep Quality Index Survey (PSQI), and the Perceived Stress Scale (PSS). The USDA ERS survey and FIES model was used to measure food insecurities among individuals to measure their eating habits. Sleep will be measured with the PSQI survey. The PSS was used to measure stress levels in individuals. We expect to find a significant relationship between all with stress predicting increased sleep disturbances and greater food insecurity to demonstrate the complex interplay between mental health and behavioral outcomes.

Jason Whitehair

IL - University of Illinois at Chicago

Discipline: Biology

Authors:

#1 Natalia Saldivia

#2 Gregory Heller

#3 Diego Zelada

#4 Maria Givogri

#5 Ernesto Bongarzone

Abstract Name: Galactosylceramidase Deficiency in Adult Oligodendrocytes Exacerbates Demyelination in Experimental Autoimmune Encephalomyelitis

The lysosomal enzyme galactosylceramidase (GALC) is essential for the proper myelination of the mammalian nervous system throughout early developmental stages. However, the effects of GALC deficiency in the adult brain are still unclear. This study found that mice with GALC enzyme selectively removed from mature oligodendrocytes have worsened pathology following the administration chronic experimental allergic encephalomyelitis (EAE), which ultimately leads to fatal sensitization. In contrast, mice not treated with EAE and who have GALC ablated from their oligodendrocytes only exhibit non-lethal demyelination. Within the doubly challenged experimental group, we have identified severe inflammatory demyelination with a lack of remyelination, as well as increased gliosis and a disrupted fusion of lysosomes and autophagosomes. Our findings highlight that the physiological impact of GALC deficiency depends strongly on factors such as the time when it occurs, the cell type (i.e. oligodendroglial vs. global expression), and the presence of inflammation. Thus, this study concludes that GALC expression in adult

oligodendrocytes is critical for maintaining myelin within the adult central nervous system and reducing susceptibility to demyelinating injury.

Kristian Whitehead

MD - Morgan State University

Discipline: History

Authors:

Abstract Name: “‘We are at War!’: The New Afrikan Independence Movement and the Internationalist Struggle to Free PoWS”

In the early 1970’s, the New Afrikan Independence Movement (NAIM), a coalition of Black nationalist organizations aspiring to create a Black nation within the United States, organized for the release of Black Liberation Army (BLA) members. The BLA engaged in military actions against police officers, banks, and drug dealers often in self-defense of what they deemed the Black nation. Once imprisoned, the NAIM declared BLA members Prisoners of War. This research analyzes the NAIM’s citation of international law in their argument for BLA members status as a PoW, which reframed their domestic criminalization and positioned them alongside anti-colonial guerrillas from a variety of national liberation movements. “We are At War!: The New Afrikan Independence Movement and the Internationalist Struggle to Free PoWS” illuminates how the evocation of PoW status facilitated a politics of solidarity with other national liberation movements on the basis of their universal right as colonized people to use armed struggle to “Free the land!”

Ella Whitehead

NC - Western Carolina University

Discipline: Chemistry

Authors:

#1 Patrick Drake

#2 Brian Dinkelmeyer

Thomas Bolick

Abstract Name: Synthesis of Europium (III) Thenoyltrifluoroacetate Terpyridine Complexes and the Influence of Electron Donors and Acceptors on Fluorescent Efficiency.

In this project europium (III) complexes were synthesized to probe the effect of electron-donating and withdrawing ligands on the quantum yield of Eu(III) fluorescence. The fluorescent spectra of europium(III) complexes have large Stokes shifts and long emission lifetimes which make them potentially useful in fluorescent bioassays, labeling experiments, and as dyes in confocal microscopy. A simple definition of quantum yield Φ is the ratio of photons emitted to the number of photons absorbed. Europium(III) fluorescence is enhanced when coordinated with Thenoyl Trifluoroacetate (TTA) which acts as an antennae that increases the number of photons absorbed (UV-Vis). Adding ligands such as terpyridine to the EuTTA3 center influences the efficiency of the emission of photons (Fluorescence). This study used 4-methylphenyl terpyridine (CH₃-terpy) as an electron-donating ligand and 4-trifluoromethylphenyl terpyridine (CF₃-terpy) as an electron-withdrawing ligand. The structure and properties of the ligands and europium complexes are being determined by FT-IR, ¹H-NMR, UV-Vis, and fluorescence spectroscopy along with the influence of each ligand on the europium fluorescence and quantum yield.

Ainsley Whiting

MO - Truman State University

Discipline: Psychology

Authors:

#1 Ainsley Whiting

Abstract Name: A Study on Negative Self-Perception and Academic Self-Efficacy in Neurodivergent College Students

The objective of this study is to assess the association between negative self-stigma and academic self-efficacy among neurodivergent college students. Negative self-stigma, characterized by internalized negative beliefs and attitudes about one's neurodivergence, can significantly influence students' perceptions of their academic capabilities and performance. Neurodivergence – which includes ADHD, autism spectrum disorder, and learning disabilities – encompasses individuals whose brain process, learn, and/or function differently from what is considered typical. The difference between neurodivergent and neurotypical thinking and interpreting information can be crucial when learning in an environment suited for the typical population. When these differences are noticed by an individual with neurodivergence, they may begin to think poorly of themselves since stereotypes about neurodiversity say that neurodiverse persons are “stupid,” “lazy,” “needy” given the academic or occupational accommodations they may receive. Drawing on the previous literature, this study will examine how self-stigma manifests in neurodivergent students, and how it affects is associated with their academic self-efficacy, the perception of their ability to be academically successful. With this, it can be surmised that neurodivergent college students that perceive negative stereotypes or have internalized negative self-stigma about neurodivergence will report lower academic self-efficacy scores. Participants enrolled at least part time in a post-secondary education, and those with and without neurodivergent identities will be needed. Self-stigmatization, academic self-efficacy, and level of neurodivergent traits will be asked in a self-report survey.

Gracie Whitney

GA - Georgia State University

Discipline: English and Literature

Authors:

#1 Gracie Whitney

Abstract Name: There's No Place Like (Someone Else's) Home: The Wizard of Oz as American Settler Folklore

Over a century after the publication of L. Frank Baum's *The Wonderful Wizard of Oz* (1900), the beloved story, with hundreds of adaptations across mediums, has transcended from its origins as a simple children's novel into a multifaceted cultural phenomenon embedded into popular culture as a vital, yet nearly undefinable, component of American folklore. It is important to understand the folklore of any given society as not only cultural archive but also a dynamic space for deliberation on collective identity and ideology, and in the case of the American settler state, our folklore has often been used as an arena to widely rationalize colonial violences. With this in mind, I evaluate the role of *The Wizard of Oz* within American folklore. I do this first by determining the lore's foundation through analysis of both the 1900 novel and the 1939 film adaptation as settler colonial narratives which reflect the collective anxieties of their respective eras and

depict Dorothy as the idealized, benevolent American settler. I expand upon this analysis by engaging each iteration of *Wicked* — Gregory Maguire’s revisionist novel, the Broadway musical, and the 2024 film adaptation — all of which effectively exonerate the Wicked Witch of the West and bring Oz into the contemporary age by attempting, but perhaps failing, to view the story through a postcolonial lens. My project examines *The Wizard of Oz* not as some static artifact but rather as a dynamic cultural text which constantly evolves to reflect shifts in societal values and political ideologies, yet always retains the settler colonial underpinnings embedded in the tale from its conception. Ultimately, I inspect both the evolving Land of Oz and the society which keeps reinventing it in order to determine how narratives adapt over time to continually justify the existence of the American settler state.

Samantha Whyte

WI - University of Wisconsin-Eau Claire

Discipline: Psychology

Authors:

#1 Samantha Whyte

#2 Dhalia Wrublski

#3 Natalie Prochazka

#4 Jennifer Muehlenkamp

Natalie Prochazka

Abstract Name: "Raising our awareness is a suicide prevention strategy": Personal impact of an undergraduate suicidology course

Despite repeated calls for improved suicide prevention strategies (United States Surgeon General’s Office, 2021), provisional data shows suicide continues to be a public health crisis (CDC, 2024). Integrating suicide prevention education has shown promise as a way to improve direct care (Cramer, 2018) and motivate advocacy (Muehlenkamp et al., 2019). Most suicidology courses are introduced at the graduate level for clinical training, limiting prevention knowledge and potential for broader public health impacts within the general public. The current study evaluates the effects of a semester-long undergraduate course in suicidology. Participants included (n =102) undergraduate students from a variety of majors who enrolled in an undergraduate suicidology course. Students completed an end of semester reflection prompt inquiring about the personal impact of the course. Four investigators inductively analyzed the responses to generate themes. Each response was coded twice by different authors to ensure inter-rater reliability. Five major themes emerged: 1) empowerment (e.g. "this class has taught me that I have the capability of creating change in a positive way."), 2) knowledge (e.g. "I learned a lot about the complexities surrounding mental health crises and suicide and it has deepened my understanding of human struggle"), 3) application (e.g. "from this class I can better talk to my loved ones about suicide and if I am noticing changes in them."), 4) general personal/lived experiences (e.g. "I was able to learn more about the thinking of an individual that I lost to suicide"), and 5) reflection upon value/experience of class. Additional sub themes were identified and will be expanded upon. This research emphasizes the value of undergraduate education on suicidology. Undergraduate suicidology courses may help facilitate understanding, advocacy, and strengthen support for public health interventions to prevent suicide.

Ayrin Lie Widyadewi

FL - Embry - Riddle Aeronautical University

Discipline: Business

Authors:

Abstract Name: Market Dynamics and Competitive Strategies in Airline industry

The airline industry is dynamic, being affected by economic changes, altering consumer preferences, and continuous technological changes. The main critical question that the study explores is: What are the market dynamics and competitive strategies in the business aviation sector? This study investigates how airlines respond to these emerging challenges in the environment: increased fuel and labor operational costs, demands of sustainability, and competition coming from low-cost carriers. The following paper points out ways in which airlines use their business model to gain a competitive edge through a combination of influencing factors-operational cost trends, revenue trends, consumer preference, and regulatory environment. This research focuses on an oligopolistic market structure dominated by a few companies, with high entry barriers increasing the competition. It will also investigate new emerging markets' opportunities, sustainability innovation, and the effects of digital transformation. The research will adopt a quantitative approach using historical data for 2019-2023 on cost structures, revenue patterns, and passenger traffic. Major airlines will be studied through case studies, which would qualitatively assess their strategic choices and operational challenges. Comparisons would be made in operational performance and customer satisfaction between full-service and low-cost carriers. Preliminary findings show the airline industry is resilient post-pandemic, with passenger traffic and revenues close to pre-2020 levels. However, challenges like rising fuel prices, labor shortages, and strict environmental regulations remain. Yet, opportunities exist in emergent markets, sustainable aviation technologies, and digital innovations that boost efficiency and customer experience. This study will discuss how the long-term sustainability and growth of the airline industry can be promoted. The adaptive strategies to attain cost efficiency, environmental duties, and changing consumer demand need to be balanced by an airlines competitive advantage through complex settings globally. This study provides key insights for stakeholders, including industry leaders, investors, and policymakers, as they navigate the airline sector.

Billy Wijaya

CAN - University of Calgary

Discipline: Interdisciplinary

Authors:

#1 Mung Chung

Abstract Name: Echoes from Galang to Calgary: Tracing the Vietnamese Refugee Journey

Cultural preservation, identity formation, and integration within the cultural fabric of Canada are critical challenges that define the experiences of Vietnamese refugees and their descendants. This research explores the nuanced, personal journeys of Vietnamese refugees who resettled in Calgary, Alberta and examines how these individuals navigate the pressures of cultural retention, assimilation, and survival in a multicultural society. This study employs a qualitative methodology grounded in 15 in-depth, semi-structured interviews with first- and second-generation Vietnamese refugees and their loved ones to contribute to refugee studies and cultural preservation literature. Open-ended questions guided these interviews, allowing participants to reflect on how they maintained cultural ties to their Vietnamese heritage while adapting to Canadian societal norms. Thematic analysis, enriched by historical context and supported by relevant literature, reveals the tension between preserving cultural traditions and the societal demands of adaptation. First-generation refugees often prioritize economic stability and their children's success in Canadian society over cultural retention, reflecting the trauma of displacement and survival. Conversely, second-generation individuals frequently strive to reconnect with their Vietnamese roots, showcasing a renewed emphasis on cultural identity reclamation. This study emphasizes the critical role of Calgary's Vietnamese community in bridging generational gaps. Community institutions, including language schools, religious centers, and cultural events, emerge as necessary resources for fostering cultural continuity and identity exploration. Despite the enduring

impact of trauma and integration challenges, families demonstrate resilience through efforts to honour their heritage via language, cuisine, and traditional celebrations. By examining these dynamics, the study provides valuable insights into the Vietnamese refugee understanding and contributes to broader discourses on refugee integration and cultural heritage preservation in Western multicultural societies. Ultimately, this study underscores the significance of community-driven efforts to promote cultural preservation and support the well-being of refugee populations.

Dylan Wikel

CA - California State University - Channel Islands

Discipline: Psychology

Authors:

#1 Peter Krause

Adriana M. Calatayud

Vanessa Feazell

Abstract Name: Timing of Consonant and Vowel Articulation When Reading Aloud Primed Words

The objective of this study is to tease apart the timing of lip movements associated with initial consonants and tongue movements associated with vowels. It is usually assumed that all tongue and lip movements within a spoken syllable are planned and coordinated in advance, and that physical articulation of initial consonants and nuclear vowels is started simultaneously. However, emerging evidence suggests that at least some movements can be controlled independently in real-time (Kawamoto et al., 1998; Krause & Kawamoto, 2020). The key research question is how this timing is affected by giving a speaker advanced knowledge of consonants or vowels before giving them the whole word to say. In this in-process study, participants wear the Micro Speech Research Ultrasound headset that has an ultrasound probe to capture tongue movements, a camera to track lip movements, and a microphone to record their auditory responses. Participants read aloud monosyllabic consonant-vowel-consonant words, preceded by overt unmasked primes. Primes are neutral (e.g., “_ _ _”) or signal the initial consonant (e.g., “P _ _”) or vowel (e.g., “_ A _”). Preliminary data will be reported. If speakers can independently control these movements inside the same syllable, assumptions common to most theories of motor speech will require re-evaluation.

Dustin Wilde

TN - University of Tennessee at Chattanooga

Discipline: Linguistics and World Languages

Authors:

Abstract Name: The Power of Attention: Simone Weil's Antidote to the Collective Ego

Philosopher, mystic and activist are all terms associated with Simone Weil. Her works emerged during the profound upheaval of the Second World War, standing at the crossroads of spiritual, political, and ethical philosophy. Though dismissed by some for their mystical undertones, her writings—such as *The Need for Roots* (*L'Enracinement*)—profoundly influenced figures like Albert Camus. This was particularly evident in their shared concern for justice and the intrinsic value of the individual. Simone de Beauvoir once remarked that Weil had “a heart that could beat right across the world,” reflecting the deep connection between her life of activism and work as an academic. Weil's critiques of Marxism, her reflections on oppression and affliction (*malheur*), and her mysticism are well-documented. Simone Weil's attention has been

underexplored as an antidote to totalitarianism and the collective ego. Weil described attention as a radical openness to reality, requiring the suspension of ego and the courage to confront truth. Attention as an ethical and spiritual discipline challenges the dehumanizing abstractions of totalitarian regimes by affirming individual dignity and intrinsic human value over blind allegiance to ideological constructs. Current scholarship largely examines totalitarianism through systemic and ideological lenses, yet Simone Weil's notion of attention offers a distinct psychological and spiritual perspective. By addressing how individuals can resist authoritarian power through an understanding of human suffering and the structures that perpetuate it, her work provides a valuable framework for countering the collective ego that fuels totalitarianism. This project, engaging with her writings in their original French, seeks to underline the relevance of her work in modernity. It advocates for a deeper study of her thought as a guide for transforming how we perceive and interact with the world today.

Reaghan Wilkerson

PA - Westminster College

Discipline: Criminology/Criminal Justice

Authors:

#1 Reaghan Wilkerson

Abstract Name: Public Policy and the Human Condition: A Study of Poverty, Crime, and Mental Health in Rural Pennsylvania

This interdisciplinary study investigates the intricate, multidimensional impact of poverty on crime, drug use, and mental health in Lawrence County, Pennsylvania. Serving as an exemplary microcosm of rural socio-economic challenges, Lawrence County highlights the complex interplay between individual well-being and community structures shaped by economic hardship. Employing a mixed-methods approach, this study integrates quantitative data from national crime and health databases with qualitative insights obtained through ethnographic observations and participant interviews conducted during an internship with local social services. Ethical considerations, including IRB approval, participant consent, and cultural sensitivity, were meticulously observed to protect participants' confidentiality and dignity. Findings underscore the need for targeted policy interventions and additional research in similar communities to address these interwoven socio-economic challenges. The study ultimately contributes to a broader understanding of poverty's impact on community dynamics and mental health, emphasizing the necessity of holistic approaches in policy and support frameworks for rural populations facing economic adversity.

Laura Wilkinson

GA - Kennesaw State University

Discipline: Psychology

Authors:

#1 Sharon Pearcey

#2 Erica Holiday

#3 Cody Mashburn

Abstract Name: Investigating The Relationship Among CRP Levels, Executive Functioning, and Self-Reported Mood Disturbances

Over 20 million individuals in America have had at least one major depressive episode and 18.6% are young

adults (SAMHSA, 2023). Depression is just one of the mental health disorders that is leading to the estimated 5 trillion USD associated with the global mental health burden (Arias et al., 2022). C-reactive protein (CRP), a measure of systemic and neuroinflammation, is an emerging biomarker for mood disorders. Higher CRP levels have been associated with bipolar disorder (Chang et al., 2017), manic symptoms in individuals who have major depressive disorder (Becking et al., 2013), and may predict stress disorders like PTSD (Friend et al., 2022). Along with mood disorders, CRP is also a potential predictor for diminished executive functions like burnout (Toker et al., 2005) and impaired memory (Noble et al., 2010). This study investigates the relationship among CRP levels, executive functioning, and self-reported mood disturbances (i.e., depression and stress). Participants completed a series of questionnaires including demographics, the adverse childhood events checklist (ACES), the alcohol use disorders identification test (AUDIT), and the Depression, Anxiety, and Stress Scale (DASS). Saliva samples were collected and will be measured to quantify CRP using enzyme-linked immunosorbent assays (ELISAs; Salimetrics, State College, PA). Participants also completed a series of computerized tasks, including a number-letter switching task (NLT), to measure cognitive flexibility (millisecond.com). We anticipate that neural inflammation, as indicated by CRP levels, will moderate the effects of adverse childhood experiences and substance use on cognitive flexibility. Our hope is that integrating self-report, cognitive, and biological perspectives will yield insights into the psychological basis of various mental health disturbances. If so, CRP may offer a useful biomarker for monitoring and evaluating treatment progress in mood disorders by helping to link inflammation with symptom changes.

Margaret Williams

PA - Albright College

Discipline: Biology

Authors:

#1 Lindsey Morais

#2 Morgan Bridi

Abstract Name: Understanding Stress During Microgravity Using a Tail Traction Hindlimb Unloading Model

Space flight presents numerous psychological effects, including space noise, periods of prolonged confinement, irradiation, loneliness, and microgravity. Microgravity seems to be a significant stressor during spaceflight, which can be studied through the hypothalamic-pituitary-adrenal (HPA) axis, the neuronal and hormonal stress responder. Elevated stress-hormone levels are typically found in microgravity experiments, but this is the first exploration of regulatory hormonal stress circuitry and cells in microgravity. However, we aim to study how microgravity acutely and chronically changes activity in the paraventricular nucleus of the hypothalamus (PVN), where corticotropin-releasing hormone (CRH) is released due to the presence of stressful stimuli activating the HPA axis. Tail traction is the current National Aeronautics and Space Administration standard for microgravity stimulation with hindlimb unloading (HU), reducing impacted body weight by 50%. To observe stress, CRH cells of the PVN will be recorded in vivo fiber photometry to test neuronal reaction, and corticosterone, a hormone released from activation of the HPA axis, will be tested through CORT ELISA from fecal boli. Heterozygous CRH-Ires-Cre mice will have Cre-dependent unihemispheric GCaMP8m AAV injections into the PVN, with a fiber optic cannula implanted above the PVN. Our tail traction HU housing system is single-hinged with a chain that allows the mouse to rotate without twisting the photometry cord for continuous recording with access to essentials and nest changings. The fiber optic cannula observation of the in-vivo CRH activation will be for three longitudinal time points: 7, 14, and 21 days. We hypothesize that the peak neuronal activity of CRH-positive neurons within the PVN will occur on day 14 and activity acclimation to microgravity conditions day 21; alternatively, PVN-CRH neuronal activity may continuously increase through observation. By learning the in-vivo and hormonal stress response in the PVN with HU conditions, we can better understand plasticity in typical to atypical stress responses.

Tate Williams

FL - University of West Florida

Discipline: Visual Arts

Authors:

Abstract Name: Japanese Ink Painting

Abstract This project explores the intersection of traditional Japanese art forms, particularly ukiyo-e woodblock prints and sumi-e ink painting, with contemporary artistic interpretation. Drawing from the Edo period's rich history and folklore, I created a narrative series inspired by Japanese yokai, focusing on themes of fear, connection, and transformation. The work blends historical techniques and personal innovation, reflecting a deep respect for Japanese artistic traditions while contributing a modern perspective. Early inspirations stemmed from exposure to Japanese media, evolving into a fascination with the precision and storytelling in ukiyo-e prints. Through research using public domain resources and published art books, I studied the technical and cultural significance of these works. This informed my decision to use traditional materials such as sumi ink, rice paper, and calligraphy brushes to maintain authenticity. Material experimentation posed challenges, particularly with the absorbency and fragility of rice paper, which required adaptation and pre-mounting for display. The resulting pieces balance traditional aesthetics with a contemporary graphic style, drawing on the wabi-sabi philosophy to embrace imperfections. The narrative follows human characters interacting with yokai, highlighting both the mythical creatures' cultural symbolism and their emotional resonance. This work deepened my understanding of Japanese art history, folklore, and technique while pushing my creative boundaries. Future works will expand on this project by integrating pop-art influences and acrylic paint to create bold, modern reinterpretations of ukiyo-e. This exploration contributes to my portfolio by showcasing technical versatility, thoughtful engagement with cultural storytelling, and a commitment to bridging historical and contemporary art forms. This series celebrates the enduring relevance of Japanese art and its potential to inspire meaningful connections across time and cultures.

Mary Williams

TX - The University of Texas at El Paso

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Mary Williams

#2 Alessia Pineda

Alessia Pineda

Abstract Name: The Role of Psychological Distress between Cognition and Life Satisfaction in People with Multiple Sclerosis

Multiple sclerosis (MS) is an autoimmune condition that significantly affects individuals' cognitive abilities, emotional well-being, and overall life satisfaction. This study investigates whether mental distress mediates the relationship between cognitive functioning and life satisfaction in individuals with MS. A total of 373 participants, recruited through the National MS Society, completed surveys assessing cognition, mental distress, and life satisfaction. Correlational and mediation analyses were conducted to explore the interactions among these factors. Findings revealed that cognitive difficulties were positively correlated with mental distress and negatively correlated with life satisfaction. Mental distress was inversely associated with life satisfaction. Mediation results suggested that mental distress partially mediated the relationship between cognitive functioning and life satisfaction. Reducing mental distress may help mitigate the negative impact of

cognitive impairments on life satisfaction. Given the substantial role of mental distress, it is crucial for care plans to address mental wellness in MS patients, with a collaborative approach involving rehabilitation professionals to support the individual's challenges and goals.

Jeremyah Williams

WI - University of Wisconsin-Madison

Discipline: Sociology

Authors:

#1 Jeremyah Williams

#2 Jennifer Dykema

#3 Nadia Assad

Abstract Name: Persistent Anger and Mental Health: Evidence from WisconSays

Anger is a common emotional response frequently linked to stress, but its long-term effects on overall health remain less understood. This study explores the relationship between the frequency of anger and its impact on health outcomes, using data from the WisconSays survey. By controlling for key demographic variables such as age and gender, the study seeks to test the hypothesis that individuals who experience anger frequently report more days of mental health struggles. The preliminary findings reveal that individuals who report feeling angry "very often" or "extremely often" are significantly more likely to experience mental health problems. Up to eighty percent of those in this high-anger group reported experiencing at least one or more days of poor mental health. Interestingly, the data show minimal gender differences in how often people experience anger. However, an age-related trend is evident, with younger adults reporting anger more frequently than older adults. This difference suggests that younger adults may be more vulnerable to experiencing worse mental health outcomes due to anger, compared to their older counterparts. These findings underscore the potential role of anger in amplifying stress-related health issues. When demographic factors such as age and gender are controlled for, anger appears to exacerbate mental health problems, contributing to more frequent episodes of mental distress. By understanding the connection between anger and health outcomes, this research highlights the importance of addressing anger management in mental health interventions, especially for younger individuals, to reduce the negative health impacts of anger.

Morgan L. Williams

NC - Elon University

Discipline: Environmental Science and Sustainability

Authors:

#1 Kelsey S. Bitting

Abstract Name: Heatwave: A Game-Based Learning Experience Bridging Climate and Health

Human-caused climate change is a pressing issue for the world's population. However, some populations face disproportionate impacts from the heat. According to the Washington Post, heat is impacting the health of vulnerable populations worldwide, such as those with preexisting health conditions and less financial or social capital. For example, imagine suffering from heat exhaustion without air conditioning or neighborhood tree cover. To raise awareness of these important issues, we ask: How do we educate and engage people in learning about heatwaves and health? Raising awareness of the health effects of heat can be done using games, which increase engagement and enjoyment of learning about a topic. Game-based learning allows

players to become engaged in a learning objective via games that leverage design principles such as motivation caused by a challenge, socialization, and an emotional experience. Through its simulated environment, games have the potential to motivate players to learn with challenges and get students to practice critical thinking skills. This study designed and tested a game-based learning experience teaching the health implications of heatwaves and the populations most affected. Using a role-playing game called “Heatwave,” players take on the perspectives of members of vulnerable communities during a heatwave, answer climate-related trivia questions, and encounter random heat-related events that influence the players' health points. Two focus groups were assembled to investigate the relationship between the game, the topic, and student interest and engagement. They were then interviewed in a semi-structured interview format, with anonymous qualitative data being coded, to determine the primary learning outcomes of gameplay and inform future revisions to the game. Future revisions to Heatwave based on the coding of the focus groups will likely include increasing the game difficulty overall, adding more interactivity, and making character decisions more unique to their demographics.

