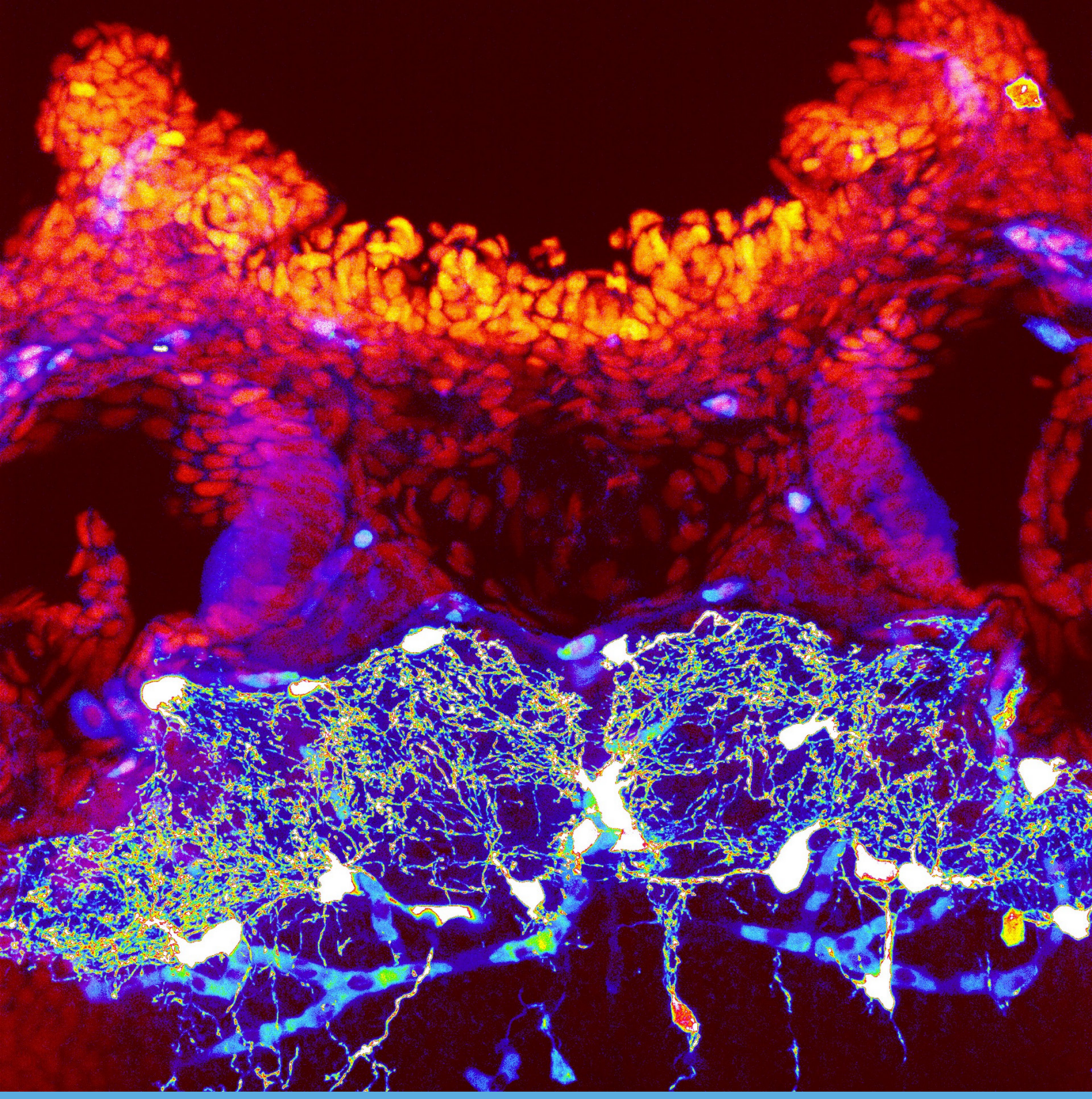

FLORIDA ATLANTIC UNIVERSITY

Undergraduate
Research and Inquiry

16TH ANNUAL
UNDERGRADUATE RESEARCH SYMPOSIUM

APRIL 3, 2026

Welcome

Welcome to the *16th Annual Undergraduate Research Symposium*, which showcases undergraduate students at FAU who are engaged in research, scholarship and creative activities. Students present their findings through poster or visual and oral or performing arts presentations, and represent all disciplines, all colleges, and all campuses of FAU.

Few activities are as rewarding intellectually as research and inquiry. In addition to the acquisition of invaluable research skills, students learn how knowledge is created and how that knowledge can be overturned with new evidence or new perspectives. Such scholarly activities engage students in working independently, overcoming obstacles, and learning the importance of ethics and personal conduct in the research process.

Again, this year we are pleased to offer cash awards for first place oral winners in all categories, thanks to the generous donation of Dr. Eric H. Shaw, Emeritus Professor, College of Business. We are grateful to Dr. Shaw's support of the Undergraduate Research initiative and our student scholars.

The Office of Undergraduate Research and Inquiry (OURI) serves as a centralized support office of faculty and students who are engaged in undergraduate research and inquiry across all colleges and campuses. We offer and support university wide programs such as undergraduate research grants, annual undergraduate research symposia, undergraduate research journals, and the undergraduate research certificate, and collaborate with the Learning Environment and Academic Research Network Program (L.E.A.R.N.), Prestigious Fellowships, and Vertically Integrated Projects (V.I.P.) program in support of research and scholarship at FAU.

For more information on how OURI can help you, please visit our website at www.fau.edu/ouri

Special Thanks To:

The late Dr. Eric H. Shaw, Emeritus Professor, College of Business
College of Business
Division of Research
Division of Student Affairs
Faculty Judges
Faculty Mentors/Advisors
Graduate and Professional Student Association (GPSA)
Graduate College
OURI Faculty Liaisons & Peer Mentors
Staff and Student Volunteers
Council for Research and Inquiry (CSI)
Undergraduate Studies
University Communications - Marketing and Creative Services
University Libraries

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Undergraduate Research Symposium Agenda

Friday April 3rd, 2026

Time	Event	Location
8:00 am – 4:00 pm	On-Going Registration	Schmidt Family Complex (SFC) Lobby
8:00 am – 10:00 am	Refreshments available (coffee)	SFC Hallway
8:30 am – 8:50 am	Welcome: President Hasner	SFC 107
9:00 am – 10:00 am	Poster Session I (morning)	SFC Lobby/Hallway
10:15 am – 11:45 am	Oral Sessions	SFC Classrooms
Noon – 12:30pm	Lunch	SFC Lobby
12:30pm – 12:45 pm	Keynote Welcome: Provost Dawson-Scully	SFC 107
12:45 pm – 1:30 pm	Keynote Panel	SFC 107
1:30 pm – 2:30 pm	Poster Session II (afternoon)	SFC Lobby/Hallway
2:45 pm – 3:45 pm	Poster Session III (late afternoon)	SFC Lobby/Hallway
4:00 pm – 5:00 pm	Poster Session IV (late afternoon)	SFC Lobby/Hallway

Location: Schmidt Family Complex (please **click here** for directions)

Navigate (FAU login required)	Poster People's Choice (FAU login required)	Oral Judging Rubric (FAU login required)	Oral First & Second Place Winner (FAU login required)

Lunch Panel Session

Time: 12:30-1:30 pm
Location: Schmidt Center College of Business SFC 107

Vertically Integrated Projects (VIP) at FAU: Research, Mentorship, and Innovation Across Academic Levels

Florida Atlantic University's Vertically Integrated Projects (VIP) Program offers a distinctive model for research and education that involves faculty, graduate students, and undergraduates in long-term, cross disciplinary- research teams addressing real world challenges. As the first university in Florida to join the global VIP Consortium, Florida Atlantic's VIP Program emphasizes early student engagement, sustained mentorship, and collaboration across academic levels. This keynote panel brings together program administration, as well as faculty VIP Team leads, graduate student mentors, and undergraduate researchers, each from a different project, to share how vertically integrated research works in practice. Panelists will discuss big-picture goals of their projects, integration of Artificial Intelligence and data science into their research, and the distinctive leadership, mentorship, and skill-building components the VIP environment provides. The session highlights how VIP Experiences differ from traditional research mentorship models while supporting growth of opportunities for meaningful learning, innovation, and research impact.

Panel Moderator:
Dr. Donna Chamely-Wiik, Senior Associate Dean, Undergraduate Research and Prestigious Fellowships, Undergraduate Studies and Associate Scientist, Department of Chemistry and Biochemistry

Panelists:

- Dr. Alan Kunz-Lomelin, Assistant Professor, Sandler School of Social Work
  VIP Team: *Enhancing Child Welfare Research and Translation through Artificial Intelligence*
- Mohammed Selim, PhD Candidate, Department of Chemistry and Biochemistry
  VIP Team: *Mechanisms of Intracellular Amyloid-Beta Aggregation and Associated Mitochondrial Dysfunction*
- James Kane, Undergraduate Student, Department of Electrical Engineering and Computer Science
  VIP Team: *Smart Sensors and AI for Coastal Destination Resilience*
- Dr. Casey Spencer, Assistant Professor, Wilkes Honors College
  VIP Team: *Nervous System Aging and Glia: Modeling with Experimental Insights*
    - Kimberly Schweiger, Graduate Student, Department of Biomedical Engineering
      VIP Team: *Nervous System Aging and Glia: Modeling with Experimental Insights*
    - Panteha Sartipi, Undergraduate Student, Wilkes Honors College
      VIP Team: *Nervous System Aging and Glia: Modeling with Experimental Insights*

For more information about Florida Atlantic's Vertically Integrated Projects (VIP) Program, click here.

2025-2026 Undergraduate Researcher of the Year Winners

Each year the Office of Undergraduate Research and Inquiry (OURI) invites nominations for the Annual *Undergraduate Researcher of the Year* awards. One student from every college is selected for this award and is recognized at the annual Honors Convocation with an "Undergraduate Research Scholar" stole to wear during their graduation ceremony. These selected students are in good academic standing, have participated in at least two semesters of documented faculty-mentored undergraduate research and inquiry at FAU, and often have presented at multiple conferences and symposia, engaged in additional research activities, and even published their research as an undergraduate!

The 2025-2026 Awardees:

Undergraduate Researcher of the Year	College	Faculty Mentor
Kezia Abraham	Dorothy F. Schmidt College of Arts & Letters	Katharina Rynkiewich
Taylor Smith	College of Business *Allen E. Smith Awardee*	Monica Escaleras & Eric Levy
Isabelle Yi	College of Education	Maria Vasquez-Colina
Mark Zagha	College of Engineering & Computer Science	George Sklivanitis
Shyla Grant	Harriet L. Wilkes Honors College	Tracy Mincer
Adina Silverstein	Charles E. Schmidt College of Medicine	Ceylan Isgor
Sarah Lievano	Christine E. Lynn College of Nursing	Lisa Wiese
Kayla Mosteller	Charles E. Schmidt College of Science	Tiffany Roberts Briggs

2025-2026 Distinguished Mentor of the Year Winner

Faculty who serve as model mentors to their undergraduate research students are eligible to receive the Distinguished Mentor of the Year: Excellence in Undergraduate Research and Inquiry award. Each year, one university-wide award will be given based on the undergraduate research engagement in the previous year. The Distinguished Mentor of the Year will be recognized with a $2,500 award at the annual Honors Convocation.

Dr. Rindy Anderson

Associate Professor of Biological Sciences
Charles E. Schmidt College of Science

Dr. Rindy Anderson is an Associate Professor of Biological Sciences at Florida Atlantic University, where she leads a research program in animal behavior, bioacoustics, and behavioral ecology. Since joining Florida Atlantic in 2014, Dr. Anderson has made undergraduate research mentorship a central component of her academic mission, integrating students at all levels into her laboratory as active contributors to scientific discovery.

Over the course of her career at Florida Atlantic, Dr. Anderson has mentored more than 130 undergraduate researchers, including 62 students in the past three years alone. Through her vertically integrated lab structure, undergraduate students collaborate closely with graduate students and peers, gaining experience in experimental design, data collection, analysis, and scientific communication. Her mentorship has supported numerous student achievements, including more than 20 Office of Undergraduate Research and Inquiry (OURI) grant awards, multiple Summer Undergraduate Research Fellowships (SURF), and dozens of research presentations at Florida Atlantic symposia and regional and national conferences.

Dr. Anderson is particularly proud of fostering a lab environment that emphasizes collaboration and student growth. She is committed to expanding access to research opportunities and inspiring students to see themselves as scientists, regardless of their background or prior experience. Many of her mentees have gone on to graduate and professional programs, and two have been named Undergraduate Researcher of the Year for the College of Science, reflecting both individual excellence and sustained mentorship.

Dr. Anderson considers it a privilege to mentor undergraduate researchers and to play a role in their academic and professional journeys. She is deeply grateful to OURI, her colleagues, and her students for creating a community where undergraduate research can thrive.

Prestigious Fellowships

Florida Atlantic University supports students and recent alumni in pursuing prestigious fellowships, which are nationally competitive, merit-based awards. Prestigious fellowships offer many opportunities to develop and connect your academic and personal interests. They provide funding to help you conduct research, study abroad, pursue public service and social justice work, attend graduate school, and much more. Florida Atlantic's fellowship advisors work with undergraduates, graduates, and recent alumni. We help you determine which opportunities align with your goals and assess your eligibility, and once you identify the right fellowship, we support you through the application process. We are proud to celebrate the following students for being nominated during the 2025-2026 application year.

2025-26 Prestigious Fellowship Nominees

Goldwater Scholarship
Danylo Fedkiv, *Awardee*
Kyle Loh, *Awardee*
Vivien Levine, *Nominee*
Chrishera Smith, *Nominee*
Jake Thornberry, *Nominee*

Gilman Scholarship
Celeste Diaz, *Recipient*

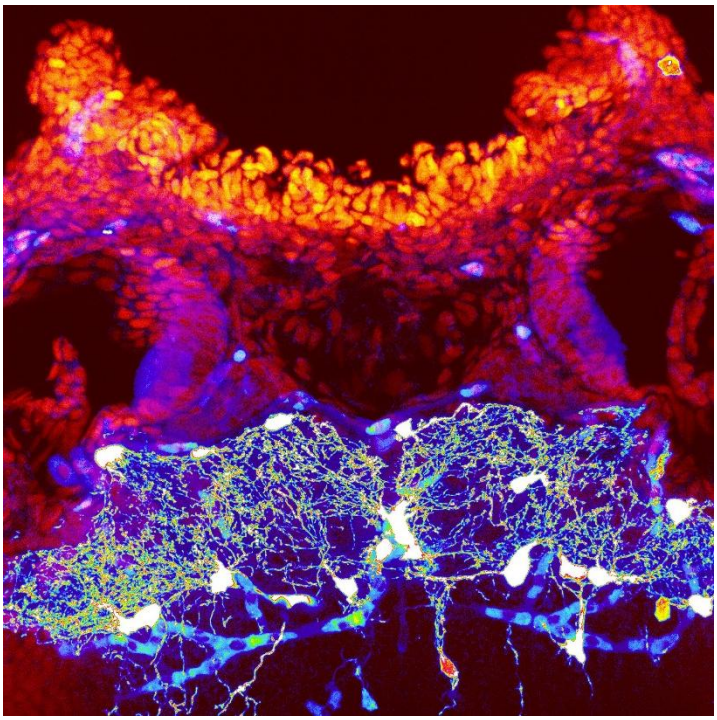
Critical Language Scholarship
Ciara O'Neill, *Alternate*

For more information, please visit our website (www.fau.edu/fellowships):

For questions, please contact: Donna Chamely-Wiik, Ph.D.
Senior Associate Dean of Undergraduate Research and Prestigious Fellowships
Email: fellowships@fau.edu
Location: GS-2, suite 212 E

Cover Artist Statement

Signals in Bloom



This image shows a colorful snapshot of a zebrafish brain section. The bright, glowing areas are oligodendrocytes, which are support cells that wrap around nerve fibers to help signals travel quickly, while the darker areas in the background are cell nuclei. Zebrafish are often used in neuroscience because their transparent bodies and rapid growth allow researchers to see how brain cells develop and interact. Through my involvement in (my professor's) lab, I have been exploring how these support cells protect the nervous system and what happens when they stop working properly. In diseases like multiple sclerosis, oligodendrocytes break down, leading to damaged communication between brain and body. What fascinates me most is how tiny changes at the cellular level can have such big effects on memory, movement and health. For me, this image represents not only the hidden beauty of the brain but also the importance of research in understanding and protecting it.

Sofia Aristizabal, BS in Neuroscience & Behavior,
Charles E. Schmidt College of Science

Attention Students

Have you been involved in research or scholarly activities? Share your experience!

Submit your work to the **Undergraduate Research Journal!**

Application Deadline: May 30th
Questions? Email: ouri@fau.edu

The Florida Atlantic Undergraduate Research Journal (FAURJ) is a peer-reviewed journal published online annually to:

- **Showcase** high quality undergraduate research
- **Teach** younger students of the standard of research
- **Promote** inquiry-based activities at FAU

Eligibility:

- research conducted by an undergraduate
- research mentored by FAU faculty member
- research compliant, if necessary

For complete information please visit our website.

Become a Peer Mentor!

Application Deadline: May 30th
Questions? Email: ouri@fau.edu

Applicant Eligibility

- Good Academic Standing at FAU
- at least one semester of documented research or scholarly experience

What's in it for you? You will:

- earn funding to support your scholarly activity
- gain experience in leadership and teamwork
- guide, mentor, and inspire your peers
- expand awareness of undergraduate research at FAU
- plan and host workshops to expand the research culture
- have tons of fun!

For complete information please visit our website.

For More Information on Office of Undergraduate Research and Inquiry, please visit our website here.

Oral Presentations

Business, Marketing, Finance & Public Administration and Cross Disciplinary Projects
Room: SF109

Business, Marketing, Finance & Public Admin and Cross Disciplinary Projects
The Resale Advantage: Assessing Fairness in Online Ticket Purchase
By: Luna Dominic
Faculty Mentor(s): Monica Escaleras and Eric Levy
Presenters: **Luna Dominic**

The ticket purchasing experience has evolved from a simple transaction into a high-stakes digital race. With demand for entertainment tickets increasing, some ticket platforms have attempted to make purchases more accessible by adding exclusive access codes and pre-sale benefits. There still appears to be a gap between these efforts and the perception of fair access for the general public. I suspected that the effectiveness of online ticketing systems at ensuring fair access varies depending on the purchase channel used. To formally test the hypothesis, I constructed a 15-question survey and collected data through RepData, yielding 413 responses from US citizens 18 and over. My results indicate that secondary marketplaces (StubHub, VividSeats, or SeatGeek) are most effective at ensuring fair access, while primary platforms (Ticketmaster) were most likely to limit consumer access. These results prompt further investigation into how primary and secondary systems shape accessibility and fairness in the ticketing market.

Business, Marketing, Finance & Public Admin and Cross Disciplinary Projects
Catching Moments: Major League Baseball 2025-26 Case Study
By: Joanne Silme, Fernanda Souza, Joy Charles Dias, Kim Do, and Tyler Morris
Faculty Mentor(s): Eileen Acello
Presenters: **Lauren Rosenblatt**, Fernanda Souza, Joy Charles Dias, Kim Do, and Tyler Morris

The United States was built on resilience, tradition, and opportunity, values reflected in its most celebrated achievements. Baseball must remain one of them. As America's Pastime, it is more than a sport; it is an experience that begins long before the first pitch. Major League Baseball faces the challenge of reengaging fans who have lost interest and connecting with audiences who feel the sport does not reflect their interests or behaviors. Gen Z, ages 13 to 28, is a key audience where MLB under performs and was identified in the case brief as essential for growth. Research including 30 interviews, 461 surveys, and an AI driven focus group showed the barrier is not awareness but digital relevance. Our campaign, Catching Moments, activates five marketing tactics to address this gap and create lasting connections with Gen Z fans.

Business, Marketing, Finance & Public Admin and Cross Disciplinary Projects
The Price of Sleep: How Rest Influences Worker Preferences
By: Luisa Lucigniani
Faculty Mentor(s): Eric Levy and Monica Escaleras
Presenters: **Luisa Lucigniani**

With rising unemployment rates, the job market has become increasingly competitive, compelling workers to enhance their productivity and efficiency. However, this raises the question of whether such demands come at the cost of adequate sleep. Specifically, the literature has evaluated the relationship between sleep duration/quality and labor-market outcomes such as wages, employment or presenteeism. Advancements have been made regarding how sleep affects the economy, however the question remains: How does variation in sleep quantity and quality influence self-reported productivity among working-age adults? To answer this question, a 15 question survey was distributed using Repdata and 386 responses were collected. This study found that when participants were asked whether they would take a lower paying job that guaranteed more consistent sleep, respondents across sleep brackets, not just those with low sleep, would accept the position: suggesting that workers place intrinsic economic value on adequate sleep, even at the expense of income.

Business, Marketing, Finance & Public Admin and Cross Disciplinary Projects
From Repression to Remembrance: Exploring the Transformation of ESMA as a Detention Center to a Site of Memory
By: Teresa Velarde and Meredith Ellis
Faculty Mentor(s): Meredith Ellis
Presenters: **Teresa Velarde**

Microhistories examines localized or narrowly focused cases to illuminate broader cultural, social, and political dynamics. This presentation explores the controversial history of ESMA, or the Escuela de Mecánica de la Armada (Naval School of Mechanics) in Buenos Aires, Argentina as a case study. By tracing the institution's perverted role during the last military dictatorship and its subsequent transformation into a memory site, it analyzes the evolving discourse surrounding memory, trauma, and reconciliation inArgentine society from the late twentieth century to the present. In doing so, it highlights how efforts to reckon with the past remain ongoing and politically contested, as successive governments-including the current administration-continue to grapple with, reinterpret, or even undermine human rights discourses

Health & Medical Sciences and Basic Sciences I
Room: SF110

Health & Medical Sciences and Basic Sciences I

Pseudoproline-Driven Yield Optimization in Challenging Peptide Synthesis

By: Ramon Guadalupe IV, Mihajlo Josipovic, Nancy Vela, and Mare Cudic

Faculty Mentor(s): Mare Cudic

Presenters: **Ramon Guadalupe IV** and Mihajlo Josipovic

The objective of this research was to determine the effect of pseudoproline dipeptides (PPDPs) on the yield and purity of the amyloid-beta peptide (AB-40) prepared by solid phase peptide synthesis (SPPS). AB-40 is implicated in the development of Alzheimer's disease (AD); thus, high-yield and high-purity AB-40 are necessary to meets the demands of AD research. Synthesis of AB-40 is challenging because its hydrophobicity promotes peptide chain aggregation during SPPS, leading to truncated peptides. PPDPs have been shown to reduce aggregation by introducing a bend in the polyamide backbone. AB-40 was synthesized using a peptide synthesizer with standard FMOC chemistry. The cleaved peptides were purified by preparative HPLC and characterized using mass spectroscopy (MS) and analytical RP-HPLC. Preliminary results indicate that incorporating PPDPs increases both yield and purity. Additional analysis, including circular dichroism (CD), is ongoing to confirm findings.

Health & Medical Sciences and Basic Sciences I

Interleukin-1 Type 1 Receptor Modulates Seizure-Induced Neuronal Injury and Death Associated with Repeated Generalized Tonic-Clonic Seizures in a Transgenic Mouse Model of Adult-Onset Epilepsy

By: Adina Silverstein, Tashi Dillon, and Ceylan Isgor

Faculty Mentor(s): Ceylan Isgor

Presenters: **Adina Silverstein**

Postictal generalized EEG suppression (PGES) follows generalized tonic-clonic seizures (GTCS) and is positively associated with seizure severity and mortality risk. Interleukin-1β is a pro-inflammatory cytokine activated by epileptic injury that promotes neurodegeneration and hyperexcitability via interleukin-1 receptor 1 (IL-1R1). We tested whether eliminating IL-1R1 reduces seizure severity and mortality in TgBDNF mice, a model of adult-onset epilepsy with GTCS and progressively prolonged PGES. TgBDNF mice were bred with IL-1R1 knockout (IL-1R1 KO) mice. Approximately 50% of IL-1R1 KO mice showed suppressed epileptogenesis. Epileptic IL-1R1 KO mice exhibited shorter PGES and faster seizure recovery. TgBDNF mice demonstrated hypertrophy of the anterior cingulate cortex and dentate gyrus, atrophy of the nucleus pontis oralis (PnO), and an inverse relationship between PGES duration and the number of gigantocellular neurons in the PnO. Conversely, IL-1R1 KO mice had preserved PnO neuron number and volume. These findings implicate IL-1R1-mediated inflammation in brainstem pathology underlying epilepsy-related mortality.

Health & Medical Sciences and Basic Sciences I

Investigating PAK6-Mediated Cytoskeletal Remodeling in Cancer Progression

By: Tanvi Desai, Felipe Carvalho, and Michael Lu

Faculty Mentor(s): Michael Lu

Presenters: **Tanvi Desai**

Cytoskeletal remodeling is a hallmark of cancer progression, enabling tumor invasion, metastasis, and resistance to chemotherapeutics. Although p21-activated kinases (PAKs) are known to regulate cytoskeletal dynamics, the specific role of p21-activated kinase 6 (PAK6) in coordinating actin filament organization and microtubule stability remains poorly understood. Considering its interaction with Rho GTPase signaling and the scaffold protein IQGAP1, we investigated the function of PAK6 using CRISPR/Cas-9 generated PAK6-deficient knockout cancer cell models, followed by cytoskeletal analysis through high-resolution confocal microscopy and ImageJ-based quantitative analysis. PAK6-deficient cells displayed disrupted actin filament alignment, greater structural filament dispersion, and reduced filament abundance, suggesting compromised cytoskeletal integrity. Loss of PAK6 also increased CLIP-170 comet length, indicating altered microtubule plus-end dynamics and excessively persistent microtubule growth. In conjunction, these findings identify PAK6 as a critical upstream regulator of actin-microtubule coordination and identify it to be a promising candidate for therapeutic targeting in metastatic and chemotherapy-resistant cancers.

Health & Medical Sciences and Basic Sciences I

The Crosstalk Between O-GlcNAcylation and Phosphorylation of Tau Protein in Neurodegenerative Disorders

By: Vanessa Illanez, Andrew Whyte, and Maré Cudic

Faculty Mentor(s): Mare Cudic

Presenters: **Vanessa Illanez**

Neurodegenerative disorders, including Alzheimer's disease (AD), affect millions worldwide, and no current therapies are available to halt disease progression. A hallmark of AD pathology is the accumulation of abnormally phosphorylated tau, which drives the formation of toxic aggregates. Because O GlcNAcylation of tau has been proposed to exert neuroprotective influence, this project was developed around the central hypothesis that alterations in tau O GlcNAcylation and phosphorylation critically modulate neurodegenerative processes. To test this, we synthesized site specifically modified tau fragments using solid phase peptide synthesis and evaluated how these modifications influence structure and aggregation using TEM and circular dichroism (CD). Our findings show that glycosylation alters aggregate morphology and reduces fibril formation. Notably, modification at Ser396 promotes greater aggregation than modification at Ser400. CD spectra further support this distinction: Ser396 modification induces shift toward β sheet structure, consistent with increased aggregation, whereas Ser400 modification maintains a predominantly random coil conformation.

Behavioral, Educational & Social Sciences
Room: SF111

Behavioral, Educational & Social Sciences
Perspectives of AI Analytics in Professional Sports: Contracts, In-Game Strategy, and Health
By: Luke Black
Faculty Mentor(s): Eric Levy and Monica Escaleras
Presenters: **Luke Black**

Since the first Olympic Games in 776 B.C.E., human judgment has guided athletic strategy and decision-making. Today, however, artificial intelligence (AI) and data analytics are increasingly reshaping these processes, creating uncertainty about whether AI enhances performance or whether human judgment should remain central. This shift raises questions about how AI influences viewers' trust and opinions regarding sports decisions. This research examines Americans' views on the extent to which AI should be integrated into decision-making within the sports industry. To address this, I designed a survey focused on AI use in contract decisions, in-game strategy, and athlete health. The results demonstrate that support for AI varies by age: younger respondents are significantly more supportive of AI-driven decision-making than older respondents. These findings suggest that, consistent with trends in other industries, AI use in professional sports is likely to expand as younger, more AI-supportive generations grow within the fan base and workforce.

Behavioral, Educational & Social Sciences
Perceptions of General Education Requirements Across Educational Backgrounds.
By: Jake Dalessio
Faculty Mentor(s): Eric Levy and Monica Escaleras
Presenters: **Jake Dalessio**

This study explores contemporary views on general education requirements in college programs. A survey of 400 participants measured agreement with the idea that being well-rounded contributes to professional success and asked whether respondents preferred a four-year accounting degree with general education courses or a two-year, major-only option. Overall, most participants agreed that well-roundedness supports success, indicating broad cultural support for foundational learning. However, preferences differed by educational background; respondents with lower educational attainment favored the shorter, specialized program, while college graduates and postgraduates preferred the traditional four-year degree. These results suggest a gap between general beliefs about education and personal preferences shaped by one's educational experience.

Behavioral, Educational & Social Sciences

Passports to Fantasy: Tourist Worlds in Contemporary South Korea

By: Xander Hickman
Faculty Mentor(s): Jacqueline Fewkes
Presenters: **Xander Hickman**

This project explores how tourism in South Korea produces affective experiences through curated spaces, cultural symbolism, and interpersonal encounters. Conducted through firsthand site visits, note-taking, and informal observations, I participated in a range of tours, from natural heritage sites like Nami Island and the Garden of Morning Calm to culturally branded experiences such as a BTS ARMY tour. My goal was to understand how tourist spaces engage different audiences, offer diverse attractions, and cater to international visitors while constructing narratives of identity, nostalgia, and belonging. This research highlights how emotion, fandom, and place-making intersect in contemporary Korean tourism. While my analysis is limited by the short duration of site visits and language barriers, it reflects my personal experiences and critical reflections as both a participant and observer. This study contributes to broader discussions in anthropology and cultural studies on the politics of tourism, media influence, and transnational cultural flows.

Behavioral, Educational & Social Sciences

Educators' Perceptions of Artificial Intelligence Use to Support Feedback

By: Isabelle Yi, Shihab Siddique, and Maria Vasquez-Colina
Faculty Mentor(s): Maria Vasquez-Colina
Presenters: **Isabelle Yi**

This systematic review focuses on teachers' attitudes towards AI tools in classroom assessment. A sample of 27 articles (N = 9,101 educators) met eligibility criteria (out of 325 articles). We focused on studies discussing K-12 in-service and pre-service teachers. The results show that AI literacy and attitudes toward AI integration were examined through correlational studies mostly conducted outside the United States. Additionally, most studies were published between 2021-2026 and focus on pre-service teachers. A significant finding was that educators reported using AI as a tool to mostly provide constructive feedback. Findings also indicate a willingness to incorporate AI in classroom assessment and highlight the need to strengthen teachers' AI literacy. This study contributes to generalizable knowledge by providing evidence that introducing AI literacy and AI use in teacher preparation programs and classroom curricula enhances feedback provision for K-12 students, suggesting its applicability across similar educational settings.

Behavioral, Educational & Social Sciences

Investigation of Drosophila Sleep Homeostasis in Social Environment

By: Charan Jarugula, Binbin Wu, and William Ja
Faculty Mentor(s): Tucker Hindle and William Ja
Presenters: **Charan Jarugula**

Sleep is a conserved biological process regulated by homeostatic mechanisms that compensate for prior sleep loss. In Drosophila melanogaster, social experience has been shown to alter sleep and activity, yet the real-time effects of social environment on sleep homeostasis remain poorly understood. This study investigates sleep recovery following sleep deprivation and whether it differs between social isolation and enrichment. We quantify sleep behavior in social environments using our newly developed long-term, identity-preserving tracking system. We propose that the social environment influences sleep baseline and stress release, providing a novel explanation for post-social phenotypes. These findings aim to elucidate the true impact of the social environment on the sleep patterns of flies.

Health & Medical Sciences and Basic Sciences II
Room: SF112

Health & Medical Sciences and Basic Sciences II

Computer Vision and Deep Learning Assisted Eye Motion Detection for Nystagmus Diagnosis

By: Reece Mathew, James Levi, Kowshik Balasubramanian, Abhijit Pandya, and Ali Danesh

Faculty Mentor(s): Abhijit Pandya and Kowshik Balasubramanian

Presenters: **Reece Mathew** and James Levi

Nystagmus is a disorder causing involuntary eye movements, visual instability, and impaired gaze control. This study presents the design and validation of an AI-driven, vision-based system for detecting and quantifying nystagmus using standard smartphone video as a low-cost alternative to Videonystagmography (VNG). The proposed pipeline integrates face landmark detection, contrast enhancement, adaptive pixel thresholding, grid-based filtering, connected-component analysis, and centroid tracking to extract a normalized iris position time-series in real time without specialized eye-tracking hardware. A camera-positioning module ensures consistent subject alignment, while calibration against clinical VNG recordings established a stimulus velocity of 20°/sec, enabling angular measurement of eye motion. Experimental validation across eight optokinetic recordings from three subjects successfully detected characteristic sawtooth nystagmus waveforms and identified slow and fast phases. Computed slow phase velocity (SPV) values ranged from 18 - 23°/sec horizontally and 15 - 21°/sec vertically, remaining within clinically accepted limits and consistent with known physiological optokinetic responses.

Health & Medical Sciences and Basic Sciences II

Living off the "Land": Supplementation of Lunar and Martian Regolith to Increase Algae Nutrient Production for Future Astronauts

By: Tanzeela Tasneem, Jasmine Coyle, Cassie Hopton, and Ceth Parker

Faculty Mentor(s): Jasmine Coyle and Ceth Parker

Presenters: **Tanzeela Tasneem**

Long-duration human space flight will depend on In-Situ Resource Utilization (ISRU) and Bioregenerative Life Support Systems (BLSS) capable of generating oxygen, biomass, and micronutrients from local resources. Phosphate, nitrate, and iron are the primary limiting nutrients for agricultural crops, thus iron-rich lunar and Martian regolith present potential in-situ nutrient sources to enhance crop yields. This study evaluates whether supplementing the microalga Tetraselmis suecica with iron-rich lunar and Martian regolith simulants will increase biomass and vitamin. Cultures were supplemented with iron chloride, iron citrate, or regolith simulant, alongside water controls. Biomass was quantified via hemocytometer, and scanning electron microscopy.Results show successful cultivation in high iron growth media and no morphological damage due to regolith algae interaction. Anticipated results suggest regolith supplementation enhances growth, supporting the viability of algae-focused regenerative life-support systems. This provides a foundation for integrating T. suecica into sustainable BLSS for future crewed lunar and Martian missions.

Health & Medical Sciences and Basic Sciences II

Development of Artificial Oxygen Carriers Utilizing Two Methods of Emulsification

By: Deema Zaidan, Adeleh Kazemialamouti, and Sarah E. Du

Faculty Mentor(s): Sarah E. Du

Presenters: **Deema Zaidan**

In cases where blood shortages have occurred, artificial oxygen carriers (AOCs) mimicking human red blood cells (hRBCs) could take their place. hRBCs are unique for their deformability and biconcave disc shape, which maximizes space for hemoglobin—the protein responsible for transporting oxygen throughout the human body. In this study, we attempt to replicate a recent method that produced concave-shaped, deformable perfluorocarbon-based oxygen carriers (cDFCs) resembling hRBCs. Two emulsification methods were investigated: pumping emulsification using a hydrophilic glass membrane, and direct emulsification using a syringe pump for precise flow control. Preliminary results indicate success in forming perfluorocarbon-based microparticles using both methods, with observable differences in particle size and morphology between the two techniques. The cDFCs will be further evaluated for deformability using a microfluidic maze device and an electro-deformation method. If replicable, this method will be fundamental in the production of biocompatible and functional AOCs, and the field of biomedical engineering.

Health & Medical Sciences and Basic Sciences II

The Effects of mTOR Inhibition on Doxorubicin-Induced Toxicity in Human Coronary Arterial Endothelial Cells.

By: Jack Meyer, Juliana Marques, and Claudia Rodrigues

Faculty Mentor(s): Claudia Rodrigues

Presenters: **Jack Meyer**

Cardiotoxicity is a common side effect of a potent class of chemotherapy drugs known as anthracyclines. Preservation of vascular function has been proposed as a potential approach to prevent cardiotoxicity. However, the mechanisms by which anthracyclines affect vascular cells remain unclear. RNA-sequencing analysis of human coronary arterial endothelial cells (HCAECs) exposed to the anthracycline doxorubicin indicated significant changes in genes that regulate cell growth and metabolism, including MYC, CDKN1A, and TFEB, targets regulated by the mTOR signaling pathway, which is central to endothelial cell function. HCAECs were treated with Torin-1, a mTOR inhibitor, in combination with doxorubicin. Torin-1 attenuated the impact of doxorubicin on the expression of c-MYC and p21, without reversing doxorubicin-induced decline in proliferation and DNA damage. The findings suggest that doxorubicin may cause mTOR overactivation. Future studies will verify if the mechanism involved is associated with attenuation of cellular senescence.

Music, Art, Literature, Theater, History & Philosophy I
Room: SF114

Music, Art, Literature, Theater, History & Philosophy I
Preserving Voices: An Oral History of the Venetian Ghetto and the Jewish Community's Legacy
By: Reeselyn Haring
Faculty Mentor(s): Ilaria Serra
Presenters: **Reeselyn Haring**

This project focuses on uncovering and preserving the diverse stories of the Venetian Ghetto, the first-ever Jewish ghetto, established in 1516 in Venice. Through historical research and multimedia storytelling, the project highlights the resilience and cultural contributions of a community that endured centuries of marginalization and oppression. Despite its rich history, the narratives of the Venetian Ghetto remain unfamiliar to many. Working with Ilaria Serra, this SURF research combines archival research with six interviews conducted with members of the contemporary Venetian Jewish community. These interviews provide firsthand perspectives on the challenges facing the modern ghetto, including cultural preservation and population decline, while illustrating how the community has maintained identity and resilience despite historical hardship. The interviews and historical research are compiled into a final digital webpage that presents the project's findings through journalistic writing and multimedia storytelling, making the history and legacy of the Venetian Ghetto accessible to broader audiences.

Music, Art, Literature, Theater, History & Philosophy I
Trampled Grasslands: The Development of Human Trafficking Laws in Mongolia
By: Franco Loyola
Faculty Mentor(s): Jason Sharples
Presenters: **Franco Loyola**

Development of Mongolia's legal codes through the democratic transition of 1990 not only shaped the nation's vulnerability to human trafficking but also produced a legal trajectory that distinguishes Mongolia from its post-Soviet neighbors. Since independence from the Qing Dynasty, provisions against aspects of human trafficking were preserved in Mongolia's legal codes up to democratization. The strongest provisions were founded within the 1940 and 1960 Soviet constitutions. However, upon comparing and analyzing each iteration, these provisions diminished considerably by 1990. Inversely, by 1990, anti-trafficking provisions became significantly more comprehensive in Mongolia's criminal code. Though prosecutorial barriers remain and constitutional recommendations ought to be considered, Mongolia's capacity to combat human trafficking has grown, allowing the nation to stand out among its larger neighbors, Russia and China. In conclusion, the democratic transition thus empowered Mongolia to distance itself from longstanding foreign influence and craft more independent human trafficking provisions.

Music, Art, Literature, Theater, History & Philosophy I

Evolution on Trial: Tennessee v. Scopes and the Separation of Church and State

By: Kris Barrios

Faculty Mentor(s): Adrian Finucane

Presenters: **Kris Barrios**

The 1925 Scopes Trial embodied the Christian fundamentalist hysteria over evolution in the early 20th century, demonstrating the limits of American intellectual freedom at that time. The courtroom clash revolved around one teacher's violation of the Butler Act–a new law that prohibited the teaching of evolution in Tennessee's public schools and universities. In both the original 1925 trial and the 1927 appeal, the Tennessee courts defended the constitutionality of the Butler Act. Drawing on original case documents and other primary sources, my research found that the Christian fundamentalists won the case because the prosecution and presiding judge were religiously biased. Ultimately, this bias contributed to a narrow interpretation of the state constitution's Religious Preference clause. I argue that the Scopes Trial remains relevant to contemporary evangelical politics by highlighting the consequences of judicial disregard for the separation of church and state.

Music, Art, Literature, Theater, History & Philosophy I

Perfect Storm: Warlordism in the Aftermath of the Soviet-Afghan War

By: Gryffyn Okoee

Faculty Mentor(s): Christopher Ely

Presenters: **Gryffyn Okoee**

Afghanistan immediately following the Soviet-Afghan War was the textbook definition of a failed state, with a non-functional central government, no economic policy, and no social support networks. Into this socio-political power vacuum stepped the warlord - the charismatic leader of a non-state-affiliated armed group, who controlled a territory through force. The chaos of post-war Afghanistan was the perfect storm required for warlords to appear en masse; the absence of basic functionalities a state would provide, such as security, supplies, and stability, were provided on a regional level by warlords, in exchange for popular loyalty. This presentation will analyze the how and why Afghanistan ended up as a patchwork of warlord-led proto-states.

Music, Art, Literature, Theater, History & Philosophy I

Reclaiming Context: Teaching Collections, Machine Gaze, and Curatorial Justice

By: Véronique Côté and Daniela Rivera
Faculty Mentor(s): Véronique Côté
Presenters: **Daniela Rivera**

In 2024, FAU initiated the digital cataloging of collections to improve access, accuracy, and stewardship using Artwork Archive. Driven by institutional failures to preserve contextual integrity, this research harnesses artificial intelligence to identify gaps in metadata and address misattributions from reductive acquisition practices. The case-study includes over seventy sculptures from Papua New Guinea and Africa previously labeled in culturally nonspecific terms. To support efforts toward accessibility and informed curation, we tested an AI art-recognition tool to assess whether it could identify works' regional origins through stylistic analysis. While the software provided limited insights, most conclusions were reached through qualitative research and expert consultation. Our results highlight the potential for AI to support, rather than replace, human-centered curatorial research. The University Galleries remain committed to ethical use of technology in provenance research, positioning the museum as a dynamic learning space that fosters accessible, context-rich collections for students, scholars, and the public.

Engineering
Room: SF116

Engineering

Investigation of Graphene Nanoplatelets Reinforcement into Low Density Polyethylene (LDPE)

By: Jacob Malayil, Stefan Manevski, and Hassan Mahfuz
Faculty Mentor(s): Hassan Mahfuz
Presenters: **Jacob Malayil** and Stefan Manevski

Nanocomposite fibers consisting of Graphene Nanoplatelets (GNPs) and Low-Density Polyethylene (LDPE) were prepared to improve mechanical and electrical properties of base LDPE. Fibers were prepared through melt-mixing LDPE pellets and GNPs then single-screw extrusion using a Laboratory Melting Extruder. Fiber specimen were prepared at varying concentrations of GNPs to LDPE: neat LDPE, 0.5% wt GNP-LDPE, 1% wt GNP-LDPE, and 1.5% wt GNP-LDPE. When added, GNPs fill the polymer matrix of the LDPE and interact with chains of LDPE, improving the dielectric permeability. The infilled GNPs reduce the load on the LDPE and hence increase the nanocomposite fiber's strength. Mechanical testing showed increased GNP concentration improving mechanical properties, with a 45% increase in Tensile Stress for 1.5% wt GNP-LDPE fiber. As for electrical testing, an increase in the dielectric constant correlated with an increase in GNP concentration, with the 1.5% wt GNP-LDPE composites having a 64% increase in the dielectric constant.

Engineering

Human-Robot Collaborative SLAM Using Meta Quest 3 and Stereo Vision from Ground Robots

By: Layla Ashry, Georgios Sklivanitis, and Nathan Hahn
Faculty Mentor(s): Georgios Sklivanitis and Nathan Hahn
Presenters: **Layla Ashry**

Simultaneous Localization and Mapping (SLAM) enables autonomous vehicles to construct maps of unknown environments while localizing themselves in those environments. Multi-agent SLAM faces challenges with differing system configurations/loadouts, bandwidth, and loop closure. This project applies a real-time heterogeneous SLAM system, merging imagery and visual-intertial data from a Meta Quest 3 headset and a Clearpath Dingo-O robot. Camera pose and video frames data are streamed from the headset into the Robot Operating System 2 (ROS2), where the multi-agent SLAM system runs. Extrinsic calibrations and timestamp aligned imagery from both agents generates a shared frame of reference, and voxel-based volumetric fusion produces a shared 3D map. This approach presents a real-time map fusion framework, which reduces drift, and produces a stable, shared real-time map. It targets key multi-agent SLAM challenges of sensor disparities, frame alignment, and bandwidth issues. This system provides support for future scalable mixed-reality human–robot collaboration in dynamic environments.

Engineering

Critical Infrastructure Under Attack: The Rising Cost of Cybercrime in U.S. Industries

By: Angelyse Perez, Sergio Gutierrez Flores, Shahansha Ferdous, Mikayal Faisal, and Daniella Strauss
Faculty Mentor(s): Valentine Aalo
Presenters: **Sergio Gutierrez Flores**, Angelyse Perez, Shahansha Ferdous, Mikayal Faisal, and Daniella Strauss

Cyberattacks targeting U.S. industries have increased significantly, affecting organizations across the public and private sectors and causing massive financial and operational damage. These breaches reflect global trends, including the rise of state-sponsored attacks, evolving ransomware tactics, and the widespread use of malware, phishing, and spyware as the United States faces escalating threats from hostile actors. This study analyzes the five most vulnerable U.S. industries by examining reported breach data, financial losses within each sector, and economic consequences affecting critical infrastructure. Using comparative cost analysis of breach recovery expenses and cybersecurity prevention investments, the research evaluates the economic burden imposed on each sector. By correlating attack frequency within each industry with documented financial losses, this study highlights the disproportionate impact on critical infrastructure and underscores the economic necessity of proactive cybersecurity investment.

Engineering

Pore-Scale Visualization of Wettability Alteration Mechanisms in Rock-Mimicking Surfaces for Enhanced Oil Recovery

By: Mia Mandili, George Kamel, Amelia Anderson, and Myeongsub Kim
Faculty Mentor(s): Myeongsub Kim
Presenters: **Mia Mandili**, George Kamel, and Amelia Anderson

The rapidly increasing demand for energy and the decrease in crude oil supply due have driven a search for alternative oil recovery methods. Unfortunately, substantial amounts of oil remain trapped in reservoir pores, making it challenging to extract using conventional methods. This research explores Enhanced Oil Recovery (EOR) mechanisms to observe the behavior in a lab environment by closely mimicking the rock reservoir surface through wettability alteration, chemically altering the surface. The project uses various mixtures of PDMS (a silicone polymer) and CaCO3 (the primary mineral in reservoir rocks). Oil samples stained with Nile Red are utilized with fluorescence imaging to visualize the amount of oil absorbed by the rock samples. Preliminary results show high-quality images of oil behavior across different rock samples, thereby improving the accuracy of surface visualization. Real-time visualization of oil absorption in rock samples could provide insight into oil extraction behavior during subsequent EOR flooding operations.

Engineering

Fully Onboard Vision-Based Drone-to-Drone Localization in GPS-Denied Environments Using NVIDIA Jetson Orin Nano and YOLO

By: Emily King and Pratik Mukherjee
Faculty Mentor(s): Pratik Mukherjee
Presenters: **Emily King**

Accurate localization is crucial for autonomous drones operating in GPS-denied environments, where reliable onboard perception is required. To achieve such precision, prior approaches have relied on external markers, such as AprilTags, for drone-to-drone localization. However, these third-party markers are susceptible to lighting variations and physical damage, which can disrupt the localization pipeline and compromise operations. This project focuses on developing an onboard localization system using NVIDIA's Jetson Orin Nano, a compact AI edge computing module, and YOLO, a real-time object detection algorithm, to enable autonomous drones to detect and estimate the relative position of drones. The primary objective is to create a system in which drones can identify and localize one another in real time using onboard cameras alone. Using the Jetson platform and YOLO framework, we developed a dataset of Starling 2 drones and trained a model achieving over 95% detection accuracy, establishing a foundation for autonomous formation flight.

Music, Art, Literature, Theater, History & Philosophy II
Room: SF128

Music, Art, Literature, Theater, History & Philosophy II
The Invisible Hand in Invisible Man: Ralph Ellison, Adam Smith, and The Blindness of Power
By: Franco Alvarenga
Faculty Mentor(s): Regis Fox
Presenters: **Franco Alvarenga**

In Invisible Man, the world becomes a microcosm of a market failure. By applying philosopher Adam Smith's warnings from The Wealth of Nations, we can see Ralph Ellison's novel not just as a story of race, but as a critique of how institutional power leads to the erasure of the individual through economic exploitation. While existing analysis has examined the novel through racial and historical lenses, my paper positions Ellison's novel as a literary analog for economic corruption. It explores how the hidden motives of powerful institutions, driven by profit and greed, exploit the individual. General readers of 20th century African American literature, as well as educators who utilize Ellison's works in their classrooms, can utilize this research as a resource to enhance interpretation and pedagogy. It will also enrich understanding of how fields of Literature and Economics speak to each other about timely matters of identity and social change.

Music, Art, Literature, Theater, History & Philosophy II
Tropicalization as a Form of Resistance: An Analysis of Bad Bunny's Shift of the Cultural Memory of Puerto Rico in the United States
By: Juliana Lopez Candelaria
Faculty Mentor(s): Irma Zamora
Presenters: **Juliana Lopez Candelaria**

During the late 1890s, the United States sent soldiers to Puerto Rico to document the island's invasion, portraying 'lesser' lives in the island. By creating a state-imposed cultural memory of Puerto Rico as full of primitive Others, the United States justified its urgent and violent intervention there. This 'blissfully oblivious, poverty-stricken space' is one of the remaining tropes that falls under what scholar Frances R. Aparicio defines as tropicalization, which is ideological fictions "with which the dominant (Anglo and European) cultures trope Latin American" identities in order to justify their own involvement in said country (1). This paper proposes that, in Bad Bunny's most recent album, DeBi TiRAR MaS FOToS, he uses these established tropicalizations and ropes in the listener to create a new Puerto Rico, no longer a tropical escape, but also a home undeniably marked by ongoing resistance. Bad Bunny shows what happens when the Other defines himself.

Music, Art, Literature, Theater, History & Philosophy II

Subverting Stereotypes and Embracing Impossibility: Exploring Contemporary Latino Resistance Literature

By: Jocelyn Colon

Faculty Mentor(s): Irma Zamora and Regis Fox

Presenters: **Jocelyn Colon**

Countless minority authors have built a legacy of subverting colonial ideologies surrounding "proper" development. However, analyses of queer, U.S., Latinx literature--especially post-2016, a time in which U.S. Latinx communities face a growing wave of discrimination--remain incomplete. Marianne Hirsch describes the genre of the coming-of-age novel as a "story of a representative individual's growth and development within the context of a defined social order." Here, I interrogate the way queer, Latinx writer Justin Torres problematizes the classical structure of the bildungsroman and works towards imagining different futures in his novel, We the Animals. My research suggests that his novel is not about instituting oneself as part of a nation, but rather about coping and surviving with the loss of one. Thus, this project promotes new ways of reading, modeling interpretive frameworks useful for both readers new to Torres' work, and for educators and scholars committed to Latinx Studies.

Music, Art, Literature, Theater, History & Philosophy II

Haunted By Our Memories: Depression & Melancholy In Extreme Metal Lyricism

By: Luis Loyola III

Faculty Mentor(s): Regis Fox

Presenters: **Luis Loyola**

Haunted By Our Memories: Depression & Melancholy In Extreme Metal Lyricism aims to critically build a case for an emotionally intensive genre of music and literature, developing a understanding through psychoanalytical lenses of melancholia established by Sigmund Freud. It firstly examines Doom Metal with Lyricist of Swallow The Sun and secondly examines the lyrics of Amber Warne of the Depressive Suicidal Black Metal (DSBM) project Cold July. Studies on Extreme Metal are considered sparse, often choosing sociological lenses by which Nina Kärki makes the argument in the viewing of Metal Lyrics as forms of literature. This project aims to continue this goal of Kärki's, however, adding greater theory. Because each artist intimately interacts with gender, a theme that is common amongst the genre, this argument furthers its development by incorporating feminist and queer lenses, namely Julia Kristeva, and others. These frameworks, ultimately argues that these elements embedded in these works.

Music, Art, Literature, Theater, History & Philosophy II

The Undefined Monster: A Jungian Reading of Grendel from Beowulf

By: Sebastien Cabrera
Faculty Mentor(s): Regis Fox
Presenters: **Sebastien Cabrera**

One of the most problematic monstrosities in all of literature exists within the early medieval epic of Beowulf. This monster has been primarily puzzling to readers, artists, and scholars alike due to the poem's abstract nature. In following J.R.R. Tolkien's belief that the poem's monsters should be looked at more intensely, "The Undefined Monster: A Jungian Reading of Grendel from Beowulf" utilizes Jungian psychoanalysis as a method that provides a whole new way of examining the monster in relation to the text, culture, and in relation to other texts. Through a Jungian framework that poses Grendel as fulfilling the Jungian archetype of the shadow, the monster comes to illustrate the poem's underlying themes of an inherited repressed culture of guilt and violence.

Music, Art, Literature, Theater, History & Philosophy II

The Pillars of Colonialism in Giovanni's Room: How the American Colonial System Alienates the Self

By: Sarah Martí
Faculty Mentor(s): Regis Fox
Presenters: **Sarah Martí**

This project takes a post colonial and queer studies approach as to why the social fabric of America breeds alienation, performativity, and apathy as seen in Giovanni's Room by James Baldwin. While critics such as Monica B. Pearl and Mae G. Henderson explore expatriation, gender roles, and whiteness in Giovanni's Room neither of them explore the absence of an important queer voice: the lesbian. By drawing on the work of Judith Butler's theory of performativity in Gender Trouble I aim to understand David's performativity of masculinity and deconstruct how his colonial background informs his relationship to gender and sexuality. This performance of gender upholds what I am calling the pillars of colonialism: alienation, performativity, and apathy. I argue that if David were met with a queer feminine body he would be forced to dismantle the pillars of colonialism, as lesbianism is the embodied rejection of patriarchal oppression tied to colonialism.

Environmental, Ecological & Marine Sciences
Room: SF122

Environmental, Ecological & Marine Sciences
Shark Biomechanics: Swimming Efficiency in Blacktip Shark Aggregations
By: Selena Weathers, Ashkaan Fahimipour, Marianne Porter, and Darien Satterfield
Faculty Mentor(s): Marianne Porter and Darianne Satterfield
Presenters: **Selena Weathers**

Large predator groups create competition for prey, but some hypothesize that locomotor efficiency gained by moving in groups may energetically offset increased competition. In small-bodied fishes, schooling reduces locomotor effort. However, these effects remain unresolved for large-bodied fish groups. Blacktip sharks (Carcharhinus limbatus) are high-trophic-level predators that overwinter in massive aggregations along Florida's Atlantic coastline. We use drones to capture videos of nearshore schools and AI algorithms to track swimming kinematics. We measured average velocity, swimming speed, tailbeat frequency, tailbeat amplitude, stride length, and Strouhal number (a measure of locomotor efficiency) in schooling sharks. We compared our data to previously published data on solitary swimming. We found that in schools, the average velocity is slower, tailbeat amplitude is similar, stride length is longer, and tailbeat frequency and Strouhal number are lower than in isolation. These findings suggest that sharks in schools require less effort for locomotion than those in isolation.

Environmental, Ecological & Marine Sciences
Investigating the Impacts of Lordosis on Green Sea Turtle (Chelonia mydas) Swimming
By: David Gonzalez, Jeanette Wyneken, and Samantha Trail
Faculty Mentor(s): Jeanette Wyneken and Samantha Trail
Presenters: **David Gonzalez**

Green sea turtles (Chelonia mydas) migrate impressive distances at all life stages, relying exclusively on their flipper strokes and streamlined body. Despite the importance of that body shape, studies have identified normal turtle hatchlings can develop a spinal deformity (lordosis) that causes a dip in their shell with variable severity that can persist throughout adulthood. We hypothesize that turtles which develop lordosis will decrease flipper stroke rate and force production per stroke, while increasing breath rate compared to morphologically normal turtles. From 2022-2024, we collected high-speed video, force production measures, and associated morphometrics of green turtles as hatchlings and again after reaching ~120 grams. When compared to normal turtles from the same clutch, turtles with lordosis exhibited a significant increase in stroke rate but did not differ in other measures. We suggest this increase may be an attempt to compensate for a decrease in hydrodynamic efficiency.

Environmental, Ecological & Marine Sciences

Analysis of Storm-induced Subaerial Beach Sedimentology Change Using Sediment Cores to Evaluate Overwash and Recovery on Southwest Florida Barrier Islands

By: Alondra Calderon, Kayla O'Brien, and Tiffany Roberts Briggs
Faculty Mentor(s): Tiffany Roberts Briggs
Presenters: **Alondra Calderon**

Sandy beaches are among the most important coastal environments for supporting human populations, providing habitat for various species, and protecting coastal communities from storm impacts. The objective of this study is to evaluate subaerial beach stratigraphy after two years of major storm impacts to quantify the geological conditions of the beaches and explore whether certain areas are more vulnerable based on the sedimentological signatures captured. This study evaluates changes in the sedimentology resulting from recently storm-impacted southwest Florida barrier islands through granulometric analysis, sedimentology, and lithology of core samples. Comparisons between environments on developed and undeveloped barrier islands can show variability in the organic content, substrate sediment characteristics, and preservation potential of overwash. The results of this study have created a deeper understanding and correlation between the stratigraphy and lithology of the sediment to not only identify overwash but evaluate the importance of coastal resilience and beach management.