Bentlee Williams

NC - University of North Carolina at Chapel Hill

Discipline: Biology

Authors:

#1 Jessica Hoffman

#2 Sara Faccidomo

#3 Clyde Hodge

#4 Elizabeth Shannon

#5 April Kim

#6 J. Elliott Robinson

Abstract Name: Development of a Novel Chronic Traumatic Encephalopathy Mouse Model via Retro-Orbital AAV Delivery to Examine the Impact of Chronic Alcohol Exposure

Background: Chronic Traumatic Encephalopathy (CTE) is a frontotemporal dementia resulting from repeated concussive brain injuries incurred throughout the course of a lifetime. CTE, though commonly observed in professional athletes and military personnel, remains frequently undiagnosed due to a lack of biological markers and inconsistent diagnostic symptoms. It is also well-documented that individuals with CTE are diagnosed with alcohol use disorders at higher rates than the general population. Objective: The current experiments introduce a novel preclinical model of CTE that incorporates human Tau (huTau) in non-transgenic mice. We will 1) validate the model and 2) explore the behavioral changes that result from a retro-orbital injection of huTau adeno-associated viral (AAV) vector followed by repeated cycles of repetitive mild traumatic brain injuries (rmTBI) and alcohol exposure. Methods: huTau was introduced to mice via retro-orbital injection of a systematic AAV vector (AAV-PHP.eB-CBA-eGFP-2A-Tau, 5E10 vg/mouse). After 4 weeks of incubation, the mice were assigned experimental conditions and then repeatedly exposed to sham or rmTBI weight drop procedure (conducted under anesthesia) and, 4 hours later, exposed to air or vaporized ethanol for 16 hours overnight. The rmTBI + ethanol exposure procedures occurred 4x/week for 3 consecutive weeks. Finally, mice were tested in a cognitive behavioral battery to assess sensory motor gating, locomotor activity, and spatial memory. To examine CTE-related pathology, immunohistochemistry of fixed tissue samples was examined using antibodies for gliosis, tauopathy and inflammation. Results & Conclusions: This pre-clinical model of CTE and chronic intermittent ethanol exposure is a useful model to study the neural mechanisms involved in CTE. Significant trends and interactions were observed for open field locomotion, sensorimotor gating, and spatial memory. These findings suggest potential behavioral symptoms associated with CTE and ethanol exposure in mouse models expressing huTau.

Perrin Williams

TN - University of Tennessee at Knoxville

Discipline: Health and Human Development

Authors:

#1 Jennifer Miller PhD, RN

Abstract Name: Type of Treatment, Length of Treatment, and Length of Stay for Infants of Mothers with a Self-Reported Prenatal Opioid Use

Appalachia has a high incidence of opioid use especially in women of child-bearing age. Infants born with opioid dependency require long-term care. There is limited information regarding the type of prenatal substance abuse and exposure with resultant birth history. The purpose of this non-experimental quantitative study is to examine the relationship between self-reported opioid use during pregnancy and infant withdrawal length of treatment, length of stay, and need for secondary medication for treatment of withdrawal symptoms. Data analysis is ongoing.

Elizabeth Williams

VA - Liberty University

Discipline: Biology

Authors:

#1 Kyle Harris

Jenna Morris

Abstract Name: Flora of Candler's Mountain: Documenting Natural Communities and Establishing an Herbarium

Herbaria are natural history collections containing dried plant material and function as the working tool of taxonomists to support understanding plant identification, nomenclature, classification, distribution, ecology, and further consideration of the societal implications of plants (Bridson & Forman, 2013). By providing an accessible system of primary data centralized in one location, these plant collections are essential in investigating plant types and biodiversity of ecoregions. Teaching Herbariums are typically small-scale, limited collections housed at a university to illustrate representative populations of the local area and provide an educational resource on plant morphology and taxonomy (Bridson & Forman, 2013). The collection conducted on Candler's Mountain would compile data on the species present, biodiversity, and microclimatic conditions of the collected specimens. The project aims to perform field surveys of Candler's Mountain for (1) the documentation of flora in distinct natural communities and (2) the establishment of a botanical collection to be used as an educational and research resource. The project aims to establish a local herbarium focused on the >1200 vascular plants documented in Campbell County, VA, and identify flora within distinct natural communities on Candler's Mountain, located outside of Lynchburg, VA.

Brittney Williams

TN - Middle Tennessee State University

Discipline: Biology

Authors:

#1 Christopher Clark
#2 Souvik Banerjee
#3 April Weissmiller

Abstract Name: Interrogating Novel Tubulin Inhibitors on the A375 Melanoma Cancer Cell Line

Cancer is defined as an uncontrolled growth of abnormal cells capable of spreading either locally to surrounding tissues or throughout the body. Cancer remains one of the leading causes of death globally, with millions of new cases reported annually. Chemotherapy is one of the most effective treatments against this disease and is typically used to target fast-growing cells or cells that are in various phases of the cell cycle. One such chemical used in chemotherapy treatments targets the formation of microtubules, which are important structures critical for proper cell division and aid in the process of mitosis. Because cancer cells rely on cell division, blocking tubulin incorporation into microtubules can prevent mitosis, leading to cancer cell death. Unfortunately, current tubulin inhibitors show high toxicity against normal cells. To overcome issues with toxicity, a new way to inhibit tubulin polymerization has emerged that focuses on binding small molecules to the colchicine site of tubulin to destabilize polymerization. Potential tubulin inhibitors have been synthesized to target the alpha and beta subunits of tubulin at the colchicine site. This study sought to determine the preliminary effects of these compounds on the melanoma cancer cell line A375, and their potential to function as inhibitors of tubulin polymerization. Initial screenings of these compounds used Western blotting techniques and immunofluorescent staining to determine the presence of proteins specific to the Sub-G1 and G2/M phases of the cell cycle and the structures of cells after incubation with potential inhibitors, respectively. Results from this study indicate that these compounds do have the potential to inhibit polymerization and provide the foundation for future studies. Further development of variations to these initially tested compounds may provide a novel way to reduce toxicity and overcome issues in current chemotherapy treatments.

Clare Williams

NE - Creighton University

Discipline: English and Literature

Authors:

Abstract Name: Taking Turns: A Color Analysis

MK Czerwiec's graphic novel *Taking Turns* was a heart-wrenching yet informative glimpse into the HIV/AIDS Care Unit 371. Throughout reading, it became clear that Czerwiec's goal was to use the color of these backgrounds to establish settings and tone throughout this novel. Color, viewed through the lens of graphic novels, often has a level of iconography associated with it. According to Scott McCloud, author of *Understanding Comics*, colors in comics could be used to establish mood, depth, or sensations within their readers. The primary research question for this project is: How do the colors in the novel *Taking Turns* by MK Czerwiec influence how the story is told and how the novel's settings are expressed? I believe this research is important because graphic novels are intrinsically artistic and a large part of art is color, so understanding how Czerwiec uses color can help us better understand this novel's overall implications. I created a spreadsheet to keep track of all the pages and box numbers in *Taking Turns*. I then went through the novel using the eyedropper tool to get the exact color associated with that page. Using my judgment, I then classified each color from the page with its word associate. For a final time, I went through the novel and determined if the page was establishing setting, and what that setting was, to see if there was a correlation between color and setting. In my results, I am looking to see the correlation between colors, setting, and themes.

Ethan Williams-Warren

OK - University of Central Oklahoma

Discipline: Nursing and Public Health

Authors:

Abstract Name: Induction of Remission through diet for Crohn's Disease

Crohn's disease is a chronic & destructive disorder that belongs to the group of inflammatory bowel diseases that can affect any area in the gastrointestinal tract. Crohn's disease treatment is multidisciplinary and complex depending on the patient's disease severity, subtype, behavior, mucosal healing, and deep remission, and location. Studies have shown that there is a strong link with dietary shifts towards a Westernized diet leading to intestinal dysbiosis and a disturbance in intestinal immunity. Management of this disease is multifaceted and usually involves only medication and surgery depending on the severity of the disease. Dietary therapy is often overlooked by clinicians due to patient adherence. Although studies have shown that dietary intervention could be the start of correcting a patient's intestinal dysbiosis. The implementation of dietary intervention with EEN and PEN shows the most effective at inducing remission. EEN and PEN diets have been comparable to pharmacological intervention in inducing remission. Although the results have been effective, patient adherence is low due to the lack of whole food. Whole food diets have shown promising results for inducing remission such as SCD, low-FODMAP, MD diets. These diets tend to be more palatable and adherence is higher. Keywords: Dietary therapy, Crohn's Disease, Whole Food diets, dysbiosis

Keegan A. Williford

AL - University of Alabama at Birmingham

Discipline: Health and Human Development

Authors:

#1 Erin Y. Earnhardt

#2 Abel Lopez

#3 Aaron Alford

#4 Jennifer L. Tipper

#5 Kevin S. Harrod

Abstract Name: Influenza A Virus Alters Iron Homeostasis in the Microenvironment of Human Bronchial Epithelial Cells within Air Liquid Interface Cultures

Influenza A Virus (IAV) causes severe lung inflammation, leading to pneumonia and ARDS. Importantly, secondary bacterial infections following influenza increase the mortality and morbidity of IAV. Here, we identify potential mechanisms through which IAV facilitates secondary bacterial infection with *Streptococcus pneumoniae* (Spn) with a focus on the effects of iron binding and distribution within the cellular microenvironment. Iron is a critical nutrient for both host and microorganisms, and mechanisms for sequestration of iron are highly orchestrated. Iron homeostasis functions, including acquisition, sequestration, and metabolism, are crucial for bacterial host defense, and are involved in antimicrobial properties of immunological phagocytic cells and mucosal membrane proteins. Iron depletion in the microenvironment is hypothesized to enhance the ability for bacteria to infect differentiated human bronchial epithelial cells (HBEC) - ciliated, secretory, basal, and rare cell types. The host limits the capability for iron to be attained by pathogen (nutritional immunity), while bacteria have evolved scavenging mechanisms. We hypothesize that IAV infection promotes increased susceptibility to secondary infections by disrupting host iron regulation. Single cell transcriptomics analysis has identified key regulatory genes in iron pathways that are altered by

IAV infection. Key regulator genes, such as the Solute Carrier (SLC) gene family are required for the transport of iron across the plasma membrane, impacting the differences of iron presence in the apical surface liquid of the Air Liquid Interface (ALI) cultures. Thus, the regulation of SLC genes within differentiated cells introduces alterations in genomic pathways, producing a disruption in the homeostatic iron relationship. From this analysis, iron acquisition and sequestration are likely important changes leading to susceptibility to secondary bacterial infection. In this study, the parts per billion (ppb) concentration of iron in the apical surface liquid (ASL) of the ALI cultures proceeded through experimentation with Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES).

Abigayle Willis

OK - University of Central Oklahoma

Discipline: Health and Human Development

Authors:

Abstract Name: Increasing Nursing Knowledge and Interventions Related to Childhood Obesity

Childhood obesity impacts a child's psychological and physiological health. The rate of childhood obesity continues to increase annually with nearly 20% of children in the United States being diagnosed as obese. Although nurses can provide education and early interventions, many do not. Nurses cite various rationales for their lack of intervention, including complex communication with parents and a lack of in-depth understanding of the topic. This study's purpose is to identify if providing education on communication strategies and care plans related to prevention and management of childhood obesity will increase nursing knowledge, confidence, and patient-centered interventions. The theoretical framework of this study is based on Humanistic Nursing Theory. This theory emphasizes the therapeutic relationship between a nurse and patient and the importance of a patient's self-actualization. Nurses in a pediatric primary care office, specializing in the treatment of obese children, will complete a pre and post survey evaluating their level of knowledge, confidence, and active interventions. Between the pre and post survey, nurses will be provided with education on the prevention and management of childhood obesity and strategies to mitigate communication barriers. The research's outcomes will determine the effectiveness of education on nursing intervention and provide information to assist with future research on enhancing interventions to care for children with obesity. Keywords: Childhood Obesity, Nursing Interventions, Nursing Confidence, Communication Strategies, Education, Nursing

nihya-nicole willis

GA - Georgia State University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

#1 Nihya-Nicole Willis

Abstract Name: "The Sexualization and Traumatization of Black Women"

My research delves into the harrowing impact of sexual assault/ trauma upon black women and connects their experiences of thriving in motherhood, sisterhood, and caretaking while dealing with the trauma and navigating healing. Looking at cases between the 1940s up to the 21st century, specifically in and around the deep south. The main purpose for this research is to shed light on the history of sexual assault upon black women and give way to different avenues of healing. I wish to display how the justice system has also created multiple generations of black women that have been silenced and forgotten about by not taking a stance in our defense sooner. My contribution to this aspect of research will focus on different types of sexual assault such as rape, sexual assault and sexual abuse. It will pose and answer the questions, "Why have Black women been targeted?", "Is there a lack of protection amongst black women?", "Why is there a gap in the research?" and "What does healing look like for the modern black woman?". It will also include the shift of conversation as to what healing looks like as it pertains to socioeconomic statuses, age, location, and even relation to the abuser. For this research, I will lay out how black women are the least protected in America using historical novels, interviews, and poetry. There will be an analyzation of statistics and how they have changed over the past seventy to eighty years. It will include data of what the crime of sexual assault does to the human body and how it changes the brain chemistry forever. Most importantly, it includes real life testimonies and

interviews of sexual assault survivors. I conclude my research by examining social movements, changes in policies, and healing journeys. Aiming to push the conversation forward.

Ty Wilson

UT - Utah State University

Discipline: Biology

Authors:

#1 Ty Wilson

#2 Anna Watkins

Abstract Name: Isolation of Endophytes from Nodules of Native Plants for Sustainable Agriculture

Plants have an intimate relationship with microbes; a fascinating aspect of this relationship is their ability to attract beneficial bacteria and fungi depending on their current needs and nutrient deficiencies. Among the many beneficial microbes used in the agricultural community, *Rhizobium* is among the most notable and well-studied. This nodule-forming, nitrogen-fixing bacteria is extremely important, primarily when using legumes in crop rotation systems, and plays a significant role in crop production. However, legumes are not the only plants that form beneficial relationships with rhizobacteria and endophytes. Actinorhizal plants play an essential role in the global nitrogen cycle by forming nodules with actinobacteria *Frankia*. *Ceanothus velutinus* and *Shepherdia* sp. are two native plants in the Intermountain West region that attract beneficial microbes and can form nodules with bacteria, such as *Frankia*. *Frankia* not only fixes nitrogen by inducing nodules but also fixes nitrogen while living freely in the soil. This quality makes it a perfect candidate as a biofertilizer in agricultural systems. We performed two isolation screenings for endophyte bacteria and *Frankia* from the nodules of *C. velutinus* and a *Shepherdia* Hybrid. The first approach isolated the microbes from nodules by filtering nodule extract through 40 μ M and 20 μ M filters. The second approach was done by ultra-centrifuging the nodule extract in a sucrose gradient and collecting the fraction. We used two *Frankia* and endophyte-specific media, QMOD and *Frankia* basal media (FBM), to isolate bacteria. We isolated 16 unique bacteria from the nodules of *C. velutinus* using the filtration method and 15 via the gradient method. We are characterizing these microbes and will then identify them using 16S rRNA sequencing. We are still in the process of purifying isolates from the *Shepherdia* Hybrid using both methods.

Rachel Wilson

PA - Carnegie Mellon University

Discipline: Interdisciplinary

Authors:

Abstract Name: What We Can Learn from University Student Experiences Reading Non-English Code

Prior work has studied barriers for non-native English speakers learning computer programming. To discover what resources inside and outside the classroom can address such barriers, many studies have focused on quantitative assessment of beginner programmers working in programs like Scratch, and few have studied university-aged students. While improving translations and tools for non-English speaking beginners is important, most programmers are eventually expected to use English-based, text-based programming languages. This requires that students transfer their early experiences into the less scaffolded syntaxes of widely used programming languages. This paper contributes a qualitative case study of linguistically diverse students at a top computer science university in the United States to understand what skills and resources are

important when reading code not based in English. To investigate this, I conducted a survey and five interviews that involved live code tracing activities of code in various human languages. Results show that students' familiarity with a variety of programming languages helped them identify patterns and make confident guesses to read code that used a human language they did not know. This suggests that adaptability to unfamiliar syntax is an important skill that can be developed through explicit language-conscious instruction and practice reading code in a variety of syntaxes.

Madison Wilson

KY - University of Kentucky

Discipline: Biology

Authors:

#1 Katie Land

#2 Brittney Williams

#3 Patrick Hannon

Caroline Harper

Abstract Name: EXPOSURE TO AN ENVIRONMENTALLY RELEVANT PHTHALATE MIXTURE INHIBITS OVULATION BY IMPAIRING PROSTAGLANDIN FUNCTION IN THE MOUSE OVARY

Phthalates are solvents and plasticizers found in cosmetics, food/beverage containers, and medical supplies; therefore, human exposure is ubiquitous. Phthalates are known endocrine disruptors that target the ovary, meaning exposure could disrupt ovarian processes like ovulation. Prostaglandins (PGs) are vital mediators of ovulation due to their involvement in angiogenesis and cumulus-oocyte complex (COC) expansion. PGs are synthesized by various cell types within the ovulating follicle (granulosa and cumulus cells) and bind to their receptors on endothelial and cumulus cells to facilitate angiogenesis and COC expansion, respectively. Levels of active PGs, inactive PG metabolites, expression of PG synthases, expression of PG receptors, and ovulation rates were measured via various ovulatory experimental mouse models using cultured whole ovarian follicles (WF), COCs, and ovarian endothelial cells. Culture media contained vehicle control (dimethylsulfoxide, DMSO) $\pm$ a mixture of 6 phthalates (MPTmix, 1-500 μ g/mL) derived from urinary phthalate levels in pregnant women to best mimic human exposure. In WFs, exposure to MPTmix decreased active PG levels (PGE2 and PGF2 α) and increased PG metabolite levels. The levels of PGE2 were also decreased in COCs exposed to MPTmix. These decreases were largely attributed to decreased expression of PG synthase (Ptgs2) in WFs and COCs exposed to MPTmix. MPTmix exposure increased expression of PGE2 receptor 4 in ovarian endothelial cells and altered expression of PGE2 receptor 1 and 3 in WFs. Most notably, exposure to MPTmix in WF cultures decreased ovulation rates. Across these ovulatory models, MPTmix exposure likely disrupted the function of PGs by decreasing PG levels and synthases, increasing metabolite levels, and altering PG receptor levels. These MPTmix-induced changes may be why ovulation was inhibited in the WFs. Thus, exposure to phthalates may disrupt the ovulatory process and may ultimately contribute to the prevalence of infertility in women. Supported by R01ES033767.

Sarah Wilson

OK - University of Central Oklahoma

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Across Time and Space: Queer Love and the Influence of History, Age, and Media

The average age gap observed in same-sex relationships is three times larger than that of heterosexual relationships, raising questions about power dynamics and age of consent. Queer Time Theory offers an explanation for why these age disparities exist and the nuances that come along with them through a historical and social analysis of queer relationships and culture. By using a combination of literature and primary sources this presentation adds to the discourse surrounding Queer Time Theory by analyzing how age gap relationships have been intertwined with queer culture and the way power dynamics impact relationships of all kinds. Age gaps in queer relationships can be expected considering the climate that they had to develop in throughout history. Still, this subject has been minimally researched or often simplified into the common harmful "groomer" stereotype. Often, gay romantic connections could not grow past being a short sexual connection. If a long-term relationship did occur, individuals were signing up for a life of danger and ridicule. Age gap relationships can be observed in queer history most notably in the trials of Oscar Wilde where Wilde, a gay man, faced charges of "gross indecency" for being in relationships with younger men. Historical sources display age gaps within personal advertisements where younger gay men are looking for a "daddy" to "show them the ropes", as well as in gay cruising culture. Age gaps are often sensationalized in media today such as in films like Call Me By Your Name. This research presentation analyzes the way queer lives have been directly impacted by the oppression their community has faced throughout history and the ways that those effects have been perpetuated and interwoven into queer lives today. Presenting this research will equip queer people with an improved understanding of themselves resulting in healthier more fulfilling relationships.

Ty Wilson

UT - Utah State University

Discipline: Biology

Authors:

#1 Ty Wilson

Abstract Name: Rhizobacteria from Native Plants Promote Growth and Induce Drought Tolerance in Arabidopsis

Climate-induced environmental stresses increasingly threaten food production across the Intermountain West and, ultimately, the world. This issue is exacerbated due to the overuse and overreliance on chemical fertilizers, which can significantly deteriorate soil health. This is becoming particularly impactful in large-scale agricultural settings. In natural soils, microbes perform the vital function of protecting the health of the soil and assisting in native plants' growth. The Intermountain West region is home to many drought-tolerant native plants that are able to thrive in the high desert climate and nutritionally poor soils. *Shepherdia argentea*, also known as Silverleaf Buffaloberry, and *Shepherdia rotundifolia*, Roundleaf Buffaloberry, are two such native plants. Because these native plants can flourish in such adverse conditions, we hypothesized that they attract potent microbes in native soils that provide them with the resources and stress tolerance needed to survive. We harvested the roots and isolated plant growth-promoting rhizobacteria (PGPR) from both plants. We characterized seven potential Plant Growth Promoting traits, including Catalase activity, Protease activity, ACC-deaminase activity, Nitrogen fixation, Siderophore production, Phosphate solubility, and Indole-Acetic Acid production. We then tested the four most potent bacteria from each plant on *Arabidopsis thaliana*, the model plant, to determine growth promotion and drought tolerance. Ultimately, we found that four microbial treatments showed increased plant leaf surface area, one increased the fresh weight, and three microbes significantly increased dry weight. Additionally, we found that two of the bacteria helped the drought-stressed plants recover after rewatering.

Eva Wilstermann

PA - Penn State Greater Allegheny

Discipline: Nursing and Public Health

Authors:

Abstract Name: Advance Care Planning in the Appalachian Rural Region: A Qualitative Study

In the medical care setting, decision-making is hugely important in the patients' lives and their families. Advance care planning (ACP) is a way of deciding how someone would like to be treated in crucial times and serious illnesses (Owen, L et .2019). This process is critical for the patient's decision to be respected. In some areas of the United States [especially the rural areas as the Appalachian States] can be quite a challenge to apply the Advance Care Planning due to some political or religious beliefs, healthcare access, and socioeconomic issues. It is important to understand decision-making in the medical setting because it appreciates the patients' future wishes and it's important to know how this will impact the rural communities where usually medical care and decision-making are scarce and chronic illnesses abundant.

Kayla Win

FL - Florida Atlantic University

Discipline: Biochemistry

Authors:

#1 Kayla Win

#2 Qi Zhang

Abstract Name: Using Behavioral Tests and Immunohistochemistry to Gauge the Role of Cholesterol Dysregulation in Alzheimer's Disease

Alzheimer's disease (AD) is a chronic and lethal disease remains incurable and thus imposes an enormous economic and social burden worldwide. One of the major challenges in fighting AD is finding the cause. The popular amyloid hypothesis is questionable in case of sporadic AD (sAD), consisting of more than 95% cases. Evidence has pointed to the dysregulation of lipids in the brain, especially cholesterol (Chol), during aging. It is well known that certain types of brain cells and brain regions are vulnerable to sAD and exhibit neurodegeneration earlier than other parts. New tissue-clearing methods like iDISCO and volume imaging (i.e., light-sheet microscopy, LSM) allow the study of molecular and cellular changes in large samples like whole mouse brains. Immunofluorescence labeling was used to distinguish two types of brain cells, neurons and astrocytes, and gauge their cellular Chol regulation by measuring the amount and subcellular distribution of SREBP212, a Chol regulator in the brain. A set of tests for memory, learning, and locomotion were conducted to gauge the cognitive and sensorimotor functions of male and female hApoE4/4 mice and compare them with age-matched male and female C57B6/J mice as a wildtype control. The transgenic and wildtype mice were tested side-by-side for a fair comparison and the results of the control allowed for the set up of the baseline and identification of performance differences from ApoE4's effect on neurodevelopment. The outcomes of all tests provided a reference to normalize any differences due to gene or age-associated changes in locomotion, muscle strength, and coordination. For each age group, male and female mice were subgrouped to analyze any sex-associated change. All data was statistically analyzed plotted with GraphPad Prism and RStudio. ANOVA, followed by post-hoc comparison tests, were used to identify statistically significant differences across different groups.

Kalliyan Winder

PA - Point Park University

Discipline: Communications

Authors:

Abstract Name: Visualizing the News: The Role of Graphics in Effective Information Sharing

In today's modern media landscape, we continually witness a rapid flow of information that overloads our senses, which can skew our ability to consume material in a way that is digestible and impactful. In this era of news media, graphic design is no longer just a creative tool to catch the viewer's eye but a powerful communicator. This presentation will not only address methods for gaining attention in our attention-scarce world, but also how we as an audience value credibility when it comes to deciphering true information through design. In our time of civic unrest where attention is fickle and information is weaponized, these skills are crucial for students and viewers to develop. This presentation will focus on the chronological process of curating motion and still graphics for U-View Television's 2024 Presidential Election Newscast at Point Park University, including background research, design, animation, finalization, and reception of said graphics through the live newscast. The presentation will examine the process with narration on each step and a demonstration of how well-designed graphics can transform data into core messages in seconds. After executing the project, we found that design was an essential element for our audience's comprehension of multilayered information, as newscasts must include quick 1-2 minute summaries of topics that viewers may struggle to understand due to the format. Through motion graphics and concise, striking visuals designed to engage even the most inattentive viewer, we ensured that our audience was able to decipher what candidate won, what the reporters were discussing, and maintain overall interest. We also discovered that it aided brand identity to convey to viewers the trustworthiness of the newscast and the reporters themselves. Above all, our work on this project demonstrates that cohesive design can uplift visual polish, clarity, and attention to detail to project authority and competence.

Ethan Wingfield

TX - Sam Houston State University

Discipline: Engineering

Authors:

#1 Ethan Wingfield

#2 Hayden Behrens

#3 Helen Gomes

#4 Iftekhar Basith

#5 Syed Faruqui

Abstract Name: Gait Analysis using Multivariate Extended Kalman Filter to Improve Patient Care

Gait analysis is a critical component of physical therapy, aiding clinicians in diagnosing and treating movement disorders by examining an individual's walking patterns. Key parameters such as step length, stride length, walking speed, step symmetry, step height, and foot clearance provide valuable insights into potential leg impairments. Traditionally, gait analysis relies on 3D camera-based motion capture systems, which are time consuming, expensive and may require elaborate, stationary setups limiting their accessibility in clinical settings. This study explores the feasibility of using wearable Inertial Measurement Units (IMUs) to measure joint angles and perform gait analysis as an accessible alternative to traditional systems. By attaching IMUs to the thigh, calf and foot joint, we can determine leg angles and replicate the side-by-side imagery that physicians utilize in assessments. The data from the IMUs allows for the calculation of leg positioning relative to the ground, enabling gait analysis to be conducted in any environment without the constraints of fixed equipment. Furthermore, we utilize the data collected through the IMUs (position and

angle) to develop a Multivariate Extended Kalman Filter (MEKF) algorithm, that is used to monitor and analyze the gait movements for possible anomalies. The biggest advantage of MEKF is that it is an online algorithm and can be performed on-board to provide instant feedback to the patients. We hypothesize that our proposed approach, relying solely on IMU data in addition to the MEKF algorithm, can provide accurate gait analysis while being more accessible and cost-effective, thus broadening the scope of clinical applications and benefiting a larger patient population.

Kaitlyn Wingnean

NC - Western Carolina University

Discipline: Chemistry

Authors:

#1 Kaitlyn Wingnean

Abstract Name: Analyzing the Effect of Alkylamine Length on CsPbBr₃ Nanocrystal Storage Longevity

Cesium lead bromide nanocrystals have garnered significant interest in the chemistry and physics communities due to their potential applications in renewable energy. The surfaces of these nanocrystals are covered in ligands that protect the nanocrystal from degradation and preserve their electronic properties. There are typically two ligand species used in CsPbBr₃ nanocrystal syntheses, an alkylamine and oleic acid. This study focuses on the effect of the length of the alkylamine ligands on the shelf-life of CsPbBr₃ nanocrystals. Oleic acid interacts with long-chain amines primarily through van der Waals forces and binds to the surface of these CsPbBr₃ nanoparticles. To investigate how varying the ligand identity affects the stability of the nanocrystals, the study will examine how the alkylamine carbon chain affects the stability and storage life of CsPbBr₃ nanocrystals. We monitored the stability by measuring fluorescence spectra at various time intervals for each nanocrystal sample. Future research could contribute to improved renewable energy technologies.

Dean Wink

WI - University of Wisconsin-Whitewater

Discipline: Geography/Geology

Authors:

#1 Prajukti Bhattacharyya

#2 John Ejnik

#3 Devin Friedrich

Gwenyth Heidinger

Abstract Name: Effects of Hydrothermal Vents on Chemistry and Mineralogy of 2021 Fagradalsfjall Eruption

Beginning with the first eruption at Fagradalsfjall in 2021, the Reykjanes peninsula of Iceland has been undergoing an intense period of volcanic activity. Recent studies done by Francesco Sauro indicate rare minerals and signs of extremophile life have been found in lava tubes created during the 2021 Fagradalsfjall eruption. Rock discoloration near the vents indicates chemical changes. These changes could be similar to those within the lava tubes. Our goal is to understand the effect of hydrothermal vents on nearby basalts. We collected and analyzed samples of altered and unaltered basalt. We are using powder X-Ray Diffraction (pXRD) for mineralogical analyses. Preliminary results from unaltered samples showcase magnesium-rich olivine and calcium-rich plagioclase. From vent altered samples we found zeolites such as Hydromagnesite,

Hydroxyl Clinohumite, Mordenite, and Laumontite and other layered silicates that are not present in unaltered samples. We are also using Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES) for chemical analysis. We did two separate closed vessel digestions, one in 70% v/v nitric acid and one in 70% v/v hydrofluoric acid in order to get a complete chemical signature of the sample. Changes in basalt chemistry and mineralogy due to hydrothermal reactions can provide important information about conditions of early life formation and can also create new and rare minerals. Therefore it is important to conduct detailed chemical and mineralogical analyses of samples altered by reactions with fresh lava. Overall, this study aims to find any existing relationship between reactions taking place around the vents found on the surface of the lava field and the lava tubes created during the eruption. This presentation will cover our analytical methods, data, and implications of our findings.

Eryn Winkelhake

MN - College of Saint Benedict/ Saint John's University

Discipline: Biology

Authors:

#1 Eryn Winkelhake

#2 Alias Bachmeier

#3 Emma Young

Emma Young

Alias Bachmeier

Abstract Name: Is there a difference in female and male affectionate interactions within prides of African lions (*Panthera leo*) in the Ngorongoro Crater and Serengeti National Park, Tanzania?

Most wild felids exhibit solitary social behavior. African lions are the exception, living in social groups of two to eighteen related females, their dependent offspring, and unrelated males. Within prides, affectionate behavior reduces tension and increases social bonding. In this study, we looked at the affectionate behavior shown by lions concerning their gender. We hypothesized that there was a relationship between gender and the rate of affectionate behavior. Based on this hypothesis, we expected to see more affectionate behavior in females because of their greater role in cub caretaking and reliance on the social group. The lions studied were in Serengeti National Park and the Ngorongoro Crater, Tanzania (May/June 2024). Ten groups of lions were observed, and our data reflects a combination of all lions. We took note of how many lions were seen in the same area, the gender of the lions, and if lions were exhibiting head-butting, rubbing, cuddling, mating, or licking with another lion. We found that female lions were more affectionate than male lions, with 80% of affectionate behavior observed conducted by females (the sample size was too small for statistical analysis). We also found that 50% of lions observed showed no affectionate behavior, either sitting near but not interacting with other lions, or sitting alone apart from their pride. Confounding factors included the time of day that lions were observed (mid-morning to afternoon) as lions are most active during dawn and dusk. Lions tended to be observed close to the road, where safari vehicles have easy observational access. Our hypothesis was supported - female lions are more likely to exhibit affection than their male counterparts and we conclude that this is due to their roles as cooperative hunters and communal cub carers.

Madison Winters

GA - Georgia Southern University

Discipline: Engineering

Authors:

#1 Ayooluwa Oyerinde

Abstract Name: A Novel Magnetically Actuated Insulin Delivery Device

An estimated 8.7 million individuals worldwide live with Type 1 Diabetes (T1D), a condition affecting the pancreas' ability to make insulin. Automated Insulin Delivery systems, also known as Hybrid Closed Loop systems or Artificial Pancreas (AP) systems, are used to monitor and control unstable blood glucose levels. Left untreated, such blood glucose levels could have serious health problems for people with T1D, including damages to the heart, kidneys, eyes, and nerves. Studies from the Type 1 Diabetes Index suggest greater adoption of artificial pancreas systems as treatment for T1D could save 673,000 lives by 2040. However, many patients avoid these systems due to the inconvenience of carrying cumbersome on-body pancreas systems, which include an insulin pump and a glucose monitoring device. As a result, there is a growing demand for artificial pancreas systems with reduced size and improved user-centric features to enhance user adoption. This study introduces a magnetorheological peristaltic micropump designed to deliver insulin in a compact, lightweight, portable, and energy-efficient manner— combating common issues with modern artificial pancreas systems. The pump is wirelessly controllable and built for durability, catering to the specific needs of T1D patients. A physics-based 3D simulation using COMSOL Multiphysics software and the Magneto-Solid-Fluid Interaction model were employed to evaluate its performance. Results show that the micropump achieves a flow rate of 3.08 μL per pumping cycle within 0.41 seconds under a magnetic field strength of 125 mT. While primarily developed for insulin delivery, the micropump's versatility extends to applications in micro-cooling systems, cell sorting, and various other fields requiring precise fluid control. This innovative approach addresses critical barriers to adopting artificial pancreas systems by offering a promising pathway to improve health outcomes for T1D patients while also enabling advancements in related technological domains.

Grace Wisniewski

MI - Northern Michigan University

Discipline: Biology

Authors:

#1 Grace Wisniewski

#2 Scott Rose

#3 *Kristian Choate

#4 Paul Mann

#5 Robert Winn

#6 Matthew Jennings

Abstract Name: Rapid Detection of ATRX (Alpha-Thalassemia X-Linked Retardation) truncation for Glioma utilizing Loop Mediated Isothermal Amplification (LAMP)

Glioma is a fast-growing central nervous system cancer found in the brain or spinal cord tissue that forms from supportive tissue called glial cells. The 2021 WHO (World Health Organization) recommendations for diagnosis of glioma places added emphasis on molecular characterization of tumors with approximately 80% of IDH (isocitrate dehydrogenase) gliomas harboring ATRX mutations as well. The key molecular distinction differentiating IDH mutant oligodendroglioma from IDH mutant astrocytoma is the presence of a truncated ATRX gene product in astrocytoma. The presence of the ATRX truncation leads to a worse prognosis and different treatment regimen, making identification of the mutation more clinically significant. However, identification of the ATRX mutation is typically performed over days utilizing next generation sequencing. Here, we provide proof of principle for the nucleic acid amplification technique, LAMP (Loop Mediated Isothermal Amplification), as a viable option for detection of the ATRX mutation. Utilizing synthetic DNA, we have demonstrated that LAMP can detect the truncated mutant ATRX with discrimination from the wild

type (WT) sequence in 45 minutes. With this molecular technique, we can quickly identify the ATRX mutation resulting in a more rapid and personalized treatment for the patient.

Gary Witkowski

PA - Community College of Allegheny County

Discipline: Biology

Authors:

Abstract Name: The Ampullae of Lorenzini and its Role in Environmental Health

The ongoing problem with global warming has a direct impact on these creatures beyond just the literal warming of the ocean. For instance, the ice caps melting reduces ocean salinity which changes the electrical conductivity of the water. This academic panel presentation will analyze a lesser-known organ found in cartilaginous and basal bony fish; an extension of the lateral line system called the ampullae of Lorenzini. This is a sensory organ that fish such as sharks and rays use to detect electrical fields in water. Great White Sharks are so sensitive to electric fields that they are known to react to charges of one millionth of a volt in water. With that kind of sensitivity to small changes and the environmental damage being done on a macro scale, it could lead to ecological ruin. In this sense, humanity has reached a global crossroads in terms of how it proceeds with scientific findings of this nature. This presentation, part of the Natural and Physical Sciences discipline area, will pose the question: Can a better understanding of the ampullae of Lorenzini, how it's affected and how it's used, show us the state of marine and freshwater environmental health? I will briefly discuss its evolutionary place in our oceans and its discovery by Italian ichthyologist, Stefano Lorenzini. Then, the role of the ampullae of Lorenzini in hunting and mating will be discussed. Overall, this research encourages us to consider a seemingly minor finding within the context of environmental sustainability, with the goal of safeguarding our fragile ecosystem for future generations.

Cody Witt

WI - University of Wisconsin-Milwaukee

Discipline: Interdisciplinary

Authors:

#1 Nathaniel Stern

#2 Gwen Knutson Knutson

#3 Greta Craemer-Meihsner

#4 Ava Schultz

Sydney Seebach

Abstract Name: Generation 2 Generation: Conversing with Kindred Technologies

Generation 2 Generation: Conversing with Kindred Technologies explores how humans and technology have always evolved together. This immersive, traveling art exhibition blends the past, present, and future of technology and language through physical, digital, and written media. Inviting viewers to consider their relationships and attitudes towards current and emerging technologies, this show and catalog act as both an action and a call to action. Generation 2 Generation provokes a reflection on how technology both enhances and evolves our understandings of politics and society, matter and nature, our world and ourselves. New technologies - with Artificial Intelligence being the latest and most rapid form - should induce neither blind optimism, nor crippling fear. AI, for example, continues to rapidly progress and improve, and Generation 2

Generation encourages discourse about its place in our personal lives, relationships, and broader society. The unifying element of a font created by AI, creates an aesthetic that challenges technology itself. Asking and answering these questions has seen the production of a monumental, poetic landscape of reclaimed electronic waste; an interactive mirror that “reads” human movement and translates it into dynamic code; a print- and image-based installation, featuring a custom AI font that evolves past human understanding, beyond the limits of the screen or page; play-based installation of stencils, coloring books, and paint; concrete poetry made of precious metals recovered from mining slag and computer waste — alchemized artifacts of digital communication; and, media-rich (generative/oral/aural/digital) performances of AI-powered poetry, updating an ancient art form for the approaching posthuman age. Neural Networks, as well as novel understandings of natural networks – are enabling and enhancing unique forms of creative exploration in and with various matter and materials, life and non-life. Generation to Generation hopes to open up those spaces for even greater exploration.

Derek Witucki

PA - California University of Pennsylvania

Discipline:

Authors:

Abstract Name: Uncertainty and Wickedness in Creative Research

This presentation explores scaffolding techniques for adapting undergraduate research into hands-on, creativity-based courses aimed at solving novel, often wicked problems. Wicked problems, characterized by their complexity and lack of clear solutions, challenge students to embrace inquiry, navigate uncertainty, and trust in the process of discovery. Through a series of projects in placemaking and environmental graphic design, this session will demonstrate how students learn to set aside preconceived solutions, overcome fears of failure, and engage deeply in creative problem-solving. These methods not only foster innovative thinking but also prepare students for real-world challenges, highlighting the transformative power of research-driven, experiential learning in graphic design education.

Julia Wodarek

PA - Mercyhurst University

Discipline: Psychology

Authors:

#1 Derek McKay

Abstract Name: Early Internet Exposure and Personality Traits in Relation to Social Media Use and Anxiety and Depression Symptoms

The purpose of this study is to investigate how early internet exposure and personality traits relate to excessive social media use later in life which, in turn, relates to increased reported anxiety and depression symptoms. There have been many studies regarding social media. However, the factors being examined in this new study have never been examined together. There have been separate studies detailing how social media use can lead to increased anxiety and depression symptoms, how social media use is related to specific personality traits, and how early internet use may lead to increased social media use in adulthood. This study makes a unique contribution to this area of inquiry because it is incorporating the different factors of early internet use and personality traits to excessive social media use which has been correlated to higher anxiety

and depression symptoms. This new study also investigates an undergraduate student population while other studies have either focused on adulthood or adolescence. The methodology consists of using an online questionnaire. While the study is anonymous, there is a demographics questionnaire consisting of knowing the participant's age, gender, and academic standing. There is also an internet use questionnaire consisting of the participant's screentime, what age they first had access to the internet, and what their first internet connected device was used for. The study utilizes the HEXACO-60 for examining personality traits, PHQ-9 for depression symptoms, and the GAD-7 for anxiety symptoms. The expected result is that the earlier an individual was exposed to the internet, the higher their social media use later in life. For personality traits, high openness, emotionality, and extraversion are expected to relate to social media use in adulthood. It is anticipated that the combination of these factors, including increased social media use, will be significantly related to anxiety and depression symptomology.

Aleksandra Wojtowycz

NY - Siena College

Discipline: Interdisciplinary

Authors:

#1 Aleksandra Wojtowycz

#2 Ashley Bonomi

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#7 Prizma Adhikari

#8 Thomas Sherwin

#9 David Jesse Mathis

Grace Caton

Abstract Name: Assessing Community Needs Through a Community Engaged Lens

Rotterdam is a town in Schenectady County, New York. Organizations in the area, such as the Rotterdam Community Center, are assets within the community, yet unaddressed needs still exist within the town. It is important to understand the needs of towns like Rotterdam because many other communities across the country are similar and may have similar needs and assets. What do Rotterdam residents identify as the needs in their community, and how can the Rotterdam Community Center address those needs? Additionally, can this study provide information for other local agencies to address the needs that the Rotterdam Community Center cannot address alone? Needs assessments allow for organizations to understand the awareness, availability, accessibility, and acceptability of services in the community and the interventions that they can implement toward their targeted populations. We partnered with the Rotterdam Community Center through the Nonprofit Excellence and Transformation program at Siena College to create this survey-based needs assessment as well as an analysis of that data. The study was a convenience survey of 229 Rotterdam residents over the age of 18, with 37 quantitative questions to understand their feelings regarding safety, job security and opportunity, inclusion, healthcare needs, comfortability within the community, as well as participants' ability to have their needs met within their community. The survey also included 4 qualitative questions that allowed participants to express additional needs. The conclusions of the study have found that many residents' needs are more expansive, such as infrastructure improvements, that are unable to be addressed by the community center alone. We provided suggestions for the Rotterdam Community Center to address these needs through a report which will also be disseminated to other organizations for more expansive needs.

Kenidee Wolery

MT - Rocky Mountain College

Discipline: Biology

Authors:

#1 Holly Basta

Megan Smith

Abstract Name: Zebrafish endogenous retrovirus (ZFERV) potential phosphodiesterase predicted to disrupt the Innate Immune System.

Endogenous retroviruses (ERVs) are ancestral viruses that have integrated into host DNA and are inherited through the germline. Zebrafish models offer a simple framework for evaluating viral pathogenesis due to their well-characterized immune system that shares similarities with humans. Zebrafish endogenous retrovirus (ZFERV) is selectively expressed in the thymus and random insertions of ZFERV have been tied to T-cell leukemia in zebrafish. ZFERV contains a gene similar in sequence to cellular viral phosphodiesterases (PDEs). Viral PDEs have been shown to interfere with production of interferons that the host uses to defend against viral infection. In this study, we propose characterization of the ZFERV-predicted PDE using cell culture, transfection, and fluorescence microscopy. We hypothesize that the expression of ZFERV putative PDE will disrupt the oligoadenylate synthetase (OAS) - RNase L response to viral RNAs by cleaving the effector molecule 2-5A. Our research provides insight into the interplay between ERVs and the host immune response and would represent the first characterization of a PDE in a retrovirus.

Brianna Wolf

CA - Medanos College

Discipline: Biology

Authors:

#1 Lauren Parodi

#2 Carissa Bondoc

#3 Caleb Easiley

#4 Quintin Ngo

Abstract Name: Abundance of *Azolla filiculoides* on Dissolved Oxygen Concentration

Mosquito fern, or *Azolla filiculoides*, is an abundant native aquatic species at Big Break Regional Shoreline, where it is found forming dense floating mats at the surface. It is a unique species due to its symbiotic relationship with cyanobacteria, allowing it to fix atmospheric nitrogen and double its entire mass in just 1.9 days. Historically, *Azolla* is also associated with major paleoclimatology shifts due to its ability to draw down carbon dioxide and regulate climate. This study aims to build on previous research on the ability of *Azolla* in lowering dissolved oxygen (DO) levels and further investigate its complex ecological role in the Sacramento-San Joaquin Delta. We grew varying masses of *Azolla filiculoides* (2g, 6g, 10g, 14g) in Delta water over a 20-day period and monitored DO levels regularly. The highest mass of *Azolla* yielded the lowest mean concentration of DO (6.206mg/L), whereas the lowest mass yielded the highest concentration (6.592mg/L). This negative correlation is likely due to the dense covering of *Azolla* on the surface, inhibiting oxygen diffusion into the water. While *Azolla* functions as a carbon sink, this plant genus clearly exhibits some ecological duality in lowering dissolved oxygen and potentially decreasing biodiversity in the Delta.

Catherine Wollan

PA - Villanova University

Discipline: Engineering

Authors:

Abstract Name: Anterior Cruciate Ligament (ACL) Injury Prediction and Prevention in Athletes: Analysis and Experimental Design

Anterior cruciate ligament (ACL) injuries are prevalent in athletes during high-acceleration movement. This particularly affects female athletes due to a combination of biomechanical, anatomical, and external factors including hormone fluctuations, quadricep dominance, and differences in neuromuscular activation patterns. This study aims to develop a computational model to better understand the biomechanics of knee loading. The focus is on analyzing biometric data and neuromuscular activation patterns during dynamic movements using a sensory system comprised of electromyography (EMG) sensors, pressure insoles, and a motion capture system. EMG sensors will provide insight into the internal mechanisms of knee loading by capturing muscle contraction intensity and timing. Pressure insoles will record the location and magnitude of the forces being exerted. The motion capture system will measure key data including joint angles, acceleration, and deceleration speeds, and tracking knee valgus for an in-depth evaluation of knee loading patterns. Trials will be performed by male and female collegiate athletes and include kinematic and soccer-specific agility drills, with the aim of replicating high intensity and game-like movements. Using comparisons of knee loading patterns, joint angles, and acceleration data, this study aims to identify differences in injury risk between the sexes. This will allow for the identification of safe loading patterns and high-risk movements. With these insights, increased risk for ACL injuries, particularly for female athletes, can be predicted and would lead to injury prevention programs.

Kyla Wolslegel

VA - Liberty University

Discipline: History

Authors:

Abstract Name: The Battle of Kwajalein: A Critical Conflict for U.S. Amphibious Operations in World War II

Kwajalein, a tiny atoll in the Central Pacific, became a critical battleground in World War II. This paper examines Operation Flintlock, the U.S. attack on Kwajalein in February 1944, and its impact on future U.S. amphibious operations in the Central Pacific. It incorporates research from a variety of primary sources, such as official military reports, newspaper articles, and personal accounts, as well as secondary articles and books that examine parts of the invasion of the Kwajalein Atoll, to create a fuller account of the operation. This research was conducted by searching databases, analyzing peer-reviewed articles, as well as studying a variety of primary sources from individuals present at the invasion to materials from 1944 with information about the operation and its outcome. This paper considers the individuals responsible for the attack plan, the equipment utilized to carry it out, and the factors influencing the plan's development, leading to the final result. It then evaluates the invasion of Kwajalein Atoll, at both Kwajalein Island proper and at Roi-Namur. I used personal accounts, newspaper stories, and official reports to describe the experience of the American soldiers during this invasion. I further evaluate the impact on future U.S. operations by examining the results of this operation for both the Americans and the Japanese. It demonstrates the devastating impact this operation had on the Japanese, as well as concludes that it was critical to the future success of the Americans in the Central Pacific as it served as an example for future amphibious assault, advanced the United States position in the Pacific, and significantly weakened the Japanese in World War II.

Kyle Wong

WA - Eastern Washington University

Discipline:

Authors:

#1 Shamima Yasmin

Abstract Name: Enhanced Linear Algebra Learning Through Interactive Virtual Reality.

Virtual reality (VR) can improve learners' spatial abilities with its interactive and immersive features. This may facilitate affective learning as students experience positive emotions like curiosity and fun. VR has the potential to accentuate abstract mathematical concepts and cultivate higher-order thinking and problem-solving skills. Hence, learners can be motivated to investigate abstract mathematical concepts with enhanced engagement in VR. Linear algebra is essential for many fields, such as computer science, engineering, and physics, yet many students struggle to grasp and visualize the concept fully. The materials educators can use for visual demonstrations often limit linear algebra instruction. Learners have limited opportunities for interactive explorations. This project uses VR to better relay linear algebra concepts in a more understandable and interactive environment, allowing students to explore concepts, such as vector operations, projections, norms, dot products, and cross products, while enjoying the experience of VR. The application provides tools to spawn and select vectors, giving freedom to perform operations like addition, subtraction, dot product, cross product, norms, and projections, with interactive updates. VR creates a dynamic and scalable learning platform to provide unlimited educational cases and problem-solving experiences. By providing a VR platform for "hands-on" practice of linear algebra concepts, students can apply mathematical concepts more effectively and build stronger connections between concepts to support their learning. Playful explorations of mathematical concepts can make students better prepared to embrace underlying challenges. Investigating different operations in real-time helps visualization of abstract concepts while keeping the learning journey engaging. This project aims to incorporate immersive VR technology to help understand linear algebra concepts and show the potential to expand learning within VR. VR can facilitate effective pedagogical strategies, significantly improving instructors' teaching capabilities and maximizing student learning outcomes in linear algebra concepts.

Nick Wong

PA - Pennsylvania State University

Discipline: Chemistry

Authors:

Abstract Name: Oxidation of Chlorophenols Using Hypervalent Iodine Compounds as a Potential Route Towards Their Indirect Detection

Chlorophenols (CPs) are organic compounds that are often used as insecticides, pesticides and/or herbicides due to their antimicrobial properties. However, these compounds are toxic to the environment and can potentially bioaccumulate; causing them to be problematic for human health. This results in a number of them being placed on the EPA's list of Priority Pollutants. Contamination of CPs into the environment is widespread as many of the proposed hazardous sites to be included in the EPA National Priority List (NPL) contain CPs. This leads to a need for simple on-site monitoring of these compounds. Electrochemistry is an attractive means to accomplish this due to its simplicity, high sensitivity, and portability. Unfortunately, the

electrochemical oxidation of CPs tends to foul the electrode, causing material accumulation on the surface. This results in a significant decrease in the performance and hinders the long-term monitoring ability of the compounds. This project focused on a new way of detecting CPs by using hypervalent iodine (HVI) compounds to initially chemically oxidize the CPs, then electrochemically reduce the product formed. HVIs are known to chemically oxidize phenols, but little to no electrochemical studies have been conducted on the forming products. This presentation will show a preliminary study applying a specific HVI compound, Hydroxy(tosyloxy)iodobenzene (HTIB), to oxidize the CPs to quinone compounds, which can be electrochemically reduced. This allows for the indirect detection of CPs and would overcome the issue of electrode fouling. Specifically, we will present spectroscopic and electrochemical studies using HTIB to chemically oxidize 2-chlorophenol (2-CP) and 4-chlorophenol (4-CP) into products as an explorative experiment to determine the viability of this procedure for chlorophenol detection.

Ryan Wood

GA - University of Georgia

Discipline: Education

Authors:

#1 Logan Fiorella

#2 Paula Lemons

Philimon Zaagbil

Abstract Name: Optimizing Students' Problem-Solving in Biochemistry Through Theory-Driven Instructional Strategies

Undergraduate science education aims to equip students with coherent knowledge of concepts and the ability to transfer that knowledge to novel problems. However, evidence shows that many science undergraduates complete their degrees without a strong grasp of foundational concepts and have difficulty applying their learning in new contexts. Metabolic pathway dynamics and regulation (MPDR), a core concept in biochemistry, is consistently challenging for undergraduates. Instructional shortcomings likely contribute to these outcomes. Research from educational psychology suggests two promising instructional approaches for addressing these instructional limitations: explicit instruction followed by problem-solving (I-PS) and problem-solving followed by explicit instruction (PS-I). These approaches are grounded in cognitive load theory and the productive failure hypothesis, respectively. Despite substantial support for both approaches, it remains unclear if one is inherently more effective or if their effectiveness depends on learners' prior knowledge. Few studies have compared these approaches across different knowledge levels in the life sciences. To address this gap, we developed MPDR instructional materials and conducted a randomized controlled study with 284 upper-level biochemistry students (advanced learners) and 295 introductory biology students (novice learners). This abstract focuses on data from the advanced learners. We hypothesized, based on our guiding theories, that advanced learners instructed with the PS-I approach would demonstrate better near transfer and far transfer performance in MPDR compared to I-PS students. Upper-level biochemistry students' problem-solving data are being scored qualitatively using an analytic scoring rubric. Scored data will be quantitatively analyzed using ANCOVA with prior knowledge as a covariate. We will compare the efficacy of I-PS versus PS-I for these learners. Our findings should provide insights into optimal instructional sequencing for problem-solving skill development and guide the design of improved support for learners at different stages of knowledge acquisition.

Elena Wood

MI - University of Michigan - Ann Arbor

Discipline: Psychology

Authors:

#1 Mary Herring

#2 Hairou Ren

#3 Angela Ebreo

Mary Herring

Abstract Name: Exploring the Intersection of Sense of Place and Belonging Among Minoritized STEM Students

Underrepresented groups in Science, Technology, Engineering, and Mathematics (STEM) often experience a lower sense of belonging, which is linked to reduced career retention rates (Dancy et al., 2018). Sense of belonging is not only derived from interpersonal interactions but is also linked to individuals' experiences and perceptions of specific geographical spaces, aligning with the focus of the theory of sense of place (Pearsall et al., 2015). Sense of place has been defined as the emotional connection that individuals or groups develop toward a specific place (Relph, 1976). Subsequent research has further elaborated on how this emotional connection can be eroded by places devoid of meaningful interactions or, conversely, fostered through positive spatial engagement (Pearsall et al., 2015; Ramkissoon, 2016; Relph, 1976). Based on this theory, exploring the interaction between campus environments and STEM students, and how it influences their sense of belonging, offers new perspectives to enhance STEM students' campus experience. A PhD investigator and a masters level student interviewed nine STEM students using a semi-structured set of questions regarding their sense of belonging on campus. Two research team members independently coded the interview transcripts in Dedoose, using pre-set codes related to sense of belonging and several descriptions of space. Results showed students felt a greater sense of belonging when they were in spaces where there's a positive communal environment involving the people inside the space, the positive interactions occurring there, and its academic or social functionality. This suggests that minoritized students feel a greater sense of belonging when they are in a space where they feel supported. In addition, some visual elements of the space (e.g., size/vastness, peacefulness) contributed to how students felt in the space. The findings will be discussed in terms of their implications for the design of spaces that encourage functionality plus positive interactions.