Environmental, Ecological & Marine Sciences

Method Development for Separation of Chlorophylls α and β with HPLC

By: Stephen Parks
Faculty Mentor(s): Shailaja Allani
Presenters: **Todd Parks**

Reverse phase high performance liquid chromatography was used to separate the structural analogs; six different methods were developed. Two methods showed higher efficiency, method six and method two. In Method six Chlorophyll – α was detected at 29.70 minutes and chlorophyll – β was detected at 23.20 minutes. The resolution was 12.8; the column efficiency for chlorophyll – α was 56079 theoretical plates (TP), and for chlorophyll – β 32681 TP. In Method two Chlorophyll – α was detected at 11.30 minutes and chlorophyll – β was detected at 14.30 minutes. The resolution was 7.25; the column efficiency for chlorophyll – α was calculated at 13094 TP, and for chlorophyll – β calculated at 17424 TP. This method is notable for it's shortened run time, this method saw the final eluate detected at 14.30 minutes. The resolution and column interaction falls within acceptable parameters for the purpose of quick detection.

Environmental, Ecological & Marine Sciences

Exploring Nesting Behaviors of the Gopher Tortoise at the FAU Preserve

By: Martha Torres, Bailey McCormack, Lauren Gapczynski, and Evelyn Frazier

Faculty Mentor(s): Evelyn Frazier

Presenters: **Bailey McCormack**

Gopher Tortoises (Gopherus polyphemus) are an endemic species in Southeastern USA and state listed as threatened in Florida. Throughout its distribution Gopher Tortoises reproduce and lay eggs during Spring (May-July), however there is one record of Gopher Tortoises in Jupiter, Florida reproducing in the Fall season (August-September). We hypothesize that the Gopher Tortoises at the Florida Atlantic University Preserve would show reproductive behaviors in the Fall. We placed camera traps at the apron entrance of three burrows known to harbor adult females. The cameras were set to shoot 15 second videos when motion was detected, and were active from May 2023 - May 2024. A total of 1,083 camera days captured 485 videos of tortoise activity and 50 videos of reproductive behaviors. Preliminary results show general activity of the gopher tortoises was caught mostly in September, but reproductive behavior was most abundant in the month of August.

Environmental, Ecological & Marine Sciences

Seasonal Variability of Dissolved Organic Matter at FAU Campus Lake

By: Laasya Pagadala, Angelica Joy Yu, and Natalia Malina

Faculty Mentor(s): Natalia Malina

Presenters: **Laasya Pagadala**

Dissolved organic matter (DOM) is a natural component of aquatic environments that plays a protective role in ecosystems. DOM structural shifts contribute to water quality deterioration and are often associated with algal growth. Through this research, we advance our knowledge in seasonal changes of DOM in algae-impacted lakes. Samples were collected from the FAU Campus Lake in Boca Raton, Florida, in September 2025, January, February, and March 2026. We hypothesize that the FAU Campus Lake will predominantly show microbial DOM composition during September and March due to higher average temperatures. Fluorescence (FI), biological (BIX), and humification (HIX) indices of DOM were analyzed using Fluorescence Spectroscopy, while functional groups were determined using Fourier Transform Infrared Spectroscopy (FTIR) spectroscopy. Calculated FI (1.73-1.78) indicates strong microbial impact, while BIX (0.59–0.61) indicates transitional state of DOM. This research advances understanding of how seasonal/biological inputs may influence freshwater quality through altering DOM composition.

Poster Presentations

Poster Session 1: 9:00 – 10:00 AM

Engineering
1. Thinking Like a Fly: Emulating Insect Vision with Simple Sensors
By: Gabriel Falco Finger
Faculty Mentor(s): Juan Yepes and Daniel Raviv
Presenters: **Gabriel Falco Finger**

Visual looming is the process of analyzing sensor input based on the derivative of the signal rather than the signal itself. This project involved developing a device that computes a real-time looming value using simple sensors. The design mimics the vision of a fly, whose brain operates with minimal power yet enables rapid navigation through complex environments. An Arduino UNO and basic circuit components were used along with a Python differentiation algorithm. Sensor measurements were processed to generate an analog signal representing the looming value in real time, showing the possibilities of simple circuitry. The results demonstrate that low-power, real-time calculations and computer vision can be achieved without complex hardware.

Engineering
2. Optimization of Benthic Underwater Robotic Bodies Inspired by Stingrays
By: Emma Boudreaux, Mackenzie Smith, and Oscar Curet
Faculty Mentor(s): Oscar Curet
Presenters: **Emma Boudreaux**

Underwater walking robots provide a novel method of motion useful in exploring complicated environments, operating through water columns, facilitating surveying. Underwater walking robots have difficulties maintaining ground contact due to the neutral buoyancy needed for motor efficiency. This study utilizes the specialized morphology of the benthic Ocellate River Stingray (Potamotrygon motoro) to replicate the negative lift used to swim near the bottom. 3D simplifications of the P. motoro pectoral fin were designed using points along a scan of P. motoro and resin printed. Force measurements of the robot body and the various frontal sections were conducted in a recirculating flume for different flow velocities and distances from the ground. Preliminary data shows increased negative lift without significant drag increase in the stingray-based attachments when compared to the flat face. Further testing aims to examine more heights and to examine the effects of profiles attached to the rectangular model's rear end.

Basic Sciences

3. Fuel from Water: Hands-On Chemistry for the Next Generation

By: Sandra Dickson and Sam Xie Zhu-Lin
Faculty Mentor(s): Sam Xie Zhu-Lin
Presenters: **Sandra Dickson**

This is an education research project that involves demonstrating chemistry related to climate change to the younger generations. Two demonstrations are currently included in the project – one explaining electrolysis as a means of producing water-generating hydrogen fuel, and the other illustrating the acidification effects of CO2 in water through a simple pH indicator and human breath. The electrolysis process begins with an electrolyte solution of water and separates it into H2 and O2 gas, both being extremely resourceful as hydrogen gas can be combusted to produce clean water and energy. Excess carbon dioxide and its impact in water is investigated by the students in the second demonstration. By choosing these demonstrations important concepts are covered, such as: the carbon cycle, renewable energy, clean energy, ocean acidification, and climate change. Explaining these critical issues to young students is valuable for achieving viable solutions in the future.

Environmental, Ecological & Marine Sciences

4. Comparative Evaluation of Three Fecal Diagnostic Flotation Methods For Detecting Pachysentis canicola Eggs

By: Kanaa Clarke, Alexandra Veras, and Oscar Alejandro Aleuy
Faculty Mentor(s): Oscar Aleuy
Presenters: **Kanaa Clarke**

Pachysentis canicola- an acanthocephalan intestinal parasite- affects multiple carnivorous mammals worldwide. Detected in San Miguel Island foxes (SMF) in California in 2012, it has been associated with the rapid fox population decline. Since conventional fecal diagnosis of parasites relies on egg buoyancy, the greater density of P. canicola eggs limits the reliability of conventional flotation techniques, complicating diagnostic/epidemiological assessments. To address this, I compared three flotation methods using 15 fecal samples from SMF: Mini-Flotac using Fecamed solution with density of 1.40, Mini-flotac using sugar solution with density of 1.3, and Wisconsin double centrifugation with sugar solution. Preliminary results show that these methods can detect P. canicola with different levels of effectiveness. I predict that flotation with double centrifugation is the best method for detecting the P. canicola eggs. These findings are relevant to accurately determine the prevalence and intensity of the acanthocephalan eggs in the SMF and other mammals.

Business, Marketing, Finance & Public Administration

5. Is Being Fat a Choice?

By: Ruby Johnson

Faculty Mentor(s): Eric Levy and Monica Escaleras

Presenters: **Ruby Johnson**

Obesity remains a major public health challenge in the United States, yet Americans hold varied views about its causes and about individuals' responsibility for weight loss, views that often differ across demographic groups. These conversations have become increasingly sensitive in today's social climate. This study explores Americans' perceptions of the factors contributing to overweight and obesity. A 15-question survey was administered through Repdata. While most respondents recognized processed foods as an important contributor, opinions differed by ethnic background. Additionally, most participants did not believe that being overweight is linked to laziness, with Latino/Hispanic and African American respondents largely rejecting this idea and Asian/Pacific Islander responses more evenly divided. These findings highlight how perceptions of obesity are shaped by demographic factors, underscoring the need for public health messaging that consider cultural and generational differences.

Health & Medical Sciences

6. Examining Correlations Between High Pollution Exposure and Brain Health in a Rural Underserved Community

By: Samantha Boucher and Lisa Wiese

Faculty Mentor(s): Lisa Wiese

Presenters: **Samantha Boucher**

Older adults living in rural communities may experience environmental conditions that affect cognitive health, yet the impact on memory performance could go unrecognized. This quantitative correlational study examined the relationships among perceived PM2.5 exposure, educational attainment, and memory performance, as measured by the Montreal Cognitive Assessment Memory Index Score (MoCA-MIS), in rural older adults. Residents' perceptions of air quality were collected via ecological momentary assessment (EMA) delivered via wearable technology, and the MoCA assessed participants' cognition. Pearson's correlation and multiple regression analyses were conducted to identify strategies to improve cognitive health and mitigate the effects of PM2.5, an environmental pollutant, on vulnerable rural populations. The results showed a positive association, although not statistically significant ($B = 0.19$, $p = 0.292$). These findings suggest that although educational attainment acts as a protective factor, aging counteracts this protective effect, increasing the risk of cognitive decline among rural residents exposed to pollution.

Engineering

7. Suction Pile Added Mass Simulator

By: Jiovanny Cruz, Gregory Langager, and Lauren Gander
Faculty Mentor(s): Pierre-Philippe Beaujean
Presenters: **Lauren Gander**, Gregory Langager, and Jiovanny Cruz

Suction piles, when in deployment, have a large amount of added mass. These suction piles usually have vents on the top plate and sometimes vents on the bottom of the pile. These vents, if less than 5% of the entire surface area of the pile, can be ignored in the calculations for the added mass. The objective of this project is to design and fabricate an experiment that can measure the tension in a wire when a suction pile is being vertically moved up and down in water, simulating subsea deployments. With these measurements, we can determine if ignoring these vents does not make a difference or if including them in calculations would be beneficial. Part of the design is creating an OrcaFlex simulation to see how similar the results are along with picking the parts for the experiment based off OrcaFlex results.

Environmental, Ecological & Marine Sciences

8. Inventing Novel Ways to Identify Coral Cryptic Lineages

By: Jessika Cooney and Carsten Grupstra
Faculty Mentor(s): Carsten Grupstra
Presenters: **Jessika Cooney**

Currently, our lab identifies the cryptic lineages of Porites samples through DNA sequencing, which is time-consuming, labor-intensive, and costly. My research project is to identify a novel way to identify the cryptic lineage of Porites samples, that would be quicker and cheaper. A recent journal article, "Barcoding and mitochondrial phylogenetics of Porites corals" by Combosch et al., used mRNA primers in PCR to isolate specific, small mtDNA sequences in Porites that differed between cryptic lineages. After finding correlations between the cryptic lineages described in this journal article and the three cryptic lineages our lab works with, I identified three mRNA primers that could work to easily distinguish our three cryptic lineages from one-another without having to sequence their full genome. If the mtDNA sequencing of the amplicons shows significant differences between the lineages, we will be able to use this process to easily identify the lineages of unknown Porites samples.

Environmental, Ecological & Marine Sciences

9. From Detection to Response: Quantifying Sensorimotor Delays in Collective Shark Behavior

By: Isabella Urban, Ashkaan Fahimipour, Marianne Porter, and Darien Satterfield

Faculty Mentor(s): Ashkaan Fahimipour and Darien Satterfield

Presenters: **Isabella Urban**

Sensory-motor response time is hypothesized to scale allometrically with body size, yet most schooling research has focused on small-bodied teleosts, emphasizing vision's role in maintaining formation. To evaluate visual response dynamics in a sizable coastal predator, we analyzed drone footage of schooling Blacktip sharks (Carcharinus limbatus). Using AI-based pose estimation, we quantified individual velocity and heading, and reconstructed first-person visual fields to identify visible neighbors. Application of visibility-gated cross-correlation allowed us to determine response latency to shifts in neighbor speed and direction. Mean response latency to speed and directional changes were 383 milliseconds (ms) and 407 ms respectively, comparable to reported values for teleosts (<365 ms). These findings suggest that despite substantial differences in body size and ecology, sensory-motor delays in this large predator elasmobranch, for this particular visual motion task, are similar to those observed in smaller schooling fishes, potentially highlighting conserved temporal constraints on visually mediated collective behavior.

Health & Medical Sciences

10. Protective Effect of Endothelial C-Myc in High-Fat Diet-induced Kidney Fibrosis

By: Maria Clara Degrande and Claudia O Rodrigues

Faculty Mentor(s): Claudia Rodrigues

Presenters: **Maria Clara Degrande**

Chronic kidney disease (CKD) is characterized by progressive kidney fibrosis and loss of renal function. Endothelial dysfunction, a hallmark of obesity, is an early predictor of CKD. Previous studies from our lab showed that deficiency of the transcription factor c-Myc in endothelial cells contributes to kidney fibrosis. This proposal will investigate if overexpression of c-Myc in endothelial cells prevents high-fat diet-induced kidney fibrosis. We will use a mouse model in which c-Myc is overexpressed (OE) in endothelial cells. Animals will be exposed to a high-fat diet for 20 weeks, kidneys extracted and processed for inflammation and fibrosis analysis. Controls will consist of littermates and control diet exposure. We anticipate that mice exposed to a high-fat diet will show increased kidney inflammation and fibrosis, and that overexpression of c-Myc in endothelial cells will reduce or attenuate fibrosis showing a protective effect.

Environmental, Ecological & Marine Sciences

11. Time Is of the Essence: Early Incubation Temperatures and Sea Turtle Hatchling Sex Ratios

By: Jonathan Chavez and Jeanette Wyneken
Faculty Mentor(s): Jeanette Wyneken
Presenters: **Jonathan Chavez**

Many organisms have Temperature Dependent Sex Determination (TSD), where each individual's sex is directed by the environmental temperature across part of incubation. Embryos are receptive to thermal cues during a portion of development known as the thermosensitive period (TSP). TSD occurs across all sea turtle species, which are considered threatened or endangered globally. The Loggerhead Turtle (Caretta caretta) is our focal species and exhibits a TSD pattern of warmer female vs. cooler male. However, predicting the sex of hatchlings incubating in nature remains imprecise. Interpretation of incubation temperatures that are typical in nature often relies on the proportional time spent above or below the pivotal temperature (that producing 50%M:50%F sex ratio). Data from nests laid across multiple years suggests that cooler temperatures may be more impactful earlier in the TSP rather than later. This discovery may improve the accuracy of sex ratio predictions, which are important for conservation.

Behavioral, Educational & Social Sciences

12. Gendered Perceptions of Gene Editing: A Survey of Public Comfort with Somatic vs. Germline Gene Editing

By: Ricardo Onescar
Faculty Mentor(s): Eric Levy and Monica Escaleras
Presenters: **Ricardo Onescar**

The modernization of medical science has led to innovative biomedical procedures addressing persistent health conditions. With the introduction of CRISPR technology, gene editing has become possible; however, its implementation has led to controversy. To better understand the public's perception of gene editing, I distributed an 18-question survey through REP Data, receiving 417 total responses. The results revealed gender differences in comfort in similar yet distinct areas of biotechnology. Males were more likely to endorse germline gene editing for serious disease prevention, while females demonstrated greater uncertainty toward germline gene editing interventions this hesitancy diminishes when the focus shifts to somatic gene editing. More female respondents supported somatic editing for serious disease prevention, indicating greater acceptance when genetic modifications only affect the individual treated rather than potential offspring. This gender divergence highlights the importance of understanding how ethical perspectives informed by social and biological roles influence public acceptance of emerging biotechnologies.

Behavioral, Educational & Social Sciences

13. Seeing Success: How Visual Supports Help Students with Disabilities Thrive in the Classroom

By: Kiara Jones

Faculty Mentor(s): Lisa Finnegan

Presenters: **Kiara Jones**

Many students with autism have communication disorders that can cause frustration and challenging behavior. Additionally, they can become upset when there are changes in their routines (Borron, 2019). Visual supports are an evidence-based practice using written words, pictures or objects, or photos, videos, or even visual boundaries that provide students with autism the support needed to guide them through daily routines, tasks, and behavioral expectations (Liang et al, 2024). Visual supports help students with the completion of tasks and can help reduce frustration and anxiety, foster independence, and improve classroom behavior. Studies have shown that even caregivers have found visual support interventions to be feasible and effective when used in home settings (Avery et al., 2025). This presentation will share research on visual support strategies as well as the findings from implementing visual supports as a classroom strategy during a special education student teaching internship.

Environmental, Ecological & Marine Sciences

14. The Role of Mangroves in Mitigating Erosion and Enhancing Resilience

By: Andrae Cockburn

Faculty Mentor(s): Melina Matos

Presenters: **Andrae Cockburn**

Coastal erosion poses a significant threat to urban areas, particularly with rising sea levels. Mangroves serve as a natural defense, reducing erosion through their root systems and stabilizing coastlines. This research explores the role of mangrove ecosystems in mitigating erosion and recommends integrating mangrove restoration into urban planning to enhance resilience. Case studies from Florida and other regions compare erosion in areas with and without mangroves. The Goal is to demonstrate how mangrove forests reduce coastal erosion, protect urban coastlines and examine how restoring mangroves can help enhance cities' resilience to climate change impacts, including rising sea levels and storms.

Health & Medical Sciences

15. Study of Transcriptional Regulation of the Transduction Adaptor MYD88

By: Giulia Nuernberg, Sean Paz, and Massimo Caputi

Faculty Mentor(s): Massimo Caputi and Sean Paz

Presenters: **Giulia Nuernberg**

Myeloid differentiation primary response gene 88 (MYD88) is a key adaptor protein linking toll-like receptors (TLRs) to downstream activation of NF-κB and AP-1, driving immune responses, cellular proliferation, and apoptosis. Despite its central role in innate immunity, the mechanisms regulating MYD88 expression remain poorly understood. To investigate these regulatory pathways, we employed a cDNA expression library containing more than 80 transcription factors and 180 RNA-binding proteins (RBPs) in HEK293 cells. Our preliminary data indicate that SRSF1, an RBP predominantly known for its involvement in alternative splicing, enhances MYD88 transcription by recruiting components of the transcriptional machinery to the RNA Pol II complex shortly after initiation. Several additional RBPs may similarly influence transcriptional output by modulating RNA Pol II initiation and processivity. We are completing library screening and will validate initial findings through time-course experiments to elucidate the full regulatory landscape controlling MYD88 expression.

Health & Medical Sciences

16. Identification of Early Dose-Dependent Molecular Changes in Mouse Hearts after Exposure to the Anthracycline Doxorubicin by Gene Expression Analysis

By: Stella G. Potenti, Michelle H. Shanefield, Juliana R. Marques, and Claudia O. Rodrigues

Faculty Mentor(s): Claudia Rodrigues

Presenters: **Stella Potenti**

Cardiovascular disease is a common complication in cancer survivors due to chemotherapy-induced cardiotoxicity. Current strategies to prevent cardiotoxicity are limited. The aim of this study is to identify acute gene expression signatures associated with cardiac injury from cumulative exposure to anthracyclines, a potent class of chemotherapy agents. Mice were exposed to cumulative doses of the anthracycline doxorubicin and hearts analyzed by RNA-sequencing. Results revealed 77 genes significantly altered in hearts exposed to single dose versus 125 with cumulative doses. A set of chaperone genes, known to be essential for DNA repair, were significantly downregulated in both doses. Cumulative dose exposure showed additional alterations in inflammation and metabolism-associated genes relative to exposure to single dose. Our findings indicate that downregulation of chaperones is a major early event found in doxorubicin-exposed hearts and that even small doses of doxorubicin are sufficient to disrupt this important repair mechanism.

Engineering

17. Amputee Residual-limb Comfort and Thermal Insulation Cuff (A.R.C.T.I.C)

By: Priscilla Sanchez, Vimala Goolcharan, Caled Ghannam, Ella Roberson, and Jerin George
Faculty Mentor(s): Homayoon Abtahi
Presenters: **Jerin George**, Priscilla Sanchez, Caled Ghannam, Vimala Goolcharan, and Ella Roberson

Para-bobsled and para-skeleton athletes face challenges when competing in below-freezing conditions due to regulations that prohibit warming devices on their residual limbs during runs. Blankets and socks do not provide sufficient heat or comfort for athletes. Therefore, Project S.E.R.V.E. partnered with FAU students to design a device to enhance the comfort and safety of these athletes. A.R.C.T.I.C (Amputee Residual-limb Comfort and Thermal Insulation Cuff) is a unique wearable heating sleeve that regulates temperature for below-knee amputees and can be used beyond winter sports applications. The design incorporates a battery, carbon nanotube fiber (CNT) heating, thermistor sensing elements, and a practical tightening mechanism. The layered material layout allows the device to provide insulation, waterproofing, and moisture-wicking properties. Through analytical heat transfer and thermal resistance modeling, the system maintained limb temperatures between 95°F and 99°F under ambient conditions as low as –22°F. These findings were experimentally validated using thermocouples during prototype testing.

Engineering

18. Mission Autonomy Arbiter: Infrastructure Aware Governance for Delay Resilient Lunar Robotics

By: Kishore Adarsh Arulselvan, Pedro Brizuela Kury, Joseph Trejo, Stephen Nixon, and Lavar Jamison
Faculty Mentor(s): Minghan Wei
Presenters: **Kishore Adarsh Arulselvan**, Pedro Brizuela Kury, Joseph Trejo, Stephen Nixon, and Lavar Jamison

Sustained lunar and Mars class exploration requires robotic systems capable of operating under significant communication delays without continuous human oversight. This work presents the Mission Autonomy Arbiter, a deterministic governance framework embedded within a lightweight, infrastructure connected lunar rover. Rather than replacing navigation or perception subsystems, the Arbiter elevates autonomy to mission level authorization by integrating projected energy margin, state estimation confidence, communication latency classification, and interaction safety constraints into bounded decision logic. Simulation based validation under latency injected conditions demonstrates a sixty to seventy percent reduction in supervision events and more than twofold improvement in operational efficiency while maintaining strict safety thresholds. The architecture is software dominant and fleet replicable, enabling scalable robotic deployments aligned with NASA's Moon to Mars exploration strategy. This research reframes surface robotics from reactive control to certifiable, delay resilient mission governance.

Behavioral, Educational & Social Sciences

19. From the Sidewalk to the Hospital: A Statistical Comparison of Non-Motorist Safety in Miami-Dade and Collier Counties

By: Valentine Aalo, Ian Bush, Chelsea McLaren, Edgar Najera, Muddasir Shah and David Suarez
Faculty Mentor(s): Valentine Aalo
Presenters: **Ian Bush**, Chelsea McLaren, Edgar Najera, Muddasir Shah, and David Suarez

Non-motorist traffic injuries and fatalities have increased in recent years, raising public safety concerns in Florida. Rates of non-motorist accidents vary across counties, with more urban areas experiencing higher incident levels than less densely populated regions. These differences suggest that environmental, demographic, and situational factors may influence accident frequency and severity. This study compares non-motorist accident trends in Miami Dade County and Collier County to examine how county characteristics affect accident rates. Specifically, it analyzes factors such as road characteristics, population density, demographic characteristics, and time of day to identify contributing variables associated with non-motorist related traffic accidents. Understanding these relationships may help inform safety interventions and policy improvements aimed at reducing non-motorist accidents.

Business, Marketing, Finance & Public Administration

20. The Impact of Mall Rise, Decline, and Redevelopment on Housing and Neighborhoods

By: Regina Lewis and Yanmei Li
Faculty Mentor(s): Yanmei Li
Presenters: **Regina Lewis**

The hypergrowth of e-commerce has accelerated the decline of traditional shopping malls, prompting widespread calls for redevelopment. While extensive research examines how urban redevelopment affects housing prices, households, and neighborhood change, little attention has been paid to how the full lifecycle of shopping malls, from development and peak performance to decline and redevelopment, shapes surrounding housing markets. To address that gap, we examine neighborhood changes around Eagle Ridge Mall in Lake Wales, Florida. Using three housing data panels capturing pre-opening, operational and peak years, and decline and redevelopment phases, we apply spatial difference-in-differences (DiD) models to estimate proximity-based effects. Housing transaction data are integrated with the longitudinal U.S. Census demographic and housing data and complemented by interviews. By adopting a lifecycle framework, the study provides new evidence on how commercial developments influence housing values and neighborhood trajectories, offering policy insights for planners seeking to balance redevelopment, affordability, and community stability.

Business, Marketing, Finance & Public Administration

21. Fear, Attention, and Spending: How Psychological Agents Predict Market Risk and Consumer-Sector Performance

By: Fillipe Costa
Faculty Mentor(s): Kevin Lanning
Presenters: **Fillipe Costa**

Behavioral finance suggests that optimism and fear could be factors that influence risk evaluation and capital allocation decisions. In this project, we test whether increased consumer fear correlates to increased market volatility and decreased short-term returns. Further, we also evaluate whether higher consumer sentiment (confidence) predicts increased short-term returns and stronger performance in discretionary sectors relative to staple sectors. Discretionary sectors include companies that sell non-essential goods while staple sectors include companies that sell essential goods. This project uses monthly data from Federal Reserve Economic Data (FRED) and Yahoo finance to analyze specific trends that persist through various datasets inside these larger datasets. We hypothesize that elevated fear is associated with higher market volatility and lower short-term returns, while increases in consumer sentiment (confidence) predict stronger future market performance and greater allocation toward discretionary sectors.

Behavioral, Educational & Social Sciences

22. Beyond Party Lines: Demographic Moderation of Consistency and Compensation in Moral Judgment

By: Mariana De Araujo, John Bayliss, Mekhi Bell, Raquel Minowitz, and Zenobia King
Faculty Mentor(s): Robin Vallacher
Presenters: **Mariana De Araujo**, John Bayliss, Mekhi Bell, Raquel Minowitz, and Zenobia King

Decision dilemmas require individuals to choose between competing moral, social, or practical considerations, often involving trade-offs between short- and long-term outcomes, self-interest and collective welfare, or emotional and rational priorities. Moral self-regulation theory distinguishes two judgment perspectives: consistency, where individuals act in ways that align with their prior actions and outcomes, and compensation, where individuals adjust their actions to offset perceived disadvantages or past misfortunes (Joosten et al., 2014). Political affiliation has been shown to influence moral reasoning and decision preferences. However, less is known about variability within political groups. The present study examines whether demographic variables moderate the relationship between political affiliation and individuals' choices in decision dilemmas, testing whether political affiliation predicts dilemma choices and whether this association varies as a function of demographic characteristics. By examining this potential moderation effect, this research aims to move beyond between-party differences and uncover meaningful within-party variations in moral decision-making.

Behavioral, Educational & Social Sciences

23. Is It the Journey or the Destination? Development of a Process-Outcome Motivation Scale

By: Gal Hakshur, Annabella Toledo, Brook Ritter, Charledgar Bedouet, Mariana De Araujo, Luis Campuzano, Laura Gust, Alara Karatuna, Maryana Madeira Borri, Robin Vallacher and Andrzej Nowak
Faculty Mentor(s): Andrzej Nowak
Presenters: **Charledgar Bedouet**, Annabella Toledo, Brook Ritter, Mariana De Araujo, Gal Hakshur, and Luis Campuzano

Motivation research includes several related but distinct theories, such as intrinsic versus extrinsic motivation (Ryan & Deci, 2000), goal-setting versus goal-striving (Gollwitzer, 1999), and growth versus fixed mindsets (Dweck, 2006). This study brings these ideas together by developing a new scale that measures a single motivational dimension: process orientation versus outcome orientation. Process-oriented individuals value effort, learning, and engagement in the activity itself, while outcome-oriented individuals focus more on results, rewards, and external recognition of a task. To construct the scale, 56 items were generated to represent key aspects of process and outcome orientation. An exploratory factor analysis will be used to evaluate the scale's underlying structure and guide item modifications and improvements. This work represents an early step in developing and validating a measure designed to capture individual differences in process- and outcome-focused motivation.