John Woodman

AZ - Embry-Riddle Aeronautical University

Discipline:

Authors:

#1 John Woodman

#2 Chloe Nelson

Chloe Nelson

Abstract Name: Blooming Possibilities: Using Research to Enhance Career Perspectives

Extracurricular research in undergraduate education is a high impact practice supported by many institutions and a valuable way for students to learn and set themselves apart. Starting out in a new institution without senior faculty or on-going projects limited the view students had of career options available and left a void for students with aspirations of graduate programs. With the need for opportunities the next several years were spent building an undergraduate research laboratory where both existing and new projects could be shaped along with a culture of mentor and peer support. Research programs were built around applied topics students were motivated to learn with and develop their own lines of interest and build sub-projects into the larger work which are tied to future interests. Expected and unexpected factors have led to this endeavor growing to a group of about a dozen current students. Over the course of the presentation, we will discuss the growth of students from early introduction in projects to the self-led capstone projects they have been able to

accomplish. A look at how to recruit and retain students within the lab and even the importance of letting them leave to explore other areas. Ultimately, more students are finding they have opportunities in the mental health field with and without graduate school as they find success in research.

Zachary Woods

OK - Southern Nazarene University

Discipline: Biology

Authors:

Abstract Name: The Role of Venom in Releasing the Constraint on Vertebrae Counts in Snakes (Serpentes)

The constraint-release hypothesis is a critical hypothesis in the field of evolution, which states that there are constraints on certain adaptations that can be released by other adaptations or by environmental change. In this study, we test the constraint-release hypothesis by looking at snake vertebrae. Snakes that rely on constriction to catch prey are limited to having a certain number range of vertebrae that is ideal for constriction. When a snake uses venom, there is a lower evolutionary pressure to maintain a certain number of vertebrae. Thus, the restriction on vertebrae counts would be released in venomous snakes, giving them higher variability in vertebrae counts. By investigating the number of vertebrae in constricting and non-constricting snakes, we hoped to find evidence supporting or not supporting this hypothesis. Our hypothesis based on the constraint-release hypothesis states that there will be more variation in the number of vertebrae of venomous snakes than constricting snakes. To investigate this, we conducted a literature review to find the vertebrae counts of a representative species for all snake families. We calculated the standard deviation among vertebrae counts in individuals of each species. Then we separated the data into two groups: constricting and non-constricting snakes. We then ran an ANOVA analysis comparing the standard deviations of each species in each of the two groups. It was found that non-constricting snake species did not have lower standard deviations in vertebrae count than constricting snake species.

Natalie Woolwine

NC - Western Carolina University

Discipline: Psychology

Authors:

#1 Natalie Woolwine

#2 Sam Castelblanco

Abstract Name: Short Interval Bright Light Therapy and Well-Being of College Students

Prior research has found that 30-minute Bright Light Therapy sessions can have anxiolytic effects, decrease feelings of depression, lower sleepiness ratings, increase alertness, and be an effective treatment for Seasonal Affective Disorder. As the majority of studies focus on repetitive exposure of working adults, it is unclear if singular short-interval exposure carries the same results, especially in college-aged students. This study aims to explore the effect of one 15-minute session of 10,000 lux lamp exposure on college students' mood, fatigue, anxiety, and concentration. Participants are randomly assigned to an experimental or control group. First, all participants complete a visual analog scale, Stanford Sleepiness Scale, and State-Trait Anxiety Inventory. Next, participants are given 15 minutes to complete a word-search task while being exposed to either: 1.) a 10,000 lux lamp 24 inches away at eye level (experimental group) or 2.) dim (2,000 lux) ceiling light 9 feet overhead (control group). After exposure, participants completed the visual analog mood scale,

Stanford Sleepiness Scale, and State-Trait Anxiety Inventory again. A between-groups comparison of pre- and post-score means will be analyzed. Additionally, the average number of words found within each condition will be analyzed. Based on prior research, it is hypothesized that students exposed to a bright 10,000 lux light will have improved mood, fatigue, and anxiety scores, and a higher number of words found compared to those exposed to the dim ceiling light.

Nolan Worley

FL - University of South Florida

Discipline: Engineering

Authors:

#1 Jason H. Ideker

#2 Kristian Walker

#3 Kevin Ero

#4 Anuj Parashar

Abstract Name: Low CO₂eq Ultra-High Performance Concrete for Use in Highway Infrastructure

Ultra-High Performance Concrete (UHPC) is a type of concrete with many beneficial traits, such as a discontinuous pore structure, chloride penetration resistance, and high compressive strength. Due to these benefits, UHPC garners increasing interest and usage for highway infrastructure. However, traditional UHPC mixtures require an elevated cement content, increasing the material's carbon footprint due to greenhouse gas (GHG) emissions from cement production. In efforts to reduce the carbon footprint of UHPC, this study developed an economical, non-proprietary, low CO₂eq UHPC mixture; it is anticipated that this mixture will be used by the Oregon Department of Transportation. A total of twelve UHPC mixtures were fabricated incorporating variables of differing cement content, cement type, fine aggregate size, various supplementary cementitious materials (SCMs) usage, and the quality of supplementary cementitious materials and the curing time before mechanical compression testing. Evaluations of the UHPC mixtures stemmed from compressive strength, a static flow test, free water evaporation, the mixture density, and the mixture's carbon footprint. Furthermore, the carbon footprint of each mixture was assessed by using a life cycle inventory program that calculated the greenhouse gas emissions when upscaling mixture sizes for Oregon Department of Transportation usage. SCM usage in the UHPC mixtures was effective at reducing carbon footprint without being detrimental to the compressive strength. Subsequently, the UHPC mixture using the SCMs of fly ash class C and metakaolin has the most promise after current evaluations, but further experimentation and evaluations are needed before the Oregon Department of Transportation selects an economical, non-proprietary, low CO₂eq UHPC mixture.

Julia Wozniak

IL - Elmhurst University

Discipline: Nursing and Public Health

Authors:

Abstract Name: Escape Room for Health Assessment

This project was aimed at developing an educational escape room for junior nursing students enrolled in a health assessment course as a means to enhance their critical thinking, clinical decision-making and active learning in an interactive, high-fidelity experience. The escape room had two clinical scenarios, one for

hypoglycemia and one for pneumonia; two patient conditions the students have already studied. Students collaborated as they solved clues and challenges related to their course objective; mirroring actual clinical situations designed to develop students' health assessment skills. The project was inspired by the increasing use of escape rooms for education as a pedagogical approach. The use of escape rooms is a developing method in many areas such as health care education. The aim of this work was to meet the current demand for more innovative teaching methods which promote engagement through active problem-solving and collaborative learning in difficult contexts, namely high-stakes clinical settings. Methods included challenges based on principles of health assessment and utilized a simulated patient experience through real-world clinical cases. Students solved clues to history, symptoms, diagnostics and treatment plans. This included patient scenarios and implementation of innovation. For example, students assessed the simulated patients using glucometers and vital sign monitors. The learning outcome of the escape room was to demonstrate competencies such as identification of symptoms and management of medication. The goal was to demonstrate that the escape room is an effective tool in facilitating engagement and increase retention of clinical knowledge for students. The immersive, hands-on experience received excellent feedback from students who reported it as engaging and an effective delivery method for key concepts. Future versions will optimize the escape room scenarios, incorporate more varied clinical cases, and investigate further how this mode of learning influences student performance in practice.

Skyler Wrubleski

PA - Duquesne University

Discipline: Engineering

Authors:

#1 John Viator

Abstract Name: In Vitro Stage II Pressure Ulcers: An Evaluation of Wound Healing Behavior in Cutaneous Models

Pressure ulcers, or injuries caused by prolonged pressure on localized areas, specifically bony prominences, remain a significant challenge in healthcare institutions. These wounds can extend deep within the cutaneous tissue, categorized from stages I-IV based on wound depth and exposed tissue. This experiment simulates in vitro cutaneous tissue by culturing seeded keratinocyte and fibroblast layers, supported by a gelatin scaffold to represent the four epidermal layers and the underlying dermal layer. A stage II pressure ulcer will be created within the cutaneous tissue model, characterized by an injury that penetrates both the epidermal and dermal layers. These wounds appear as shallow craters within the cutaneous tissue, varying in depth depending on anatomical location. This experiment aims to replicate the depth characteristics of a sacral wound. To create the pressure injuries, several custom 3D-printed apparatuses with extruded structures will be constructed. These will press into the keratinocyte-gelatin matrix at a consistent pressure to produce crater-like wounds that extend to the dermal layer. Variations in the wound apparatus dimensions will allow for representation of partial-thickness injuries of different sizes, diameters, and morphologies, including both spherical and amorphous forms. The primary focus will be the observation of wound healing and regeneration in terms of cellular behavior. Microscopy will measure keratinocyte confluence and migration along the wound borders, while clinical techniques will assess the length, width, and depth of each wound, as well as macroscopic features. Fibroblast behavior will be monitored to assess the efficacy of the model in the reconstruction of the scaffold. It is anticipated that keratinocyte and fibroblast activity will vary depending on the characteristics of the pressure ulcer applied, providing insight into cutaneous tissue regeneration in wound healing.

Benjamin Wu

PA - Duquesne University

Discipline: Biochemistry

Authors:

#1 Michael Cascio

Abstract Name: Characterization of the Incomplete N-Terminus of the Glycine Receptor with Crosslinking Mass Spectrometry

The human $\alpha 1$ glycine receptor (GlyR) is an inhibitory ion-gated channel mostly residing in the spinal cord and brainstem. GlyR is involved in various functions like pain perception/regulation and motor control. However, the N-terminus of GlyR is unresolved in all known high-resolution structures. By introducing a single cysteine-point mutation at the K6C location in the terminus, the mutated GlyR was overexpressed in Sf9 insect cells. Overexpressed GlyR was purified and reconstituted into lipid vesicle for subsequent analysis using crosslinking mass spectrometry (CXMS) to identify sites of covalent crosslinking from the site of attachment at Cys6. Sites with covalent crosslinking were further fragmented (MS/MS) to refine these sites to obtain a more accurate structure of the region, which can be used as a blueprint for designing drugs targeting GlyR.

Jingyu Xiao

IN - Purdue University Main Campus

Discipline: Engineering

Authors:

#1 Lena Azimi

Abstract Name: Flood Prediction with Sentinel-1 Synthetic Aperture Radar from Hurricane Helene

Floods are the most common type of natural disaster worldwide, causing thousands of deaths every year. Timely and accurate flood forecasts are crucial for evacuation plans and mitigation strategies. Hydrological models used in forecasting depend on high-resolution, spatially continuous soil moisture data. However, existing remote sensing-based techniques for soil moisture estimation lack the spatial resolution needed for accurate flood modeling. In this study, we present an approach for soil moisture estimation using Sentinel-1 C-band synthetic aperture radar (SAR) data. SAR offers high spatial resolution, day/night operation, and operation in adverse weather conditions, making it advantageous for flood mapping. Furthermore, Sentinel-1's frequent revisit cycle allows for relatively continuous monitoring of soil moisture, which is essential for flash flood modeling. Analyses are performed for flooding following Hurricane Helene in North Carolina and Tennessee from September 25 to 30th of 2024. We gathered Sentinel-1 data using the Alaska Satellite Facility's Vertex Data Search and streamflow data using the USGS National Water Information System (NWIS) Mapper. Three backscatter parameters --- VV reflectance, VH reflectance, and the VV/VH ratio --- are selected for analysis. An initial soil moisture model is obtained by analyzing the relationship between the selected backscatter parameters and streamflow. Then, flood extent is mapped using thresholding of Sentinel-1 data and verified using NDWI calculated from Sentinel-2 multispectral data. Using the generated flood maps and ancillary data such as precipitation, soil type, and vegetation cover, we create a predictive soil moisture-based flood model. We verify the model using streamflow data gathered using the NWIS Mapper. This approach is promising for improving the accuracy and temporal range of flood prediction, especially in areas with limited ground-based soil moisture monitoring networks.

Julia Xiong

WI - University of Wisconsin-Madison

Discipline: Psychology

Authors:

#1 Haley Vlach

#2 Ashley Reece

Abstract Name: Children's Awareness in their Forgetting in Massed vs. Spaced Learning

Generalization is the ability to transfer knowledge from one context to another and plays an important role in children's learning and cognitive development. Research has found that spacing out learning across time leads to more effective learning in long-term generalization than other methods, such as massed learning schedules. Researchers have suggested that the forgetting between learning events and retrieval practice across learning events are the mechanisms that lead to the efficacy of spaced learning schedules. The present study will determine whether children are aware that they forget and engage in more difficult retrieval during spaced schedules relative to massed schedules. This study will also examine whether this awareness contributes to their perception of the efficacy of spaced learning. We predict that when children start to be aware of their forgetting and retrieval difficulties, they will start to think that spaced learning is less efficient for learning. To test our hypothesis, we will present preschool children with an experiment where they learn new words; they will learn a total of 16 science nouns via massed or spaced presentation. Researchers will administer a post-test that will evaluate children's word learning. The children will also participate in tasks to assess their metamemory, such as by asking questions about whether participants believed they successfully learned the science words and if they felt like they had forgotten them. Caregivers will complete questionnaires about their children's vocabulary. The results of this study will have implications for early instructional methods on the effective use of learning strategies. That is, this work will identify the time period and mechanisms by which children start to believe that spaced learning is ineffective, supporting parents and teachers to successfully correct this misconception. Key Terms: generalization, science learning, spaced learning, forgetting, metacognition

Ethan Xiong

WI - University of Wisconsin-Madison

Discipline: Biology

Authors:

#1 Ethan Xiong

#2 Nike Gnanateja

#3 Dhatri Devaraju

#4 Ravin Kabra

Abstract Name: Bringing EEG Out of the Lab: Evaluating Portable EEG Technology With Naturalistic Stimuli

Electroencephalography (EEG) plays a critical role in cognitive neuroscience research, allowing scientists to study brain activity in response to various stimuli. However, lab-based EEG systems are expensive and lack the flexibility needed in real-world environments. Portable EEG devices offer an affordable and accessible alternative, but their effectiveness in capturing reliable data for complex, and continuous natural stimuli remains largely unvalidated. Yet we know this study is feasible due to previous studies validating the EEG devices for short-duration natural stimuli that are not ecologically valid. This study aims to assess the validity of using a portable EEG device by comparing its temporal response functions (TRFs) to natural speech stimuli with those of a lab-based EEG system during a divided attention task involving simultaneous audiobook narratives. We hypothesize that the portable EEG device provides TRFs comparable to a lab-based

EEG system. While lab-based EEG systems are widely considered for their precision in recording and measuring brain responses, portable EEG devices provide an affordable and accessible option for portable EEG recording. If our hypothesis is confirmed, it would suggest that research-grade EEG data can be captured with portable EEG devices in a real-world setting. Our findings will have significant implications for cognitive neuroscience, particularly for applications that require mobility and adaptability to obtain data in the real world. By enabling research in dynamic, real-world environments, the portable EEG device will help democratize studies, making it feasible for a wider range of researchers to explore brain responses to complex, real-life stimuli to obtain more ecologically valid and generalizable neuroscience data.

Yiting Xu

WI - University of Wisconsin-Eau Claire

Discipline: Business

Authors:

#1 Yiting Xu

Abstract Name: Process Over Prizes: Goal Orientations and Team Evaluations in Global Virtual Teams The result may joke with you, but the process won't.- Marcel Proust

This study examines the impact of goal orientations (results-oriented vs. process-oriented) on team dynamics and performance evaluations within global virtual teams, challenging traditional assumptions about team efficiency. Drawing on Herzberg's Two Factor Theory(1959), Locke's Goal-setting Theory(1967), and intrinsic motivation frameworks, we analyzed data from the X-Culture Project, encompassing 3,660 undergraduate business students in 925 global virtual teams during Fall 2020. Our research specifically investigates how different approaches to incentive mechanisms and goal orientations influence team member perceptions and evaluations. Through multivariate regression analysis, we found that while both results-oriented (focused on monetary rewards and certificates) and process-oriented (valuing collaborative experiences and relationships) team members reported similar levels of subjective satisfaction, their peer evaluations differed significantly. Results-oriented members received lower peer evaluations, being perceived as less creative, less effortful, and less task-compliant. Conversely, process-oriented members were evaluated more positively, demonstrating stronger leadership qualities, active thinking, and perceived work ethic. This favorable evaluation of process-oriented members may be attributed to their stronger focus on team relationships, communication, and collaborative learning, which are particularly crucial in virtual environments where building trust and maintaining engagement require extra effort. Their emphasis on the journey rather than just the destination likely leads to more consistent participation, better communication patterns, and stronger relationship building - all qualities highly valued by peers in virtual collaborative settings. These findings challenge conventional wisdom about incentive structures in global virtual teams and suggest that process orientation may offer a competitive advantage in virtual collaborative environments. The study contributes to our understanding of team dynamics and has important implications for designing effective incentive mechanisms and managing diverse goal orientations in virtual team settings.

Srivatsav Yaddanapudi

AL - University of Alabama at Birmingham

Discipline: Exercise Science and Nutrition

Authors:

#1 Srivatsav Yaddanapudi

#2 Harshvardhan Singh

#3 John McCarthy
#4 Gary Hunter

Abstract Name: Novel Finding of Type I Muscle Fiber Contribution to Running Economy in Recreational Runners

The contribution of different muscles toward stretch-shortening cycle potentiation (SSCP) and performance measures dictated by SSCP is an area of active research. The long head of the biceps femoris (BF_{lh}) may be important for hip extension. We present a secondary analysis from our cross-sectional study conducted on 19 male recreational runners that examined the relationship between SSCP (via jump and leg press throw) and running economy (@188 meters/min) with muscle and fiber type cross-sectional area (CSA) assessed via magnetic resonance imaging. We obtained a significant correlation between the muscle CSA of the BF_{lh} and running net VO₂ ($r = -0.55$; $p < 0.05$). However, there was no significant correlation between BF_{lh} cross-sectional area and SSCP is also not significantly related to running economy. We infer that BF_{lh}'s relationship with running economy may be driven by biochemical rather than biomechanical processes. We posit that a larger/stronger BF_{lh} muscle could utilize more efficient type I fibers to a greater extent because of preferential activation of type I vs type II muscle fibers. Our results yield preliminary evidence of the role of hip extensors for efficient running. Our results also indirectly indicate that biochemical and biomechanical mechanisms of SSCP could be muscle-specific.

Rebekah Yager

MT - Montana State University - Bozeman

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:
#1 Doug Downs

Abstract Name: Analysis of the Impact of Notable Texts Referencing Gender Roles on American Contemporary Gender Norms

Christianity and its subjects have been a significant sociocultural influence on American culture – specifically in the way it has viewed men's and women's gender roles. According to Amy M. Blackstone, "gender roles are based on the different expectations that individuals, groups, and societies have of individuals based on their sex and based on each society's values and beliefs about gender." There have been plenty of written and spoken works discussing the idea of Christianity and gender roles. However, there is no overall consensus across those that I have read on what the role of gender is in both the historic and contemporary church. To better map this range of gender roles advocated in Christian cultural commentaries over time, I am building an overview of what commonplace Christian scriptures and commentaries say about gender roles. My ultimate aim is better tracing how Christian thought has contributed to gender roles in historical and contemporary America. To this end, I have analyzed texts in three categories—texts from early Christianity, texts from contemporary Christianity, and texts from popular culture that advocate certain gender roles—using a code created from said texts. This analysis allows me to study gender roles present in Christianity in order to explain common-day American gendered norms and place a more specific definition of the role of sex in the history of the Christian church.

Thelmalane Yalartai

MN - St. Catherine University

Discipline: Biology

Authors:

Abstract Name: Accessing Neuromuscular Fatigue in Childhood Cancer Survivors

Vincristine is a chemotherapeutic drug commonly used to treat blood cancers such as leukemia and lymphoma, which is especially prevalent in young children. With significant advances in new cancer treatments, it is expected that over 80% of diagnosed children will become long-term survivors. However, its side effects include peripheral neuropathy causing acute damage to the motor, sensory, and autonomic functions of the body. The goal of this study is to understand the effects of chemotherapy on neuromuscular fatigue in childhood cancer survivors. We hypothesized that survivors would fatigue faster than an age and sex-matched control group. For the study, we gathered participants between the ages of 12 to 21 who have or have not received chemotherapy. Both groups completed fatigue-related surveys and other clinical tests to observe sensory loss. Participants also completed hand grip fatigue tests (50% max hold and 40 reps), a 6-minute walk test, and a Biodex test (40 reps of plantar/dorsiflexion). Cancer survivors showed decreased sensibility in their hands and feet, shorter walking distances, and less power and work while doing the 40 reps of dorsiflexion. Unexpectedly, the percent difference in the first and last repetitions of dorsiflexion revealed that the control group experienced greater fatigue, even when body weight was factored in. This could be because survivors generally used less power and work, leading to a smaller degree of fatigue. Regardless, adolescents who have been off vincristine for extended periods still show signs of decreased neuromuscular function. Considering this allows for possible preventive measures that stop further decline in neuromuscular functions.

Anuhya Yalavarty

UT - University of Utah

Discipline: Biology

Authors:

#1 Cooper Gangi

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Cooper Gangi

Abstract Name: Role of Perineuronal Nets in Androgen-Induced Masculinization of Female Vocal Pathways of African Clawed Frogs

African clawed frogs (*Xenopus laevis*) use sex-specific vocalizations—fast clicks by males and slow clicks by females—to facilitate reproduction. A previous study showed that administering testosterone to adult female frogs masculinizes their calls, suggesting androgen-induced reconfiguration in the vocal pathways. This inspired exploration into how hormones can reorganize the mature nervous system, with potentially high relevance for neurodegenerative disease reversal. Neural plasticity is partly regulated by perineuronal nets (PNNs), a specialized extracellular matrix that stabilizes neural networks by limiting synaptic plasticity after development. Disrupting PNNs can modify otherwise stable synaptic connections. Interestingly, PNNs surround neurons that express parvalbumin (PV), a calcium-binding protein enabling fast spiking. This suggests androgen may modulate synaptic formation on PV neurons surrounded by PNNs in female *X. laevis*. We hypothesized that androgen-induced vocal masculinization is mediated by the loss of PNNs around PV neurons in the vocal pathways. Testing this required effective staining protocols for PV neurons and PNNs in *X. laevis* brains—a challenging endeavor. We successfully stained PV neurons, revealing numerous fast-spiking neurons in female *X. laevis* vocal nuclei. However, PNN staining posed difficulties. The standard approach using *Wisteria floribunda* agglutinin (WFA) yielded variable results, likely due to species-specific

efficacy. I tested four additional methods targeting different PNN components: antibodies for chondroitin sulfate proteoglycan (CSPG), glycosaminoglycan (GAG), and Cat-301, in addition to a biotinylated hyaluronic acid binding protein (HABP). None of the antibodies produced consistent results, and HABP showed no specific binding. As an alternative, we are focusing on staining effector proteins bound to PNNs, such as Semaphorin 3A, which stabilizes neural circuits by repelling axon growth away from PV neurons and preventing new synaptic formation. Preliminary trials successfully labeled Semaphorin 3A overlapping PNN structures in control female and male *X. laevis* brains. Progress on Semaphorin 3A labeling in testosterone-treated female *X. laevis* will be discussed.

Keyao Yan

WI - University of Wisconsin-Eau Claire

Discipline: Economics

Authors:

#1 Keyao Yan

#2 Dantong Zhang

Dantong Zhang

Abstract Name: FDI Under Pressure: How Cultural Distance and Political Risk Shape Investment Decisions

This study examines the impact of cultural distance on foreign direct investment (FDI) flows and the moderating role of political risk in this relationship through a dyadic analysis of 96 countries spanning North America, South America, Europe, Asia, Africa, and Oceania. While existing research has explored cultural influences on international investment, the complex interaction between cultural distance, political risk, and FDI across different economic contexts remains understudied. Our methodology employs a dyadic approach, analyzing country-pair relationships where cultural distance serves as the independent variable and FDI flows as the dependent variable. Using panel data from our sample countries, we measure cultural distance through Hofstede's cultural dimensions framework and incorporate political risk measures from the International Country Risk Guide (ICRG). The analysis combines World Bank FDI data with these cultural distance metrics in a regression model to examine bilateral investment patterns. The findings confirm that greater cultural distance between country pairs negatively affects FDI flows, with this effect amplified under conditions of high political risk. These results suggest that multinational enterprises face compounded challenges when investing in culturally distant countries with political instability, though the magnitude of these effects may vary across different economies. Our research contributes to the understanding of cross-border investment barriers and provides valuable insights for policymakers and international business strategists working to enhance global economic cooperation.

Mai Nhia Yang

WI - University of Wisconsin-Madison

Discipline: Nursing and Public Health

Authors:

#1 Jingxi Sheng

Abstract Name: Recruitment and Retention of Asian American Women in Health Research: A Feasibility Study Collecting Multiple Forms of Data

The underrepresentation of minority populations in biospecimen research exacerbates health disparities. This

study aimed to describe and identify strategies for recruiting and retaining Asian American (AsA) women in a study collecting multiple forms of data. The recruitment and retention strategies are guided by Kimberlé Crenshaw's Intersectionality framework, which acknowledges sociodemographic identities can interplay and influence individual experiences. In this study, we used racially concordant team members to arrange personalized study visits. Descriptive statistics were calculated for recruitment and retention rates, and participant feedback was collected. We recruited English-speaking AsA women residing within 30 miles of the study site. Participants self-collected saliva samples four times/day for two days, wore an accelerometer for ten days, and completed a survey. Recruitment strategies included mass emails through a Midwest university, community organizations, social media, word of mouth, and information sessions. This ongoing study aims to recruit 20 participants. Of 424 individuals screened, 65.33% were eligible. Among these strategies, mass emails generated the highest response rate at 71.23%, followed by community outreach (3.30%), and social media (2.59%). The recruitment rate was 4.67 participants/month (14 participants), with a 100% retention rate and 92.96% completion rate. The average time from initial contact to study completion was 33.23 ± 12.80 days. Additionally, most participants expressed appreciation for conducting the study and willingness to support future studies. These results suggest that mass emails were the most effective method for reaching AsA women. The study's success was enhanced by the inclusion of racially concordant team members, flexible scheduling, and personalized study visits, offering a model for engaging underrepresented populations in health research.

Min-Chun Yang

PA - University of Pittsburgh School of Nursing

Discipline: Nursing and Public Health

Authors:

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#3 Heeyoung Lee

Abstract Name: Healthy longevity in individuals with serious mental illness: A quality improvement approach

Individuals with serious mental illnesses (SMI), such as schizophrenia, bipolar disorder, or major depressive disorder, face significant challenges in accessing and managing physical and mental health care, contributing to a reduced life expectancy of 15–20 years compared to the general population. While advancements in treatment have helped patients manage their health more effectively, healthcare professionals often overlook a crucial aspect of healthy longevity: patients' limited awareness of how to manage their health for long-term well-being. The purpose of this quality improvement project aims to assess the current understanding of health longevity among individuals with SMI. This project will employ a cross-sectional design and collect data through a survey distributed to adults with SMI in outpatient settings, ensuring anonymity and confidentiality. The survey will include semi-structured open-ended questions to capture the diverse experiences and perspectives of participants. Thematic analysis will be conducted to analyze the data, providing detailed insights into patients' understanding of their health and longevity. We expect individuals with serious mental illness to have limited awareness of their longevity and may not be adequately prepared to live a healthy, long life. The findings from this study will highlight the need for clinicians to provide targeted patient education aimed at promoting healthy longevity. Additionally, the results will guide clinicians on how to better prepare patients for managing chronic physical and mental health conditions, prevent disability, and promote long-term well-being, while emphasizing the importance of integrated care models. This study will contribute valuable insight to inform clinical, healthcare policy, and patient empowerment strategies, ultimately improving the healthy longevity of individuals with SMI.