Behavioral, Educational & Social Sciences

24. The Enjoyment of Task Engagement or Goal Attainment: Constructing a Process-Outcome Motivation Orientations Scale

By: Annabella Toledo, Gal Hakshur, Kira Conn, Max Rosenstein, Raquel Minowitz, Kenya Banks, Rebecca Comper, Laura Gust, Maryana Maderia Borri, Alara Karatuna, Robin Vallacher and Andrzej Nowak
Faculty Mentor(s): Andrzej Nowak
Presenters: **Annabella Toledo**, Kira Conn, Max Rosenstein, Raquel Minowitz, Kenya Banks, and Rebecca Comper

Individuals differ in their motivations to engage in, persist through, and complete tasks. Some are process-oriented, finding value and satisfaction in the steps involved with task engagement; others can be understood as outcome-driven, placing greater emphasis on the results or external feedback from an activity. Previous motivation literature, however, lacks a valid and reliable measure to systematically address this aspect of personality and motivation. To better understand why individuals derive and sustain motivation during task engagement this study seeks to develop and validate a measure for process-oriented versus outcome-oriented motivation styles. Specifically, this research aims to assess the item-health of the scale by examining item-total correlations, reliability estimates, and social desirability bias in answer choices. Providing a reliable measure of individuals' motivational style will enable researchers to examine how variation in this orientation shapes outcomes across multiple domains, including academic and clinical contexts.

Basic Sciences

25. Steric Modulation of Twisted Intramolecular Charge Transfer in Naphthalimide Fluorophores

By: Regan Hostetter, Nicholas McInchak, and Maciej Stawikowski
Faculty Mentor(s): Maciej Stawikowski
Presenters: **Regan Hostetter**

Naphthalimide fluorophores are widely used in probe design due to their strong fluorescence and environmental sensitivity. However, emission can be diminished by twisted intramolecular charge transfer (TICT), in which rotation of an electron-donating group (EDG) promotes non-radiative relaxation. While steric hindrance is often introduced to inhibit TICT, the relationship between donor sterics and photophysical output is not straightforward. Three N-propyl-1,8-naphthalimide analogs bearing EDGs of increasing steric bulk piperidine, 2-methylpiperidine, and 2,6-dimethylpiperidine were synthesized from 4-bromo-1,8-naphthalic anhydride. Comparative fluorescence studies revealed a non-linear trend. The least hindered derivative exhibited strong fluorescence when conformationally restricted, whereas increasing steric demand reduced planarity in the intramolecular charge transfer state and diminished emission. Quantum chemical calculations further indicated that the most hindered analog is pre-twisted. These results demonstrate that optimal fluorescence requires accessible donor–acceptor planarity rather than maximal steric inhibition, emphasizing the importance of balanced conformational control in probe design.

Behavioral, Educational & Social Sciences

26. Ketamine Effects on Spatial Learning in a Rat Model of Schizophrenia

By: Julia Jainarine, Skye Brown, and Jumani Brooks
Faculty Mentor(s): Robert Vertes
Presenters: **Julia Jainarine**, Jumani Brooks, and Skye Brown

A neuropsychiatric condition called schizophrenia is linked to thalamic dysfunction as well as memory and learning deficits. The brain mechanisms underlying these abnormalities are being studied increasingly using rodent models. In this work, we investigate whether rats' spatial learning and memory are impacted by ketamine, an NMDA receptor antagonist frequently used to simulate symptoms of schizophrenia. Ketamine-treated rats were assessed on maze-based behavioral tasks designed to evaluate cognitive flexibility and spatial awareness, including directional navigation. The effects of ketamine on learning accuracy and adaptability were assessed by comparing performance with that of control animals. In order to better understand how thalamic dysfunction may contribute to the cognitive abnormalities seen in schizophrenia, this work attempts to evaluate the validity of ketamine-treated rats as a behavioral model of the condition.

Health & Medical Sciences

27. The Association Between Morse Fall Scale Score and 90-day Return to Emergency Department in Older Head Trauma Fall Patients

By: Joseph Yenko, Gabriella Engstrom, and Richard D. Shih
Faculty Mentor(s): Richard Shih and Gabriella Engstrom
Presenters: **Joseph Yenko**

Falls are a leading cause of emergency department (ED) visits among older adults. Morse Fall Scale (MFS) is widely used to classify fall risk but its relationship to short-term ED return is unclear. This study aims to determine the association between MFS and 90 days return to the same ED. This is a secondary analysis of patients >65 who presented the ED for head trauma after a fall. MFS scores were categorized as low (0-24), medium (25-44), and high (>45). The primary outcome was return to the same ED within 90-days. Pearson Chi-Square test (two-sided α=0.05) were used. Of 5,425 ED patients, 4,547 (84%) presented after a fall. MFS categories were low 1,224 (27%) medium, 944 (22%), and high 2,329 (51%). Ninety-day ED return rates were similar across groups; 23.4%, 24.6%, and 23.2% respectively p=0.02. Differing MSK risk groups did not differ with 90-day return to ED.

Basic Sciences

28. Finding the Best Way to Form Disulfide Bonds while Making Cyclic Peptides on a Solid Support

By: Predrag Cudic, Lucas Alves Britto Da Costa, and Nilclark Merilien
Faculty Mentor(s): Predrag Cudic
Presenters: **Nilclark Merilien**

Cyclic peptides are increasingly important in drug discovery due to their enhanced stability, bioactivity, and target affinity. Cyclization restricts backbone flexibility, reducing entropic penalties upon binding and improving resistance to proteolytic degradation. Many naturally occurring cyclic, disulfide rich peptides such as those from venomous organisms exhibit potent pharmacological activities, and several have progressed to approved therapeutics. Disulfide bonds, which can significantly stabilize peptide structure, are commonly introduced during solid phase peptide synthesis (SPPS) using oxidative methods. This study focuses on optimizing SPPS conditions for odorranalectin (OL), a bioadhesive cyclic peptide with a single disulfide bridge and strong potential for intranasal drug delivery. We systematically evaluated key parameters influencing on-resin disulfide formation, including iodine concentration, oxidation time, and solvent choice EtOAc (ethyl acetate) to identify conditions that maximize yield and structural integrity.

Music, Art, Literature, Theater, History & Philosophy

29. From Italy to Vernon Avenue: An Italian Family Immigration Story

By: Emily Oswald
Faculty Mentor(s): Ilaria Serra
Presenters: **Emily Oswald**

The purpose of the project "From Italy to Vernon Avenue: An Italian Family Migration Story" is to research personal genealogical history, as well as Italian and Italian-American history. By using primary sources such as civil records, photographs, and objects, this research traces the lives of my ancestors from their origins in Italy to their settlement in the United States. Broader historical contexts relating to these sources were also explored in order to illustrate the connection between my family and Italian/Italian-American history. The project combines personal stories with historical analysis to show how ordinary lives have a role in major historical moments. By combining genealogical research with historical research, this work demonstrates how family history can serve as a lens for understanding Italian immigration and the Italian-American experience.

Behavioral, Educational & Social Sciences

30. When Parenting Becomes Production: Family Vlogging, Child Labor, and the Law's Silence

By: Morgan Robinson
Faculty Mentor(s): Anita Blowers
Presenters: **Morgan Robinson**

The rise of family vlogging and the ability to earn revenue online through monetization programs have ushered in a new era of child stars. So-called “kidfluencers” are frequently under the scrutiny of their parents, sponsors, and audience. Child influencers currently lack federal protections that ensure their well-being. Family vlogging has been proven to place a financial, mental, and sometimes, physical burden on children involved. Federal regulations are encouraged by experts and survivors of child internet exploitation, but have not been passed. This article will examine the impact of vlogging on children and propose legal safeguards to prevent exploitation. Federal laws must be passed to not only ensure children are compensated financially for their content, but to protect children from abuse and defend their right to request deletion of content. Without strict regulations, there is a significant risk of thousands of children being abused or exploited by their parents or audience.

Health & Medical Sciences

31. Combination of Alpha-santalol and Curcumin as a Potential Therapeutic Regimen against Human Melanoma Skin Cancer Development

By: Victoria Cescato
Faculty Mentor(s): Ajay Bommareddy
Presenters: **Victoria Cescat**

Previous studies have shown that Alpha-santalol, a naturally occurring compound from sandalwood oil, and curcumin, an active component of turmeric to be effective against development of various cancers. However, the combination of these two phytochemicals have never been explored for their anti-tumor potential. In this study we investigated their effects by employing human melanoma SK-MEL2 skin cancer cells. CCK-8, migration assay and DCFH-DA assays were employed to assess cell viability, wound-healing ability and generation of reactive oxygen species respectively. Results suggest that alpha-santalol reduces cell viability, migration and ROS generation more effectively when compared to curcumin. The combination regimen is still being explored, and a clear synergistic or additive relationship has not yet been confirmed. These preliminary findings suggest that alpha-santalol and curcumin when used alone or in combination could serve as a potential treatment option for melanoma and warrants further studies to fully understand their relationship in combination therapy.

Cross Disciplinary Projects

32. Attacking Ring-LWE with Machine Learning Algorithms

By: Asvatha Barath and Veronika Kuchta
Faculty Mentor(s): Veronika Kuchta
Presenters: **Asvatha Barath**

Our current post-quantum cryptosystems are based on hard mathematical problems such as Learning with Errors (LWE) and Ring-LWE (RLWE). The security of LWE relies on integer and matrix multiplication. However, transformer algorithms, like SALSA, have found a way to attack search and decision LWE on a small scale. In our work, we create an algorithm based on SALSA that attacks RLWE which previous studies did not cover. RLWE uses polynomial ring multiplication instead of integers to secure systems, making it faster and more efficient than search and decision LWE. Our process involves covering the background of post-quantum hard problems, developing our own transformer algorithm, and presenting preliminary results alongside a pathway for future studies. By finding a way to attack RLWE with machine learning, we develop a better understanding of the use of transformers in cryptography, defense against them, and the structure of RLWE itself.

Health & Medical Sciences

33. Relationship Between Mode of Transportation, Social Isolation or Loneliness, and Dementia Risk in an Underserved Cohort

By: Sarah Lievano and Lisa Wiese
Faculty Mentor(s): Lisa Wiese
Presenters: **Sarah Lievano**

Rural older adults are often vulnerable to transportation inaccessibility, which increases social isolation, loneliness, and associated dementia risk. Identifying relationships among transportation accessibility, social isolation, and loneliness is needed to develop interventions to mitigate cognitive decline in rural settings. We analyzed the influence of transportation accessibility on social isolation, loneliness, and dementia risk among broadly representative older adults in rural Florida. A mixed-methods sequential explanatory pilot study was conducted (N=829 quantitative and 32 qualitative). Only car ownership and accessibility presented significant predictions to larger social networks, less perceived loneliness, and better cognitive outcomes. Thematic analysis identified that residents ages 45-91 (Mean = 64.5) prioritized the need to participate in administrative decisions regarding transportation. Transportation is an essential community resource for maintaining social and cognitive health. Expanding this community-engaged nursing research will inform future actions to support the 2024 National Alzheimer's Plan Act goal of dementia prevention.

Behavioral, Educational & Social Sciences

34. Beyond Practice: Examining the Effects of Post-Practice Daytime Sleep and Quiet Rest on Speech-Motor Learning

By: Brielle Walter and Anne van Zelst
Faculty Mentor(s): Anne van Zelst
Presenters: **Brielle Walter**

Language learning and effective communication rely on one's ability to perceive and articulate new speech sounds. Memory consolidation is required to learn a new motor skill, and it is widely accepted that overnight sleep allows for this process. This research aims to investigate the lesser known effects of post-practice daytime naps and rest, absence of linguistic input, on speech motor learning outcomes of young adults, ages eighteen to twenty-five. A Danish vowel contrast will be introduced to native English speakers, and pre- and post-tests will be administered to compare the results of both perception and production of participants who had a three-hour sleep or rest period after initial learning to those who did not. Understanding the effects of daytime sleep and rest on speech motor learning may inform speech-language therapy and educational practices, particularly for individuals with motor speech disorders and those learning a new language.

Environmental, Ecological & Marine Sciences

35. Establishing a Standardized Menthol Protocol for Effective, Low-Mortality Coral Bleaching

By: Josefina Lamaison, Naomi Letizia Sananikone, and Carsten Grupstra

Faculty Mentor(s): Carsten Grupstra and Naomi Letizia Sananikone

Presenters: **Josefina Lamaison**

Menthol-induced bleaching is widely used as a tool to investigate coral–symbiont dynamics; however, species-specific responses remain under evaluated. This study aims to establish a menthol-induced bleaching protocol that maximizes bleaching efficiency while minimizing or preventing coral mortality in three Scleractinian species: Siderastrea siderea, Montastraea cavernosa, and Porites astreoides. Coral fragments will be exposed to menthol under controlled laboratory conditions while maintaining constant environmental parameters. Bleaching severity will be measured through changes in symbiont cell density, chlorophyll concentration, standardized color analysis, and photosynthetic efficiency measured via Pulse-Amplitude Modulated (PAM). Survival and recovery will also be monitored after exposing the corals to bleaching. We hypothesize that increasing menthol concentration will increase bleaching intensity (symbiont loss) in corals, but bleaching efficiency and survival rate will differ among the species. This research will help create a standardized, non-lethal bleaching protocol and improve understanding of coral–symbiont responses under controlled chemical stress.

Environmental, Ecological & Marine Sciences

36. Burrow Occupancy Patterns of Gopher Tortoises and Invasive Green Iguanas in a Degraded Scrub Habitat on the FAU Boca Raton Campus

By: Abigail Scigliano, Jack Werner, and Joshua Scholl

Faculty Mentor(s): Joshua Scholl and Jack Werner

Presenters: **Abigail Scigliano**

Gopher tortoises (Gopherus polyphemus) are state-threatened in Florida and much of the southeastern U.S., mainly declining due to urbanization and habitat loss. Invasive species like the green iguana (Iguana iguana) may also impact tortoise populations by occupying their burrows. We studied burrow occupancy on FAU Boca Raton's degraded scrub habitat to see if iguanas affect tortoise burrow use and if habitat type influences iguana presence. Florida Fish and Wildlife Conservation Commission guidelines estimate about 50% average burrow occupancy by tortoises. We hypothesized occupancy would be higher due to dense tortoise populations and that iguanas would only inhabit mowed areas. Using a burrow camera scope, we surveyed 26 burrows under permit. Thirteen (50%) were occupied by tortoises, aligning with expectations. Iguanas appeared in three burrows but were absent from scrub habitats. These early findings suggest habitat type may limit iguana presence, potentially reducing their impact on tortoise burrows.

Behavioral, Educational & Social Sciences

37. Personality Differences and Artificial Intelligence Addiction

By: Kaeley Lyons, Alyssa Branz, Reilly Miller, Tessa Cassab Charabati, Jordan Thompson, and Geoffrey Wetherell

Faculty Mentor(s): Geoffrey Wetherell and Jordan Thompson

Presenters: **Kaeley Lyons**, Tess Cassab Charabati, Alyssa Branz, and Reilly Miller

Generative Artificial Intelligence (or GenAI) is a rapidly developing technology that uses neural networks and machine learning in order to generate original text, images, and to act as a productivity tool. Concerns have emerged about addictive engagement. GenAI addiction refers to a psychological dependence characterized by compulsive use, parasocial tendencies, and increased loneliness, with behavioral similarities to internet gaming and social media addiction. While prior research has examined links between personality traits and addictive behaviors, GenAI as a potentially addictive medium remains underexplored. This study investigates the relationship between personality traits and everyday GenAI use. A self-report survey will be distributed. We expect people higher in neuroticism and introversion to have a higher frequency of interaction with artificial intelligence. If the hypotheses are supported, it could show that GenAI usage has unintended psychological risks and could have possible implications for other types of interactions.

Environmental, Ecological & Marine Sciences

39. Impacts of Hydrolagus colleli's Olfactory Microstructure on Sensory Surface Area

By: Najae Thomas, Tricia Meredith, and Lauren E. Simonitis

Faculty Mentor(s): Lauren Simonitis

Presenters: **Najae Thomas**

Chondrichthyans possess a frill-shaped olfactory organ called a rosette located inside their olfactory capsule. Within this rosette, there is a collection of plates called lamellae, which are covered in olfactory sensory epithelium. These lamellae are secondarily folded to increase the sensory surface area. Recently, unique microstructures were identified on the lamellae of spotted ratfish (Hydrolagus colliei), including looping, tertiary folding, and branching on the secondary folds. The purpose of this research is to understand how these microstructures affect the surface area of the lamellae and identify where they occur within the rosette. Using scanning electron micrographs, we mapped the presence of looping, tertiary folding, and branching based on the lamellae's position within the rosette. It is hypothesized that sensory microstructure correlates with water flow patterns. By mapping the locations of these microstructures on the rosette, we can continue to investigate the correlation between olfactory microstructures and hypothesized water flow patterns.

Health & Medical Sciences

40. Comparison of Muscle Power and Physical Function in Older Martial Artists and Active Adults

By: Evalyn Tonos and Ashely Artese

Faculty Mentor(s): Ashely Artese

Presenters: **Evalyn Tonos**

Age-related declines in muscle power affect physical function and independence in older adults. Martial Arts training incorporates rapid, multidirectional movements that train strength, power, balance, and coordination, potentially better preserving muscle power compared to aerobic activities. Since muscle power declines more rapidly than strength and is associated with functional performance, identifying activities that preserve muscle power is critical for healthy aging. The purpose of this study is to compare muscle power and physical function between older martial artists and active older adults. Adults (≥50 years) will complete one laboratory visit to assess muscle power using the Tendo Power Analyzer and physical function via the 30-second sit-to-stand, grip strength, and six-minute walk. Group differences will be analyzed using independent t-tests. We expect martial artists to demonstrate greater lower-body muscle power and functional performance with similar aerobic capacity. These findings will inform exercise recommendations for aging populations.

Environmental, Ecological & Marine Sciences

42. Juvenile Sea Turtle Development Under Controlled Laboratory Conditions

By: Elizabeth Morris, Mia Rivera, and Da'Yahna Joiner

Faculty Mentor(s): Jeanette Wyneken and Emily Turla

Presenters: **Elizabeth Morris**, Mia Rivera, and Da'Yahna Joiner

Loggerhead sea turtles' (Caretta caretta) and green sea turtles' (Chelonia mydas) growth rates and development are largely unknown because of their early life offshore. As dispersed pelagic neonates, they are effectively inaccessible at sea. This study examines early juvenile growth rates over the first few months of life to characterize growth under standardized laboratory conditions. Data were collected by measuring the carapace length and width (mm), body depth (mm), and weight (g) weekly from the day of emergence from the nest up to 18 weeks of age. These findings could help bridge the understanding of shape change with age between the hatchlings and post-hatchlings. Future work could include growth rates as an analysis of different ages of turtles and include water temperature as a variable.

Health & Medical Sciences

43. Testing the Effect of the Foraging Gene in Post-Traumatic Brain injury Decline in Drosophila Melanogaster

By: Ananya Tewari, Gabriella Boehm, Neel Gurram, and Jennifer Krill
Faculty Mentor(s): Jennifer Krill
Presenters: **Ananya Tewari**

Traumatic brain injury (TBI) occurs when an outside force causes an injury to the brain resulting in the disruption of brain function. Previous studies have shown that the two allelic variants of for (high PKG-activity Rovers and low-PKG activity sitters) influence stress tolerance in Drosophila melanogaster. A high-impact trauma (HIT) device will be used to induce TBI in the for allelic variants and then their climbing ability will be tested and compared. The aim of this study is to determine whether naturally occurring genetic variation in the Drosophila foraging (for) gene alters the development and severity of TBI phenotypes induced by a HIT device. Ultimately, this research will aid in identifying downstream pathways that could be targeted therapeutically to mitigate post-TBI decline.

Classroom Research Project/Assignment (not eligible for Oral Presentation)

44. Gopher Tortoise Heads Popping Out of Burrows Everywhere. Real or Imaginary?

By: Evelyn Frazier and Chiara Scholl
Faculty Mentor(s): Evelyn Frazier
Presenters: **Chiara Scholl**

The FAU campus supports a population of state-protected gopher tortoises (Gopherus polyphemus) that appears to have increased from approximately 100 individuals in 2010 to 175 in 2025. While encouraging, such rapid growth is unexpected for a long-lived, slow-maturing species, which warrants closer investigation. Habitat loss within the preserve may be elevating burrow occupancy above the standard 50% metric used statewide by the Florida Fish and Wildlife Conservation Commission, potentially inflating population estimates. Invasive green iguanas (Iguana iguana), first documented on site in 2011, may also compete for burrows and influence detection rates. Using long-term burrow surveys, mark–recapture records, and published growth parameters, we modeled whether this increase reflects true population growth or apparent growth driven by crowding and invasive species presence. Preliminary results suggest the rise is unlikely due to natural growth alone and instead reflects tortoise relocations and inflated estimates associated with the 50% occupancy assumption.

Classroom Research Project/Assignment (not eligible for Oral Presentation)

45. Navigating Pollution Through Sand: Sediment Analysis for Clean and Healthier Coasts

By: Jeana Delva
Faculty Mentor(s): Tiffany Roberts Briggs and Austin Scheinkman
Presenters: **Jeana Delva**

In this project I will be demonstrating my sediment analysis skills that includes analyzing grain size, composition and embedded contaminates on our local coast beaches. By collecting only surface samples on various shorelines in the east coast, I will analyze shorelines with stress from urbanization, whist being able to identify various type of debris. This project isn't not only to being awareness to my community but how we can strengthen and reshape it. With these results I can spark inspiration for environmental education and action to take better care of the marine habitat. And to preserve it for future generations to enjoy.

Poster Session 2: 1:30 – 2:30 PM

Behavioral, Educational & Social Sciences

1. Does Productivity Plateau After Working 40+ Hours a Week?

By: Logan Fain

Faculty Mentor(s): Monica Escaleras and Eric Levy

Presenters: **Logan Fain**

Research suggests that work-life balance is generally better outside the United States, contributing to higher mental well-being than among American workers. To explore this, I surveyed 411 Americans about their productivity after working more than 40 hours a week and their control over work schedules. Overall, 44% of respondents reported feeling very or slightly unproductive when working over 40 hours. Low- and middle-income individuals were more likely to feel unproductive compared to those with higher household incomes. Similarly, respondents with a high school education or less reported lower productivity than those with higher education levels. These patterns suggest that income and education influence productivity. Lower-income and less-educated workers often experience limited autonomy, rigid schedules, and higher stress, which reduces productivity during long workweeks. In contrast, higher-income and more-educated workers may maintain productivity due to greater flexibility, better conditions, and increased job security.

Environmental, Ecological & Marine Sciences

2. Development of Mushroom-Derived Iron Oxide – Chitin Air Filters

By: Christian Woehr, Edward De La Uz, Fariha Binthe Rahman, Hassan Mahfuz, and Vivian Merk

Faculty Mentor(s): Vivian Merk

Presenters: **Christian Woehr**

Current air filters are made of polymer blends such as polypropylene and polyester. These materials do not decompose readily, and plastics cannot be recycled easily. This project aims at replacing synthetic polymer filters with mushroom-derived chitin, by immersing edible mushrooms in an initial 0.5M sodium hydroxide solution, followed by a 2M hydrochloric acid solution, and finally a 1% acetone solution mixed with 0.5% sodium chlorite. Subsequently, the ferrimagnetic iron oxide mineral magnetite was precipitated from an aqueous solution of mixed-valence iron salts to improve the composite's mechanical and electrostatic properties. X-ray diffraction was used to confirm the deposition of the mineral phase within the critical-point dried scaffold, SEM and MicroCT to characterize the multiscale porosity of the aerogel, and compression testing to prove the filter can withstand pressure drops. This synthesis yields a free-standing functional air filter that is biodegradable, allowing for the future preservation of the global environment.

Basic Sciences

3. Investigating The Role of Eggshell Elemental Composition In Leatherback Sea Turtle Hatching Outcomes

By: David Morgan, Emily Turla, and Jeanette Wyneken
Faculty Mentor(s): Jeanette Wyneken
Presenters: **David Morgan**

Many factors play a role in the success or failure of embryonic development within sea turtle eggs. One such factor is exposure to toxic elements from the mother or the nest environment. Using Energy Dispersive Spectroscopy, we investigated whether the elemental composition of leatherback sea turtle eggshells differed between hatched and unhatched eggs. We found no significant difference, suggesting that the elemental composition of eggs is likely not the driving factor in determining egg success or failure. Most elements that were detected were expected and are considered essential for life, such as calcium, oxygen, carbon, magnesium, sodium, and sulfur. The elements chlorine and aluminum were detected in a number of samples, which was unexpected, but ultimately did not affect the success of eggs. This study is the first to investigate leatherback sea turtle eggshells in this nesting region and provides a baseline understanding of eggshell elemental composition.

Basic Sciences

4. Latent Toxoplasma gondii Infection: Neurochemical, Neuroinflammatory, and Behavioral Consequences

By: Natalia Delince
Faculty Mentor(s): Garry Perry
Presenters: **Natalia Delince**

Toxoplasma gondii, creates life-long latent infections in about 1/3 of the world's population. Although once considered clinically unimportant in healthy individuals, current research suggests that subclinical effects on the brain are present as a result of chronic infections. The parasite produces bradyzoites that remain in neural tissues for many years, primarily in areas like the amygdala, hippocampus, prefrontal cortex, and basal ganglia. Chronic low-grade neuroinflammatory responses to latent Toxoplasma infection have been demonstrated through the presence of activated microglia and continued release of cytokines, along with decreased glutamate regulation and decreased dopamine production. This can cause alterations in synaptic plasticity and neural circuitry leading to measurable changes in reaction time, risk taking behaviors, ability to control cognitions, and emotional processing. The epidemiologic literature has also established that there are significant associations between Toxoplasma gondii seropositivity and the development of psychiatric disorders, and this is indicative of potential public health implications.

Health & Medical Sciences

5. The Impact of Aging on Aortic Hemodynamics in Response to Acute Aerobic Exercise

By: Matthew T. Schallipp, Alexandre A. Hamaide, Chase Rohwedder, Ameera Juman, Frederique Audet, and Dr. Brandon G. Fico
Faculty Mentor(s): Brandon Fico
Presenters: **Matthew Schallip**

This study examined whether aging alters aortic hemodynamic responses to acute aerobic exercise. We hypothesized that older adults would have exaggerated aortic hemodynamics responses to exercise. Twenty-six younger adults (22±4 years) and eight older adults (58±6 years) completed ~35 min of moderate-intensity cycling (~200 kcal). Aortic systolic blood pressure, augmentation pressure (AP), and augmentation index normalized to 75 bpm (AIx@75) were assessed by pulse wave analysis before and immediately after exercise; aortic stiffness was measured by carotid–femoral pulse wave velocity (cfPWV). At baseline, older adults had higher aortic systolic pressure than young adults ($p=0.012$), but values were similar post-exercise ($p=0.377$). AP decreased in older adults ($p<0.001$) but not in young adults ($p=0.676$). AIx@75 decreased in older adults yet increased in young adults ($p=0.029$). Older adults had a greater increase in cfPWV ($p=0.041$). These findings indicate age-related differences in central pressure augmentation and aortic stiffness responses to acute aerobic exercise.

Health & Medical Sciences

6. Study of the Regulation Splicing of the Transduction Adaptor MYD88

By: Enzo Barrella, Sean Paz, and Massimo Caputi
Faculty Mentor(s): Massimo Caputi and Sean Paz
Presenters: **Enzo Barrella**

Myeloid differentiation primary response gene 88 (MYD88) is a key adaptor protein that links toll-like receptors (TLRs) to interleukin-1 (IL-1)–related kinases, leading to activation of transcription factors such as nuclear factor-κB (NF-κB) and activator protein 1 (AP-1). Activation of NF-κB and AP-1 induces the expression of genes involved in immune responses, cellular proliferation, and apoptosis. MYD88 undergoes alternative splicing to generate two isoforms: a full-length form (MYD88L) and a short isoform lacking exon 2 (MYD88S). Because MYD88S cannot transduce TLR signals, it fails to activate NF-κB and AP-1–mediated inflammatory pathways. Although regulation of MYD88 expression and splicing is not fully understood, preliminary data indicate that serine/arginine-rich splicing factor 1 (SRSF1) enhances MYD88 transcription. To investigate these mechanisms, we engineered a reporter minigene containing the MYD88 promoter, coding exons, and introns with an N-terminal HA tag. We are evaluating whether this minigene recapitulates endogenous MYD88 expression and splicing patterns.