Guohao Yang

NJ - Kean University

Discipline: Computer Science

Authors:

#1 Guohao Yang

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#4 Mengtian Lin

Dan Li

Mengtian Lin

Abstract Name: Comprehensive Evaluation of Large Language Models for Multi-Dimensional User Productivity and Satisfaction

The exponential growth in developing and deploying Large Language Models (LLMs) has transformed productivity and user satisfaction across various applications. This study presents a comprehensive evaluation framework for assessing the performance of 14 state-of-the-art LLMs across four critical domains: Content Creation, Programming Assistance, Data Analysis, and Customer Service & Q&A. Each task encompasses multiple subtasks designed to evaluate specific aspects of user experience, including accuracy, efficiency, creativity, and structural logic. The framework utilizes a combination of manual assessments and automated tools to ensure precision and reliability in scoring. The methodology includes designing domain-specific subtasks with predefined scoring rubrics and benchmarks to test the LLMs. For instance, Content Creation tasks are assessed for theme relevance, linguistic fluency, and originality using tools such as Grammarly, Hemingway, and Turnitin. Programming Assistance tasks evaluate functionality, error handling, and code readability, employing cognitive complexity metrics and cyclomatic complexity analysis. Data Analysis tasks require LLMs to tackle statistical problems and regression analyses, with scoring based on accuracy and solution completeness. Customer Service tasks involve real-world scenarios, scored for key point coverage, politeness, and readability using manual extraction and automated tools. This structured approach ensures a detailed and multi-dimensional assessment of model capabilities. The results reveal that GPT-4o mini leads overall performance with a score of 85.37, excelling in Programming Assistance and Customer Service while displaying limitations in Data Analysis. GPT-4o (85.07) and Llama 3.1 70B (84.68) demonstrate balanced capabilities across all domains, notably in customer interactions and statistical inference tasks. The study emphasizes the strengths and weaknesses of each model, and its findings underscore the need for advancements in areas such as data-heavy computation, contextual creativity, and adaptability across varied domains. This research establishes a robust methodological foundation for evaluating and improving LLMs, offering a benchmark for future innovations in AI-driven productivity and satisfaction metrics.

Stephanie Yau

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Wonjae Chung

#2 David Lewis

Abstract Name: Investigating Parvalbumin Interneurons in the Prefrontal Cortex and Visual Cortex

Schizophrenia, a chronic psychiatric disorder, affects 24 million people and causes working memory deficits. Working memory is proposed to emerge from synchronized neural activity at γ -frequencies, creating transient γ -oscillations in the primary visual cortex (V1) and sustained γ -oscillations in the prefrontal cortex (PFC).

These oscillations emerge from a microcircuit created by excitatory pyramidal neurons and inhibitory parvalbumin-expressing interneurons (PVI). Schizophrenic patients show a deficit of PV firing at gamma frequencies in these regions, which correlates to working memory deficits. Our preliminary computational data found different levels of excitatory drive to PVIs create distinct types of γ -oscillations. This study proposes that different levels of excitatory drive to PVIs are required to generate different types of γ -oscillations in different regions. This involves both expansion and confocal microscopy of control postmortem human brain tissues to measure the synaptic and subsynaptic level of excitatory drive to PVIs in PFC and V1. The results are expected to show a greater amount of excitatory input in the V1 region compared to the PFC, thus resulting in transient γ -oscillations in V1 and sustained γ -oscillations in PFC. This aims to understand the neural mechanisms of working memory in control patients to ultimately provide insights for future therapeutic approaches of schizophrenia.

Neha Yawalkar

TX - The University of Texas at Austin

Discipline: Health and Human Development

Authors:

#1 Nefertiti Aneke

#2 Timothy Riedel

#3 Elizabeth Abels

#4 Kenneth Moise

Abstract Name: Diagnosing Rhesus Alloimmunization in Low-Resource Settings Using A Lateral Flow Immunoassay

Hemolytic Disease of the Fetus and Newborn is a condition that occurs when a pregnant individual's immune system attacks the red blood cells of their fetus, potentially leading to severe complications including anemia, hydrops, and fetal death if not identified early in pregnancy. The most common cause of this disease is the development of maternal anti-D antibodies (Rhesus alloimmunization) which is preventable with the prophylactic administration of Rhesus immunoglobulin. Unfortunately, the absence of affordable point-of-care diagnostic tools for detecting Rhesus alloimmunization in low-resource settings leaves many individuals at risk for preventable outcomes. To address this critical need, we are developing a lateral flow-based diagnostic test to detect anti-D antibodies in maternal blood. Our system employs a lateral flow assay utilizing a biotinylated RhD antigen and a universal human IgG dipstick to identify the presence of anti-D antibodies. If anti-D antibodies are present, the biotinylated RhD antigen binds to the antibody, forming a complex with a streptavidin gold tag at the sample well. This complex migrates up the dipstick and is captured by the IgG test line, producing a red line. Preliminary tests of this system have demonstrated rudimentary detection of pure proteins. These early results suggest further optimization is warranted. This will include increasing the sensitivity, testing the specificity, and ensuring the system works with whole blood as an input. By providing a timely diagnosis of Rhesus alloimmunization, this tool may help resource-limited clinics refer patients for more advanced care of their pregnancies. In cases where no antibody is detected, patients who will benefit from the timely administration of prophylactic Rhesus immune globulin to prevent the formation of anti-D antibodies can be identified. The long-term impact of this tool will be a more efficient use of limited healthcare resources, saving time and costs for providers and patients alike.

Kailyn Yeisley

TX - Schreiner University

Discipline: Biology

Authors:

#1 Susan Klinedinst

Abstract Name: Using Bacteria to Trigger the Innate Immune Response in *Drosophila* to Examine the Potential Role of Dynactin in Toll Signaling

The innate immune response is the body's initial non-specific defense against invading pathogens. It is initiated through the cellular Toll signaling pathway by bacteria and injury which leads to the production of certain antimicrobial peptides. These responses have been found in vertebrates, invertebrates, and plants, where the basic mechanisms that regulate them are conserved. In *Drosophila*, the Toll Signaling pathway is involved in both dorsal/ventral axis specification as well as innate immunity. Dorsal, an NF- κ B related protein, a component of the Toll signaling pathway, is found to be expressed in both larval and adult fat body, an organ that functions like a vertebrate's liver. After larval injury, the Toll signaling pathway is activated, which results in a rapid translocation of Dorsal from the cytoplasm to the nucleus. Once in the nucleus, Dorsal activates the transcription of various defense genes. The transport of essential biological materials throughout the cell requires the molecular motors, Dynein and Kinesin. Dynein associates with the protein complex Dynactin, and it is known to promote Dynein function by serving as an adaptor for cargo and enhancing processivity. It was hypothesized that Dynactin could be involved in the transport of Dorsal from the cytoplasm to the nuclear envelope. To test this, *Drosophila* dynactin mutant larvae were challenged by feeding with bacteria in order to stimulate an innate immune response and the fat body was examined under a fluorescent microscope to compare the amount of Dorsal protein found in the nucleus in the unchallenged vs. challenged larvae. Fluorescent intensity analysis indicates that Dynactin is involved in the nuclear translocation of Dorsal. This reveals the pivotal role of Dynactin in regulating the nuclear translocation of Dorsal, shedding light on a key mechanism of Toll signaling with implications for understanding conserved pathways in innate immunity.

Krishin Yerabolu

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Discipline: Health and Human Development

Authors:

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Abstract Name: A Segmentation-Free R(2+1)T Deep Learning Model for Automated End-Diastolic and End-Systolic Frame Detection in Echocardiography

Introduction: Accurate assessment of left ventricular (LV) ejection fraction is critical for detecting cardiac abnormalities in echocardiography. This is achieved by measuring LV volumes at the end-diastolic (ED) and

end-systolic (ES) phases. Current methods for ED and ES detection rely predominantly on deep learning models that segment LV volumes across all frames in echocardiographic sequences. However, these multi-frame segmentation approaches are computationally intensive, memory-demanding, and prone to errors inherent to the segmentation process, posing significant challenges to scalability in clinical and research applications. **Methods:** To address these limitations, we propose a novel approach utilizing an R(2+1)T model to identify ED and ES phases. Each cardiac cycle is classified into one of three categories: ED frame, ES frame, or non-ED/ES frame. This approach effectively captures both spatial features and temporal dynamics by employing 2D convolutions for spatial processing and 1D convolutions for temporal processing. The study dataset comprised echocardiographic studies from 407 patients focusing on the LV view, with an 80:20 split for training and testing. **Results and Conclusion:** The proposed model achieved an Area Under the Curve (AUC) of 97.79%, surpassing the performance of existing methods. In conclusion, the proposed approach enables accurate detection of ED and ES phases without relying on additional deep learning models, allowing direct utilization of detected ED and ES frames for ejection fraction calculation. Future work will focus on integration into automated echocardiography systems in clinical settings.

jagan yetukuri

VA - George Mason University

Discipline: Computer Science

Authors:

Abstract Name: EduVerse: Revolutionizing Career Guidance Through AI-Powered Mentorship

How can AI mentorship systems, like EduVerse's "Edura," be effectively integrated into academic and professional workflows to simplify learning, enhance skill development, and improve collaborative efficiency for students and professionals? This research explores the potential of AI-driven mentorship systems in transforming the way students and professionals approach education, skill acquisition, and teamwork. By leveraging personalized insights and actionable recommendations, AI mentorship can bridge existing gaps between traditional learning systems and modern professional demands. EduVerse aims to demonstrate how integrating such systems can create an accessible, inclusive, and efficient ecosystem for academic and career growth. Despite advancements in educational technologies, most platforms focus solely on either skill development or networking, failing to provide a comprehensive solution. EduVerse addresses this gap by integrating adaptive learning, project collaboration, and real-time skill assessments. By exploring these capabilities, the project contributes a novel perspective on leveraging AI to create a more accessible and inclusive academic and professional environment. The study employs a mixed-methods approach, combining user interviews, prototype testing, and algorithm analysis. Data on user engagement, learning outcomes, and collaborative efficiency will be collected to evaluate the effectiveness of Edura's personalized recommendations and project-matching features. The research anticipates that AI mentorship can simplify learning, enhance collaboration, and improve employability. Users are expected to benefit from tailored learning pathways, skill-matching, and dynamic platform features that encourage active engagement. These findings will provide insights into the role of AI in shaping future educational technologies and workforce development strategies, positioning EduVerse as a pioneering solution in the field.

Grace Yi

KY - University of Kentucky

Discipline: History

Authors:

Abstract Name: Our Model Ally China: How America Recast Chinese Stereotypes During World War II

Throughout the Second Sino-Japanese War (1937-1945), Chinese Americans engaged in various domestic and militaristic war efforts including fundraising parades, enlisting in the U.S. army, and boycotting Japanese goods. This activism developed increasingly “positive” American perceptions of Chinese people as patriotic and civilized, especially following Imperial Japan’s attack on Pearl Harbor. Consequently, Sino-American relations briefly improved throughout the 1940s and Chinese Americans earned an elevated status in American society through realistic media representations that defied Orientalist misconceptions. However, current research on this stereotype transition contains little analysis of the U.S. Government aiding said efforts. To fully understand the impact that American WWII efforts had on changing perceptions of Chinese people, this paper presents an examination of pro-Chinese WWII propaganda disseminated and influenced by the U.S. Government. An analysis of primary sources ranging from Department of Defense pamphlets, newspapers, and newsreels from various digital archives will be used. The contextualization of their motivations and content within shifting stereotypes of Chinese people reveals how American domestic WWII efforts combined with Chinese American war efforts. Together, they eradicated prior ideas of inferiority and foreshadowed the modern “Model Minority Myth.” Despite the central role that Chinese American campaigns for social acceptance and war relief played in this process, the concept of the model minority serves to instill American minority disunity. Therefore, its precedent cannot be attributed to just a side effect of Chinese American advocacy. Instead, it is required to look at the U.S. government and mainstream America’s agency in the creation of a myth beneficial to White America.

Eli Yoder

CO - University of Colorado at Boulder

Discipline: Engineering

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#1 Eli Yoder

#2 Sherri Cook

Abstract Name: Building Resilience in the Dialysis Population: Using Life Cycle Thinking to Inform Dialysis Technology Development, Deployment, and Selection for a Range of Patients and Extreme Events

Patients experiencing end-stage kidney disease need continuous dialysis treatments multiple times a week. The treatment requires large amounts of energy and water, relies on public infrastructure, and is vulnerable to extreme weather events. For example, Hurricane Helene in 2024 disabled production centers vital to dialysis supply. Hurricane Katrina in 2005 caused extended closures of 94 dialysis centers, affecting over 6,000 patients. Despite increasing extreme weather threats, there is a need to make dialysis treatment more resilient so that patients retain access to their almost daily treatments, including during extreme events. To this end, this study will use quantitative sustainable design, including life cycle assessment (LCA), to identify the most resilient dialysis modality (in-center hemodialysis, home hemodialysis, or peritoneal dialysis). We are quantifying life cycle energy and water use to reduce the reliance on these increasingly expensive and scarce resources and calculating carbon footprints (i.e., equivalent carbon dioxide emissions due to greenhouse gasses based on ecoinvent databases and TRACI impact method) to minimize the positive feedback loop between carbon emissions and the intensity and frequency of extreme events. These three metrics will be quantified by generating life cycle inventories of all the amounts and types of materials, energy, chemicals, and water required over a dialysis machine’s life cycle (e.g., production, disposal) and patient’s treatment sessions (e.g., transportation, medication). A range of representative patients will each have a digital twin to evaluate patient health as a fourth metric. With each digital twin, we will evaluate all four metrics, for each modality, over a range of extreme events (e.g., flooding, power loss, supply chain failure) to identify the most resilient modality based on patient type and extreme event. This data can be used to build resilience in the dialysis population, especially by informing dialysis technology development, deployment, and selection.

Pheven Yohannes

AL - University of Alabama at Birmingham

Discipline: Biology

Authors:

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#2 Macy McCuiston

Abstract Name: Understanding the Effects of Ketone Diester Supplementation on Reducing Neuroinflammation and Neuropathology in TgF344 AD Rat Model of Alzheimer's Disease across the Lifespan

Alzheimer's disease (AD) is characterized by progressive neuropathology and neuroinflammation that causes impaired cognitive functions, but the mechanism and its relationship to aging is not fully understood. This study aims to explore the differences of pathology and neuroinflammation between normative aging and AD across the lifespan of a transgenic rat model, focusing on the basal lateral amygdala which is involved with emotion processing. We are additionally investigating the effects of ketone diester supplementation on neuropathology and fear behavior in these rats. The experiment uses staining techniques such as immunohistochemistry and simple Western blots to visualize and quantify biomarkers related to AD including amyloid-beta, microglia, astrocytes, and tau neurofibrillary tangles. Preliminary results suggest that ketone diester supplementation may modulate neuroinflammatory responses and protein buildup, with rescued fear extinction behavior in AD rats. The results will allow us to better understand the differential progression of AD pathology compared to normative aging, and the potential for dietary interventions in reducing neuroinflammation and neuropathological changes in the BLA and addressing fear extinction impairments associated with BLA dysfunction in AD.

Jeongwoo Yoon

NY - Cooper Union for the Advancement of Science and Art

Discipline: Engineering

Authors:

#1 Jeongwoo Yoon

#2 Jabeom Koo

Jabeom Koo

Abstract Name: Design and Analysis of a High Gain, Low Power 60 GHz CMOS Low-Noise Amplifier for mmWave Applications

Millimeter-wave (mmWave) technology, operating in the 30–100 GHz range, is integral to next-generation systems such as 5G networks, automotive radar, satellite communications, and IoT devices. By offering abundant bandwidth, mmWave enables high-speed data transmission and precise sensing. However, the design of circuits for mmWave frequencies is challenging due to increased signal losses, parasitics, and the need for low noise and power efficiency. This research presents the design and simulation of a 60 GHz low-noise amplifier (LNA) in 65-nm CMOS technology, addressing these challenges with a current-reused cascode topology and integrated noise-canceling techniques. The LNA achieves high gain, low noise, and efficient power usage, critical for energy-constrained and high-frequency applications. Inductive degeneration ensures wideband input matching, achieving an S11 parameter of -17.6 dB for effective power transfer. Using

Cadence Virtuoso, the design was rigorously simulated and optimized, yielding a peak gain of 30.4 dB, a noise figure (NF) of 5.4 dB, and power consumption of just 12.06 mW from a 1 V supply. A figure-of-merit (FoM) combining gain, noise, and power efficiency was used to benchmark its performance, with an FoM of 31.8 dB demonstrating its competitiveness with state-of-the-art designs. These results highlight the potential of CMOS technology to meet the stringent requirements of mmWave systems through innovative design and optimization. The proposed LNA offers a scalable solution for integrating mmWave technology into advanced communication and sensing platforms, paving the way for broader adoption in future wireless and IoT applications.

Tihomira Yordanova

PA - Duquesne University

Discipline: History

Authors:

Abstract Name: Post 9/11: The Legislative Impact of the USA Patriot Act

This research investigates the link between the terrorist attacks of 9/11 and subsequent legislation like the USA Patriot Act on the curtailment of civil liberties by granting agencies more power to monitor, gather information, and screen for potential terrorists. Even though this legislation was passed to safeguard the country, one can argue that by doing so, the people's civil liberties were compromised. This raises a question that the research seeks to address by providing historical context: How can the U.S. government achieve a balance between national security and civil liberties? The Patriot Act's primary goal was to enhance national security by giving law enforcement and intelligence agencies expanded powers to detect and prevent terrorism. This newly acquired power was used by agencies to access personal records, private emails, and tap phones. The Patriot Act's provisions allowed the government to have access to medical records, privacy emails, and monitoring individuals without their knowledge or consent and all of this in the name of national security. Critics claim that this access to private information violates the Constitution, such as its Fourth Amendment's protection against unreasonable searches and seizures. Understanding this balance between safety and privacy after a terror attack matters because it raises critical questions about the obligations of government and the rights of citizens. By studying the Patriot Act, my research highlights this intertwined relationship between security and civil liberties, especially in distressed times. The goal of the analysis is to show how U.S. legislation continues to evolve in an effort to uphold the intricate equilibrium between national security and civil rights.

Faith Yost

PA - Villanova University

Discipline: Biology

Authors:

#1 Samantha Chapman

#2 Therese Adgie

Abstract Name: Presence and Abundance of Arbuscular Mycorrhizal Fungi in Florida Mangroves that are Encroaching into Salt Marshes

Subtropical mangroves are encroaching into temperate salt marshes in the southeastern United States because of reduced freeze events. Mycorrhizal fungi serve as important mutualists for tree species globally but are

often thought to be less abundant in wetland soil, where flooded, anoxic conditions render their chemoheterotrophic strategy difficult. We investigated the presence and abundance of arbuscular mycorrhizal fungi (AMF) on black mangroves (*Avicennia germinans*) that are increasingly present in salt marsh ecosystems in northeast Florida. Using plots from the WETFEET project in a marsh-mangrove ecotone, soils were sampled from two contrasting zones: a more frequently inundated creekside zone and a rarely flooded interior zone. We sampled 10 plots (2 hydrological environments x 5 replicates) and collected cores at a depth of 1-15 cm to analyze AMF abundance using microscopy. We hypothesized that AMF abundance is higher in less waterlogged soils. We stained root fragments (1 cm in length) and examined them under a light microscope to quantify AMF. We counted the number of arbuscules and hyphal branches at 20 randomly selected observation points per root fragment. Our results revealed that the mean percentage of fungal colonization in roots from plots in the interior zone was approximately 25% higher than that of the creekside zone, suggesting that zones with rarely flooded soils support higher AMF colonization. Although AMF have been documented in other coastal wetlands globally, this is the first study to investigate their presence in Florida's black mangrove ecosystems. Preliminary findings may suggest that AMF could play a role in supporting mangrove resilience and northward migration, though further research is needed to explore these potential links. This study contributes to understanding AMF's role in mangrove ecology and paves the way for future investigations.

Ryan Younes

PA - Moravian University

Discipline: Psychology

Authors:

#1 Ryan Younes

#2 Sarah Johnson

Abstract Name: Remembering Stereotypes: The Influence of Implicit Biases On Sexual Minorities

This Honors Project investigates the interaction between implicit biases and false memory formation, specifically targeting stereotypes related to sexual orientation. Using a modified Deese-Roediger-McDermott (DRM) false memory paradigm, participants were presented with seven distinct word lists. Four lists, drawn from the original DRM paradigm, served as controls, while three experimental lists were created to evoke stereotypes regarding gender, scientists, and sexual minorities. Participants completed a memory recall task following the exposure to each list, during which false memories were measured by their tendency to recall non-presented but stereotype-consistent words. Although false recall is anticipated across all seven of the word lists, the experimental lists are expected to elicit higher rates of false recall in comparison to the control lists. Among the three experimental lists, the sexual orientation list is hypothesized to result in greater false recall than the gender and scientist lists, reflecting the influence of stereotypes associated with out-group identities. This research aims to deepen the understanding of how implicit biases impact memory, with broader implications for the ways that stereotype-driven information might alter perceptions and judgments in social contexts. This study is the first to use the DRM paradigm to explore biases toward sexual minorities and scientists, contributing novel insights to the field.

Brynnlee Young

UT - Weber State University

Discipline: Health and Human Development

Authors:

#1 Matthew Nicholaou

Abstract Name: Tattoos as a Risk Factor for B-cell Lymphomas

Tattooed individuals have been shown to have an approximately 21% higher risk of developing lymphoma than those without tattoos. Lymphoma is a malignancy characterized by uncontrolled proliferation of lymphocytes, specifically B-cells. These B-cells can have mutated or abnormal expressions of their cluster of differentiation (CD) markers that lead to this uncontrolled proliferation. While the cause behind the uncontrolled proliferation in lymphoma is unclear, tattoo exposure may participate in triggering this abnormal B-cell proliferation. The goal of this study is to identify atypical and precancerous B-cells that are associated with tattoo exposure from CD marker phenotyping. Using flow cytometry, we will phenotype B-cells from 50 people (25 with tattoos, 25 without) in search for CD marker expressions that are associated with atypical cells, activated B-cells, and possible lymphoma cells. Atypical Memory cells will be identified by the expression CD45+/CD19+/CD27-/CD21- and Activated B-cells will be identified when expressed as CD45+/CD19+/CD27+/CD21-. Possible lymphoma-associated cells will be identified with the expression CD45+/CD19+/CD10+/CD43-. These CD expressions show abnormalities in B-cells and will be used to find a possible link with tattoo exposure. If successful, the study will demonstrate an increase in atypical and precancerous cells in people with tattoos compared to those without. This would provide insight into how B-cells express markers differently when exposed to tattoo ink and could provide information for future studies on the immune response to tattoos.

Tyler Young

PA - Westminster College

Discipline: Criminology/Criminal Justice

Authors:

#1 Dr. Andrew Bain

#2 Dylan Kresak

Abstract Name: Policing Local Communities: A Thematic Analysis of Tonality Trends and Perceptions of Media Coverage (2017-2023)

In 2003, Ashcroft, Daniels, and Hart penned the report Factors that Influence Public Opinion of the Police and stated (as one of the four main findings) that media did not affect residents' perception of the police. Some 20 years later, Succar et al. (2024) have noted that public sentiment towards the police can be greatly influenced by both mass and social media. With these two conflicting positions posited, this study seeks to investigate how national, regional, and local media coverage in the United States interacts with public knowledge and perception. By analyzing patterns in media portrayals, the research examines how reporting at different levels informs individuals and community perspectives, shedding light on how local communities understand the police and policing. Given the significant influence of news media on perceptions of policing, the study adopts a thematic analysis as outlined by Braun and Clarke (2006), stating that thematic analysis identifies, analyzes, and reports patterns in the data. Thereby offering the greatest example of how people learn about, experience, and make decisions about policing in their local community. In order to explore the topic area from the broadest perspective, the analysis made use of two databases: (1) Newsbank and (2) U.S. Major Dailies, and examined media coverage from 2017-2023. Initial findings taken during the Fall of 2024 revealed that national media often presented law enforcement in neutral or critical tones, with supportive portrayals notably absent, especially in response to high-profile incidents. Regional and local contexts suggested a potential shift toward more nuanced perspectives. It is expected that by expanding the dataset and scope, the study would be able to provide a deeper understanding of how media coverage influences public perceptions of policing across varying levels of reporting.

Hannah Young

AR - Lyon College

Discipline: Psychology

Authors:

#1 Allison Sonia

Abstract Name: Students' Use of ChatGPT as a Writing Tool

Over the past decade, educational technology has drastically evolved. Generative artificial intelligence, commonly known as AI, chatbots such as ChatGPT developed by OpenAI, have recently become popular resources for students seeking help with assignments. These tools offer valuable support, making them widely used in academic settings. While articles discuss whether students should use generative AI, little research exists on how students engage with it in academic settings. Understanding how students interact with chatbots like ChatGPT can help us understand the implications of their use for academic performance. This study analyzes student interactions with ChatGPT, where participants enrolled in College English were tasked with writing a one-page essay. The selection of the College English course is aimed at providing a diverse range of students from different disciplines and skill sets, rather than a large group of English majors in a higher-level course. Without guidance on using ChatGPT, researchers instructed students to use AI to assist in essay development. Students' interactions with ChatGPT and their final essays are collected and analyzed across multiple dimensions, including the total number of prompts and types of requests, such as brainstorming, outlining, and information research. The essays will be evaluated using Natural Language Processing for grammar, organization, and vocabulary level. Finally, we will examine whether ChatGPT interactions reliably impacted essay quality. Understanding how ChatGPT can assist students in developing writing skills and comprehending generative artificial assistance will support further education regarding chatbots like ChatGPT and promote further curiosity about how generative artificial intelligence can be used morally and correctly. The findings of this research will also shed light on students' prior knowledge of artificial intelligence, showing how, without instruction, students interact with ChatGPT and use the resources to the fullest extent they know, such as outline development, language enhancement, sentence structuring, and source searching.

Grace Young

GA - Kennesaw State University

Discipline: Theatre/Drama

Authors:

Abstract Name: Elizabethan Protestants, Catholic Persecution, and the Popularity of Hamlet

Queen Elizabeth I reigned in the late sixteenth century during a period when Catholicism was outlawed, and Protestantism was enforced. Today's modern perception of and academic teachings about Elizabeth I's reign promote the stereotype that the commoners in Elizabethan Protestant society shunned people who adhered to the Catholic religion. Scholars like Hervé Picton write that England had successfully stamped out religious minorities and become a Protestant nation by the end of the century; 250 Catholics were executed during Elizabeth I's reign. Despite these perceptions, teachings, and executions, my research suggests that Elizabethan society did not necessarily adhere to the religious laws of the monarchy or agree with the monarchy's actions. This paper explores historical accounts of Elizabethan London society, specifically

applying these studies to William Shakespeare's Hamlet. It argues that despite the monarchy's influence, Protestant society did not necessarily shun people who adhered to the Catholic religion. Hamlet was considered one of Shakespeare's most popular plays despite several Catholic remnants, such as Hamlet's father appearing as a ghost. This presentation draws upon scholars such as Isabelle Gatt and Peter Zhang who discuss the kind of community that theatre creates where audiences believe the actors, formulating a theatrical agreement, a point of connection grounded in a mutual understanding of societal truths. Even though Catholicism was outlawed, even though Protestants were told by their monarchy to despise Catholics, and even though Protestants denounced ghosts and other Catholic beliefs, they had no issue accepting the Catholic representation within the theatrical performances of their beloved Hamlet. For common Elizabethan Protestant society to love Hamlet as much as they did, they had to go against the monarchy's influence and be at least civil with the Catholics in their midst.

Arnesha Young

TX - Sam Houston State University

Discipline: Linguistics and World Languages

Authors:

#1 Arnesha Young

#2 Miriam Akoto

Abstract Name: Hidden in Plain Sight: The French Influence in Texas

When considering the contributions to Texan culture, beliefs, and identity, much of the focus is placed on the influences of Mexico and the United States, with communities such as Tex-Mex serving as a notable example of cultural hybridization. These influences are often celebrated for shaping Texas's bold and dynamic character. However, the French impact on Texas has been largely overlooked, despite its significant historical presence. Many view the connection between Texas and France as a relic of the past or a mere myth, overshadowed by the more visible legacies of the United States, Spain, and Mexico. This view ignores a rich and persistent French heritage that remains hidden in plain sight. While the involvement of France in Texas's path to independence is often acknowledged (Barker, 1967), French contributions to Texas identity are scarcely discussed in primary and secondary education (Davidson, 1973). Texas's pride in its cultural, historical, and moral diversity rarely extends to its ties with France, even though French-speaking communities, such as the Cajuns of East Texas, have left an indelible mark on the region (Louder & Leblanc, 1979). This research seeks to address this gap by investigating the ongoing presence of Franco-Texan cultural hybridization, particularly how varying designations—such as Tex-French and Franco-Texan—reflect regional identities and linguistic variations. Moreover, this study will explore the factors that led to the decline of the French language and its cultural influence in Texas, and whether any efforts have been made to preserve this heritage (Jordan, 1986). Through archival research and oral histories, the project will uncover the French presence in Texas and its enduring legacy, fostering a more comprehensive understanding of the state's diverse cultural roots. By recognizing these overlooked contributions, this research aims to ensure the preservation and appreciation of Franco-Texan heritage as a vital part of Texas's multifaceted identity.

Taylor Young

MT - Montana State University

Discipline: Health and Human Development

Authors:

#1 Natasha Gesker
#2 Sophia Rodriguez
#3 Kalli Decker

Abstract Name: Caregivers' Perspectives of a Museum Based Early Learning Program for Children

Purpose: The purpose of this research is to investigate how children and caregivers are influenced by participating in museum-based early learning classes. Museums can be a place for early learning opportunities, but it is crucial to include children's caregivers in these activities because it supports children's learning and positively influences caregiver-child interactions and relationships. There may be a variety of reasons why caregivers attend this type of programming: socialization, supporting the child developmentally, and supporting themselves as caregivers. **Methodology:** Our research took place at a regional cultural and natural history museum. We invited children's caregivers who attended early learning classes to participate in a survey that included questions about demographics, the caregiver, and the child(ren) who attends classes. The survey included questions about the reasons caregivers choose to attend classes, how they feel that the classes influence their child(ren) and their interactions with their child(ren). **Results:** Caregivers reported that early learning classes are a great way to spend quality time with their child(ren). Caregivers' perception about quality time positively predicts that they felt that the classes are meaningful to their relationship and that they have learned new ways of interacting with their child(ren) by attending. However, quality time is not a predictor of caregivers talking to their child(ren) about what they learned or did in classes. We will now analyze if the age of the child(ren) affects these correlations. Caregivers' experiences and expectations may differ based on the age of the child(ren) or based on the type of caregiver who is attending class (ex: parent, grandparent, nanny). When comparing caregiver types, we found that parents and nannies view these classes as a way to socialize and connect with other adults, but grandparents did not. This information could be used to inform museum-based programming for different ages or caregiver types.

Cora Youngs

VA - Virginia Tech

Discipline: Biology

Authors:

#1 Tamalika Paul
#2 Irving Allen
#3 Victor Lopez
#4 Eli Vlasisavljevich

Abstract Name: Histotripsy Ablation of Pancreatic Tumors Modifies Tumor Microenvironment and Improves Systemic Anti-Tumor Immunity

Histotripsy is a novel treatment modality utilizing focused ultrasound and acoustic cavitation to ablate tumor cells and generate acellular homogenates. The non-ionizing, non-thermal, non-invasive, and real time imaging properties make it a promising treatment for historically resistant malignancies such as pancreatic cancer. Our hypothesis is that the generation of acellular homogenates will activate the immune system and improve systemic anti-tumor immunity, causing the recognition of metastasized sites and produce abscopal like effects. This study was conducted using C57BL/6 mice with contralateral Pan02 tumors developed in their flanks. One tumor on each mouse was treated with histotripsy and tumor diameter and immune cell populations were measured for both tumors at 0-, 1-, 7-, 14-, and 21-days post treatment. Our data suggests that histotripsy generates an acute abscopal like effect in the treatment of pancreatic tumors through the reduction in tumor diameter and change in tumor microenvironments in both the treated and untreated contralateral pancreatic tumors. Moving forward, we aim to evaluate the mechanisms of immune cell activation including the potential presentation of neoantigens with the hope that these could be modified to create stronger abscopal like effects and offer a greater chance at remission.

zina yousef

FL - University of West Florida

Discipline: Biology

Authors:

#1 Rodney Guttman

#2 Bonnie Bruner

Abstract Name: Vascular Endothelial Growth Factor Receptor Phage-Mediated Cancer Control

The purpose of this project is to successfully identify a bacteriophage binding partner for VEGF (Vascular Endothelial Growth Factor) and observe inhibitory effects, supporting a new immunotherapy for various cancers. VEGF contributes to the growth of solid tumors by encouraging tumor blood vessel formation and plays a role in the onset of several other diseases associated with abnormal blood vessel development. VEGF is frequently overproduced in tumors, along with its receptors VEGFR1 and VEGFR2. These tumors have been detected throughout the body, promoting the rapid formation of blood vessels, which accelerates their growth and leads to faster tumor expansion. In this study, bacteriophages will be investigated as a possible inhibitor of VEGF RTKs (receptor tyrosine kinases). Bacteriophages, also known as phages, are viruses with remarkable specificity for bacterial receptors, enabling them to invade bacterial cells and reproduce inside them. We aim to exploit the targeting nature of phages and apply them to the overexpressed VEGF model in HEK-293 cells (Human Embryonic Kidney). Our process includes transfecting a VEGF plasmid tagged with Red Fluorescent Protein (RFP) and G418 resistance into HEK-293 cells to establish a stable cell line. This cell line, maintained in G418-treated media, will be tested with agonists, antagonists, and fluorescently tagged antibodies to confirm overexpression of VEGF RTKs before panning multiple bacteriophage libraries. Successful identification of bacteriophage binding partners to VEGF RTKs will lead to repeated panning to confirm binding, and further application of the identified bacteriophages is expected to show inhibitory effects. If the bacteriophage binding partners to VEGF RTKs exhibit the expected response, further research may support the use of bacteriophages as an immunotherapy in cancer related to angiogenesis.

Gal Yovel

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Gal Yovel

#2 Jessica Packard

#3 Sarah Maya

#4 Sara Walters

#5 Megan Culler Freeman

Abstract Name: CHARACTERIZING THE EPIDEMIOLOGY OF HUMAN PARECHOVIRUS IN NEONATAL SEPSIS AT UPMC CHILDREN'S HOSPITAL OF PITTSBURGH

Human parechovirus (hPeV) is a non-enveloped, single-stranded, positive-sense RNA virus in Picornaviridae family. Transmitted through fecal-oral and respiratory routes, hPeV leads to near-universal infection by the age of 5. While most children older than 6 months are asymptomatic or experience mild symptoms, hPeV is more severe in children 3 months or younger leading to neonatal sepsis, meningoencephalitis, and/or death.

Nationally, hPeV is not included in routine testing for neonatal sepsis. As a result, the contribution of this pathogen to neonatal sepsis is incompletely understood. To improve the treatment of hPeV in children, a better understanding of the epidemiology and clinical presentation of hPeV is crucial. We aim to characterize the clinical presentation and epidemiology of hPeV at UPMC Children's Hospital of Pittsburgh through remnant cerebrospinal fluid (CSF) analysis and a clinical chart review. CSF samples from febrile infants under 3 months of age presenting between April to December 2024 were analyzed for the presence of hPeV genomic material using RT-PCR using panPeVF1 and panPeVR1 primers and the panPeVprobe1 as previously described. To assess differences in the clinical presentation of febrile infants with hPeV as compared to other viral or bacterial causes, we created a database of clinical information that included patient diagnoses, blood test results, CSF test results, bacterial culture results, hospitalization duration and course, and any abnormal findings such as rashes or seizures. Analysis of the data will create a better understanding of the hPeV clinical disease and the extent of similarities and differences between neonates with hPeV and those with other febrile illnesses in the first three months of life. Future work includes genotyping hPeV-positive samples to determine the prevalence of specific genotypes and their associations with clinical presentations¹. Nix, W. A. et al. Detection of All Known Parechoviruses by Real-Time PCR. *Journal of Clinical Microbiology* 46, 2519 (2008).

Derrick Yu

NY - Cooper Union for the Advancement of Science and Art

Discipline: Engineering

Authors:

#1 Derrick Yu

#2 Gabriel Chodon

#3 Richard Chung

#4 Jabeom Koo

Gabriel Chodon

Richard Chung

Abstract Name: Innovative DC to DC Buck Boost Power Converters for high efficiency, low load Applications, and Producing a Scalable Design

The DC-DC buck-boost converter is a commonly used voltage regulator, found in any electrical systems requiring a constant voltage. Despite high-voltage DC-DC Buck-Boost regulators being a well-studied field at high-loads, application for low-load is underdeveloped and often faces poor power efficiency characteristics, oftentimes having only about 20% or lower power efficiency. This DC-DC buck-boost converter aims to implement multiple modulation schemes dependent on the load, allowing for more efficient voltage conversion for items such as portable medical devices, mobile devices such as smartwatches, and any other device which implements and requires low current draw for extended periods of time. This paper aims to implement pulse width modulation (PWM), pulse frequency modulation (PFM), and pulse skip modulation (PSM) to meet target specs, as well as a mode control system to autonomously switch between these modulation schemes at optimal operating points. This paper will implement a DC-DC buck-boost converter at the low-load range which feature higher power efficiencies than most commercial DC-DC buck converters available today. For this design, the buck-boost converter will achieve at least 80% power efficiency at all ranges of current, and a physical printed circuit board implementation of the circuit will be designed, ordered, and tested. In addition, a layout of an on-chip design will be carried out to prove the scalability of this implementation, verifying that such a design can potentially be implemented in miniature portable devices where system form factors and its size are mainly concerned.

Xinran Yu

PA - University of Pittsburgh

Discipline: Interdisciplinary

Authors:

#1 Arish Alreja

#2 Avniel Ghuman

Abstract Name: Generating Bi-Directional Conversion of iEEG Data and Auditory Data

Bidirectional conversion between audio (human voice) and iEEG data requires a collaborative effort. Audio processing requires extraction of features such as pitch, intensity, formants, etc. They are later organized into a matrix where columns represent audio features and rows represent data points from the same time intervals. This matrix can then be input into a classifier to build a preliminary speaker classification model. Since individuals exhibit distinct preferences in pitch and intensity, this approach allows the creation of a rough classification model of speaker polarization. However, dealing with the overlap in audio features between different speakers requires manual labeling, employing supervised learning to assist the machine learning model in achieving more accurate speaker voice polarization. One significant challenge arises from the varying extraction frequencies of features such as pitch, intensity, and formants when using software like Praat. Instead of using Python's `scipy.signal` module for resampling, which involves Fourier transform that may produce ripple effects due to NaN or zero values in the input data, we opted for a simpler approach. Specifically, scaling the feature values based on the least common multiple of the different sampling rates for pitch and intensity. Additionally, applying a masking tool to filter out more non-voice segments from the audio, ensuring cleaner data for analysis. For processing starting from iEEG data, our laboratory already possesses a substantial dataset collected through UPMC. During data collection, not only were brain signals recorded, but eye-tracking glasses were also used to capture the objects of the patient's gaze, with a microphone nearby to record ambient audio. processed iEEG data can be associated with the faces observed and voices heard by the patient. This enables us to investigate how humans respond to external signals (auditory and visual) in real-life scenarios.

Elliot Yun

VA - Virginia Tech

Discipline: Computer Science

Authors:

#1 Elliot Yun

Abstract Name: The Evolution of Phishing: Types, Threats, and Machine Learning Mitigation Strategies

This paper explores the growing threat of phishing, which continues to target individuals and organizations using increasingly sophisticated tactics. The primary focus is on understanding how phishing has evolved over time, the various forms it takes, and how developing machine learning technologies might assist in detecting and preventing these attacks. Understanding the early strategies of phishing, which began in the mid-1990s, helps explain its progression into the diverse approaches found today, from basic false emails to sophisticated spear phishing, smishing, and deepfake-based vishing. The study provides a historical overview of phishing, categorizes its different types, and explains the motivations behind these attacks, which often exploit human trust and fear. Both technical and psychological factors that lead to phishing 'success' are discussed, emphasizing the importance of combining technological defenses with user education. Detection strategies are explored, such as machine learning-based email filtering and advanced URL analysis, which are essential tools for mitigating phishing risks. Additionally, machine learning models are evaluated, such as supervised and unsupervised algorithms, which are also effective at phishing detection by analyzing email content, sender behavior, and link credibility. The conclusions stress that while technological solutions are

vital, user education is an irreplaceable component of an effective defense strategy. The paper also examines how global events, such as the COVID-19 pandemic, have influenced phishing, with attackers taking advantage of public uncertainty to boost their chances of success. By investigating current trends, such as the use of AI and behavioral analytics in phishing detection, this study underscores the need for continuous adaptation in cybersecurity to counter increasingly sophisticated attacks. The goal is to provide clear knowledge of phishing's development and evolution and urge proactive defenses to minimize its impact, protecting both individuals and organizations from this ongoing threat.

Baokou Yung

MN - St. Catherine University

Discipline: Physical/Occupational Therapy and Speech Language Pathology

Authors:

#1 Stephanie De Sam Lazaro

Mariam Toure

Richanta Pollard

Abstract Name: Assessing Health Literacy in an Adolescent Oral Health Education Curriculum to Prevent Oral Diseases

Prevalent oral diseases in adolescents include cavities, gum disease, and forms of oral cancer. Adolescent use of nicotine, including vaping, and exposure to the Human Papillomavirus (HPV) increase risks for these prevalent oral diseases. Educating students about the significance of these oral diseases and prevention strategies can improve oral health among this population. However, barriers to health education, such as readability, comprehension, and accessibility, can limit an individual's understanding of oral health. This study assessed an educational curriculum focused on vaping provided by an oral health community partner, Ready, Set, Smile (RSS), for 6th - 8th-grade students, aiming to expand the existing curriculum and improve health literacy for adolescents based on needs identified by RSS. An interprofessional student research team utilized three health literacy tools, the Center for Disease Control (CDC) Clear Communication Index, the Patient Education Materials Assessment Tool (PEMAT), and the SMOG Index, to evaluate the existing and revised educational material. Scores of 90% or above on the CDC Clear Communication Index and 70% or above the PEMAT are considered good, and a SMOG index at the 4th to 6th-grade level is recommended for health education materials. The existing curriculum received a CDC Clear Communication score of 73%, PEMAT scores of 68% (Understandability) and 42% (Actionability), and an SMOG index of 10th-grade level. The revised curriculum performed better with a CDC Clear Communication score of 93.75%, PEMAT scores of 100% (Understandability) and 80% (Actionability), and a SMOG index of 7th-grade level. The revised educational material demonstrates improved health literacy and readability scores at or near recommended levels and is being implemented to increase student engagement during teaching sessions with RSS. With improved engagement, there is hope that fewer middle schoolers will start using nicotine products and caregivers will consider HPV vaccination for their adolescents.

Ruhi Yusuf

MI - University of Michigan - Ann Arbor

Discipline: Engineering

Authors:

Abstract Name: Scalable Thermal Control Framework for Quantum Photonic Integrated Circuits Using

This research establishes a scalable framework for thermal control in quantum photonic integrated circuits (PICs), which are critical for quantum-enhanced communication, sensing, and computing. Precise resonance and phase stabilization are achieved using microheater-based systems integrated with components of the Pound-Drever-Hall (PDH) technique, including proportional-integral-derivative (PID) control and multi-channel programmable current sources. The methodology combines data acquisition systems (DAQs) with programmable current sources to independently manage multiple thermal control channels. PID feedback, implemented through field-programmable gate arrays (FPGAs), ensures exceptional temperature stability crucial for quantum photonic operation. Automated Python and LabVIEW interfaces streamline real-time data collection, enabling robust system evaluation and scalability. The PDH process further enhances resonance stabilization, serving as a backbone for integrating multiple quantum photonic components. This work introduces a novel approach to scalable thermal control, allowing for the independent regulation of multiple components within a single PIC. Preliminary results demonstrate precise stabilization of resonance and phase across multiple channels, achieving a level of scalability and precision that surpasses conventional methods. These advancements reduce energy consumption, operational costs, and the complexity of scaling quantum photonic systems. The broader implications extend beyond quantum communication and sensing to applications such as environmental monitoring, precision medical diagnostics, and autonomous navigation. By improving the thermal efficiency and scalability of quantum devices, this research contributes to a sustainable, quantum-driven future. It addresses critical global challenges in energy efficiency, secure communication networks, and precision measurement, while paving the way for breakthroughs in transformative technologies like quantum networks, advanced sensors, and energy-efficient computing systems.

Annetta Yuwono

PA - University of Pittsburgh

Discipline: Biology

Authors:

#1 Annetta Yuwono

#2 Thais Rafael-Guimaraes

#3 Amantha Thathiah

Abstract Name: The Role of the Amyloid Precursor Protein (APP) on Tau Pathogenesis in Alzheimer's Disease

Background: Alzheimer's Disease (AD) is characterized by accumulation of amyloid- β (A β) plaques and neurofibrillary tangles (NFTs). NFTs form through the progressive, pathological accumulation and aggregation of tau in degenerating neurons. The amyloid precursor protein (APP), cleaved to generate A β , is specifically upregulated in NFT-bearing neurons. Moreover, familial mutations in APP, but not the tau gene MAPT, play a causal role in AD development. Although APP pathobiology is undoubtedly involved in AD progression, the lack of appropriate models has hindered our understanding of whether APP directly impacts tau aggregation and overall AD pathogenesis. **Method:** We investigated APP involvement in tau phosphorylation and aggregation using HEK293 cells overexpressing full-length APP and a novel, blue light-activated optogenetic system (optoTAU). We utilized biochemical and immunocytochemical analysis of total tau, phosphorylated tau (pTau), and APP to establish a causal role and investigate the putative mechanisms through which APP influences tau pathogenesis. **Result:** First, we show that APP overexpression in optoTAU expressing cells increases tau aggregation and phosphorylation at several AD relevant sites. Despite correlational evidence for an A β generation and tau pathogenesis relationship, our treatments with A β monomers, oligomer, and fibrils did not affect APP-mediated tau aggregation. As such, we investigated A β -independent mechanisms through which APP may influence tau aggregation. We further determined that tau and APP directly interact and that there is a trend toward increased tau-APP colocalization in cells undergoing tau aggregation. Lastly, we show that APP overexpression enhances cytotoxicity regardless of tau aggregation, implicating APP as the putative

trigger for neurodegeneration in AD brains. Conclusion: Our results elucidate a direct role for APP on tau aggregation and provide evidence to support a putative synergism between APP and tau on AD pathogenesis. Future studies aimed at dissecting this relationship in patient-derived neurons will identify APP-dependent mechanisms upstream and/or downstream of tau pathogenesis.

Britaney Zacarias Hernandez

TX - Texas Woman's University

Discipline: Psychology

Authors:

#1 Samantha Sprigings

#2 Christian Hart

Abstract Name: Development of the Face-Saving Lies Scale: Examining Self-Esteem and Shame as Predictors

Lies and deception, though often frowned upon, are ubiquitous in human behavior. Among the various types of lies people tell, face-saving lies are particularly prevalent in everyday interactions. These lies may be told when individuals feel uncomfortable revealing something about themselves or their behavior, perhaps out of embarrassment, shame, or fear of how they may be perceived. As no existing scale specifically measures the tendency to tell face-saving lies, we developed a novel, 15-item scale. An exploratory factor analysis (EFA) using maximum likelihood extraction and varimax rotation revealed a single factor (eigenvalue = 8.48), explaining 56.52% of the total variance, with excellent reliability ($\alpha = .94$). Multiple regression analysis indicated that self-esteem ($\beta = -.38$, $p < .001$), shame negative self-evaluation ($\beta = .22$, $p < .001$), and shame withdrawal ($\beta = .17$, $p = .004$) significantly predicted the tendency to tell face-saving lies, accounting for 31.8% of the variance, $F(3, 214) = 33.20$, $p < .001$, $R^2 = .318$. Further research aims to replicate these findings and explore additional psychological factors, including social anxiety, attachment style, and narcissism.

Brianna Zaccheus

NC - University of North Carolina at Wilmington

Discipline: Biology

Authors:

#1 James Staples

#2 Michael Tift

Abstract Name: Impact of hibernation on endogenous carbon monoxide concentrations and heme oxygenase activity in thirteen lined ground squirrels (*Ictidomys tridecemlineatus*)

The thirteen-lined ground squirrel (*Ictidomys tridecemlineatus*) experiences periods of torpor in winter months that are associated with reduced body temperature, metabolism, and a significant decrease in heart rate that leads to blood flow reduction [ischemia (I)] to certain tissues. Between torpor events, brief arousals are shown by increased body temperature, metabolic rate, and reperfusion (R) to tissues. These I/R events cause damage in most mammalian tissues, but low to moderate levels of carbon monoxide (CO) have been shown to alleviate injuries in tissues exposed to frequent I/R events. High concentrations of endogenously produced CO have also been reported in blood and tissues of deep-diving mammals that routinely experience I/R in their tissues. Heme oxygenase (HO) enzymes break down heme, producing CO as a byproduct. We

examined CO concentrations and HO activity in tissues from 15 squirrels experiencing consecutive torpor for 1, 3, 4, or 10 days. Lung CO concentrations after 1 day of torpor (8.2 ± 2.3 pmol/mg) increased after 10 days in torpor (14.9 ± 5.2 pmol/mg). Conversely, HO activity in the lung on day 1 of torpor (10.2 ± 2.6 nmol/hr/g) decreased after 10 days in torpor (3.6 ± 1.2 nmol/hr/g). The spleen, an organ involved in erythrocyte turnover, had the highest average CO content among tissues (29.9 ± 7.0 pmol/mg), though values decreased with increased time in torpor. Similarly, HO activity was highest in day 1 of torpor (13.5 ± 4.4 nmol/hr/g) and decreased with increased time spent in torpor (11.6 ± 3.7 nmol/hr/g). These findings are the first to report variations in CO and corresponding HO activity in hibernating mammals, providing insight into the physiological significance of this cytoprotective gas during hibernation.

Makenzie Zagroba

PA - University of Pittsburgh

Discipline: Geography/Geology

Authors:

Abstract Name: Analyzing landslide recurrence in Pittsburgh, PA and Northern Panhandle of West Virginia through historical data and Light Detection and Ranging spatial comparison

Every year landslides kill thousands of people and cause roughly \$1 billion in damages globally. Thus, landslides are both destructive and dangerous to surrounding infrastructure, environmental systems, and human populations. Historically, landslide research has been challenged by records of historical landslides. When evaluating locations of landslides or other hillslope failures, examining patterns of remobilization or reoccurrence can provide insight for mitigation of future events. This research examines whether landslides are recurring in areas where historical landslides occurred, or in new areas where landslides have not been previously recorded. The work analyzes spatial patterns of landslide occurrence in two cases: Pittsburgh, Pennsylvania and the northern panhandle of West Virginia. In the Pittsburgh case, modern landslide data derived from citizen reporting (i.e., the 311 system) are compared with records of existing city wall infrastructure to quantify associations between modern landslides and historical landslide repair efforts. Similarly, West Virginia landslides derived from Light Detection and Ranging (LiDAR) data are compared with historical landslide mapping from the 1970s. These comparisons reveal that a majority of recent landslides occur in areas where historical landslides are not recorded. Our findings clarify where recent landslides are occurring, and thus reveal regions where remobilization should be central to assessments of future landslide events. Further, this work documents potential causation patterns in recent landslides, allowing development of safer and more sustainable risk mitigation practices in landslide prone areas.

Cleo Zagurski

NE - Creighton University

Discipline: Sociology

Authors:

Abstract Name: The Structuration of the 108th Nebraska Legislature

As the only Unicameral in our nation, Nebraska stands as a unique laboratory for the policy process, warranting critical study. Without the same procedures used in bicameralism, some may argue that there is limited public input and accountability in unicameralism. Through my analysis of the 108th Nebraska Legislature, I outline the reproduction of the structure of the session based on the changes in agency and

rules. The polarization of the nonpartisan body is at an all-time high and with heightened spotlights on the national level. The introduced socially charged policies of focus, rooted in national policy playbooks, include (a) LB574 the “Let Them Grow Act” a bill restricting gender-affirming care for minors, (b) LB575 the “Sports and Spaces Act” a bill restricting access to restrooms and school athletic teams for trans minors, and (c) LB626 the “Heartbeat Act” a bill restricting abortion. By utilizing structuration theory, I was able to define the regulation of the unicameral system by the rules and norms set by the actors. I have defined structural interactions as the micro-, meso-, and macrolevels. Primary internal and external agents interact within the microlevel. Primary internal agents adapted structural roles within the Unicameral to reproduce the structure to pass polarizing bills. External agents experienced increased barriers to engaging with the policy making process. Primary themes of personal freedoms, such as parental rights and bodily autonomy, have been highlighted through the exploration of the policies of focus within the mesolevel. Those mesolevel policy themes have reproduced macrolevel structures. The structural changes in all three levels due to agents, rules, and norms identified within the 108th Nebraska Legislature have produced unprecedented changes that caused the passing of socially charged health policies within the Unicameral.

Faizi Zaidi

CA - Liberty High School

Discipline: Engineering

Authors:

Aayushya Patel

Abstract Name: Measuring DBD Plasma Jet Gas Temperatures for its Applications in Wound Healing

Reactive oxygen and nitrogen species (RONS) generated by low-temperature Dielectric Barrier Discharge (DBD) plasma jets have demonstrated the ability to accelerate wound healing. A critical challenge, however, is maintaining plasma gas temperatures at safe levels to avoid damaging wound tissues. Developing an automated system to monitor plasma jet temperatures during wound exposure would be highly beneficial. This project is divided into three key phases. First, a DBD plasma jet torch was designed to generate a helium plasma jet (~10–15 slpm) with a length of approximately 50 mm. This was achieved using a quartz tube with two electrodes across which an AC voltage (~5–10 kV, 30–50 kHz) was applied. Plasma gas temperatures were measured using a K-type thermocouple. Second, a plasma sheet generator (50 mm wide, 50 mm high, and 2 mm thick) designed at SJSU was employed for two-dimensional (2D) temperature measurements across and along the plasma sheet. The third phase facilitated automated temperature monitoring for which a 2D scanning mechanism was developed. The scanning system incorporates stepper motors, ball screws, gears, and motor drivers. Torque and maximum speed calculations were performed to ensure the system's functionality. An Arduino microprocessor was used to control the traversing stage, enabling precise movement of the thermocouple across the plasma. Experimental results revealed that plasma gas temperatures were highest near the exit of the plasma torch (~60°C) and decreased progressively with distance, with the jet tip temperatures measuring approximately 30–35°C, depending on operating conditions. Plasma sheet experiments showed uniform temperature distribution across various locations on the sheet. In general, plasma temperatures decreased by 10–20% along the jet due to mixing with the surrounding air. Full design calculations and temperature results will be included in the final presentation.