Environmental, Ecological & Marine Sciences

7. Syntax in Birdsong: Testing Hypotheses about the Learning and Production of Preferred Transitions in Captive-Reared Bachman's Sparrows (Peucaea aestivalis)

By: Emily Chavez, Lily Roberge, Rachel Sebastian, Yajaira Cruz, Heather Wolverton, and Rindy Anderson

Faculty Mentor(s): Rindy Anderson

Presenters: **Rachel Sebastian**, Emily Chavez, and Lily Roberge

As juveniles, Bachman's sparrows learn to sing through a process called vocal learning, which involves memorizing and repeating conspecific songs. Their crystallized repertoires are organized into syntax patterns called preferred transitions, which consist of several song types commonly sung in a set order. These patterns may result from the psychological process of chunking, which aids memorization. To test the extent to which chunking plays a role in syntax development, we exposed seven lab-reared Bachman's sparrows to song playback, with some songs presented as preferred transitions during each repetition and others randomized. At adulthood, we identified their songs using bioacoustics software and analyzed their preferred transitions using the R statistical computing platform to determine if 1) the lab-reared Bachman's sparrows copied the syntax patterns they were played as juveniles, 2) if they innovated their own preferred transitions, and 3) if songs from syntax patterns were sung more often.

Health & Medical Sciences

8. Evaluation of Microglial Activation in Hippocampus of Mblac1 Knockout Mice

By: Erin E. Bell, Cara Melillo, Maureen K. Hahn, and Randy D. Blakely

Faculty Mentor(s): Maureen Hahn and Randy Blakely

Presenters: **Erin Bell**

Neurodegenerative diseases are a class of progressive neurological diseases that result in the gradual death of nerve cells known as neurons in the brain and spinal cord, leading to a decline in cognitive function. Neurodegeneration is in part driven by a neuroinflammatory response in the central nervous system (CNS) by resident immune macrophages and a subset of glial cells known as microglia. Microglia and their morphological changes are often a response to changes in cellular health, and can be indicative of increased oxidative stress in neurodegenerative conditions. Recently, the gene Mblac1 was discovered to serve a novel role in the regulation of a copper reductase as well as a risk factor for the development of Alzheimer's Disease (AD). Here, we investigate microglial change within the dorsal hippocampus (dHPC) of Mblac1 knockout (KO) mice as well as effect of treatment with copper-chaperone drug elesclomol in rescuing perturbations using immunofluorescence staining (IF).

Environmental, Ecological & Marine Sciences

9. Does Size Really Matter? Physical Clues and Indirect Measures of Reproductive Success in Gopher Tortoises (Gopherus polyphemus)

By: Jalyn Smith, Evelyn Frazier, and Joshua Scholl
Faculty Mentor(s): Evelyn Frazier and Joshua Scholl
Presenters: **Jalyn Smith**

Gopher tortoises (Gopherus polyphemus) are a threatened species throughout the southeastern United States, primarily due to habitat loss and urbanization. Understanding their reproductive ecology is essential for effective conservation and management. In many long-lived reptiles, body size influences mating success, with larger males potentially gaining greater access to high-quality mates. This field study will examine whether male body size is associated with female proximity as a proxy for reproductive opportunity. In the FAU Conservation Area, we will measure carapace length of adult males and females, and map burrow locations, assessing spatial associations. Specifically, we will test whether larger males are more likely to be near larger females, which may indicate size-based mate selection or male competitive advantage. Alternatively, male size may be independent of female proximity. Linking morphology and spatial distribution, this study will provide insight into mating dynamics and contribute to a deeper understanding of gopher tortoise reproductive ecology.

Behavioral, Educational & Social Sciences

10. Partisan's Media Exposure and Its Effects on the Tone of Cross-Party Online Political Discussion

By: Dylan Whittick, Alexa Chen and Geoff Wetherell
Faculty Mentor(s): Geoffrey Wetherel
Presenters: **Dylan Whittick**

Political polarization in the U.S. has intensified alongside increasing exposure to ideologically targeted news media. This study examines how brief exposure to partisan news content influences the tone of online political discussions between members of the same or opposing political parties. Adults(18+) will be recruited through Florida Atlantic University's SONA system and CloudResearch Connect and randomly assigned to view clips from MSNBC or Fox News. Participants will engage in a structured five-message discussion with an AI partner assigned a liberal or conservative identity. Self-report measures will assess perspective-taking, psychological reactance, perceived agency of the discussion partner, and evaluations of the political outgroup. Discussion tone will be analyzed using LIWC-22 to measure negative language use. We hypothesize that exposure to outgroup-associated news will increase negative tone, that cross-party discussion will heighten negativity relative to same-party discussion, and that news source and partner affiliation will interact to amplify hostility when politically opposed.

Behavioral, Educational & Social Sciences

11. Public Archaeology and History Programming

By: Holly Griffin

Faculty Mentor(s): Katharine Napora

Presenters: **Holly Griffin**

For this project, I will focus on developing two separate K-12 educational curriculums. This curriculum will consist of two separate programs utilized with local, private, and homeschools for historical interpretation, public outreach, community engagement, historical tourism and the promotion of historic preservation and appreciation for archaeological resources. The Jupiter Inlet Archaeological site in Jupiter, FL will be incorporated into the curriculum along with the DuBois Pioneer Home, built in 1898, on a pre-historic, indigenous shell mound. I will be creating a separate curriculum, for historic structure Salerno "Colored" Schoolhouse, 1930's, used during segregation in Port Salerno, Florida. These programs provide the opportunity to learn about the significance of history and the importance of historic preservation and archaeology today. Students will experience its impact on their quality of life and how it benefits the continued growth and sustainability of our communities.

Behavioral, Educational & Social Sciences

12. Noem v. Vasquez Perdomo and Plenary Authority: A Look at What is Happening to U.S. Citizens

By: Jose Solis

Faculty Mentor(s): Anita Blowers

Presenters: **Jose Solis**

The Supreme Court ruled in Noem v. Vasquez Perdomo that immigration officers are allowed to detain people they suspect to be undocumented based on four factors. These factors include race and ethnicity, language, location, and employment. This ruling is controversial because it permits racial profiling to justify arrests, placing Hispanic-appearing individuals at risk. In a 6-3 ruling, the Court declined to provide a legal basis for this decision, leading Justice Sonia Sotomayor to say this case was a "grave misuse of our emergency docket." My research found that immigration officers have used racial profiling to target U.S. citizens, making the implications of the Noem ruling dangerous to more than just undocumented immigrants. I argue that this ruling disregards the constitutional protections against unreasonable search and seizure by allowing immigration officers to violate the Fourth Amendment.

Basic Sciences

13. Identification of Bacterial Nutrients Regulating Dauer Formation in Caenorhabditis elegans: Implications for Controlling Parasitic Nematodes

By: David Strickland and Kailiang Jia
Faculty Mentor(s): Kailiang Jia
Presenters: **David Strickland**

Parasitic nematode infestations in humans, livestock, and agriculture cause widespread disease and crop loss, which results in billions of dollars in loss annually across multiple industries. By investigating the dauer state in Caenorhabditis elegans (C. elegans), which is analogous to the infective larvae of parasitic nematodes, we can find novel ways to combat parasitic nematodes. By screening E. coli deletion libraries, we identified specific bacterial mutations that can increase dauer formation significantly in C. elegans, which suggests a loss of the essential nutrients that are required for normal development. These bacterial signals that regulate nematode development, can help provide a foundation to create novel anthelmintic drugs that control nematode parasites.

Behavioral, Educational & Social Sciences

14. Legal Analysis Virtual Courts

By: Devani Montanez-Kniffin and Anita Blowers
Faculty Mentor(s): Anita Blowers
Presenters: **Devani Montanez-Kniffin**

The expansion of virtual court proceedings has significantly reshaped criminal adjudication in the United States, raising constitutional concerns surrounding the Sixth Amendment's Confrontation Clause. This research examines whether remote testimony and virtual courtroom practices adequately preserve a defendant's right to confront witnesses in a digital legal environment. Through constitutional and doctrinal analysis, this study evaluates how emerging courtroom technologies interact with longstanding confrontation protections designed to ensure fairness, reliability, and meaningful cross-examination. While virtual proceedings increase efficiency and accessibility within the justice system, this research finds that their use may weaken essential safeguards tied to credibility assessment and adversarial testing. The study highlights the need for carefully defined procedural limitations to ensure that technological modernization does not compromise fundamental constitutional rights.

Behavioral, Educational & Social Sciences

15. Understanding the Difference between Public Knowledge and Evidence-Based Findings on Hot Spot Policing, Drug Courts, and Prisons

By: Lincoln Sloas and Eva Damani
Faculty Mentor(s): Lincoln Sloas
Presenters: **Eva Damani**

The extent and accuracy of public knowledge on criminal justice policies remains unclear. In order to better understand this concept, a public opinion survey gauging public perception and knowledge of three different policies—hot spot policing, drug courts, and incarceration—is administered across the United States, and the survey results are compared to current empirical research results that discuss these policies. This study aids in better understanding the scope and precision of public knowledge on these three prominent criminal justice policies, and helps discern any public misconceptions. The data will be collected through Lucid Theorem, where respondents can earn $1.50 for completing the survey. We anticipate the results will show dissimilarities between public opinion and empirical research, and will show the public's lack of comprehensive and accurate knowledge on these policies.

Health & Medical Sciences

16. Investigating the Potential Relationship Between PM2.5 and Parkinson's Disease Symptoms

By: Jackelin Guzman-Alvarez and Lisa Wiese
Faculty Mentor(s): Lisa Wiese
Presenters: **Jackelin Guzman-Alvarez**

Exposure to fine particulate matter (PM2.5) has been linked to contributing to the development of many different neurodegenerative diseases. The purpose of this study was to explore the relationship between PM2.5 exposure and Parkinson's Disease (PD) symptom expression in a broadly representative and low-resource cohort (n = 40), who reported living rurally for a minimum of one year, with varying levels of exposure to PM2.5. This study utilized a quantitative, cross-sectional, correlational research design to assess the relationship between PM2.5 exposure and symptom severity of Parkinson's disease. Results revealed that while the majority of PD-related symptoms were not significantly associated with Mini-PPT performance (which assesses physical functioning), the masked face symptom showed as the most significant indicator of reduced physical functioning. These results emphasize the need to further investigate the role that rural living factors may play regarding increased Parkinson's disease risk.

Health & Medical Sciences

17. Investigating Oxytocin Levels In Veterans Receiving Canine-Assisted Interventions

By: Daniel Motola, Cheryl Krause-Parello, Beth Pratt, and Shahar Almog

Faculty Mentor(s): Cheryl Krause-Parello and Beth Pratt

Presenters: **Daniel Motola**

Veterans with post-traumatic stress symptoms (PTSS) experience suboptimal physical and mental health. Oxytocin plays a role in feelings of attachment, but its association to PTSS remains unclear. The purpose of this study was to examine the effects of a dog adoption and training intervention on oxytocin levels in veterans with PTSS. Participants were randomized into intervention (n=9) and waitlist control (n=13) groups. Longitudinal linear mixed models were used to examine changes in salivary oxytocin pre- and post-intervention. Although results revealed an increase in mean oxytocin levels (pg/mL) for [GU1.1][DM1.2]intervention (18.262 to 24.975) and waitlist control (19.927 to 25.395) groups, the difference between groups was non-significant (p=.891). Further research is required with larger samples and refined methodology to elucidate the connection between oxytocin and the human-animal bond, which could influence the availability and acceptability of human-animal therapies for veterans with PTSS and ultimately impact health policy.

Engineering

18. Express Lanes Benefitting Freight Mobility: Can Express Lane Systems and Their Benefits to General-Purpose Lanes Improve Freight Mobility?

By: Luana Santos Lima, Troy Nguyen, Ioannis-Paraskevas Ioannou, and Evangelos I. Kaisar

Faculty Mentor(s): Evangelos Kaisar

Presenters: **Luana Santos Lima**

Express Lanes are becoming an integral part of Florida's limited-access highway network to enhance system efficiency and travel time reliability. Although primarily designed for passenger vehicles, their indirect influence on freight movement in adjacent general-purpose (GP) lanes has not been comprehensively assessed. This research aims to assess the operational impacts of Express Lane implementation on freight mobility performance. The study considers changes in truck travel time, speed, and reliability using corridor-level performance measures, including variability and congestion metrics. By analyzing traffic redistribution effects and reductions in vehicle conflicts, the research evaluates whether Express Lanes improve delivery reliability and operational efficiency for freight carriers operating in GP lanes. The findings will establish measurable criteria for assessing freight-related benefits and support performance-based planning for managed lane investments across Florida's evolving highway system.

Engineering

19. LitterNet: Video-Based Litter Detection and Classification for Smart Cities

By: Sandina Charles, Emily Diaz-Silva, and Nidhi Begur
Faculty Mentor(s): Jason Hallstrom
Presenters: **Sandina Charles**, Emily Diaz-Silva, and Nidhi Begur

Litter poses a serious environmental and public health threat, making efficient monitoring essential for livable communities. Traditional litter detection methods relying on manual labor are costly, error-prone, and inefficient at large scales. To improve efficiency, automated detection methods using machine learning classification models (YOLOv9, YOLOv11, and YOLOv12) have been tested to detect live changes in video feeds. The system applies background subtraction to track human movement, followed by static scene differencing to isolate regions of interest (ROIs) where litter may appear. Each ROI is then classified in three stages: general trash detection, material type, and functional shape. The models achieved over 83% performance while avoiding false positives and negatives in detecting litter elements, with at least 50% of each litter element type identified (mAP50), and over 82% for shape and over 85% for material classification. Automated litter detection and classification can help localities plan data-driven interventions to address littering problems.

Health & Medical Sciences

20. Brain Adaptions to Language: The Influence of Multilingualism

By: Staley Bretoux
Faculty Mentor(s): Gary Perry
Presenters: **Staley Bretoux**

Language can influence more than just communication; it can also affect the brain's elasticity during aging and injury. Bilingualism and multilingualism have been associated with an outcome of increased cognitive reserve and executive control. Cognitive reserve and executive control are pertinent when brain damage occurs. Developing research proposes that the knowledge of more than one language is coupled with the delay of cognitive decline and other manifestations of brain damage, such as dementia and other traumatic brain injuries. The influence of knowing many languages allows for support in the brain despite the presence of a decline. Present evidence suggesting the benefits of multilingualism is still sparse and stalls at a few points due to interpretations of multilingualism. Combined, the foundations of neuroplasticity and cognitive reserve can offer insight into why language can strengthen the brain during neurodegeneration.

Environmental, Ecological & Marine Sciences

21. Seed Morph Ratios and Germination Patterns in a Sunflower Species

By: Emily Panton and Joshua Scholl

Faculty Mentor(s): Joshua Scholl

Presenters: **Emily Panton**

Seed heteromorphism is a bet-hedging strategy in plants that is theorized to increase reproductive success by producing multiple seed types with distinct dispersal and survival traits. Heterotheca subaxillaris (camphorweed; Asteraceae) produces non-dispersing ray achenes and dispersing disc achenes. This study examined the influence of phenology and weather patterns on achene morph ratios and germination characteristics across two growing seasons (2024–2025 and 2025–2026) in Southeastern Florida. Achenes were collected between September and March, sorted by morph, and quantified; germination trials were conducted under controlled laboratory conditions. We hypothesized that disc achene proportion would increase later in the season and germinate more quickly and to a higher proportion than ray achenes. Ray-to-disc ratios decreased due to declining ray achenes. Increased rainfall produced larger flowers and more achenes, with disc production increasing more slowly. Disc achenes germinated earlier and at higher proportions, highlighting complementary roles in balancing rapid dispersal with conservative persistence.

Environmental, Ecological & Marine Sciences

22. Investigation of the Presence of Chemical Pollutants in Sea Turtle Tissue Using NMR

By: Caylee Lia, Heather Seaman, and Sarah Milton

Faculty Mentor(s): Sarah Milton and Heather Seaman

Presenters: **Caylee Lia**

Plastic pollution is an escalating threat to marine ecosystems and imperiled sea turtle populations. Ingestion of plastics can cause physical harm, but less visible risks arise from toxic chemicals that leach from degrading plastics and microplastics. Some of these compounds, including suspected endocrine disruptors, have been detected in sea turtle tissues and may contribute to sublethal effects that impair reproduction, growth, and long-term survival. This study evaluates whether plastic-associated chemicals are detectable in sea turtle tissues even when no plastic is present in the gastrointestinal tract at death. Adipose, liver, and gonadal tissues were collected under FWC permit MTP053, processed, and analyzed for select plastic-derived compounds. By identifying chemical burdens independent of visible plastic ingestion, this research provides critical insight into hidden impacts of plastic pollution and supports evidence-based conservation and management strategies for vulnerable sea turtle populations.

Basic Sciences

23. Synthesis and Characterization of a Red-Shifted Anthracene-Derived Fluorophore

By: Robert Zamojski and Maciej Stawikowski

Faculty Mentor(s): Maciej Stawikowski

Presenters: **Robert Zamojski**

To develop a red-shifted fluorophore with reduced phototoxicity, a 9-bromoanthracene scaffold was functionalized through sequential Friedel–Crafts acylation and oxidative transformation. Treatment of 9-bromoanthracene with oxalyl chloride and aluminum chloride afforded 9-bromoanthracene-4,10-dione via electrophilic aromatic substitution. Subsequent oxidation with hydrogen peroxide yielded 9-bromoanthracene-4,10-dicarboxylic anhydride. This extended π-conjugated system is structurally analogous to 4-bromo-1,8-naphthalic anhydride but incorporates a larger aromatic core, producing a pronounced bathochromic shift in excitation wavelength (~490 nm). The final product was characterized by 1H and 13C NMR spectroscopy and mass spectrometry, and the purity of intermediates and product was evaluated spectroscopically. Ongoing studies focus on detailed photophysical characterization and resolving discrepancies in reported synthetic yields and spectral data for related anthracene-derived anhydrides.

Basic Sciences

24. The Convergence Behavior of the RMSProp Algorithm

By: Kyle Loh, Jason Mireles-James

Faculty Mentor(s): Jason Mireles-James

Presenters: **Kyle Loh**

We investigate the discrete dynamics of RMSProp using a simple quadratic loss function as a surrogate. Treating the matrix A as a tunable hyperparameter, we rigorously establish — for certain asymmetric matrices A, learning rates, and decay rates — the existence of a transverse homoclinic intersection and thus a Smale horseshoe in the six-dimensional RMSProp system. This is proven via a computer-assisted approach employing high-order polynomial manifold parameterizations and rigorous interval arithmetic to verify Newton-Kantorovich transversality bounds. We outline extensions to higher dimensions and general learning and decay rates, where varying hyperparameters can produce alternative convergence behavior such as invariant circles, convergence to fixed points, or periodic orbits.

Environmental, Ecological & Marine Sciences

25. Gene Expression Analysis of Candidate Blood-Based Sex Biomarkers in Loggerhead (Caretta Caretta) Sea Turtle Hatchlings Using Reverse Transcription Quantitative PCR (RT-qPCR)

By: Jewel Smith, Gabriella Carvajal, and Jeanette Wyneken
Faculty Mentor(s): Jeanette Wyneken and Gabriella Carvajal
Presenters: **Jewel Smith**

Sea turtles have temperature-dependent sex determination (TSD), a system in which incubation temperatures determine if a developing embryo will become male or female. As temperatures rapidly increase due to climate change, nesting beaches are estimated to produce highly female-biased primary sex ratios, potentially threatening population stability due to a lack of males. Developing non-lethal, blood-based biomarkers that can accurately identify sex would greatly enhance population sex ratio monitoring at hatching. Building on previous transcriptomic analyses that identified candidate sex-associated genes in loggerhead (Caretta caretta) hatchling blood, this study aims to validate a set of candidate biomarkers at the gene expression level using reverse transcription quantitative PCR (RT-qPCR). This work contributes toward the development of non-lethal molecular tools for assessing sea turtle sex ratios, thus providing conservation physiological approaches to predict and mitigate climate-driven impacts on TSD species.

Basic Sciences

26. Conformation-Dependent Mechanisms of Cell-Penetrating Peptides Probed by Fluorescence Spectroscopy

By: Valery Drazdova and Andrew C. Terentis
Faculty Mentor(s): Andrew Terentis
Presenters: **Valery Drazdova**

Cell-penetrating peptides (CPPs) are short, cationic amino acid sequences capable of crossing biological membranes, making them powerful tools for intracellular delivery of drugs and biosensors. Their efficiency, however, is highly dependent on secondary structure. Structured CPPs such as β-hairpin “protectides” show excellent intracellular stability but limited permeability. This project will investigate how β-hairpin folding affects CPP membrane interactions using fluorescence spectroscopy. Two model peptides, one structured (WK hairpin) and one unstructured (WK control) will be synthesized and labeled with NBD (N-terminus), a solvatochromic fluorophore. By comparing fluorescence intensity and emission shifts in lipid environments, this study aims to elucidate how conformation influences membrane affinity. Results will support the rational design of CPPs with optimized stability and uptake for biomedical applications.

Environmental, Ecological & Marine Sciences

27. Urban Heat Islands and Street Design in Boca Raton, Florida: Evaluating the Relationship Between Urban Form and Pedestrian Heat Exposure

By: Maria Teresa Ramirez
Faculty Mentor(s): Diana Mitsova
Presenters: **Maria Ramirez**

Urban Heat Island (UHI) effects have become a growing concern in South Florida due to increasing urbanization, extensive impervious surfaces, and limited street-level vegetation. In Boca Raton, several arterial and collector roadways prioritize vehicular mobility over environmental performance and pedestrian comfort, contributing to elevated surface temperatures and increased heat exposure. This research examines the relationship between street design characteristics and localized heat accumulation using spatial analysis and Geographic Information Systems (GIS). Land Surface Temperature (LST) data derived from satellite thermal imagery will be analyzed alongside land cover, tree canopy distribution, and roadway configuration data. The study aims to evaluate how factors such as pavement extent, right-of-way width, and vegetation coverage influence thermal conditions within the public realm. By linking environmental data with urban design practices, this research contributes to climate-responsive planning strategies that enhance walkability, thermal comfort, and long-term urban resilience in rapidly urbanizing coastal cities.

Basic Sciences

28. Optimization of Sialic Acid Donors for Sialyl-Tn–Serine Synthesis and MUC1 Glycopeptide Assembly via Fmoc Solid-Phase Peptide Synthesis

By: Anthonela Oliveros, Hunter Anderson, Stephanie Salterini, and Mare Cudic
Faculty Mentor(s): Mare Cudic
Presenters: **Hunter Anderson** and Anthonela Oliveros

Mucin 1 (MUC1) is a transmembrane glycoprotein whose protein backbone is densely modified by diverse O-glycans. During carcinogenic progression of epithelial cells, tumor-associated MUC1 exhibits truncated glycosylation, exposing cancer-related structures such as sialylated GalNAc (sTn). In this study, we optimized the synthesis of sTn analogs of an Fmoc-Ser building block for incorporation into MUC1 glycopeptides by Fmoc-based solid-phase peptide synthesis. We hypothesized that N-2,2,2-trichloroethoxycarbonyl (Troc) protected phenyl-β-1-thiogalactoside could more efficiently form an α-Ser-linked sTn antigen compared to phenyl-β-1-thiogalactoside. This key precursor, phenyl-β-1-thiogalactoside, was prepared on a large scale, followed by the installation of the N-Troc group in three steps, and the resulting compounds were characterized by 1H and 13C NMR spectroscopy. Our results show that Troc protection did not provide a significant advantage over phenyl-β-1-thiogalactoside for stereoselective α-sialoside formation, suggesting that alternative protecting groups may be needed to advance synthetic strategies for MUC1-based prophylactic and immunotherapeutic vaccine development.

Behavioral, Educational & Social Sciences

29. Exercise and Neural Circuit Modulation in Major Depressive Disorder

By: Lily McMullen
Faculty Mentor(s): Gary Perry
Presenters: **Lily Mcmullen**

Major Depressive Disorder (MDD) has been accepted as simply a monoaminergic imbalance, but over time has been increasingly understood as a disorder of circuit-level dysregulation and impaired neuroplasticity. Neuroimaging research, such as Mayberg's limbic-cortical model, illustrates the neurobiological framework for MDD — hypoactivity of the dorsolateral prefrontal cortex (dlPFC) and hyperactivity of the subgenual anterior cingulate cortex (sgACC)— this demonstrates compromised top-down emotional regulation. Concurrent findings reveal reduced brain-derived neurotrophic factor (BDNF) signaling and synaptic vulnerability in individuals diagnosed with MDD. This project evaluates exercise-based interventions as targeted neurobehavioral strategies capable of modulating dysregulated neural systems. These interventions include restorative mind–body movement, autonomic regulation training, and breath-and attention-based practices. Findings show that such approaches are capable of influencing core neural substrates. This kind of framework promotes a neuroscience-informed model of treatment that integrates circuit regulation, plasticity restoration, and sustainable behavioral intervention.

Health & Medical Sciences

30. Propranolol and Its Effects on Traumatic Brain Injury

By: Suzanna Lucas
Faculty Mentor(s): Gary Perry
Presenters: **Suzanna Lucas**

Traumatic brain injury (TBI) is one of the major causes of death and disability worldwide, often accompanied by excessive sympathetic nervous system activation from secondary injuries known as sympathetic storming. This overactivation leads to elevated levels of catecholamines such as norepinephrine and epinephrine, which can worsen brain injury through increased heart rate, metabolic stress and increased blood pressure. Propranolol, a non-selective beta-adrenergic blocker, has shown the potential to mitigate these effects by lowering the adrenergic response in the body. This poster examines the efficacy of propranolol's pharmacology, how it's involved in managing secondary injuries, and its influence on mortality and neurological recovery when administered early. By reviewing recent clinical studies and mechanistic findings, this poster aims to evaluate propranolol's potential and limitations in improving patient outcomes following a severe TBI.

Health & Medical Sciences

31. Chronic Social Defeat Stress and Extracellular Matrix Remodeling in a Mouse Model of Depression

By: Eric Parise, Shaida Sanson
Faculty Mentor(s): Eric Parise
Presenters: **Dabensy Alcius** and Shadia Sanon

Chronic stress plays an important role in depression and changes in brain structure. Long term stress activates the body's stress response system, known as the hypothalamic–pituitary–adrenal axis, and can alter important brain regions that are involved in mood regulation, including the hippocampus and prefrontal cortex. Studies have shown that the extracellular matrix, a structural support network in the brain, helps support normal brain function. Perineuronal nets are specialized components of this network that surround certain neurons and influence how the brain is able to change and adapt. This study observed whether chronic social defeat stress increases perineuronal net density in a mouse model. Adult mice are assigned to control or stress conditions, and brain tissue is collected after stress exposure. Sections are stained and imaged to measure perineuronal net density. Understanding these structural changes may improve the translation of stress-related findings from the mouse models to human depression.

Environmental, Ecological & Marine Sciences

32. Creating a Digital Herbarium: Utilization of MicroCT to Create 3D Models of Native Florida Plants

By: Hadassa Ebrahim, Amelia Camilo-Morillo, Evan Durante, Jasmine Coyle, and Jamie Knaub
Faculty Mentor(s): Jasmine Coyle
Presenters: **Hadassa Ebrahim**, Amelia Camilo-Morillo, and Evan Durante

Herbaria are the standard for collecting and preserving plant species for scientific study, typically consisting of press-dried plant specimens. However, traditional herbaria are often inaccessible to the general public, vulnerable to specimen decay, and limited to the display of external features. To fill these gaps, this project aims to produce a digital collection that captures the internal and external structures of native plants at FAU's Tortuga Trail and will be accessible to the general public. Micro-computed tomography (micro-CT) scans of the plant specimens will be captured and segmented to display their small internal features. A diverse collection of shrubs, vines, trees, and grasses will be included in order to establish a scanning workflow for various plant types. By using micro-CT to scan plants, a revolutionary herbarium will be compiled that displays plant internal organs and serves as an easily accessible educational tool.

Behavioral, Educational & Social Sciences

33. Evaluating the P-Star Model with Divisia Monetary Aggregates

By: Jack Steckel

Faculty Mentor(s): Bryan Cutsinger

Presenters: **Jack Steckel**

This project develops an empirical P-Star inflation model that integrates Divisia monetary aggregates to measure monetary disequilibrium and its effect on the price level. By constructing a price gap framework that compares the observed price level to its long-run equilibrium implied by money, output, and velocity, the model evaluates the role of excess money growth in driving inflation dynamics. Using modern data and refined monetary measurement, the analysis tests whether the price gap systematically predicts future inflation and assesses the stability of money demand. The findings contribute to ongoing debates in monetary economics by reexamining long-run price level determination and reinforcing the importance of properly measured money in understanding inflation.