Brianna Zamora

CA - Chapman University

Discipline: Chemistry

Authors:

#1 Jerry LaRue
#2 Stephanie Hoang
#3 Olivia Guyette
#4 DeAngelo Alvarez
Olivia Guyette

Abstract Name: Hot Electron Chemistry on Bimetallic Au Core-Shell Nanoparticles

With the evolution of carbon emissions, carbon dioxide pollution levels have grown immensely. This issue can be combated by the conversion of either carbon monoxide or carbon dioxide into methanol through plasmonic photocatalysis. These novel catalysts convert pollutants into environmentally friendly products. Specifically, we synthesize and characterize bimetallic transition metal core-shell nanoparticles as plasmonic photocatalysts. Due to their unique properties, these nanoparticles can facilitate photocatalytic reactions as the plasmon core absorbs the light generating the hot electrons. The focus of the project involves the use of a gold (Au) core metal in the bimetallic core-shell nanoparticles. The gold core nanoparticles are then synthesized and paired with either rhodium, ruthenium, or nickel shells. Characterization techniques include Ultraviolet Absorption Spectroscopy (UV-Vis), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), and Energy-Dispersive X-ray Spectroscopy (EDS). Characterization of every synthesized sample reveals the dispersivity, size, shape, and distribution of elements. After characterization, the bimetallic core-shell nanoparticles are tested in the photoreactor chamber with mass spectrometry. In this process, the oxidation of carbon monoxide, hydrogenation, and combustion of oxygen can assess the photocatalytic efficiency of the core-shell nanoparticles. This work aims to provide more knowledge of eliminating previously mentioned pollutants and instead creating renewable fossil fuel alternatives.

Lucia Zdenahlik

IL - Elmhurst University

Discipline: Environmental Science and Sustainability

Authors:

#1 Colleen Munro-Leighton

Abstract Name: Small-Scale Composting Provides Sustainable Decomposition of Polylactic Acid (PLA) Bioplastic

The recycling process for plastic materials is woefully ineffective, which leads to most plastics being used one time and then ending up in a landfill. Only 9% of all the plastic waste generated globally is recycled. Alternative processes and polymer materials are needed to address the growing problem of single-use plastics. One promising alternative is polylactic acid or polylactide (PLA), a biodegradable polyester made from renewable biomass, typically fermented plant starch. Existing research on PLA supports the use of industrial composting facilities for decomposition, however our current infrastructure is insufficient and unable to support the widespread use of PLA. As a result, PLA often ends up in landfills with the majority of plastics. To make PLA a more sustainable option, my research focuses on small-scale composting, such as that found in community gardens and backyards, as a potential solution that addresses the lack of industrial composting facilities. In prior work, various plastics and their impact on the environment and human health were investigated. My current research explores the reversible conversion of lactic acid to polylactic acid polymer with known methods. Additionally, different solute isolation techniques (water, ethanol, or propanol) were assessed to determine which is most efficient at extracting lactic acid from soil. Finally, small-scale composting experiments of PLA were conducted to identify optimal conditions for its decomposition. Initial results suggest that ethanol is the most efficient solvent for extracting lactic acid from soil. PLA was observed to decompose in the presence of *Amycolatopsis* genus bacteria in a carefully monitored compost bin.

Luciana Zecchin

MI - University of Michigan - Ann Arbor

Discipline: Biology

Authors:

#1 Christi Gendron

Abstract Name: Identifying Which Tissues Regulate Lifespan in Response to Death Perception

This study examines how the perception of death in *Drosophila melanogaster* (fruit flies) is triggered by the sight of deceased conspecifics and influences lifespan through insulin signaling. Sensory experiences have been shown to impact organismal aging across taxa. In particular, the perception of dead individuals significantly affects both the health and lifespan of animals that depend on insulin signaling. By exploring the role of insulin receptors in different tissues, this research aims to provide novel insights into aging mechanisms and strategies to promote healthy aging. The research focuses on identifying which tissues—including the gut, muscle, and fat bodies—mediate lifespan-shortening effects through insulin signaling. Specifically, it asks: Where are insulin receptors required to mediate the effects of death perception on lifespan? To investigate this, *Drosophila* were genetically modified to express a disruptable insulin receptor in specific tissues. This dominant negative insulin receptor was expressed to decrease insulin signaling in the gut, muscle, and fat bodies. Using a drug-induced expression in vivo system, we compared lifespan outcomes in flies with altered insulin signaling to those exposed to death perception. This process aims to identify tissues involved in lifespan alterations triggered by exposure to dead conspecifics. This research advances our understanding of insulin signaling and its role in aging. By identifying the tissues that mediate the effects of death perception, this study aims to clarify how sensory cues influence aging. The findings may lead to new strategies for promoting healthy aging and preventing age-related diseases, opening the door to innovative approaches for reducing the risk of such diseases and enhancing longevity.

Cole Zeh

NY - Colgate University

Discipline: Biology

Authors:

#1 Engda Hagos

Abstract Name: Klf4 sensitizes Mouse Embryonic Fibroblasts to FIN56 induced Ferroptosis

Krüppel-like factor 4 (KLF4) is a zinc-finger transcription factor involved in embryonic development, cell cycle regulation, autophagy, and DNA damage repair. Ferroptosis is a recently discovered form of cell death independent of apoptosis and is characterized by iron catalyzed lipid peroxidation. It has been hypothesized that Klf4 regulates ferroptosis-related genes. However, the molecular mechanism of how Klf4 regulates ferroptosis is yet unknown. In this study, mouse embryonic fibroblasts (MEFs) wild type for Klf4 (Klf4+/+) or null for Klf4 (Klf4-/-) were used to investigate the role of Klf4 in ferroptosis regulation. FIN56 is a drug that induces ferroptosis in cells via the degradation of GPX4, and thus reducing cellular protection against excess lipid peroxidation. MEFs both Klf4+/+ and Klf4-/- were treated with FIN56 to test the effect of Klf4 on sensitivity to FIN56 mediated cell death. In addition, trypan blue cell death assays were performed on MEFs untreated and treated with FIN56 to quantify the effects of the drug on cell death. Our findings revealed that Klf4+/+ MEFs responded to FIN56 treatment with a significant increase in cell death, while Klf4-/- MEFs showed resistance to the treatment. Furthermore, treatment of FIN56 with ferroptosis inhibitor (Fer-1) reduced Klf4+/+ MEFs' sensitivity to cell death, which further supports the hypothesis that Klf4 is positively regulating ferroptosis cell death. Finally, western blotting with primary antibodies for proteins

involved in ferroptosis regulation revealed that Klf4+/+ MEFs have higher levels of iron regulation proteins DMT1 and NCOA4, while the levels of iron storage protein FTH1 is reduced in response to FIN56 treatment. These results suggest that Klf4 is contributing to an increase of intracellular iron which could be sensitizing the MEFs to ferroptosis programmed cell death. Understanding this mechanism may illuminate possible targets for directed or combination therapy for cancer treatments.

Madeleine Zeidenberg

PA - Kutztown University of Pennsylvania

Discipline: Psychology

Authors:

#1 James Jackson

Abstract Name: Music and Intimacy: A Study on Older Adults with Dementia

This research investigates the impact of music on memory for individuals with dementia, aiming to find non-pharmaceutical therapeutic techniques. This study focuses on the potential of using music, specifically songs they enjoyed in their youth, memories that were believed to be forgotten would be triggered back into short term memory. In addition, this could be specifically significant to adults in a relationship. If an individual were to listen to a song that was meaningful in their relationship (first dance song,) this will help the individual diagnosed with dementia remember their partner, and possibly signal for an intimate moment, like holding hands or kissing. The ultimate goal is to enact music in a care note as a therapeutic technique to de-escalate individuals with dementia. With the retrieval of memory, individuals would be less confused and would calm their emotional states. This investigation will take place starting January 2025, and will be conducted as a pre-test/post-test survey and qualitative interview. Individuals will be given a basic memory test, followed by listening to their favorite songs in youth, and then the test will be given again. However, researchers are mainly looking for observational intimacy data. Results are impending, but based on literature search conducted, it is believed that results will be very impactful. This study is inspired by the documentary *Alive Inside: A Story of Music and Memory* (Rossato-Bennett). This video discusses the benefits of music therapy, with personal stories from individuals with dementia and caregivers with the intervention of songs. Music as an intervention could increase the quality of life for residents and provide a multitude of therapeutic techniques. In addition, it can increase the quality of life for families as we hypothesize that music could bring memories back.

Julia Zeiser

PA - University of Pittsburgh

Discipline: Psychology

Authors:

#1 Natasha Tokowicz

Abstract Name: Working Memory, Music, and the Sentence Generation Method: A Novel Approach to Second Language Vocabulary Acquisition

Learning vocabulary is a fundamental part of second language (L2) learning and communication. One approach to learning L2 vocabulary is through rote memorization of word pairs of first language (L1) and L2 translations. Another approach involves generating sentences using new L2 vocabulary words, emphasizing meaning of words and fostering deeper processing and long-term retention by creating a meaningful link

between the vocabulary and context. By learners generating their own information, they show a generation effect, indicating that there are more memory benefits for actively self-generating information than for passively reading information. Additionally, individual differences such as working memory and musical ability and training are also factors that are related to learning L2 vocabulary. Therefore, this study examines the efficiency of sentence generation on L2 vocabulary learning and investigates the relationship between working memory and musical ability and training and L2 vocabulary learning when trained using sentence generation. 30 native English speakers are trained on English-German word pairs using four strategies: reading a provided definition, reading an English sentence containing the target German word, generating their own definition, or generating their own sentence. Learning is assessed through a free recall task, a translation task, and a semantic relatedness task. We hypothesize that sentence generation will contribute to the best learning outcomes, and that working memory and musical ability and training will show a positive relationship with L2 vocabulary learning. We will also explore possible interactions between the training method and working memory and musical ability and training.

Abdul-Malik Zekri

FL - University of South Florida

Discipline: Computer Science

Authors:

#1 Ankur Mali

Abstract Name: Evolutionary Optimization of Biologically Inspired Mechanistic Input-Output Neural Circuit Models in the Auditory Pathway

Understanding how to compute specific functions from neural architecture is a fundamental challenge in neuroscience, with profound implications for artificial intelligence, neuromorphic computing, and neurological health. This study employs evolutionary meta-heuristic algorithms to optimize a mechanistic input-output spiking neural network (SNN) model of the cochlear nucleus, a key circuit in the auditory pathway. The research integrates biologically inspired initialization, iterative optimization, and data-driven validation to explore how connectivity and topology influence input-output relationships in neural circuits. Synthetic input-output spike train pairs for spiral ganglion and bushy cells are generated using a computational model of the cochlear nucleus. SNNs are initialized with biologically plausible parameters, and their synaptic weights and delays are refined using spike-timing dependent plasticity (STDP) while connectivity and distribution of cellular properties are evolved over generations. Fitness is evaluated based on the accuracy of replicating experimentally observed input-output patterns. The optimization is performed in parallel across a population of networks to enhance computational efficiency, with characteristic motifs in the optimized architectures analyzed to uncover their functional significance. This approach not only seeks to replicate the computations of biological circuits with high fidelity but also provides insights into the principles underlying neural circuit architecture. Preliminary findings are expected to demonstrate that SNNs can accurately mimic biological computations, offering a scalable methodology for computational neuroscience. SNNs are particularly promising for designing energy efficient models which are capable of reducing the carbon footprint of machine learning, by mimicking the sparse, event driven nature of biological neural activity. This work also has the potential to reduce the computational and time demands of traditional connectomic reconstruction by learning circuit architectures directly from empirical input-output data. Additionally, these results could inform the design of energy efficient neuromorphic hardware, test hypotheses about auditory processing, and guide neural architecture search (NAS) methods for artificial neural networks.

Jehona Zeneli

WI - University of Wisconsin-Madison

Discipline: Environmental Science and Sustainability

Authors:

#1 James Schauer

#2 Martin Shafer

Abstract Name: Revealing the History of PFAS Contamination from Seepage Lake Sediment Cores

Increasing concerns over large-scale contamination of water, food, commercial and consumer products, and waste from polyfluoroalkyl substances (PFAS) have led to growing global pressure to assess the scope, magnitude, and impacts of PFAS contamination of the environment. To improve the understanding of the environmental sources and cycling of PFAS, we initiated a research project to look at the historical deposition of PFAS in water body sediments. Lake sediments, as demonstrated with other legacy and emerging contaminants, provide an accurate archive of historical contaminant deposition which can be useful to establish a deposition history of PFAS. This study focused on characterizing and constraining poorly understood atmospheric cycling and deposition of PFAS using seepage lakes whose inputs are dominated by atmospheric deposition. Sediment cores were extracted from the two seepage lakes in southern Wisconsin - reaching back to the early 1900's, well before PFAS was first produced. The cores were sectioned at 1 cm intervals and age dated using 210-Lead and 137-Caesium, to establish timelines for PFAS deposition history. This research aims to gain a better understanding of the distribution of historical inputs of PFAS, ultimately contributing to strategies that will control future inputs of PFAS compounds to protect the environment and improve public health.

Victoria Zepeda

CA - University of California - Merced

Discipline: Engineering

Authors:

#1 Shijia Pan

Abstract Name: PAVE: Pervasive Analysis of Vibration for Enhanced home care

The need for elderly care continues to grow as the world's older (people aged 65 and over) population is projected to double by the year 2050. Caretaking requires significant advancements to ensure the safety and well-being of senior residents, particularly when caregivers cannot be physically present. This study explores the potential of autonomous vibration sensors as a non-invasive alternative to traditional monitoring methods such as microphones and cameras, which may infringe on residents' privacy. By analyzing and grading various sensor models, our research aims to optimize the efficiency of these sensors when deployed in a network, thereby enhancing the accuracy of activity detection. A key focus of this investigation is the minimization of noise interference, allowing for the precise identification of relevant events and movements through vibration sensing. Our findings will contribute to the development of improved monitoring systems that safeguard both the safety and privacy of residents in assisted living environments .

Haley Zeri

IN - Purdue University Main Campus

Discipline: Interdisciplinary

Authors:
#1 Haley Zeri
#2 Jason Ware

Abstract Name: A Multi-Perspective Case Study on Implementing a Novel College Student Coach Role in a Service-Learning Club: Oakland Academy Students in Action Team

Students in Action (SIA) is a nationwide initiative designed to empower K-12 students to lead service-learning projects that address the needs of their local communities. We are currently evaluating the implementation of a novel near-peer college student coach role to work alongside students and their advisors, typically teachers, within Greater Lafayette SIA teams local to Purdue University. This role seeks to increase K-12 student engagement with their community, provide access to university resources, and foster a meaningful partnership between the university and K-12 schools. I evaluated the implementation of this novel coach role at Oakland Academy, a local alternative high school. I analyzed skill growth from perspectives on hosting a student-led family mental health night, drawing insights from my observations, the advisor's perspectives, and the students' reflections on the event. Across all perspectives, several common themes emerged reflecting the benefits of this partnership, including increased access to resources to host larger-scale events, more opportunities for students to transform their passions into practical service projects, and growth in students' presentation, writing, collaboration, and project management skills. Implementing a near-peer mentor role can enhance students' service-learning experience by deepening their community impact and fostering professional development opportunities. Engaging students and advisors in collaborative reflection provides invaluable first-hand accounts that could not be obtained from observation alone. Furthermore, this case study examining a smaller, non-traditional school illustrates that the benefits of service-learning opportunities extend beyond financial barriers. Likewise, a university partnership can enhance opportunities through grants and mentorship. In conclusion, this case study highlights the benefits of implementing a near-peer mentor role and collaboration between an academic institution and K-12 schools in creating more impactful service-learning opportunities. We hope our work can serve as the framework for other universities to implement similar near-peer roles to develop more impactful youth service-learning opportunities.

Christine Zhang

CA - University of California - Los Angeles

Discipline: Health and Human Development

Authors:
#1 Anil Sapru
#2 Daniela Markovic
#3 Kyle Sheu
Nithya Narapa Reddy

Abstract Name: Prognostic Significance of Platelet Factor 4 (PF4) in Pediatric Respiratory Failure: Linking Inflammation, Coagulation Biomarkers, and Clinical Outcomes in a Multi-Institutional Study.

Platelet factor 4 (PF4) is a chemokine released from α granules of activated platelets and may play a role in disseminated intravascular coagulation (DIC). Platelets and PF4 play crucial roles in respiratory failure via inflammation and coagulation pathways. The release of PF4 leads to downstream stimulation of alveolar macrophages and production of chemokines promoting neutrophil recruitment and edema formation. PF4 also accelerates generation of activated protein C, which can counteract the increasing procoagulant state during sepsis. This study

aims to identify the significance and reliability of PF4 as a prognostic marker for clinical outcomes in respiratory failure. We assessed PF4 levels using Luminex assays in 295 mechanically ventilated pediatric patients from a multi-institutional pediatric insulin titration trial with heart or lung failure. We then tested the relationship of PF4 levels to clinical outcomes and systemic inflammation and immune dysregulation biomarkers. It was found that elevated PF4 levels were significantly correlated with longer mechanical ventilation (Spearman's $\rho = -0.146$, $p < 0.012$) and extended ICU stay (Spearman's $\rho = -0.144$, $p < 0.013$). Furthermore, PF4 levels were significantly lower in non-survivors (4,040 IQR 1,730-10,284) compared to survivors (7,963 IQR 2,437-16,835; $p < 0.03$), underscoring its potential as a negative prognostic marker. PF4 was also positively correlated with PAI1, P-Selectin, and platelets, while showing negative correlations with inflammatory biomarkers such as IL-6, IL-8, ANG2, TM, TREM1, ICAM1, and TNFR1. Overall, PF4 levels are significantly lower among non-survivors and patients requiring prolonged mechanical ventilation or extended ICU hospitalization. The strength of correlations between PF4 and other biomarkers suggests that it plays an integral role in the inflammatory and coagulation cascades associated with severe illness. Identifying biomarkers that reflect the complex pathophysiology of pediatric respiratory failure is crucial in improving prognostic accuracy and therapeutic strategies for this vulnerable population.

Jason Zhang

NC - North Carolina State University

Discipline: Engineering

Authors:

#1 Vivian Mota

#2 Kyla Bosh

#3 Katherine Saul

#4 Jacqueline Cole

Abstract Name: Evaluating Cartilage Degeneration And Glenohumeral Joint Alterations After Brachial Plexus Birth Injury

Brachial plexus birth injury (BPBI), occurring in 1-3 of every 1,000 births, is a neuromuscular injury caused during childbirth, leading to muscle paralysis, shoulder contracture, and deformities in the scapula and humerus. Previous rodent studies have documented changes in glenoid development after BPBI (both nerve rupture and avulsion), but the timing of alterations, particularly cartilage degeneration and glenohumeral joint macrostructure, remains unclear. This study aims to characterize these changes over time, focusing on cartilage degeneration and structural alterations in the glenohumeral joint. We hypothesize that the postganglionic injury group will have the largest macrostructural changes, detectable as early as 4 weeks post-surgery. Sprague Dawley rats ($n = 245$) underwent surgery at 3-6 days postnatally, with postganglionic neurectomy (mimicking nerve rupture), preganglionic neurectomy (mimicking nerve avulsion), sham injury, or elbow disarticulation (limb disuse). Rats were euthanized at 2, 3, 4, 8, and 16 weeks post-surgery, and the humeri and scapulae from both injured and uninjured limbs were harvested. Micro-computed tomography scans of the scapula and humeral head were reconstructed, and macrostructural parameters, including curvature and angle measurements, were analyzed using Materialise Mimics. Statistical comparisons between groups were performed using a Kruskal-Wallis test (GraphPad Prism, $\alpha = 0.05$). Preliminary findings reveal that the disarticulation group's injured limb showed a significant decrease in the glenoid inclination angle—a

key macrostructure joint measurement—compared to a healthy shoulder at all time points, followed by preganglionic, postganglionic, and sham groups. Increased glenoid inclination angle reduces joint stability and increases the likelihood of additional shoulder dysfunction. Alterations in glenoid macrostructure and early cartilage degeneration were detectable as early as 4 weeks following disarticulation injury. These findings provide critical insight into the timing and mechanisms underlying cartilage degeneration and joint alterations, informing optimal clinical intervention timing in BPBI to improve outcomes for affected individuals.

Paul Zhang

CA - University of California - Los Angeles

Discipline: Computer Science

Authors:

#1 Remy Wang

Abstract Name: Destructive E-Graph Rewrites

Traditional program optimization suffer from the phase ordering problem: Optimization performance is dependent upon the order of program rewrites. Once a rewrite occurs, the initial program cannot be easily recovered. E-graphs can efficiently represent many different, equivalent programs—enabling non-destructive rewrites, where the initial term is retained in the e-graph, in a process known as equality saturation. However, e-graph size tends to explode with certain rewrite rules. For example, associativity and commutativity can result in an exponentially growing e-graph. This limits the practicality of e-graph driven optimization because the time complexity of equality saturation is linearly dependent on e-graph size. The compiler backend Canelift uses a modified version of e-graphs termed "acyclic e-graphs," where production-grade performance is achieved at the cost of acyclicity and limit the expressivity of rewrites. We introduce destructive e-graph rewrites, where the e-graph size can be reduced during equality saturation by undoing rewrites. Given a rewrite $L \rightarrow R$, undoing it involves finding all programs matching R and removing them from the e-graph. In the egg e-graph library, destructive rewrites speed up some benchmarks by 5x and improve with larger e-graphs. We are currently applying destructive rewrites in Herbie, a project to optimize floating point expressions that uses e-graphs during its optimization workflow. Destructive rewrites remove intermediate programs from the e-graph—an optimal program may be reached through multiple intermediate rewrites that produce intermediate programs. Once the optimal program is added to the e-graph, the intermediate programs can be removed.

Dantong Zhang

WI - University of Wisconsin-Eau Claire

Discipline: Business

Authors:

#1 Dantong Zhang

#2 Keyan Yao

Keyan Yao

Abstract Name: Empowering Export Growth: Cross-Border E-Commerce for SMEs in Developing Countries

This study aims to examine how small and medium-sized enterprises (SMEs) in developing countries can leverage cross-border e-commerce to enhance their export performance, with particular attention to the roles

of internet infrastructure, government policy environment, and competitive advantages. While existing research has extensively explored e-commerce's impact on large enterprises in developed economies, limited attention has been paid to SMEs in developing countries and the external factors affecting their e-commerce success. Drawing from the Resource-Based View (RBV) theory, we propose a conceptual model investigating the relationship between cross-border e-commerce participation and export growth, moderated by government policies and mediated by customer coverage rate. The study will collect data from SMEs engaged in cross-border e-commerce across multiple developing countries through surveys and secondary data sources. Our research methodology will employ structural equation modeling to test four hypotheses: (1) higher e-commerce participation leads to increased export growth, (2) better internet infrastructure enhances export performance, (3) improved customer coverage through e-commerce drives export growth, and (4) favorable government policies positively moderate the e-commerce-export relationship. The expected findings will contribute to both theory and practice by illuminating how developing country SMEs can effectively utilize cross-border e-commerce platforms and external resources to overcome traditional trade barriers. This research will provide valuable insights for policymakers developing e-commerce infrastructure and regulatory frameworks, while offering practical guidance for SMEs seeking to expand their international market presence.

Fatima Zhantibiyeva

PA - Duquesne University

Discipline: Philosophy, Ethics, and Religious Studies

Authors:

Abstract Name: AI vs AI: Can Machines Learn to Unlearn Translation Biases Like Humans?

AI vs AI: Can Machines Learn to Unlearn Translation Biases Like Humans? Fatima Zhantibiyeva^{1 2}
Department of Mathematics and Computer Science¹, Grefenstette Center for Ethics in Science, Technology, and Law², Duquesne University
Machine translation (MT) systems—computational systems for translating text from one language to another—are essential tools for communication, yet they often perpetuate cultural and linguistic biases in their training data. These biases undermine fairness, lead to misinterpretations, and weaken trust in AI systems. In this project, I investigate the root causes of translation biases in AI-based MT systems and assess methods for mitigating these biases, focusing on the effectiveness of two specific approaches: domain adaptation and data debiasing. Through a review of academic literature, I identified key sources of bias in MT systems, including limited diversity in datasets, lack of cultural and contextual understanding, and algorithmic biases from training data. I compared two primary debiasing approaches for these issues: data debiasing, which modifies datasets to reduce bias before training, and domain adaptation, which fine-tunes models post-training. While both approaches have their benefits, my analysis suggests domain adaptation is more advantageous for MT systems because it efficiently reuses existing biased datasets and offers scalable solutions for improving fairness without the need for retraining models from scratch. These findings suggest a path forward for developing more equitable AI-based MT systems. Future research will delve into refining domain adaptation techniques and exploring the adaptability of MT systems compared to human translators in unlearning biases. By addressing these challenges, I aim to advance AI's capacity for accurate, culturally sensitive, and ethical translation practices.

Alivia Zhao

WA - Seattle University

Discipline: Computer Science

Authors:

Abstract Name: Assessing Urban Walkability Using Deep Learning Approaches: Large Language Models and Contrastive-Language Image Pretraining

Existing assessments of walkability in urban areas often lack efficiency and accuracy. This research introduces an automated framework that combines deep learning techniques with geographic data to evaluate walkability and recommend optimal pedestrian routes. OpenAI's Contrastive-Language Image Pretraining (CLIP) and GPT-4o models were trained on 21,097 Google Street View Images (SVIs) of Seattle. These images, paired with descriptive prompts on sidewalks, intersections, traffic conditions, accessibility, comfort, and points of interest, were used to generate walkability scores. A survey of respondents rating 100 SVIs demonstrated that GPT-4o scores aligned more closely with human evaluations than CLIP scores. Walkability scores were mapped to Seattle's road networks, comprising of 11,659 nodes and 37,796 segments, using OpenStreetMap Network API. Road segment scores were calculated as the average walkability of associated SVIs, and path scores were determined by aggregating segment scores between specified origin and destination points. An enhanced Dijkstra's algorithm incorporating a shortest loopless path method identified the best walkable routes. Two penalty functions, accounting for altitude changes and slope degrees, refined path rankings to prioritize pedestrian accessibility and comfort. Future work includes integrating construction data from Seattle to penalize obstructed paths, employing a multi-objective A* algorithm to optimize paths based on distance, elevation, and accessibility, and generalizing the framework across diverse urban settings. Our research raises awareness of street quality for pedestrians, which supports safer navigation and fosters greater community engagement.