Behavioral, Educational & Social Sciences

34. "Junk Science" or Admissible? The Role of Psychological Profiling in Serial Homicide Trials

By: Alice Gnesin

Faculty Mentor(s): Anita Blowers

Presenters: **Alice Gnesin**

In many homicide trials, juries have to consider more than forensic and testimonial evidence. Sometimes, a perpetrator's actions can appear illogical, and juries have to examine their mental state, motivations, and behavioral patterns. Psychological profiling has been used in criminal investigations for years, but many question its legitimacy. This article examines the effectiveness of behavioral analysis as expert testimony in serial homicide cases, using the evidentiary standards in Frye v. United States, Daubert v. Merrell Dow Pharmaceuticals, and the Federal Rule of Evidence 702, alongside relevant case law and empirical research. The examination shows that behavioral analysis is more than speculation; it can help juries understand mens rea, premeditation, and risk of recidivism. When backed by empirical research and combined with forensic and testimonial evidence, behavioral analysis is beneficial in the courtroom. Contrary to claims that behavioral profiling is "junk science," it should be admitted under established evidentiary safeguards.

Health & Medical Sciences

35. Ambient Digital Phenotyping: A Dual-Vector Framework for Continuous Cognitive Mapping

By: Umme Romana
Faculty Mentor(s): Kevin Cox
Presenters: **Umme Romana**

Episodic clinical assessments contribute to diagnostic latency in cognitive and psychiatric disorders, often detecting dysfunction only after meaningful decline. Digital phenotyping offers promise; however, current models remain constrained by behavioral friction, episodic engagement, and hardware fragmentation. This work proposes a refined architectural framework for an ambient, frictionless platform enabling continuous cognitive state mapping in real-world settings. The system integrates multimodal sensor fusion, combining human-computer interaction (HCI) metrics with inertial sensor streams optimized for edge computing. Behavioral baselines are modeled using unsupervised machine learning to support longitudinal drift detection without reliance on rigid diagnostic labels. A dual-vector clinical paradigm is introduced: the "Negative Vector" identifies early markers of decline, while the "Positive Vector" quantifies adaptive neuroplasticity and treatment response. By leveraging native mobile infrastructures, the framework advances digital phenotyping from episodic measurement toward continuous, ambient clinical architecture.

Cross Disciplinary Projects

36. Designing a Novel Approach to Archaeology Education that Connects State Standards with Experiential Learning

By: Charly Troche
Faculty Mentor(s): Katharine Napora
Presenters: **Charly Troche**

In the Fall of 2025, Florida Atlantic Laboratory Schools introduced an archaeology education program, including an authentic and in-depth archaeological simulation, designed to immerse K-12 students in Florida's past through experiential and interactive learning. Modeled after the Jupiter Inlet Lighthouse archaeological site in Jupiter, Florida, the simulated site includes a shell midden, epoxy-based hearths, and post holes, among other features. These elements illustrate changes in the environment and lifeways of Native American communities, and designing them required an interdisciplinary approach that integrated such fields as zooarchaeology, paleoclimatology, and stratigraphy. Here, I discuss the translation of this educational program into curricula that simultaneously engage students experientially and meet grade-level standards.

Health & Medical Sciences

37. Assessing the Relationship between Objective and Subjective Physical Function Measurements in Cardiac Rehabilitation Patients

By: Isabelle Garrido, Skylar Cito, Carmela Hack, Lainey Billings, Francisco Nascimento, and Ashley Artese

Faculty Mentor(s): Ashley Artese

Presenters: **Isabelle Garrido**

Physical functional assessments are essential for establishing baseline functional capacity and guide exercise prescription in cardiac rehabilitation (CR). Despite their importance, assessments are often underutilized and lack consistency across CR sites. Further research is needed to understand how objective and subjective physical function measures relate. The purpose of the study was to determine the association between objective and subjective measures of physical function in CR patients. Thirty participants from an outpatient CR clinic completed the 4-meter walk, grip strength, 6-minute walk test (6MWT), and Tendo sit-to-stand. The PROMIS Physical Function Questionnaire assessed subjective physical function. Pearson product-moment correlations were used for analysis. PROMIS scores correlated significantly to 4-meter walk (r=-.54;p=.002;), grip strength (r=.65;p<.001), 6MWT (r=.70;p<.001), and sit-to-stand (r=.61;p<.001). Findings demonstrate that objective and subjective measures were related; however, moderate correlations suggest they may reflect physical function differently, supporting the use of both for comprehensive assessment.

Behavioral, Educational & Social Sciences

38. Understanding the Psychological Mechanisms Linking Belief Framing and Anthropomorphism of AI

By: Alexandra Hickey and Michael Maniaci

Faculty Mentor(s): Michael Maniaci

Presenters: **Alexandra Hickey**

As artificial intelligence becomes increasingly a part of daily life, it's important to understand how humans perceive and relate to AI. This study examines beliefs about AI and whether those beliefs influence the extent to which people anthropomorphize it. Two hundred participants will be randomly assigned to read one of two framing narratives describing AI as either human-like (capable of emotions, intentions, and consciousness) or purely computational. Participants will then have a brief interaction with an AI chatbot and complete measures that assess perceived responsiveness, enjoyment of the interaction, willingness to continue engaging, and anthropomorphic attributions such as intentionality, emotions, and autonomy. It is expected that participants exposed to human-like framing will report higher levels of anthropomorphism and more positive perceptions of the chatbot interaction. Findings will provide insight into the psychological mechanisms that are responsible for shaping human-AI interaction and will assist in designing more effective AI systems.

Health & Medical Sciences

39. Assessing the Impact of Canine Training Program on Anxiety, Depression, and Suicidality Among Veterans with Posttraumatic Stress Symptoms

By: Alena Santos, Cheryl Krause-Parello, Shahar Almog, and Beth Pratt
Faculty Mentor(s): Cheryl Krause and Shahar Almog
Presenters: **Alena Santos**

Veterans experience higher rates of anxiety, depression, and suicidality than civilians, partly due to military training and combat-related trauma. Canines may provide companionship and assist in improving mental health for veterans, especially those with posttraumatic stress symptoms (PTSS). The purpose of this study was to assess levels of anxiety, depression, and suicidality before and after participation in an 8-week dog adoption and training intervention. A total of 54 veterans with self-reported PTSS were randomized into the intervention or the waitlist control group. Measures were collected pre-intervention (week 1), post-intervention (8 weeks), and at one-month follow-up (12 weeks). Calculations of the effect size were fully powered in an RCT; anxiety decreased significantly ($p = .017$); however, changes in depression ($p = .084$) and suicidality ($p = .529$) were not significant. Increased sample sizes are recommended in future studies to better understand the intervention's impact on anxiety, depression, and suicidality among veterans.

Behavioral, Educational & Social Sciences

40. Spatial Occupancy Patterns and Habitat Associations of Cercopithecus neglectus (De Brazza's monkey) in the Luzaka Region of the Lomami National Park in the Democratic Republic of the Congo Basin

By: Yunxin Gao, Deondra Sterling, Daniel Gorczynski, and Kate Detwiler
Faculty Mentor(s): Kate Detwiler and Daniel Gorczynski
Presenters: **Yunxin Gao** and Deondra Sterling

Lomami National Park encompasses rainforest and grassland habitats to support diverse wildlife. De Brazza's monkeys (Cercopithecus neglectus) remain critically understudied, leaving knowledge gaps in its spatial ecology. We used a single-season, single-species occupancy model during the fall (June - December 2021) to investigate gallery forest habitat associations of these primates in the Luzaka region. Across 71 events, occupancy of this cryptic monkey was 0.97 (SD = 0.01), predicting near-ubiquitous presence across forests. The seven occupancy covariates revealed no significant preference (95% credible intervals overlapped zero) unlike the height detection covariate with lower heights having high detections ($\alpha = -9.38$, 95% CI = -12.59 to -6.14)). Despite varying vegetation characteristics, the results display general understory habitat use within Luzaka. These results provide the first basis for systematic occupancy assessment of De Brazza's monkeys in the central Congo basin and establish camera placement in lower strata maximizes detection success for future monitoring efforts.

Basic Sciences

41. An Algorithm for the Automatic Categorization of SVG Wallpapers into Plane Crystallographic Groups

By: George Kamel and Daniela Nikolova
Faculty Mentor(s): Daniela Nikolova
Presenters: **George Kamel**

Wallpapers are 2-dimensional images that repeat in two directions, classified into 17 groups by the symmetries they have: namely rotational, glide, and reflectional symmetries. Most algorithms to classify wallpapers into groups require complex image processing, making them computationally expensive and reducing their reliability. This project aims to use the Scalable Vector Graphics (SVG) standard, which uses shapes to describe an image instead of pixels, to make a faster and more reliable algorithm for identifying wallpaper groups. The algorithm first organizes the wallpaper groups into binary decision trees based on their common symmetries, then descends one of the trees by eliminating possible groups until a single group remains. Because of the SVG standard's simplicity relative to raster image formats, the new algorithm is expected to run faster than alternative solutions, especially with less complex wallpapers. With some changes, the algorithm might also be extended to classify 3-dimensional crystals.

Environmental, Ecological & Marine Sciences

44. Understanding the microbial community composition in sugarcane cultivated in muck and sandy soils in South Florida

By: Yasmine Duran, Ryan Nagy, Maxine Nazaire, Jeff Debrine, Joshua Raia, Miloura Octama, Jennifer Okoro, Michael Botey, Amarachi Nwoji and Xing-Hai Zhang
Faculty Mentor(s): Xing-Hai Zhang
Presenters: **Ryan Nagy**, Yasmine Duran, Jeff Debrine, and Joshua Raia

Florida produces over 50% of U.S. cane sugar, primarily in organic-rich muck soils and mineral-rich sandy soils. However, both environments face significant challenges: muck soils are rapidly degrading through microbial oxidation (subsidence), while sandy soil lacks essential nutrients. To combat declining yields, growers often over rely on chemical fertilizers, risking long term soil health. Despite these issues, the sugarcane microbiome in South Florida remains poorly understood. This study aims to evaluate how these contrasting soil types shape microbial communities. Using Oxford Nanopore sequencing, we will characterize the composition, structure, and abundance of the microbiome in both muck and sandy environments. Our findings will provide critical insights into the relationship between soil type and microbial health, potentially offering more sustainable alternatives to chemical interventions.

Poster Session 3: 2:45 – 3:45 PM

Cross Disciplinary Projects

1. Rethinking Urban Water Management in Southeast Florida: Lessons from China and Singapore's Sponge Cities

By: Brendan Buchanan
Faculty Mentor(s): Melina Matos
Presenters: **Brendan Buchanan**

Southeast Florida currently faces major shortcomings with urban resiliency in the face of climate change; an overreliance on gray infrastructure, a prevalence of impermeable surfacing, and car-dependent land use have compounded pre-existing flood risks due to climate change and rapid urbanization. My research analyzes the successful "sponge city" approach to implementing blue-green infrastructure—primarily in China and Singapore—to remedy issues of urban inundation and waterlogging. After examining the current water management practices, and prevalence of car-dependent land uses of major municipalities in Miami-Dade, Broward, Palm Beach County, and the Comprehensive Everglades Restoration Plan, I found a significant reliance on gray infrastructure and provide recommendations to successfully implementing sponge city approaches. I recommend reducing permeable surfacing, and implementing rain-gardens, urban wetlands, and living shorelines. By re-evaluating our land uses and water management, urban planners and engineers are better equipped in improving urban resiliency, and by extension protecting life and property.

Music, Art, Literature, Theater, History & Philosophy

2. Cesare Beccaria and the American Constitution

By: Olivia Forlini
Faculty Mentor(s): Ilaria Serra
Presenters: **Olivia Forlini**

This work analyzes the impact of Cesare Beccaria's Enlightenment thought on the Founding Fathers of the United States in the formation of key documents, specifically the Constitution and Bill of Rights. This essay examines the Eighth, Sixth, Fifth, and Second Amendments, Beccaria's correlated idea, and related Supreme Court cases of the United States, both in federal and state courts. It begins with the Eighth Amendment where Beccaria's influence is clearest, and concludes with the Second Amendment where the connection has not been exhaustively researched. The aim of this project is to bridge a gap between America and the influence of Italian Enlightenment philosophers, like Beccaria, during the founding of the United States.

Behavioral, Educational & Social Sciences

3. Empty Promises? Evaluating The Effectiveness Of Honduras's Electoral Gender Quotas

By: Sarah Roldan and Lucas Perello

Faculty Mentor(s): Lucas Perelló

Presenters: **Sarah Roldan**

While electoral gender quotas have been shown to be an effective means of increasing women's representation in the Global North, the effects of quotas in the Global South remain understudied. This poster focuses on the Honduran case, which in 2000 adopted a 30% gender quota for women and subsequently increased it three times, culminating in a 50% target in 2021. Drawing on data from 12 legislative elections spanning 1981 to 2025, this poster examines two key points. First, whether quotas increased the number of female representatives. Second, if those changes were consistent across political parties and departments. The preliminary findings indicate that the average representation of women increased from 10.3% to 24.7% of legislative seats following the introduction of gender quotas. Despite the numbers suggesting an increase in women's representation, they have fallen short of their target—raising questions about their overall effectiveness.

Engineering

4. NASA Human Exploration Rover Challenge Design Project

By: Ana-Maria Briscan, Daniel Briant, Charles Travert, Paul Chazhur, Fabricio Ochoa, Lucas Kulon, Erik White and Jose Marte-Rosario

Faculty Mentor(s): Oscar Curet

Presenters: **Ana-Maria Briscan**, Daniel Briant, Charles Travert, Erik White, Fabricio Ochoa, and Paul Chazhur

The objective of this project is to design, fabricate, assemble, and test a remote controlled rover for a national competition known as the NASA Human Exploration Rover Challenge. Over the course of 29 weeks, this rover was designed and assembled with the intention to traverse a 10 obstacle course with 3 specific task performances. The obstacles replicate the varying terrain found on the Moon and the tasks simulate scientific missions conducted by NASA. Samples are collected and tested for soil moisture content, pH level, CO2 levels. The rover shall also collect velocity and G-forces sustained in a mock crew cabin. This project aids NASA in their goal of creating a pressurized rover from which unsuited astronauts can work for extended periods of time. Furthermore, it allows students to apply a culmination of engineering concepts towards a well-defined goal in an environment that supports their personal growth.

Engineering

5. Taking a Free Ride – Exploring the Hydrodynamics of a Bio-Inspired Vessel Swimming Behind an Obstacle

By: Erik White and Oscar Curet
Faculty Mentor(s): Oscar Curet
Presenters: **Erik White**

Experiments and numerical models have shown that fish can take advantage of vortex sheds from other swimmers or obstacles. Bio-inspired vessels could exploit similar hydrodynamic interactions to minimize energy and enhance maneuvering. In this work, we used a 40% scale down model of a bio-inspired underwater robotic to study hydrodynamics when positioned behind an obstacle. The model was attached through the flat plate using fishing line. The dynamics of the vessel were recorded for different flat plate widths while releasing the vessel from different distances relative to the obstacle. Particle Image Velocimetry was used to measure the flow field between the flat plate and the vessel. We found that the flat plate creates a specific region behind it where the model accelerates into the plate. These hydrodynamic interactions could be exploited by single or group of underwater robotics enhancing efficiency or finding stable configurations between them.

Business, Marketing, Finance & Public Administration

6. Predicting the Economic Impact of Urban Mining in the United States of America

By: Suhaan Mahtani
Faculty Mentor(s): Andrew Garrison
Presenters: **Suhaan Mahtani**

Urban mining has emerged as a strategic approach to resource recovery, particularly for high-value metals like gold and copper. The United States is reliant on imports for these materials, creating economic vulnerabilities and supply chain risks. This paper evaluates whether the process of urban mining electronic waste could serve as a substitute for imported gold and copper. Through literature review and quantitative analysis, this study estimates the ratio of recoverable metals in national electronic waste streams to current U.S. import volumes in order to assess import substitution potential and provides a measure of domestic resource sufficiency. Findings indicate that recoverable copper from e-waste could replace approximately 143.5% of current copper imports, while gold could exceed 1104% of current gold imports. These results suggest that urban mining has the theoretical capacity to fully offset present reliance on foreign sources for these metals.

Basic Sciences

7. Iron Biomineralization of Blue Corals (Helipora coerulea)

By: Domenico Guadalupe, Alejandra Coronel-Zegarra, Si Chen, Joonsu Han, Molly Moynihan, Kylie Morgan, and Vivian Merk

Faculty Mentor(s): Vivian Merk

Presenters: **Domenico Guadalupe**

Throughout history, corals have been a vital part of reef ecosystems and habitats. Corals are marine invertebrates, including reef-building scleractinian corals and soft Octocorals. Heliopora coerulea are unusual octocorals that build a uniquely blue, dense mineralized skeleton. Heliopora corals show higher resistance to thermal stress events like bleaching, compared to many stony corals, giving them a competitive advantage in warmer waters that led to evolutionary resilience. To date, little is known about the biomineralization and trace element incorporation in Heliopora. Using scanning electron microscopy (SEM), Raman/FTIR spectroscopy, X-ray diffraction (XRD) and synchrotron X-ray fluorescence microscopy, we analyzed the skeletal morphology, elemental composition and crystallography of Heliopora skeletons. Our data confirms that Heliopora skeletons primarily consist of the CaCO3 biomineral aragonite, with a minor iron sulfate heptahydrate phase, which might be causing the observed sturdiness towards increasing global temperatures and its trademark hue.

Environmental, Ecological & Marine Sciences

8. A Morphological Description of Green Sea Turtle (Chelonia Mydas) Hatchlings with Congenital Abnormalities

By: Navaneeta Minnamareddy, Jamie Knaub, and Lauren Simonitis

Faculty Mentor(s): Lauren Simonitis and Jamie Knaub

Presenters: **Navaneeta Minnamareddy**

Between 40,000-84,000 sea turtle nests are laid annually, each containing around 80-200 eggs. A small proportion of these hatchlings are born with congenital skeletal abnormalities, which significantly affect their survival and development. This project investigates morphological abnormalities in sea turtles. Two Chelonia mydas (green sea turtle) hatchlings, one with deformities and one without, were micro-CT scanned. Using 3DSlicer, we visualized and segmented the reconstructed scans to isolate the skeletons, then compared them to describe malformations. Compared to the normal hatchling, the deformed hatchling had craniofacial malformations. These findings highlight deviations from typical skeletal development and expand our understanding of congenital skeletal anomalies in sea turtles. Furthermore, the study demonstrates how micro-CT imaging can be used to examine and analyze skeletal morphology.

Health & Medical Sciences

9. Early Acetaminophen Exposure and Autism Spectrum Disorder: Mechanistic Insights

By: Isabella McCartney

Faculty Mentor(s): Gary Perry

Presenters: **Isabella McCartney**

Autism spectrum disorder (ASD) is a multifactorial neurodevelopmental condition influenced by genetic and environmental factors. Recent evidence suggests that acetaminophen use in neonates and young children may increase ASD risk, potentially due to heightened oxidative stress, inflammation, and immature drug metabolism during early brain development. Mechanisms include the formation of the toxic metabolite N-acetyl-p-benzoquinone imine (NAPQI), disruption of microglial development, altered immunologic pathways, altered brain-derived neurotrophic factors, and interference with the endocannabinoid system, which is critical for neurodevelopment. These findings underscore the importance of investigating acetaminophen's long-term neurodevelopmental effects and its potential role in ASD etiology. Understanding these pathways may inform safer pharmacologic practices in development and early childhood in order to guide future research into environmental risk factors for ASD. We will present and discuss data showing current epidemiological research examining the association between early-life acetaminophen exposure and ASD risk, highlighting biological pathways that may contribute to neurodevelopmental vulnerability.

Health & Medical Sciences

10. Creation of a Paradigm to Design a Highly-Precise, Real-Time Biosensor Model to Measure Blood Alcohol Concentration (BAC) in Mice

By: Suniyah Sohail and Lyonna Parise

Faculty Mentor(s): Lyonna Parise

Presenters: **Suniyah Sohail**

Alcohol Use Disorder (AUD) is a detrimental disorder that severely affects daily life by causing disruption in neuroimmune signaling through consistent neuroinflammation. Because of this, scientists have utilized mouse models to investigate the precise consequences of AUD. Blood alcohol concentration (BAC) sensing models are integral to determine the concentration of alcohol that causes these symptoms. However, most sensing models are applied in rats or humans, are unable to provide constant measurements, or are too invasive to utilize in experimentation. To combat this, we aim to outline a minimally invasive BAC sensing technique that can provide real-time, accurate measurements of BAC levels to use in mice experimentation. To do this, we will conduct searches on pre-existing models found in rats or humans and identify the sensing methods utilized. We will then use this information to pinpoint a technique that can be designed into a compact biosensor to be used in mice.

Environmental, Ecological & Marine Sciences

11. Swimming Kinematics of Sedentary and Migratory Sharks

By: Mallory Schumaker and Stephen Kajiura

Faculty Mentor(s): Stephen Kajiura,

Presenters: **Mallory Schumaker**

This study quantified the swimming kinematics of three shark species that differ in morphology and migratory behavior. I predicted that the swimming kinematics would differ among the three species. To test this hypothesis, I analyzed aerial drone footage of sharks free swimming in their natural habitat to collect tailbeat frequency (Hertz), amplitude (body length), and velocity (body lengths per second). Significant differences were found among species for all three parameters. The blacktip demonstrated the greatest tailbeat frequency and velocity, whereas the nurse shark demonstrated the greatest amplitude but the slowest velocity. The velocity of the blacktip was approximately double that of the nurse shark. The lemon shark was largely intermediate for the three kinematic parameters. These results may correlate swimming kinematics with shark migratory patterns and can be used to predict the extent of migration exhibited by a given species, including species for which studying long distance migration is difficult.

Behavioral, Educational & Social Sciences

12. Behavioral Parent Training Programs for Relative and Non-Relative Foster Caregivers

By: Emprisse M. Walker and Morgan Cooley

Faculty Mentor(s): Morgan Cooley

Presenters: **Emprisse Walker**

This study examines Behavioral Parent Training (BPT) programs developed for foster caregivers within the child welfare system. Although foster parents go through an initial preparation process, they often face additional challenges when caring for children who have experienced trauma or maltreatment. Oftentimes foster care children have pre-existing mental health and behavioral issues. While evidence-based programs are available, their accessibility and the strength of supporting evidence vary. To address this gap, this systematic review analyzed BPT programs targeting both relative (kinship) and non-relative (traditional) foster caregivers. The review aimed to (a) identify and categorize existing BPT programs and related literature; (b) summarize key components of these programs and how they are implemented; and (c) evaluate how effectively the programs apply evidence-based BPT principles. The review also examined the quality and structure of the studies, considering factors such as research design, participant characteristics, strength of evidence, methods of analysis, and key findings.

Environmental, Ecological & Marine Sciences

13. Spatial Position Predicts Social Connectivity in Aggregating Blacktip Sharks.

By: Italo Teixeira, Ashkaan Fahimipour, Marianne Porter, and Darien Satterfield.
Faculty Mentor(s): Darien Satterfield
Presenters: **Italo Teixeira**

Collective behavior emerges from local interactions, yet large-scale coordination in marine predators remains poorly understood. Blacktip sharks (Carcharhinus limbatus) form dense seasonal aggregations in shallow coastal waters of eastern Florida, providing a natural system to study social structure in elasmobranch schools. We tested whether shark schools exhibit non-random social networks and whether specific individuals contribute disproportionately to connectivity. Using drone imagery and AI-based object detection, we reconstructed swimming trajectories and projected each shark's visual field to identify mutually visible neighbors. From these interactions, we constructed adjacency matrices and calculated spectral centrality for each individual across frames. Schools averaged 44.8 sharks, with individuals visually connected to 57% of group members. Spectral centrality was strongly negatively correlated with distance from the school center, indicating that centrally positioned sharks play a disproportionate role in maintaining social connectivity.

Behavioral, Educational & Social Sciences

14. Maternal Sensitivity, Breastfeeding Practices, and Depressive Symptoms in Mother-Infant Dyads

By: Summer Robb, Chris Thuo, Joshua Hernandez, and Nancy A. Jones
Faculty Mentor(s): Nancy Jones
Presenters: **Summer Robb**, Christopher Thuo and Joshua Hernandez

Maternal sensitivity, defined as the ability to perceive/respond adaptively to the infant's signals, plays a key role in socioemotional development. The association between maternal sensitivity, breastfeeding duration and quality along with depressive symptoms were examined. It was hypothesized that maternal sensitivity would be associated with longer breastfeeding duration and higher scores on perceived quality of breastfeeding along with lower maternal depression symptoms. Data from 35 mother-infant dyads (infant ages: 6- to 16-months) were evaluated using BORIS behavioral-coding software to assess specific maternally-sensitive behaviors during a play interaction, including monitoring, responsiveness, and intrusiveness. Standardized depression and breastfeeding questionnaires were also completed. Preliminary findings ($ps < .05$) showed: 1) an association between maternal sensitivity and breastfeeding quality rather than duration; 2) duration was associated with responsiveness; and 3) more depression symptoms were associated with pumping breastmilk whereas lower depression occurred in mothers that used formula and those that breastfed via the breast.

Engineering

15. Visual Inertial Navigation System for Autonomous Robotic Surveillance

By: Daniel Granda, Vladimir Gunichev, Caleb Sanchez, James VanZwieten, Yufei Tang, and Pratik Mukherjee

Faculty Mentor(s): Pratik Mukherjee

Presenters: **Vladimir Gunichev** and Daniel Granda

The focus of this research is to develop a Visual Inertial Navigation system that enables robots to operate and coordinate in GPS-denied environments, such as electrical power stations. To accomplish this a HUSKY A200 robot equipped with a ZED X stereo camera was used to operate in a ROS 2 Humble environment and execute a SLAM algorithm to navigate waypoint routes autonomously. To ensure the algorithm and robot performed accurately, an OptiTrack Motion Capture system was used to validate the ground-truth and the position of the robot at all times. Quantitative analysis confirmed the system's reliability, with a mean position error of 0.1878 meters and a root-mean-square error of 0.2311 meters. These results showed that the system could operate without relying on external satellite signals, with minimal odometry drift. This pipeline establishes a dependable foundation that would be very useful in remote areas, indoor, and infrastructure-heavy settings.

Health & Medical Sciences

16. The Relationship Between Perceived Exercise Benefits and Barriers and Functional Capacity in Older Adults

By: Quavon Odom, Sofia Seibert, Maguire Lindisch, Emily Clark, Bernardo Bruxelas, and Ashley Artese

Faculty Mentor(s): Ashley Artese

Presenters: **Quavon Odom**, Sofia Seibert

Cardiorespiratory fitness and physical function are important predictors for longevity, fall risk, and health outcomes in older adults. Exercise can improve cardiorespiratory fitness and physical function; however, older adults may face barriers that limit ability to exercise. More research is needed to examine relationships between these outcomes. The purpose of the study was to examine the relationship between perceived exercise benefits, barriers, cardiorespiratory fitness, and physical function. Sixteen participants (68+/-8 years) completed the Exercise Benefits/Barriers Scale. Cardiorespiratory fitness (VO2peak) and physical function (30-second sit-to-stand and six-minute walk distance [6MWD]) were assessed. Pearson product-moment correlation were used for analysis. Mean VO2peak (27.6+/-5.6 ml/kg/min) was significantly associated with the 30-second sit-to-stand (r=.62;p=.01), but not 6MWD. There was no relationship between exercise benefits/barriers and cardiovascular or function measurements. Findings suggest that more fit older adults may not perceive greater benefits or less barriers compared to less fit individuals.

Environmental, Ecological & Marine Sciences

17. 3D Reconstruction & Analysis of Shark Olfactory Rosettes: Quantifying Morphological Variation to Understand Sensory Function & Ecological Adaptation

By: Puja Perumalraja, Aubrey Clark, Lauren Simonitis, Tricia Meredith, and Marianne Porter
Faculty Mentor(s): Marianne Porter
Presenters: **Puja Perumalraja**

Sharks use olfaction to detect prey, avoid predators, and navigate their environments. The olfactory rosette, used to detect odorants, is composed of lamellae, whose number, arrangement, and surface area vary across species. We hypothesized that rosettes morphologically vary among habitats due to differing reliance on olfaction. We generated contrast-enhanced micro-computed tomography (microCT) scans to build 3D reconstructions of shark olfactory rosettes to quantify their morphology with more precision than previous 2D methods. Currently, 6 shark species have been fixed, stained with phosphotungstic acid, scanned, and digitally segmented in 3D Slicer software. We quantified lamellar number, rosette volume and surface area, and rosette length/width. We compared rosette morphology among habitats (pelagic, benthopelagic, and benthic) to understand the relationship between form and ecology. Preliminary analyses indicated there were no significant differences between rosette morphology and habitat types. These data will enhance studies on sensory ecology, morphology, and hydrodynamics in shark olfactory rosettes.

Behavioral, Educational & Social Sciences

18. The Hidden Curriculum of FAU Theater Students

By: Pearl Van Zyl
Faculty Mentor(s): Katharina Rynkiewich
Presenters: **Pearl Van Zyl**

Theater education exists as a unique facet of the liberal arts' academic environment. Theater students memorize and rehearse lines using various physical and mental techniques including collaborative rehearsal (Noice 1992), rote learning (Ebbinghaus 1885), and pre-blocking (Noice 1992). At Florida Atlantic, approximately seven departmental theater productions are held each academic year, giving theater students the opportunity to embody their theater education as a performer. This project utilizes ethnographic methods to elicit theater student (N=6) reflections of personal processes and formative education within the setting of the Florida Atlantic Theater Program. Through in-depth interviewing and coding of inductive themes, using NVivo qualitative analysis software, the conscious and subconscious absorption of theater education in individual students will be analyzed as a form of "hidden curriculum" (Jackson, 1968).

Behavioral, Educational & Social Sciences

19. The Primate Architecture of Empathy

By: Aien Serrano

Faculty Mentor(s): Gary Perry

Presenters: **Aien Serrano**

Current research indicates that empathy originates from intertwined interplay of factors such as evolutionary inheritance, neurophysiological development, and cultural influence which all contribute towards the structuring of empathy as it is currently understood. The two main recognized neural systems are affective and cognitive empathy. The affective branch consists of the implicit processes such as mimicry and emotional conjugation, whereas cognitive empathy is reliant on Theory of Mind and is responsible for both imagining and adopting another individual's state or perspective using self-referential processing. In this review, empathy will be discussed through a framework grounded in electrophysiological recordings in macaques, human fMRI adaptation data, and evidence indicating the anterior insula and anterior cingulate cortex activity in affective empathy which are consistent with Frans de Waal's proposal that affective resonance represents an evolutionarily older substrate upon which more complex cognitive mentalizing systems are built.

Basic Sciences

20. The Impact of Aging on Cerebrovascular Function in Response to Acute Aerobic Exercise

By: Leila E. Nau, Alexandre A. Hamaide, Chase Rohwedder, Matthew T. Schallipp, Ameera Juman, Hector N. Anguiano, Frederique Audet, and Brandon G. Fico

Faculty Mentor(s): Brandon Fico

Presenters: **Leila Nau**

This study aimed to determine the influence of aging on cerebrovascular function in response to acute aerobic exercise. Twenty-four younger (15 males; 22 ± 4 years) and eight older adults (1 male; 60 ± 14 years) performed moderate-intensity cycling (≈35 minutes, targeting a 200-calorie expenditure). Middle cerebral artery velocity (MCAv) and pulsatility index (PI) were measured by transcranial Doppler ultrasound before and 60 minutes post-exercise. Cerebrovascular reactivity (CVR) to hypercapnia (4% and 6% CO_2) was assessed at both time points. At baseline, older adults had lower MCAv compared to the younger adults ($p = 0.025$) with no significant age-related differences in PI ($p = 0.362$). Following exercise, CVR decreased 15% in older adults but increased 22% in young adults ($p=0.044$). Age correlated negatively with baseline MCAv ($r=-0.368$, $p=0.042$) and CVR change ($r=-0.410$, $p=0.030$). These findings suggest that age-related differences in cerebrovascular function, become more apparent after acute aerobic exercise.

Environmental, Ecological & Marine Sciences

21. Nanoscale Patterns of Mineralization in Shark Vertebral Cartilage Across Species

By: Sanvi Shankar, Edward De La Uz, Dawn Raja Somu, Marianne Porter, Michelle Passerotti, Silja Flenner, Imke Greving, and Vivian Merk

Faculty Mentor(s): Vivian Merk

Presenters: **Sanvi Shankar**

Shark vertebrae are complex but sturdy biological structures that present different amounts of mineralization per species, which can affect a shark's swimming speed, behavior, and ecological niche. Studying collagenous skeletons in elasmobranchs could possibly inspire the production of collagen scaffolds for bone and dental grafts. This project aims to understand both mineralized and unmineralized vertebral cartilage, with goals of visualizing the 3D structure and quantifying the mineral content of cartilage specimens. Synchrotron X-ray nanotomography (nanoCT) scans of various ground shark species, or those from order Carcharhiniformes, were segmented into cartilage and extracellular matrix (ECM) sections using Dragonfly 3D World software. Of the 1024 total slices per sample, 3 slices were manually segmented, and the remaining slices were segmented using Dragonfly's DeepLearning Tool. The anticipated outcomes of this study are quantitative mineral percentages and trabecular thickness distributions, which could shed light on skeletal differences between shark species.

Health & Medical Sciences

22. Tyrosinase Oxidation Modulates Amyloid-Beta 40 Fibrillization

By: Arianna Lian, Md Raza Ul Karim, and Deguo Du

Faculty Mentor(s): Deguo Du and Md Raza Ul Karim

Presenters: **Arianna Lian**

Protein aggregation is a hallmark of neurodegenerative diseases. Amyloid-beta 40 (Aβ40) can misfold and self-assemble into β-sheet-rich fibrils associated with Alzheimer's disease. Because Aβ40 fibril formation is used as a marker of amyloid pathology, factors that alter fibrillization can affect assay results and highlight potential anti-aggregation strategies. Tyrosinase is a copper-containing enzyme that oxidizes tyrosine residues, generating reactive charged intermediates that increase electrostatic repulsion and disrupt peptide packing during fibril growth. In this study, tyrosinase was evaluated as a modulator of Aβ40 aggregation, emphasizing timing of addition before versus after fibril formation. Aggregation kinetics were measured using a Thioflavin T (ThT) fluorescence assay, and atomic force microscopy (AFM) assessed fibril morphology. Oxidation was greater in monomeric than fibrillar Aβ40, indicated by increased 350 nm absorbance. Tyrosinase added before aggregation reduced ThT fluorescence and produced fewer, shorter fibrils, supporting an inhibitory role and potential as a detection probe for amyloidogenic protein.

Environmental, Ecological & Marine Sciences

23. Macrotritopus Mystery: Species Confirmation for Atlantic Longarm Octopus (Macrotritopus sp.) in South Florida Using Morphological Assessments

By: Benjamin Hammond, Miranda Manross, Chelsea Bennice, and W. Randy Brooks
Faculty Mentor(s): William Brooks and Chelsea Bennice
Presenters: **Benjamin Hammond**

Octopus diversity remains poorly understood, particularly among tropical shallow-water, benthic species. Due to their cryptic nature, there is little information on longarm sand-dwelling octopuses. The Atlantic longarm octopus (ALO), Macrotritopus defilippi, remains the only fully described species in the genus with multiple species poorly described. A new species, Macrotritopus beatrixi, has recently been described in the Caribbean. Although M. defilippi is documented in the Caribbean, Atlantic Ocean, and Mediterranean. The western Atlantic populations lack formal species confirmation, leaving identification uncertain. This study aims to establish baseline morphological evidence for species confirmation of the ALO in south Florida. Preserved specimens collected from south Florida are analyzed for diagnostic morphological traits including arm formulae, beaks, ligulae, and radulae patterns. Comparison of observed traits with published species descriptions supports that species M. beatrixi is present in south Florida. Resolving taxonomical uncertainties is essential for addressing biodiversity, ecological roles, and conservation efforts.

Health & Medical Sciences

24. Immunohistochemical Evidence Supporting Brain Lymphatic Elements in Four Mammalian Species

By: Fernanda Gerzso, Jacinta Nadarajan, Giselle Shim, Ganish Chapagain, Ibrahim Shokry, and Rui Tao
Faculty Mentor(s): Rui Tao
Presenters: **Fernanda Gerzso and** Jacinta Nadarajan

Whether lymphatic vessels truly exist within the brain parenchyma remains a subject of ongoing debate. In this study, we examined lymphatic-associated protein expression using antibodies against LYVE-1 and VEGFR-3 to assess potential lymphatic structures in brain tissue. To determine whether lymphatic expression varies across species, we compared brains from mice, rats, sheep, and minipigs. Our preliminary findings reveal the presence of lymphatic-related proteins in all species examined, supporting the notion that lymphatic elements may be present within the CNS parenchyma. Moreover, species differences emerged, with signal abundance following the rank order: minipig > sheep > rat > mouse. These results highlight both the plausibility of brain lymphatics and the importance of model selection in future CNS lymphatic research.

Basic Sciences

25. Analysis of IL-1R1 expression on mouse self-grooming behavior using DeepLabCut

By: Firas Syed, Daniel P. Nemeth, Matt S. Schrier, Ning Quan

Faculty Mentor(s): Daniel Nemeth

Presenters: **Firas Syed**

Interleukin-1 (IL-1) is a cytokine known to regulate multiple physiological central nervous system (CNS) responses to infection, injury, and stress. Recently, OCD- and autism-related behaviors in mice have been associated with lack of the receptor of IL-1, IL-1 receptor Type 1 (IL-1R1). This study investigates the role of IL-1R1 in mouse self-grooming and OCD-like behaviors by validating machine-learning video processing tools, DeepLabCut and SimBA, compared to conventional methodology. Similar to hand-scoring, DeepLabCut and SimBA reveal a statistically significant result indicating that IL-1R1 knockout mice exhibit increased bouts and duration of self-grooming, with accuracy comparable to hand scoring in both facial and body grooming. Overall, this study shows DeepLabCut is a viable methodology for batch-processing grooming behavior measurements and IL-1R1 is implicated in OCD-like behaviors. Future directions aim to elucidate which cell type-specific IL-1R1 is implicated in grooming behaviors.

Environmental, Ecological & Marine Sciences

26. What A Sharp Nose: Olfactory Denticles in Atlantic Sharpnose Sharks

By: Zaralina Reid, Aubrey Clark, Tricia Meredith, Marianne Porter, and Lauren E. Simonitis

Faculty Mentor(s): Lauren Simonitis

Presenters: **Zaralina Reid**

Dermal denticles are tooth-like structures embedded in shark skin, and their shape varies among species. Denticles are also shaped for function, such as reducing drag to increase swimming performance. Denticle shape and arrangement guides water to crucial locations, such as the olfactory system, which detects chemicals in the water. One shark species, the Atlantic sharpnose shark (Rhizoprionodon terraenovae), has microscopic denticles embedded in its olfactory epithelium, an adaptation not previously described. This study describes and quantifies denticles in the olfactory epithelium. We used scanning electron micrographs to quantify denticle morphometrics, including denticle density and shape. The majority of denticles were found around the excurrent olfactory channels, ranging in densities between 60-198 denticles/cm2. Denticles were also found embedded in the epithelium, but these were more sparsely distributed and smaller than those in the excurrent channel. These data findings deepen our understanding of the distribution and roles of shark denticles.

Behavioral, Educational & Social Sciences

27. From Discretion to Enforcement: A Reform Proposal to the First Step Act to Promote Inmates Rehabilitation and Reduce Recidivism Rates to Create Greater Public Safety

By: Bryana Hamilton
Faculty Mentor(s): Anita Blowers
Presenters: **Bryana Hamilton**

The First Step Act of 2018 represents congressional effort to steer the federal criminal justice system toward rehabilitation and recidivism reduction. By requiring evidence-based programming and incentivizing inmates' participation in rehabilitative programs, Congress sought to integrate restorative justice principles into reentry policy. However, implementation by the Bureau of Prisons has remained inconsistent, leaving many of the Act's rehabilitative goals unachieved. This analysis examines the Act's legislative intent, statutory structure, and judicial interpretation to assess whether it creates enforceable rehabilitative rights for inmates. Through evaluation of case law, administrative discretion, and judicial deference doctrines, it identifies a critical enforcement gap between congressional mandates and institutional practice. I argue that without stronger accountability mechanisms, the Act functions largely as a discretionary policy rather than a binding rehabilitative framework. My analysis proposes reforms including a private right of action, mandatory transparency measures, and enhanced judicial oversight to ensure meaningful and consistent implementation.

Behavioral, Educational & Social Sciences

28. The Influence of Gender on Mother-Child Interactions During a Cooperation Task

By: Yajaira Cruz and Teresa Wilcox
Faculty Mentor(s): Teresa Wilcox
Presenters: **Yajaira Cruz**

Past research shows that mothers interact differently with infants depending on the infant's gender, shaping later relationships. This study examined how gender influences mother-child behavior during a cooperation task. Infants aged 12–24 months (N = 55) completed a shape-sorting activity with their mothers, and sessions were coded using the Coding Interactive Behavior manual (Feldman, 1998). We predicted female infants would show more vocalizations and seek more help, while male infants would show more competent use of their environment. We also expected mothers to provide more praise and affectionate touch with female infants. One-tailed independent samples t-tests revealed that there was no significant difference for vocalizations ($p = 0.315$), reliance on parent for help ($p = 0.298$), competent use of environment ($p = 0.478$), and praising ($p = 0.306$), while there was a significant difference for affectionate touch ($p = 0.043$).

Health & Medical Sciences

29. Feasibility of Exercise Combined with Transcranial Alternating Current Stimulation in Breast Cancer Survivors

By: Eva Servello, Abigail Sliter, Maguire Lindisch, Emily Clark, Bernardo Bruxelas, Yosun Yoon, Sang Hong, Ashley Artese

Faculty Mentor(s): Ashley Artese

Presenters: **Eva Servello** and Abigail Sliter

Although treatments have improved survival, breast cancer survivors contend with treatment-related side effects including cancer-related cognitive impairment. Exercise or transcranial alternating current stimulation (tACS) may improve cognition; however, the combination of these two methods has not been explored. Purpose: The purpose of this study was to examine the feasibility of a 4-week exercise and tACS intervention (Ex+tACS) vs. exercise-only control (CON). Ex+tACS completed three sessions/week consisting of 30 minutes of walking followed by tACS. CON walked and received sham tACS. Feasibility was assessed via adherence and safety using a questionnaire. Preliminary results include two participants (one Ex+tACS and one CON). Adherence for Ex+tACS and CON was 83% and 100%, respectively. Participants rated discomfort low (1-10 scale; Ex+tACS: 2.5; CON: 1.3). Preliminary data suggest that Ex+tACS is feasible with minimal discomfort. Both groups had high adherence to the intervention. The study is currently ongoing and recruiting participants.

Behavioral, Educational & Social Sciences

30. The Role of Victim Advocacy in Reporting Domestic Violence

By: Hannah Scharrer

Faculty Mentor(s): Krystal Davidowitz and Joseph Jutan

Presenters: **Hannah Scharrer**

Domestic violence is one of the most unreported crimes in the United States, with approximately half of the incidents going unreported. The lack of reporting limits many survivors from having access to legal protection and support services. Prior research that has been conducted tends to be confined to specific topics, such as the elements of economic dependence and the fear of retaliation. However, less attention has been given to whether victim advocacy can influence a victim's decision to report. While the existing studies identifies obstacles, victim advocacy could provide a potential solution. This study examines the relationship between access to victim advocacy services and reporting behavior among domestic violence survivors. This research will draw on victimology, and the procedural justice theory. It will analyze survey data measuring advocacy access, perceived institutional support, and reporting outcomes. It can be hypothesized that victims who do receive advocacy will demonstrate higher reporting rates.

Health & Medical Sciences

31. Exploring the Impact of Physical Activity on Psychological Distress and Cognitive Function in Rural Lake Okeechobee Adults: A Study of Exercise as a Low-Cost Strategy to Support Brain Health

By: Brooklyn Scavo and Alexa Maher
Faculty Mentor(s): Lisa Wiese
Presenters: **Brooklyn Scavo** and Alexa Maher

Rural Lake Okeechobee residents face an increased risk of cognitive decline due limited healthcare access and sedentary lifestyles. This study examines the relationship between physical activity, psychological distress, and cognitive performance to determine whether exercise serves as an inhibiting factor in resource-limited environments. Utilizing an existing dataset of 1,057 enrolled participants, with a sample size of 800 community members based on the largest available table value, physical performance was assessed via the Mini-Physical Performance Test (Mini-PPT) and self-reported aerobic activity. Psychological distress was measured using PROMIS scale, and cognitive function was evaluated with the Montreal Cognitive Assessment (MoCA). Pearson correlations were conducted while controlling for age and education. It is hypothesized that higher activity levels correlate with lower anxiety and depression scores and higher MoCA performance. Findings may support physical activity as a low-cost, accessible strategy for promoting brain health and improving healthcare access in rural populations.

Environmental, Ecological & Marine Sciences

32. Gopher Tortoise Ticks (Amblyomma Tuberculatum) as Potential Vectors of the Hepatozoon Sp. Transmission in Gopher Tortoises (Gopherus Polyphemus) at the FAU Preserve

By: Gabriella Maya, Jesus Tunon, and Evelyn Frazier
Faculty Mentor(s): Evelyn Frazier
Presenters: **Gabriella Maya** and Jesus Tunon

Gopher Tortoises are endemic to the Southeastern USA, listed as threatened in Florida, and experiencing population declines across their range due several factors including diseases. Hepatozoon sp. (Hp) is a protozoan that was first described in the red blood cells of Gopher Tortoises by our lab, but its vector is unknown. This project investigates two hypotheses: 1) Amblyomma tuberculatum are the vectors of Hepatozoon; 2) Hepatozoon prevalence increases with tortoise age, body size, or tick load. Ticks will be collected with tweezers from adult Gopher Tortoises and screened in the laboratory for Hp using hemolymph extraction, staining, and microscopy. Blood smears will be prepared from tortoises when ticks test positive. Logistic regression will evaluate relationships among variables. Tortoises with higher tick loads are expected to show greater infection due to increased exposure to vectors. Findings will inform wildlife disease management.

Health & Medical Sciences

33. Health Policy Literacy Among Nursing Students: Knowledge, Awareness, and Practice Implications

By: Sydney Gibbons and Louise Aurelien Buie
Faculty Mentor(s): Louise Aurelien Buie
Presenters: **Sydney Gibbons**

Health policy shapes healthcare delivery and significantly impacts nursing practice. Nursing curricula should incorporate education preparing nurses to engage in health policy development. The purpose of this study is to assess nursing students' knowledge and awareness of the current health policies influencing nursing practice in the State of Florida. A quantitative, cross-sectional, and correlational study was conducted through surveys distributed to actively enrolled undergraduate and graduate students at the FAU Christine E. Lynn College of Nursing. Results revealed that the levels of knowledge and awareness differ among nursing students enrolled in Bachelor of Science in Nursing, Master of Science in Nursing, Doctor of Nursing Practice, and Doctor of Philosophy in Nursing programs. The policy mean awareness score for all participants was 36.44 (SD=6.84), with scores ranging from 18 to 52. The study underscores the importance of curriculum revision, ensuring that health policy is threaded throughout to enhance workforce preparedness.

Behavioral, Educational & Social Sciences

34. Teachers' Perspectives on Generation Alpha Learning Styles: Preliminary Findings

By: Kenny Rojas and Maria D. Vasquez
Faculty Mentor(s): Maria Vasquez
Presenters: **Kenny Rojas**

Generation Alpha students broadly defined as children born between 2010 and 2014, represents the first generation raised entirely in a world that has become increasingly oversaturated with digital integration across virtually every aspect of daily life. As these students move through elementary and middle school, teachers face new challenges that may hinder their ability to effectively meet Gen Alpha's novel motivational, cognitive, and technological needs. This project aims to discover teachers' perspectives on how Generation Alpha students prefer to learn and be assessed. Therefore, the research question will be: What are teachers' perspectives when teaching and assessing Generation Alpha students? Through interview data, the researcher discusses teachers' perspectives on what learning strategies and assessment formats best support Gen Alpha students' abilities to learn. Preliminary data will be presented to provide a clearer understanding of Gen Alpha's educational needs and inform recommendations for teacher education programs.

Behavioral, Educational & Social Sciences

35. Everyday Talk Across Settings: Home and Classroom Differences in Early Language Environments

By: Natalie Temple, Lila Carino, Analisa Martin, Karen Benavidez, Sofia Friedlander, Kaylee McMillian and Irem Korucu

Faculty Mentor(s): Irem Korucu

Presenters: **Natalie Temple**, Lila Carino, Analisa Martin, Karen Benavidez, and Sofia Friedlander

Early language environments strongly predict children's cognitive, academic, and social development (Hirsh-Pasek et al., 2015; Gilkerson et al., 2018). However, children enter school with substantial disparities in exposure and language skills. Classic work by Hart & Risley (1995) estimated large socioeconomic gaps in early word exposure, and recent studies suggest classrooms may further widen differences (Duncan et al., 2023). Yet little is known about how language input varies across home and classroom contexts and how these differences relate to language development. We recruited 76 preschool-aged children and used wearable audio recorders to capture full-day language interactions at home and school and conducted assessments of vocabulary, literacy, math, and executive function. Preliminary results show significant contextual differences across home and classroom settings. For instance, children experienced more conversational turns and higher child vocalization counts at home than in preschool classrooms. Findings highlight how early learning settings may shape early development.

Environmental, Ecological & Marine Sciences

36. Micro-CT Imaging of Neuroanatomy in Two Shallow-Water Octopus Species

By: Diana Savitskaya, Natasha Ahrweiler, Lauren Simonitis, Chelsea Bennice, and Randy Brooks

Faculty Mentor(s): Chelsea Bennice and Randy Brooks

Presenters: **Diana Savitskaya**

Octopuses have been the subject of increasing research efforts due to their large nervous systems and complex behavior, yet the relationship between their neuroanatomy and ecological niche remains understudied. Here, we investigate the role of ecological factors, including activity cycle and behavioral flexibility (generalist vs specialist), on the size and foliation of the optic lobes and vertical lobes for two sympatric octopuses: Macrotritopus defilippi and Octopus americanus. We utilize phosphotungstic acid (PTA) enhanced micro-CT scanning as a nondestructive method of visualizing the nervous systems of preserved specimens (5 per species). Initial results suggest the diurnal, specialized M. defilippi has a larger, more foliated optic lobe, and the nocturnal, generalist O. americanus has a smaller, less foliated optic lobe. O. americanus has a slightly larger vertical lobe, though similarly foliated to M. defilippi. These results will increase our understanding of how ecology and behavior relate to neuroanatomy in cephalopods.

Health & Medical Sciences

37. Structure-Carbohydrate Binding Relationship of Odorranalectin-Based Cyclic Peptide Lectinomimics

By: Jade Little, Lucas Costa, and Predrag Cudic
Faculty Mentor(s): Predrag Cudic
Presenters: **Jade Little**

Brain and central nervous system (CNS) disorders are major causes of disability, yet most therapeutics poorly cross the blood–brain barrier (BBB). Peptide drugs are especially limited by this barrier when delivered systemically. Alternatively, intranasal (i.n.) administration enables direct nose-to-brain transport, bypassing BBB. Because the olfactory epithelium is rich in L-fucose (Fuc), D-galactose (Gal), and N-acetyl-D-galactosamine (GalNAc), we propose that grafting bioactive peptides onto a scaffold with intrinsic glycan affinity will increase nasal residence time and brain uptake. Odorranalectin (OL), a cyclic peptide that preferentially binds Fuc, serves as our delivery platform. Our proof-of-principle studies show that OL-based opioid peptides produced biological effects after i.n. administration in mice. OL structure–binding studies identified residues whose alanine substitution enhanced glycan affinity. Given the roles of arginine and phenylalanine in carbohydrate recognition in lectins, we incorporated these residues to generate OL analogues with improved binding and intranasal delivery performance.

Environmental, Ecological & Marine Sciences

38. NSAIDs as a Potential Therapeutic for Oxidative Stress in Coral Bleaching

By: Kaitlyn Keaton, Rosanyely Santana, Herbert Weissbach, and Carsten G.B. Grupstra
Faculty Mentor(s): Carsten Grupstra
Presenters: **Kaitlyn Keaton**

Coral reefs are the most biodiverse and ecologically valuable ecosystems on earth, yet they are increasingly threated by mass bleaching events driven by rising sea temperatures. Bleaching occurs when thermal stress induces excess production of reactive oxygen species (ROS), causing oxidative damage that disrupts the symbiotic relationship between benthic cnidarians and their photosynthetic dinoflagellate symbionts (Symbiodiniaceae). To save bleached corals, scientists are exploring interventions that reduce ROS toxicity. Non-steroidal anti-inflammatory drug (NSAIDs) contain antioxidant properties and have not been tested as a coral bleaching treatment. To evaluate NSAIDs efficacy, we use the symbiotic sea anemone Aiptasia as model organism, assessing health through morphology, coloration, and chlorophyll fluorescence (PAM fluorometry). Preliminary results indicate NSAIDs can reduce toxicity caused by tert-butyl peroxide, with additional tests ongoing. This work suggests certain human drugs may support coral recovery, though further experimentation is required to identify in what scenarios these drugs may work best.

Behavioral, Educational & Social Sciences

41. Association Between the ADGRL3 Gene and ADHD Prevalence

By: Arianna Alcantara and Susan Norstrom

Faculty Mentor(s): Susan Norstrom

Presenters: **Arianna Alcantara**

This poster presents a proposal to study the relationship between the ADGRL3 gene and ADHD prevalence. We will be utilizing the All of Us Research Hub, created by the National Institutes of Health, which provides genomic data for over 400,000 participants. The current understanding of ADHD suggests that its etiology is influenced by complex relationships of genetic and environmental influences; however, the exact genetic determinants and their specific role in ADHD susceptibility remain unclear. We believe that the ADGRL3 gene will present more in those individuals with ADHD, demonstrating its association with the susceptibility of ADHD. This association may be explained by ADGRL3s role in neurodevelopment as well as its role in neurotransmitter regulation. Analyzing the current data from this database will allow us to identify correlations between the ADGRL3 gene and the prevalence of ADHD symptoms, therefore giving us a deeper understanding of the genetic factors involved in ADHD.

Behavioral, Educational & Social Sciences

42. Youth Voices on Social Media, Academic Performance, and Physical Activity

By: Mritsa Vasquez, June Gray, Shradha Nair, Vritti Sodha, and Maria Vasquez

Faculty Mentor(s): Maria Vasquez

Presenters: **Mritsa Vasquez**, June Gray, Shradha Nair, and Vritti Sodha

This qualitative study employs narrative inquiry to reflect adolescents' views on social media, academic performance, and physical activities. While attending classes, using social media, and being physically active, participants will journal for two weeks, writing their immediate reactions after each activity. Participants will use their cameras to take pictures of their surroundings while participating in social media, academic performance, and physical activity. The sampling will be non-random, purposive. The selection criteria will be students enrolled in a Direct Independent research class and having taken a research methods course. Journaling will be analyzed through thematic analysis to identify core themes, content analysis to categorize content, and reflective journals to track researcher participants' biases and interpretations. Photovoice will be analyzed by reviewing images with participants to understand perspectives, coding photos and descriptions, and using comparative analysis to identify themes. Preliminary results will be presented.

Poster Session 4: 4:00 – 5:00 PM

Engineering

1. Ocean Engineering Senior Design: Near-Shore Wave Energy Converter

By: Liam Baysura, Richard Gonzalez, Gerry Perez, Parker Peterson, and Pierre-Philippe Beaujean
Faculty Mentor(s): Pierre-Philippe Beaujean
Presenters: **William Baysura**, Richard Gonzalez, Gerry Perez, and Parker Peterson

As global energy demands exponentially increase year after year, countries around the world are allocating time, money, and research to find various ways to harness natural, eco-friendly power. The world's oceans hold an incredible amount of energy that can influence humanity's future in a positive manner. From wind to currents to waves, our oceans possess a clean and reliable source of power. Wave energy converters (WECs) are a systematic form of harnessing the energy transfer of our ocean waves. While numerous WEC devices exist already, little has been done in regard to the available power right on our coastlines. This senior design project not only proves that wave energy harness is possible with a small budget, but that it can be done in a near-shore (4 foot depth) and compact (2-person deployable) application.

Basic Sciences

2. Temperature-Dependent Within-Vector Viral Dynamics and Transmission Potential of West Nile Virus

By: Lal Celik, Taran Kesharaju, and Necibe Tuncer
Faculty Mentor(s): Necibe Tuncer
Presenters: **Lal Celik** and Taran Kesharaju

West Nile virus (WNV), a mosquito-borne flavivirus, primarily circulates between birds and mosquitoes; humans and mammals are dead-end hosts. Many human cases are mild or asymptomatic, but some develop fever, and a small proportion experience severe neurological disease such as encephalitis or meningitis. Transmission dynamics depend partly on vector competence, which refers to a mosquito’s ability to become infected and transmit the virus through its saliva. Temperature strongly influences this process and shapes within-vector viral dynamics. It primarily affects the extrinsic incubation period, which is the time required for the virus to be detectable in mosquito saliva. As temperature increases, the incubation period typically decreases, which could increase transmission rates. In this study, we use laboratory data on mosquito infection and transmission and develop a mathematical model that shows how temperature affects within-vector viral dynamics. This is important because these calculations can then be used to improve WNV outbreak predictions.