Jennifer Zheng

NV - University of Nevada - Las Vegas

Discipline: Biology

Authors:

#1 Hayley Ho

#2 Tyrell Pratt

#3 Alice Lee

#4 Jingchun Chen

Faria Tavecchi

Abstract Name: Microglia and Oligodendrocyte-specific Genes are Significantly Associated with Alzheimer's Disease by Gene-based Polygenic Risk Score Analysis

Alzheimer's Disease (AD) is a progressive neurodegenerative disorder with a high heritability, but the exact genetic risk factors are not fully understood, especially at a cell-type-specific level. Recently, glial cells in the brain—microglia, astrocytes, and oligodendrocytes—are shown to be involved in AD development. This study aims to identify any glial cell-specific genes associated with AD. Lists of genes across three glial cells were obtained from a previous study. Gene-based polygenic risk scores (PRS) were constructed by PRSet software in AD cases/controls for each gene within three glial cell types, based on a previous GWAS study. Next, gene-based PRSs were evaluated in discovery data adjusted by the top two principal components (Model 1). A replication was followed in independent data for those genes with p -value ≤ 0.05 in the discovery data. Then, a meta-analysis was performed when the signals in both datasets were consistent. The association was further evaluated by adjusting with additional covariates, including age, sex, and APOE $\epsilon 4$ count (Model 2). Significance was determined by Bonferroni corrections (at $\alpha = 0.05$). Two microglia-specific genes (BCL-3 and RELB) were significantly associated with AD in Model 1, OR = 1.145[1.090-1.202], p -value = 5.26×10^{-8} for BCL-3, and OR = 1.149[1.094-1.206], p -value = 2.84×10^{-8} for RELB. However, neither reached significance in Model 2. One oligodendrocyte-specific gene (BIN1) was

significantly associated with AD in both models with similar results as $OR = 1.103[1.051-1.157]$, $p\text{-value} = 6.84 \times 10^{-8}$ in Model 1. None of the astrocyte-specific genes were significantly associated with AD. Two microglia-specific genes (BCL-3 and RELB) and one oligodendrocyte-specific gene (BIN1) are significantly associated with AD, inferring the distinct roles of glial cells in AD. Further study of those genes has the potential to provide more insights into the complex biological mechanisms and targets for the disease.

Enson Zheng

WI - University of Wisconsin-Madison

Discipline: Engineering

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Abstract Name: SteMy-AI : Advancing Stem Cell and Regenerative Medicine with AI-Driven Lab Assistant Robots

Artificial intelligence and robotics are increasingly employed across various fields, yet their application in laboratories, particularly in the cultivation of stem cells, remains underexplored. Significant advances have been made in generating diverse cell types from human pluripotent stem cells (hPSCs), offering a potentially limitless supply for research and therapeutic applications. However, these differentiation processes are time-sensitive, inflexible, and challenging to manage. The SteMy project seeks to introduce an innovative AI-powered robotic companion designed to assist in stem cell culture, with the goal of accelerating research outcomes, improving culture quality, and streamlining cell line management. The project team engaged with expert investigators in stem cell biology, differentiation, and human-robot interactions to identify key challenges, define essential functionalities, and methods of implementation through co-design, workshops and interviews. During the initial phase, critical design guidelines were established, including cell line scheduling assistance, maintenance support, and improvements in lab communication. AI-prompt engineering was initiated to design effective AI-human interactions that address these challenges. Future work will focus on finalizing the design guidelines, prototyping the SteMy robot, and optimizing and testing its functionalities to enhance its application in stem cell research.

Wilson Zheng

CA - University of California - Los Angeles

Discipline: Biology

Authors:

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#2 Carlos Galván

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Abstract Name: Exploring the Metabolic Flexibility of Stem-Cell-Derived Squamous Cell Carcinomas via Pharmacological Inhibitors

Squamous cell carcinomas (SCCs) are a common form of non-melanoma skin cancer, posing a significant health burden due to their invasive nature and metastatic potential. SCCs originating in the head and neck regions are particularly associated with increased morbidity and mortality following surgery. Understanding SCC tumor evolution is critical for advancing preventative and therapeutic strategies. The Lowry Lab identified hair follicle stem cells (HFSCs) as the cell of origin for SCCs, revealing their metabolic flexibility in utilizing alternative carbon sources for growth. Although SCCs predominantly rely on the Warburg effect for lactate production via anaerobic glycolysis, deleting lactate dehydrogenase (LDHA) in HFSCs does not impede tumor progression. Instead, SCCs adapt by activating glutaminolysis, where glutamine is metabolized via glutaminase (GLS) to fuel the TCA cycle, implicating glutamine metabolism as a compensatory pathway. This study investigates whether dual inhibition of glycolysis and glutaminolysis suppresses SCC initiation and progression. Using K15CrePR mice, GLS and LDHA were genetically deleted in HFSCs (GLSKO/LDHAKO), and tumorigenesis was induced through DMBA/TPA chemical carcinogenesis. While single knockouts of GLS or LDHA led to SCC formation via compensatory pathways, dual knockout (GLSKO/LDHAKO) prevented SCC development. Elevated nutrient uptake in single knockouts prompted the exploration of nutrient transporters as additional therapeutic targets. To pharmacologically recapitulate these findings, small-molecule inhibitors of GLS (Telaglenastat, CB839), LDHA (GSK2837808A), glutamine transporters (V-9302), and lactate transporters (AZD0095) were evaluated. Early studies confirmed their effectiveness in penetrating the skin and inhibiting their targets. Preliminary results from combined GLS and LDHA pharmacological inhibition demonstrated delayed SCC formation and progression. This work provides insight into SCC tumorigenesis and offers a translational framework for developing combinatorial metabolic therapies to treat SCCs and other cancers.

Kevin Zheng

MN - Minnesota State University - Mankato

Discipline: Biochemistry

Authors:

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Abstract Name: Glypican levels effects on temozolomide (TMZ) treatment in Glioblastoma Multiforme

Glioblastoma multiforme (GBM), is a form of brain cancer characterized by its aggressive tumor growth and low patient survival rate. GBM patients have limited treatment options and typical treatments like radiation and surgical removal are challenging due to the unique aggressiveness of GBM tumors. Chemotherapy regimens mainly consist of utilizing the drug temozolomide (TMZ) in combination with radiation and or surgical invention. Currently, TMZ is the standard of care chemotherapeutic treatment for GBM patients. Once TMZ is delivered into the tumor cell, the drug targets DNA and causes DNA damage that results in cell death and prevents cell division. Though initially effective, GBM tumor cells can develop resistance and even, in some cases, have minimal response to TMZ treatment. In this research project, we investigate the impact of extracellular proteins attached to the cellular membrane known as glypicans on GBM tumors treated with or without TMZ. We hypothesized that the high levels of glypicans on GBM cell surfaces could increase TMZ resistance in tumor cells. Understanding glypicans and their role in TMZ resistance is important for improving GBM survival rates and treatment options.

Paula Zhong

WA - University of Washington - Seattle

Discipline: Interdisciplinary

Authors:

#1 Paula Zhong

Abstract Name: Entangled timelines: Memories and Futures of the More-than-human-world

Human concepts of time are malleable and everchanging. Neither visible nor tangible, yet time can dictate our behaviours and thinking so strongly. Sometimes referred to as “time’s arrow”, and other times, a “cycle”. If it's already so complicated for humans, what about all the other bits of the world-- everything else that exists together with us? What do concepts of time look like in the more-than-human world? Timelines crash, as interconnected lives have unlike flowing of time. How will differing perceptions of time direct life by impacting priorities, desires, and experiences through a lifespan? My project aims to look at this question through imaginative exercise by short film animation. From mountains, to mosquitos and bodies of water, it is important to explore how memories of pasts and futures are perceived in the more-than-human world. To recognize that all the life around us experiences temporality and grief, is to recognize ethical and political accountability and responsibility. Everything that touches is connected (not just physical touch, but the other senses as well, like sight and smell). Although our human clocks are loud in the face of urgency and looming deadlines, if we begin to consider the perspectives of the more-than-human world that is an entangled mix of differing timelines, then we might just view our relationship with not only time, but also with the more-than-human-world in a new light. For instance, a mountain's life in comparison to that of a human's is colossal. To become a mountain--just for a moment in imagination--will require a shift in temporality from decades to millennia. Perhaps changing our definitions and scope of time will allow for new connections in human thinking.

Wenqi Zhou

PA - Duquesne University

Discipline:

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#1 Congcong Li

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Abstract Name: Mentoring Business Students in Research: An Immersive Approach

This research summarizes our immersive approach to mentoring undergraduate business students in conducting research, an area where opportunities are often limited compared to disciplines like nursing or the sciences. As business faculty members, we have successfully guided students through the research process by fostering an environment that emphasizes engagement, mentorship, and real-world applications. Our approach immerses students in research through four key steps. First, we establish strong connections with students through an open and supportive classroom atmosphere, complemented by career-related mentorship programs. For instance, one co-author leads a program that connects students with local professionals, creating an enriching network that helps students feel confident in facing challenges with faculty support. Second, in the classroom, we incorporate timely and relevant topics, such as generative AI and the Silicon Valley Bank collapse, to stimulate students' interest and encourage exploration beyond the syllabus. Third, we provide tailored guidance through a Call for Papers, offering potential research topics related to course material, and carefully select students or groups for research projects. Given that many business students have

little or no prior research experience, we organize regular meetings to ensure students remain on track with their research design and implementation plans. Fourth, we motivate students to present their findings at on-campus undergraduate research symposiums and regional conferences, fostering both professional growth and academic confidence. Our approach has resulted in increased student engagement with research, improved critical thinking skills, and greater academic opportunities for business undergraduates. In addition, we discuss the obstacles and lessons learned in our experiences, offering insights for other business faculty members interested in fostering research opportunities within their own programs.

Michael Zhou

PA - Carnegie Mellon University

Discipline: Mathematics

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Nelitha Kulasiri

Henry Siegel

Abstract Name: Mathematical Modeling of Micromagnetics

This research project investigates micromagnetics -- a theoretical framework developed by W.F. Brown, to describe the macroscopic behaviour of magnetic materials. A central concept in micromagnetics is the minimization of the magnetic energy within a material. The primary concepts used in this research were that of Absolutely Continuous Functions, Sobolev Spaces, and Gamma Convergence, as well as other ideas from analysis and measure theory such as Taylor's formulas. In this project we looked at the one dimensional variant of the energy equation developed by Brown. We analyzed several cases of the energy equation with different parameters and we constructed a sequence of functions which minimized the energy equation for each case. We studied this equation using gamma convergence and constructions of sequences of functions. We then analyzed the second order gamma limit of this energy equation. For two specific instances of the energy function we were able to explicitly solve for this gamma limit in terms of a differential equation. We were able to construct the sequence of functions which minimize the energy equation for both a specific potential energy function and a generalized potential energy function. Furthermore we characterized the speed at which these functions converge. The constructions we found could be applied to future analysis of magnetic materials and provide a framework for investigating the energy equation in higher dimensions.

Sophia Zhou

KY - University of Kentucky

Discipline: Biology

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#1 Mike Darrington

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Abstract Name: Temperature influence on the efficacy of RNAi in Colorado potato beetle

In recent years, RNA interference (RNAi), an innate antiviral immune response in most eukaryotes, has emerged as a transformative technology in therapeutics and agriculture. As extreme weather events and rising

global temperatures become more frequent, it is increasingly relevant to explore how temperature affects RNAi-based pest control strategies. In this study, we focus on the impact of temperature on RNAi efficacy in the Colorado potato beetle, *Leptinotarsa decemlineata*, one of the most devastating insect pests in the world. Through feeding assays, we found that the uptake of dsRNA was reduced at lower temperatures. To ensure a precise and direct delivery of double-stranded RNA (dsRNA) into the target insect, we elected injection rather than ingestion for the oral delivery. Based on our preliminary data and existing literature, we hypothesized that RNAi is more effective at physiologically relevant elevated temperatures. To test this hypothesis, we undertook the following steps: 1) identified temperature-sensitive gene candidates, 2) injected dsRNAs synthesized in vitro from the gene candidates into *L. decemlineata* larvae, 3) subjected the treated larvae to a temperature gradient and monitored their survival, and finally, 4) evaluated the influence of temperature on RNAi efficacy. The combined results support our overarching hypothesis. A better understanding of the temperature dependency of RNAi will not only facilitate the development of more resilient RNAi-based biopesticides, but also help optimize its application across different climates and seasons, ensuring reliable pest management under varying environmental conditions and sustainable implementation of RNAi in agriculture.

Natasha Zias

PA - Pennsylvania State University

Discipline: Computer Science

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Abstract Name: Bridging the Cybersecurity Gap for Non-Profits in Pennsylvania: Student Reflections on Website Development for Sharing Research Findings

Cybersecurity has become a growing concern for organizations of all sizes and sectors. Smaller non-profits, especially in rural communities, often face distinct challenges addressing these concerns due to limited budgets, minimal technical expertise, and restricted access to advanced security infrastructure which can leave them vulnerable to cyberattacks. Faculty and student researchers at several Penn State campuses will conduct a formal assessment of the cybersecurity posture of non-profits in Pennsylvania to help bridge this cybersecurity gap using a comprehensive assessment tool. We will recommend core “best practices” to enhance the security posture of non-profits who lack the necessary resources. A website will also be published to serve as a focal point for sharing our research results and practical resources. It will include an About page that outlines our mission to help non-profits safeguard their operations. The Interest Form page offers a QR code to invite them to participate in our cybersecurity assessment. The Methodology page explains the assessment process and its benefits. The Research Team Profiles page highlights the dedicated professors and student researchers leading this initiative. Finally, the Contact page provides an avenue for non-profits to connect with the research team for additional information. Despite having no prior experience in web development, the team built the website through faculty guidance, self-taught methods, and persistent trial-and-error. Not only has this process equipped the team with new technical skills, but it has also ensured the creation of an impactful resource for this initiative. This website will expand beyond the current initiative to support ongoing research beyond Pennsylvania non-profits. By making these resources available online, our goal is to empower nonprofits across Pennsylvania to take informed steps toward better cybersecurity readiness and to safeguard their operations.

Ryan Ziegler

MD - Loyola University Maryland

Discipline: Engineering

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Abstract Name: Evaluation of Simultaneous Localization and Mapping (SLAM) for Static and Dynamic Environments: Establishing a Benchmark in Autonomous Mobile Robotics Research

The Simultaneous Localization and Mapping (SLAM) problem within the robotics industry poses a causality dilemma because of SLAM's objective of "simultaneously" localizing and mapping a given environment. Modern mobile robots equipped with Robot Operating System (ROS) can easily autonomously navigate using SLAM and path planning. Current SLAM development has proved effective in static environments; however, SLAM's performance in dynamic environments presents a challenge and requires further enhancement. A TurtleBot4 mobile robot running SLAM Toolbox on ROS 2 outfitted with a Light Detection and Ranging (LiDAR) device was used to conduct mapping and autonomous navigation trials. Testbeds for a dynamic environment were developed, and the behavior of a TurtleBot4 using SLAM and an embedded autonomous navigation algorithm, Nav2, was analyzed. The dynamic environments were built by implementing a VEX robot and an ArcBotics Sparki Bot to serve as repeatable dynamic obstacles. These experimental results provided valuable insight into the decision-making process of the Nav2 autonomous navigation algorithm when exposed to dynamic obstacles, showcasing the accuracy and efficiency of the TurtleBot4's autonomous navigation. The TurtleBot4's behavior can be refined for a given dynamic environment by tuning the Nav2 parameters. Nav2's inflation and velocity sample parameters were tuned to test the limits of the TurtleBot4's dynamic obstacle avoidance. Looking ahead, we plan on implementing essential performance improvements to the Nav2 algorithm to refine its path planning and obstacle avoidance capabilities in dynamic environments.

Lexi Zimmerman

OK - University of Central Oklahoma

Discipline: Psychology

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Abstract Name: Mirror-Touch Synesthesia: Do You Feel What I Feel?

Mirror-touch synesthesia (MTS) occurs when a person experiences the sensation of touch on their own body when observing another person being touched. Researchers estimate that approximately 1.6% of the population has MTS, making it one of the more common types of synesthesia (Banissy et al., 2009). The motivation for this project is to explore the relationship between MTS, empathy, and the ability to identify facial expressions. Individuals with MTS may have heightened abilities in both of these domains, but research evidence is mixed (e.g., Banissy & Ward, 2007; Baron-Cohen et al., 2016). We will use validated measures of MTS (Ward et al., 2018), empathy (Muncer & Ling, 2006), and facial expression recognition (Passarelli et al., 2018) to clarify the relationship between these variables, while also expanding to the unexplored area of animal touch. It is not yet known whether observing touch to animals elicits the mirror-touch phenomenon, as prior work on MTS has been limited to observing touch to humans and inanimate objects. Participants will complete an online survey in which they will be asked to identify any vicariously felt tactile experiences while viewing videos of touch to humans, animals, and inanimate objects (Ward et al., 2018). They will also complete the Empathy Quotient (Muncer & Ling, 2006) and Facial Expression Recognition Test (Passarelli et al., 2018). Consistent with prior research, we expect to find positive correlations between the degree of MTS, empathy, and facial expression recognition ability. We

predict that the novel domain of animal touch will elicit MTS experiences that fall between those felt when observing touch to humans versus inanimate objects.

Rei Zimmerman

LA - Louisiana State University

Discipline: Gender, Ethnicity, Diversity, or Cultural Studies

Authors:

Abstract Name: Flowers and Femininity: Sex, Women, and the Botanical Sciences

This paper explores the discovery and developmental understanding of plant sexuality, sex, and gender roles during the 17th, 18th, and 19th centuries, emphasizing key botanical works and their social implications. It highlights the importance of scientific botanical works including that of the so-called “Father of Botany” is Theophrastus of Eressus, Nehemiah Grew’s *The Anatomy of Plants* (1676), Carl Linneaus’ *Systema Naturae* (1758), and Charles Darwin’s *The Descent of Man, and Selection Related to Sex* (1871). Additionally, the roles of Enlightenment thinking, female education, and changing perceptions of gender roles both in the public and private spheres. The role of female botanical illustrators has been well documented and gained more appreciation and recognition for their contributions to the field of the botanical sciences. However, the botanical sciences’ effects on human understandings of sexuality and the gender roles and societal changes which came from these revelations is not so often studied. In this paper I cover the change in modes of speaking about sexuality, effects on the education of women and children, gender roles and choosing of life and reproductive partners, the ways in which women used these new concepts in floriculture such as the Victorian Language of the flowers, and the representational nature of plants by women and society: art, literature, poetry, botanical illustration. The evolving discourse on human and plant sexuality illustrates both the challenging and reinforcing of gender norms, contributing to a broader understanding of gender and sexuality in society.

Abigail Zimmerman

PA - University of Pittsburgh

Discipline: Interdisciplinary

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Stephen Grenesko

Abstract Name: Integrated Digital Workflows for Efficient Prosthetic Manufacturing

Background: While additive manufacturing has advanced prosthetic development capabilities, current methodologies lack systematic integration across the development pipeline. This fragmented approach leads to unnecessary iterations, material waste, and inconsistent outcomes, particularly when incorporating electronic components. Clinical workflows often involve redundant steps between measurement and final

fitting, creating inefficiencies that impact both practitioners and patients. Methods: This research proposes a unified digital workflow integrating high-resolution scanning (Artec Leo, $\pm 0.1\text{mm}$), AR-guided design modification, and standardized hardware configurations with Arduino integration. The methodology employs a Unity-based visualization system with modular socket design templates that adapt to custom scanned limb data. The framework streamlines the process from initial scanning through design modification to additive manufacturing. System validation will assess technical efficiency through scanning-to-print time and iteration reduction compared to traditional processes. Results: The integrated workflow aims to demonstrate feasibility of a streamlined process linking scanning directly to fabrication through standardized base models and modification procedures. By unifying previously disconnected processes, this approach seeks to establish a systematic methodology for reducing iterations between scanning, design, and final production. Conclusion: This research addresses fundamental workflow inefficiencies in prosthetic development by establishing and validating a standardized digital pipeline. The framework provides a technical foundation for advancing prosthetic manufacturing while maintaining necessary customization capabilities.

Ashley Zingillioglu

NJ - Monmouth University

Discipline: Education

Authors:

Abstract Name: Development and Demo of "Talking with My Classmates": An Interactive Social Story for Students with Autism

Middle/high-school students with autism spectrum disorder, specifically levels one and two, exhibit social communication deficits that impede their ability to build interpersonal relationships in classroom settings. Such students may hesitate to apply those skills because they may fear the negative effects of unintentionally poor social choices. A safe and playful alternative is socialization through an interactive social story (ISS). The presentation will overview my ISS's development, from script with narration and dialogue, to a wireframe diagram, to coding with the JavaScript library p5.js and the text-to-image AI service Midjourney. The presentation will focus on a demonstration of a working prototype. The prototype will encourage socialization through teaching four social skills: identifying appropriate conversation topics, choosing appropriate responses, conversing, and staying on topic. The prototype is set in a special education classroom. The narrator initiates the first social skill simply: "Pick a classroom topic to discuss with your classmate." The player engages in a brief simulated dialogue about the skill with a classmate character. Then the narrator poses a multiple-choice question. If in response the player chooses the correct answer, the narrator and classmate provide positive reinforcement. Otherwise, the narrator encourages the player to try again until the player chooses the correct answer. This process repeats for the three other skills. We hypothesize that after playing the prototype, players will improve in all four classroom social skills in direct proportion to the number of skills and number of times they play.

Robert Zita

IL - Elmhurst University

Discipline: Computer Science

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Abstract Name: Understanding and Predicting Conversational Toxicity on GitHub

Open-source software projects thrive on the involvement and contributions of individuals from different backgrounds. However, toxic language and negative interactions can hinder the participation and retention of contributors and alienate newcomers. This study aims to understand and predict conversational derailment leading to toxicity on GitHub. By analyzing issues and pull requests that contain toxicity, we explore the characteristics of toxic conversations, including tone-bearing discussion features, discourse elements, and the timing and participation of developers vs. users. We focus on derailment points in GitHub conversations, which are critical moments in discussions where they begin to turn unproductive and toxic. Among other findings from our study, we observe that derailment point comments often contain discourse elements like second person pronouns, negation terms, and tones of Bitter Frustration and Impatience. Based on these empirical observations, we propose a proactive moderation approach to automatically detect and address potentially harmful conversations before escalation. By using LLMs (large language models) via prompting, we develop a conversation trajectory summary technique that captures the evolution of discussions and identifies early signs of derailment. Our experiments demonstrate that prompts tailored to provide summaries of GitHub conversations achieve 76.67% accuracy in predicting conversational derailment, strongly improving over a set of baseline approaches. This method of generating conversation summaries provides an important advancement in LLM-based proactive moderation of open-source software platforms.

Carter Zivin

PA - Carnegie Mellon University

Discipline: Biology

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#1 Morgan Merril

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Abstract Name: Non-genotoxic anthracyclines as a promising strategy in osteosarcoma treatment

Osteosarcoma is the most common type of bone cancer in adolescents and young adults. All patients are treated with anthracycline-containing chemotherapy regimens, and treatment response dictates prognosis. Though genotoxic agents are a mainstay of treatment, addition of highly DNA-damaging agents such as etoposide or radiation to current regimens has failed to improve outcomes. This suggests that DNA damage response-independent mechanisms may mediate the effects of doxorubicin. Here we explore in vitro efficacy of anthracycline variants that lack genotoxicity and instead perturb epigenomic phenomena, dimethyl-doxorubicin and aclarubicin, as possible alternatives for doxorubicin in osteosarcoma treatment. In patient derived cell lines, we found that cell viability at 2hr and 72hr with these two agents was similar to doxorubicin. We evaluated levels of DNA damage via amount of H2A.x, and apoptosis with cleaved PARP demonstrating that dimethyl-doxorubicin induces lower levels of DNA damage than doxorubicin at each time point. Murine studies show that dimethyl-doxorubicin can be dosed much higher than doxorubicin without incurring toxicity. We conclude that non-genotoxic anthracyclines are a promising strategy in osteosarcoma.

Lauren Zorovic

MA - Bridgewater State University

Discipline: Education

Authors:

Abstract Name: Their Story: Unveiling the Truth

In recent decades, the United States education system has shown favoritism for white students over black, indigenous, and people of color (BIPOC) students, particularly in history lessons for grades k-2. Despite public school populations becoming more diverse, BIPOC students have not, or were less likely to, see their race in history lessons due to some lawmakers thinking implementing BIPOC history will take away white people's history in lessons. The purpose of this research was to create a website that gave teachers access to positive and manageable ways to implement more racial perspectives into their history lessons without taking away the white perspective. This research utilized the evidence-based practices from books and online resources, which all promoted implementing more races into our history lessons. The knowledge gained from that went to writing the literature review portion of the project, which guided the lesson plans and resources for the website. The results of this work demonstrated that implementing more races into history lessons can be positive and add to the history stories that children learn about. Results also showed that all teachers can benefit from this work because of learning more about their students' backgrounds, which can help them be better teachers.

Huiyan Zou

PA - Lafayette College

Discipline: Mathematics

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#2 Allison Lewis

Abstract Name: The Pitfalls of Global Sensitivity Analysis: Exploring Local Variability Using Active Subspaces

Complex mathematical models provide a comprehensive representation of real-world phenomena but may present challenges for model calibration, identifiability analysis, and sensitivity analysis due to their high-dimensional parameter spaces and computational complexity. The use of active subspaces—a dimension reduction technique—enables us to bridge the gap between limited resources and model complexity by identifying the linear combinations of key parameters that most significantly impact model behavior. As such, active subspaces may be used for sensitivity analysis, which attempts to quantify the impact of each input parameter on the model output. However, this study reveals that global sensitivity metrics derived from active subspaces can be misleading, particularly when local sensitivities vary significantly across the parameter space. To quantify the discrepancies, we use two different metrics representing subspace- and subset-based approaches. For the subspace-based approach, we measure the distances between globally and locally determined active subspaces. On the contrary, for the subset-based approach, we calculate activity scores on both global and local scales, which can be used to rank the original parameters in terms of their influence on the model output. Our results demonstrate that local sensitivity metrics often provide active subspaces and parameter rankings that differ from the ones computed globally, capturing regionally distinctive behaviors that global metrics may overlook. This study offers a cautionary perspective on relying solely on global metrics for conducting sensitivity analysis that may have downstream impacts on tasks such as model calibration. Additionally, we propose guidelines for a more accurate parameter space exploration and ensuing sensitivity analysis.

Gabriella Zuccon Sindicic

PA - Pennsylvania State University

Discipline: Biochemistry

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Abstract Name: X-Ray Crystallographic Characterization of Non-Heme Diiron Enzymes

Enzymes are catalytic proteins that perform a wide range of biological functions. Non-heme diiron enzymes are a subset containing two iron ions in the active site, that are not bound to a porphyrin ring. Within the “non-heme diiron” classification, enzyme ‘families’ exist, and two such families are the Ferritin Diiron Oxygenases (FDOs) and the Heme-Oxygenase-Like Diiron Oxygenases (HDOs). The protein structures of these two families differ notably in their binding of the diiron co-factor: the FDO architecture consists of eight alpha-helices, of which four contribute amino acid ligands that coordinate the irons. In contrast, the HDO architecture consists of seven alpha-helices, of which three contribute ligands to coordinate the irons. While the general motifs are known, specific protein structures for many FDOs and HDOs remain uncharacterized. Here, we explore the structures of the N-oxygenase HrmI, an HDO, and the hydrazone N-oxidoreductase Dob3, an FDO, using X-ray crystallography. We have successfully obtained structural data for apo, mono-iron, reduced diiron, oxidized diiron, and substrate-bound states for HrmI. These structures show that the HrmI active site is highly dynamic and undergoes conformational changes that depend on the nuclearity and oxidation state of the cofactor. Dob3 is in the optimization phase with promising crystals, diffracting to around 7-10 Å. By solving the structures of HrmI and Dob3, we will compare the distinct protein structures of an HDO and FDO that both perform N-oxidation reactions. We expect these results to aid in understanding how conformational changes affect the mechanisms and biological function of HrmI and Dob3.