Engineering

3. Waste Heat Recovery for Hydrogen Desorption in Metal Hydride Tanks Coupled with a PEM Fuel Cell

By: Phung Tran and Amir Abtahi
Faculty Mentor(s): Amir Abtahi
Presenters: **Phung Tran**

Proton exchange membrane fuel cells (PEMFCs) convert hydrogen to electricity while producing heat and water as byproducts. Metal hydrides (MH) are a solid-state solution for hydrogen storage but require external heat to drive the endothermic hydrogen desorption process. This study experimentally investigates whether waste heat from a small PEM fuel cell can be utilized to support hydrogen desorption from a metal hydride storage cartridge, reducing the demand for external heat input. A PEM fuel cell operating under an electrical load schedule is thermally coupled with an MH cartridge. Temperature, hydrogen desorption rate, and fuel cell operating parameters are continuously monitored for each load condition. This experiment will evaluate the feasibility of low-temperature waste heat recovery for hydrogen desorption, and the anticipated result of this study is that higher electrical loads will lead to more waste heat recovery.

Behavioral, Educational & Social Sciences

4. From Cradle to Conduct: Early Neural Markers of Behavioral Inhibition and Adult Antisocial Outcomes

By: Angelica Mijares, Ariana Chernis, Ciara Smith, Danya Leon, Gianna Digiovanni, Alara Karatun and James J. Jakubow
Faculty Mentor(s): James Jakubow
Presenters: **Angelica Mijares**, Ariana Chernis, Ciara Smith, Danya Leon, and Gianna Digiovanni

Behavioral inhibition (BI) is a stable form of temperament, often investigated in younger populations such as infants, and children. Individuals with BI tend to display fearful and anxious behaviors. Much of the current literature on BI focuses on younger populations, glossing over late manifestations. This review aims to further clarify how early infant neuronal brain activation is related to adulthood expressions of antisocial personality disorder. To investigate adulthood expressions of BI, three databases were searched in March 2025 (Google Scholar, PsychINFO and ProQuest). Specifically, emphasis was placed on longitudinal studies to investigate the predictive value of neuronal activation patterns in infants for adulthood antisocial personality disorder. This project aims to inspire future clinical interventions that can be implemented during early childhood to combat adverse effects of early BI.

Environmental, Ecological & Marine Sciences

5. Assessing Relationships Between Nest Sediment and Hatching Success in Leatherback Sea Turtle Nests

By: Kayla Mosteller, Elizabeth K. Schultheis, Samantha G. Kuschke, and Tiffany Roberts Briggs
Faculty Mentor(s): Tiffany Roberts Briggs and Samantha Kuschke
Presenters: **Kayla Mosteller**

Southeast Florida serves as an essential nesting site for leatherback sea turtles (Dermochelys coriacea) in the U.S. On these beaches, many factors contribute to hatching success, including temperature, sediment composition, gas exchange, and microorganisms. Unfortunately, the leatherback has the lowest global hatching success at roughly 50%. This work investigates the relationship between sediment composition at different time points and locations to hatching success in leatherback nests in southeast Florida. Sediment characteristics can alter the nest environment and ultimately impact hatching success. We found the mean grain size at excavation was negatively correlated with hatching success in Boca Raton, Florida. However, this correlation was not seen at oviposition or any other beach location. That suggests that grain size may not be the only variable affecting hatching success. As such, additional investigations into other variables and their interactions are needed to understand the cause of low hatching success in leatherbacks.

Environmental, Ecological & Marine Sciences

6. Investigating the 'Enhanced Binocular Field' Hypothesis in Captive Leatherback Sea Turtles (Dermochelys Coriacea)

By: Taylor Nienaber, Jeanette Wyneken, and Samantha Trail
Faculty Mentor(s): Jeanette Wyneken and Samantha Trail
Presenters: **Taylor Nienaber**

Leatherback sea turtles (Dermochelys coriacea) have a small visual field without overlap to create binocular vision. The crossing of visual fields is important to enhance depth perception, which is advantageous during activities such as foraging. The ‘enhanced binocular field’ hypothesis suggests that side-to-side head movements can create visual field overlap in otherwise monocular species. Young captive leatherbacks exhibit a side-to-side head movement behavior, termed a “waggle", observed exclusively during feeding. We hypothesized that this behavior results in visual field overlap and therefore increases feeding accuracy. Leatherback feedings were recorded twice/week for 2 months. Maximum “waggle” angles were combined with known visual fields of each eye to determine if overlap occurs as a result of “waggle” behavior. Significant individual variation exists with maximum “waggle” angles ranging from 3° to 35°, though very few created visual field overlap. Yet, bite accuracy may still be impacted by the resulting expanded visual field.

Cross Disciplinary Projects

7. Parents Know Best: The Relationship Between Parenthood and Children's Co-ed Sports

By: Vritti Sodha

Faculty Mentor(s): Eric Levy and Monica Escaleras

Presenters: **Vritti Sodha**

During the early years of life, there is no significant difference between genders in terms of physical ability. Presumably, those who are parents/guardians have different outlooks on this controversy than those who are not. To better understand this controversy, a seventeen question survey was completed by 417 respondents. Analysis of the results showed that those that were parents and guardians were more likely to allow their children to participate in co-ed sports than those that were not, with 49.8% of parents responding "yes, always" and 35.4% of parents responding "yes, but only at younger ages." Hypothetically, those that do not have children are less comfortable with letting their children play sports with the opposite gender, which might suggest that parental experience creates a change in perspective. This could suggest that regardless of the acknowledged challenges of co-ed sports, parents and guardians still find value in children participating in co-ed sports.

Engineering

8. Quadrotor Drone Trajectory Optimization using Noether's Theorem and Rotational Invariance

By: Tanzeela Tasneem, Enzo Avelino, Yvi Wyness, George Kamel, Joseph Chazbani, Michael Rotella, Veronica Dana, Alexa Torrijos, Amelia Anderson, and Daniela Nikolova

Faculty Mentor(s): Daniela Nikolova

Presenters: **Enzo Avelino**, Tanzeela Tasneem, George Kamel, Yvi Wyness, Lexi Torrijos, and Michael Rotella

Modern quadrotor drones rely heavily on numerical path-planning algorithms. While these algorithms prioritize collision avoidance and feasibility, they often ignore the underlying physical structure that governs motion and energy use. This project introduces a novel trajectory optimization framework that applies Noether's theorem to the drone's yaw symmetry, conserving angular momentum and reducing computational complexity. To evaluate this framework, physics based simulations will be conducted using CasADi to solve multi-objective optimization problems, generating trajectories that adhere to the symmetry while satisfying engineering constraints and conserving energy. This framework is expected to reduce computation time compared to previous solutions, generate flight paths that maintain angular momentum, and improve overall dynamic feasibility. Anticipated results include reduced optimization effort, reduced energy consumption, and flight paths that more closely adhere to the physical constraints of quadrotor motion, advancing the methodology for next-generation autonomous path planning.

Health & Medical Sciences

9. Oligodendrocytes on the Move: OL Migration Dynamics in The Developing Nervous System

By: Sofia Aristizabal and Laura Fontenas
Faculty Mentor(s): Laura Fontenas
Presenters: **Sofia Aristizabal**

Oligodendrocytes (OLs) are glia traditionally thought to remain within the central nervous system (CNS), but recent findings suggest they can migrate into the peripheral nervous system (PNS), particularly when motor exit point (MEP) glia are absent. This study examined OL migration dynamics in wild type and mutant zebrafish, with and without targeted MEP glial ablations, to identify typical exit timepoints and understand how MEP glia influences OL migration. Using two-photon laser ablation and timelapse imaging between 52 and 96 hours post fertilization (hpf), zebrafish embryos were imaged, and movies were analyzed to quantify OL exit events. Mutants showed increased OL activity, with peaks around 55–57 and 64–70 hpf, followed by reduced activity. This indicates that OLs exit during defined critical developmental periods, regulated by MEP glia, supporting their role as gatekeepers of the CNS and providing a foundation for future studies on glial compensation and neural repair.

Health & Medical Sciences

10. The Protective Role of Torin1 against Doxorubicin Induced Muscle Atrophy

By: Xena Pereira, Nishant Visavadiya, Claudia Rodrigues, and Andy Khamoui
Faculty Mentor(s): Andy Khamoui and Nishant Visavadiya
Presenters: **Xena Pereira**

Some cancer patients not only suffer from the disease and harsh treatments, but also from cancer cachexia, a wasting syndrome that presents with extreme fatigue, weakness, and muscle atrophy. The purpose of this study is to determine if Torin1, a mammalian target of rapamycin inhibitor, is able to lessen or prevent Doxorubicin induced muscle atrophy, through oxidative stress and autophagy to eventually provide a better quality of life for those patients. The study uses muscle tissue from cancer bearing and non-cancer bearing mice that are treated with either saline, Doxorubicin, or Doxorubicin+Torin1. Experiments will be conducted to determine the reactive oxygen species (ROS) concentration within muscle mitochondria. The results are expected to show that Torin1 lessens muscle atrophy by increasing autophagy and lowering ROS and oxidative stress, meaning that autophagy activation may be a promising treatment to better the quality of life for patients with Doxorubicin induced muscle atrophy.

Behavioral, Educational & Social Sciences

11. The Influence of Political Memes on Candidate Evaluation and Policy Support

By: Reilly Miller, Tess Cassab Charabati, Alyssa Branz, Kaeley Lyons, Jordan Thompson, and Geoffrey Wetherell

Faculty Mentor(s): Geoffrey Wetherell and Jordan Thompson

Presenters: **Reilly Miller**, Tess Cassab Charabati, Alyssa Branz, and Kaeley Lyons

American adults are constantly exposed to politically themed memes. Previous research indicates that people are largely uncritical of political memes that align with their beliefs; early evidence suggests that polarization is positively associated with engagement with ideologically consistent memes, indicating that extreme memes receive little criticism. This study's purpose is to investigate whether exposure to political memes is related to public policy or political candidate opinions. Participants will view five memes, either liberal, conservative, or mixed, respond to questions about support for fictional candidates, and respond to the Social and Economic Conservatism scale (SECS). We expect participants to feel more positively about candidates whose positions align with the memes' positions and to endorse SECS items consistent with the memes' positions. If participants' responses align with the memes they viewed, this could provide evidence for memes' role in influencing political opinions. This underscores the urgency of combating misinformation spread through memes.

Behavioral, Educational & Social Sciences

12. It's Not Just Political Orientation: Characteristics of Men Who Endorse Restrictive Public Policies

By: Alyssa Branz, Reilly Miller, Tess Cassab Charabati, Kailey Lyons, Jordan Thompson, and Geoffrey Wetherell

Faculty Mentor(s): Geoffrey Wetherell and Jordan Thompson

Presenters: **Alyssa Branz**, Reilly Miller, Kailey Lyons, and Tess Cassab Charabati

Abortion is a contentious political issue that has remained central in public conversation, particularly following the overturning of Roe v. Wade in 2022. Attitudes toward abortion are strongly divided along political and ideological lines. This study examined whether political orientation alone or additional factors, such as masculinity and support for violence-tolerant policies, also contributed. Participants completed surveys that assessed masculinity measures, including Gender Role Discrepancy Stress (GRDS), Conformity to Masculine Norms (CMNI), and support for aggressive gender-related and restrictive abortion policies. We found that support for aggressive policies was predictive of support for restrictive abortion policies. This relationship was strengthened by higher CMNI scores, but not by GRDS scores. This indicates that while political orientation is an important predictor of abortion stances, other elements such as CMNI and support for aggressive policies also contribute. This has implications for understanding nuances in characteristics of people who support restrictive abortion policies.

Basic Sciences

13. Description and Design of PLANT - The Simplified AES Round Noise Extension Function

By: Matvei Tolochko and Veronika Kuchta
Faculty Mentor(s): Veronika Kuchta
Presenters: **Matvei Tolochko**

Modern, secure cryptography requires the fast creation of random numbers, particularly in key generation algorithms. Because computers are inherently deterministic, modern cryptographic systems rely on Pseudo-Random Number Generators (PRNGs), which require an initial, highly-random ”seed” to produce secure output. However, obtaining this initial seed is a significant challenge. This project introduces the concepts behind secure seed generation and proposes a new fast algorithm which does exactly that. The proposed system, PLANT, is largely based around the internal RING function, which itself is an extension function utilizing a reduced variant of the cipher round used in the Advanced Encryption Standard (AES).

Behavioral, Educational & Social Sciences

14. Rio Blanco: Farming in the Cloud Forest

By: Sol De la Mora and Brandon Toledo
Faculty Mentor(s): Valentina Martinez
Presenters: **Sol De la Mora** and Brandon Toledo

During the summer of 2025, the FAU Field School program in coastal Ecuador conducted research in the cloud forest region. The aim was to collect ethnographic information on agricultural methods, including the varieties of plants cultivated, harvesting strategies, storage practices, consumption patterns, and the ways in which organic waste is disposed of. The goal was to integrate this data with archaeological evidence to understand ancient and modern horticultural practices in the cloud forest. Participant observation was the principal method used for this project. The collected data provided preliminary information on gender roles, planting patterns, crop diversity, storage methods, and local consumption. Using a multidisciplinary approach, the ethnographic data were combined with archaeological data. Through these means, an image began to emerge of a population that has been uniquely adapting to its environment while preserving part of its culture.

Basic Sciences

15. Methylation in the Genome of Gopherus Polyphemus

By: Haley Evans, Emily Cummings, Gabriella Funderlich, Hollis Hodges, Sammy Jeannot, Edward King, Andrew Koscho, Ryann Martin, Shane Patel, Karolina Thomas, Brianna Tonner, Jon Moore, and Kelsie Bernot

Faculty Mentor(s): Kelsie Bernot and Jon Moore

Presenters: **Haley Evans**

The gopher tortoise's entire genome has not yet been sequenced, limiting genomics-informed conservation efforts. Previous investigations of gopher tortoise private alleles have indicated that the South Florida gopher tortoise population is vastly different from those in northern regions. Although DNA modifications such as methylation remain unknown with the gopher tortoise genome, numerous studies have shown the importance of methylation in gene regulation and its influence on other vertebrates' responses to environmental factors. Unfortunately, without a completely sequenced gopher tortoise genome, it is difficult to fully understand how methylation affects gopher tortoises' gene expression and regulation. Using ultra long-read whole-genome sequencing and de novo assembly from blood DNA, this study aims to identify the presence of methylation in the Gopherus polyphemus genome. These results intend to provide a genomic and epigenetic resource for gopher tortoises supporting future studies aimed at better protecting this keystone species for long term viability.

Health & Medical Sciences

16. Comparative Analysis of CNS Lymphatic Signals in Mice and Rats Using RNAscope

By: Gianni Giordano, Sanika Burkule, Lilian Cruz, Giselle Shim, Ibrahim M. Shokry, and Rui Tao

Faculty Mentor(s): Rui Tao and Ibrahim Shokry

Presenters: **Gianni Giordano**, Sanika Burkule, and Lillian Cruz

In this comparative study, we quantified lymphatic-related signals in the mouse intestine and brain, then further evaluated species differences between mice and rats. Using RNAscope molecular imaging, we found that lymphatic signals in the mouse brain were markedly less abundant than those observed in intestinal tissue, consistent with the brain's lower baseline lymphatic density. Cross-species comparisons revealed that rats exhibited stronger and more widespread lymphatic signals than mice within corresponding CNS regions. These findings support the presence of lymphatic structures in the brain that may contribute to waste-clearance processes. Moreover, the observed species differences highlight important considerations for selecting appropriate animal models in studies of CNS lymphatic function and neurodegenerative disease mechanisms.

Environmental, Ecological & Marine Sciences

17. Vertebral Morphology of the Caudal Keel in the Shortfin Mako (Isurus Oxyrinchus)

By: Klaudia Jarek, Jamie Knaub, Jake Wood, and Marianne E. Porter

Faculty Mentor(s): Marianne Porter

Presenters: **Klaudia Jarek**

The shortfin mako shark (Isurus oxyrinchus; Lamnidae), one of the fastest swimming fishes, has a specialized body structure anterior to the tail fin known as the keel. The keel, and its vertebral column, is a region hypothesized to increase stiffness and improve thrust during swimming. A previous study noted morphological changes in several species in keel vertebrae, but, the mechanical implications of those changes are not understood. In this study, we examined the vertebral column of six I. oxyrinchus specimens using contrast-enhanced μCT imaging and 3D reconstructions. We measured the second movement of area (I), a morphological measure of bending resistance and quantified the ratio of mediolateral (IML) to dorsoventral (IDV) to evaluate directional stiffness. Our results show increases in lateral stiffness of the vertebral column in the keel region, supporting its proposed function in enhancing swimming performance and insights into vertebral adaptations in fast swimming lamnid sharks.

Environmental, Ecological & Marine Sciences

18. The Role of Pendant Amine Groups in Electrocatalytic CO_2 Reduction

By: Jonas Putigna, Popy Paul, and Zhu-Lin Xie

Faculty Mentor(s): Zhu-Lin Xie

Presenters: **Jonas Putigna**

Electrocatalytic CO_2 reduction converts a greenhouse gas into CO, storing renewable electricity in chemical form. Two cobalt complexes based on N,N-bis(2,2′-bipyrid-6-yl)amine (bbpya) were prepared with para- (Co-1) and ortho-amine (Co-2) substituents. The ortho-NH_2 group is designed as an intramolecular proton relay to stabilize a bent Co–CO_2 adduct and lower the proton-coupled electron-transfer (PCET) barrier to Co–COOH. Complexes were synthesized via metalation with $Co(BF_4)_2$ and characterized by paramagnetic NMR and X-ray diffraction. Cyclic voltammetry in CH_3CN under CO_2 showed strong catalytic currents that increased and shifted positively with the addition of 15% H_2O, indicating accelerated PCET. In dry solvent, Co-2 displayed an earlier onset and higher turnover frequencies (TOFs) approaching 10^3 s^{-1}, while Co-1 was slower. In 15% H_2O, both reached multi-10^3 s^{-1} TOFs. Controlled electrolysis of Co-2 gave sustained CO production (55–65% Faradaic efficiency) with minor H_2 (5–10%).

Classroom Research Project/Assignment (not eligible for Oral Presentation)

19. Investigating Trends in Student Visa Enrollment: National and Institutional Comparison

By: Isabella Grove, Nicolas Navarro Vega, Brioncka Russell, Mason Bongo, Chris Clark and Valentine Aalo

Faculty Mentor(s): Valentine Aalo

Presenters: **Isabella Grove**, Nicolas Navarro Vega, Brioncka Russell, Mason Bongo, and Chris Clark

International student enrollment plays a significant economic and academic role in U.S. higher education. According to data from the Student Exchange and Visitor Program, thousands of students enter the United States annually on F-1 visas. Enrollment levels have changed in recent years due to policy shifts, global events, and institutional factors. Limited research directly compares national visa trends with enrollment patterns at individual universities, like Florida Atlantic University. This study asks: to what extent do changes in national F-1 visa enrollment trends correlate with international student enrollment patterns at FAU? The analysis uses SEVP national data and FAU reports spanning multiple years beginning in 2018. National F-1 visa trends serve as the predictor, while FAU enrollment measures are the outcomes evaluated, including total enrollment, country of origin, and the number of STEM concentrations. The findings may help explain how various factors shape where and what international students choose to study.

Health & Medical Sciences

20. Current Implications of Neurosurgical Implants

By: Jason Talabert

Faculty Mentor(s): Gary Perry

Presenters: **Jason Talabert**

This study examines the current information, benefits, and ethical implications of invasive neurosurgical implants, primarily brain-computer interfaces (BCIs). Using scholarly sources published from 2018 onward, as well as reputable tertiary sources, this study synthesizes recent advancements in BCI technology, surgical techniques, and clinical applications for individuals with neurological impairments. Results indicate that invasive BCIs can restore forms of communication, motor control, and allow for wireless connections to devices. Advances such as biocompatible materials, flexible polymers, compact hardware, and co-operated surgical robots significantly reduced risk of BCIs. Overall, while invasive BCIs present transformative opportunities for individuals with severe disabilities, their future impact will depend on how BCI companies treat and care for their patients. This paper highlights both the promise and uncertainties surrounding neurosurgical implants as they progress toward broader clinical implementation.

Health & Medical Sciences

21. Unleashing the Cytotoxic Abilities of Macrophage Toward Esophageal Cancer Cells

By: Sia Tzouanaki, Diana Wong, James X. Hartmann, and Kevin Yunqing Kang
Faculty Mentor(s): James X. Hartmann
Presenters: **Aspasia Tzouanaki** and Hope Morrison

Esophageal cancer is highly resistant to conventional therapies. Tumor cells express inhibitory "don't eat me" signals such as CD47, which suppress macrophage-mediated phagocytosis through the CD47–SIRPα axis. Targeting this pathway with anti-CD47 antibodies may enable M1 macrophages to eliminate cancer cells. Our study investigates whether coating manganese dioxide (MnO_2) hollow nanoparticles with anti-CD47 antibodies enhances macrophage phagocytosis of esophageal cancer cells in vitro. Initial observations showed phagocytosis of KYSE-30 esophageal cancer cells even without anti-CD47 antibody treatment. We hypothesized that this effect resulted from loss of CD47 surface expression caused by trypsinization during cell harvesting, as trypsin can cleave surface proteins. To test this, we compared standard trypsin harvesting with EDTA-based non-enzymatic detachment, which preserves surface proteins. These findings will determine whether harvesting methods alter CD47 expression and ensure accurate evaluation of the CD47–SIRPα pathway in immunotherapeutic targeting of esophageal cancer.

Environmental, Ecological & Marine Sciences

22. Co-Occurrence of Gopher Tortoises and Green Iguanas

By: Brooke Grieshop, Sydney Stern, Jordan Richman, and Evelyn Frazier
Faculty Mentor(s): Evelyn Frazier and Jordan Richman
Presenters: **Brooke Grieshop** and Sydney Stern

Gopher Tortoises (Gopherus polyphemus) are a keystone species as their presence increases other species populations, by shared use of their burrows which serve 360+ animal species. We hypothesized that if Green Iguanas compete with Gopher Tortoise (GT) at the 3 sites, then Green Iguanas will use burrows for their own needs and exclude the GT's from the burrows. 166 total camera trap days recorded 5,923 videos of both species utilizing the same burrows. The FAU preserve had 4,240 videos total - 1,733 GT, 2248 Iguana, and 259 GT/Iguanas interactions. Hugh Taylor Birch park had 1623 videos total - 1559 GT, and 64 Iguana. The Pond Hawk Natural Area had 658 videos total,- 657 GT, and 1 Iguana. This data demonstrates FAU is the best site to study GT/ Iguana interactions and that Iguanas haven't established at other parks.

Engineering

23. Remote Laboratories to Engage Undergraduate Students

By: Gary Jr Marroquin Irizarry, Harry Joseph Vecchio Ferrer, and Maria Larrondo Petrie, PHD
Faculty Mentor(s): Maria Larrondo Petrie and Harry Joseph Vecchio-Ferrer
Presenters: **Gary Marroquin** and Harry Joseph Vecchio-Ferrer

This research evaluates the efficacy of Smart Adaptive Remote Laboratories (SARL) in mitigating high failure rates within core undergraduate engineering courses. Previously, the course used physical circuits and breadboards. However, it hindered student engagement and added complexity to the course. Nonetheless, the course would then use Hardware Description Languages (such as VHDL) that use a logical component-based coding style. Still, the failure rate in the course persists. To address these pedagogical barriers, we have implemented an architecture currently utilizing Raspberry Pi 4s. This remote laboratory enables students to interact with the physical component, which can enhance their understanding and help faculty refine how they teach the curriculum. The long-term objective of this research is to integrate Field-Programmable Gate Arrays (FPGAs) into the SARL ecosystem. By unifying theoretical constructs and practical hardware, this adaptive approach aims to enhance learning, increase student retention, and better prepare engineering candidates.

Environmental, Ecological & Marine Sciences

24. Exploring Possible Host Trees of the Spotted Mule-Eared Orchid in South Florida

By: Ann Levarity, Bethany SImpson, and John Baldwin
Faculty Mentor(s): John Baldwin and Bethany Simpson
Presenters: **Ann Levarity**

Trichocentrum undulatum, (Spotted Mule-Eared Orchid), is the second largest epiphytic orchid native to southern Florida and is state-listed as endangered. Historically documented on multiple host tree species in Florida, current wild populations are now primarily restricted to a single host, Conocarpus erectus (Green Buttonwood). In contrast, Cuban populations occur on 92 host species. This clear narrowing of host use in Florida may reflect local evolutionary changes at the northern edge of the species range. We tested whether Florida orchids can utilize host trees beyond C. erectus by outplanting 69 laboratory-grown orchids on 23 trees representing 13 species across three habitat types. After one year, survival was 67 percent (46/69), and 80 percent (37/46) of surviving plants were attached and showing new growth. These findings support incorporating alternative hosts into restoration and land management strategies and highlight the importance of future genetic comparisons among remaining wild populations to aid conservation planning.

Behavioral, Educational & Social Sciences

25. Mirror, Mirror on the Wall: Using Silicon Participants to Reflect Human Values

By: Taylor Sutton, Anaya Bruno, Michael Vittorini, Analisa Martin, Esther Correia Santos, Rebecca Goodman, Alara Karatuna, Maryana Madeira Borri, Laura Gust, Robin R. Vallacher, and Andrzej Nowak

Faculty Mentor(s): Robin Vallacher and Andrzej Nowak

Presenters: **Taylor Sutton**, Anaya Bruno, Micheal Vittorini, Analisa Martin, Esther Correia Santos, and Rebecca Goodman

The use of Large Language Models (LLMs) as a research tool is gaining increased attention, however their applications in social psychology have not been fully examined. This research empirically establishes the use of "silicon participants" (Argyle, 2023). Silicon participants, created in the LLM, have embedded demographic characteristics and personality traits. Each silicon participant mirrors their respective human participant and are asked to respond to the same decision-making dilemmas. The dilemmas are created to capture different domains, and complexities of social life. The results of this study aim to determine whether LLMs can accurately mirror the values of human participants in ambiguous social situations. Results demonstrating high agreement would indicate that silicon participants can successfully replicate human decision-making patterns, advancing silicon models as a potential resource for future psychological research. This research is highly salient considering the increased use of LLMs for decision-making in domains such as academics and business.

Behavioral, Educational & Social Sciences

26. Action Identification, Prior Religious Commitment, and Subjective Anxiety About Identity Reconstruction Post-Deconversion

By: Anaya Bruno, Madeline Pardue, and Robin Vallacher

Faculty Mentor(s): Robin Vallacher

Presenters: **Anaya Bruno** and Madeline Pardue

This project aims to understand how individuals' methods of understanding their actions moderate the relationship between the extent of their prior religious commitment and their subjective anxiety about reconstructing a new identity that is outside of their previous faith, after religious deconversion. The study will also compare how methods of understanding general behavior versus religious behavior differently relate to such anxiety. Participants will be recruited on the Prolific crowdsourcing platform, and moderation analysis will be conducted on SPSS. There is not a particular expectation of the direction of the relationship between each level of action identification and subjective anxiety since this relationship is expected to depend on whether concrete or abstract understandings of actions stir more unease in each individual, hence this study will take an exploratory approach. The findings of this study will shed light on the under-researched topic of mindset and emotional adjustment post-deconversion.

Engineering

27. Establishing Electrophysiological Characteristics of Huntington's Disease with hiPSC-Derived Neurons

By: Grace Zhu, Jennifer Giordano, and Erik Engeberg
Faculty Mentor(s): Erik Engeberg and Jianning Wei
Presenters: **Grace Zhu**

The electrophysiological differences defining Huntington's Disease (HD) relative to healthy neurons is currently poorly quantified. To clearly establish the characteristics of this disease, we will utilize human induced pluripotent stem cells (hiPSCs) on microelectrode arrays (MEAs). The stem cells will be sourced from an HD and healthy group, and will be differentiated into neurons. These neurons will be electrically stimulated, and the resulting spike and burst behavior will be analyzed in MATLAB. HD and healthy cells will be compared through several spike and burst metrics to quantify the electrophysiological differences between these two groups. It is expected that the results will establish a set of characteristics specific to HD, in addition to previously known imaging and genetic ones. The results could also aid in advancing research on developing cellular-based treatments.

Environmental, Ecological & Marine Sciences

28. Multimodal Microscopic Analysis of Gastric Nematodes in Kogia Whales Using Stereoscopy, Scanning Electron Microscopy, and Histology

By: Lenny Hanisko, Lauren Simonitis, Jamie Knaub, Wendy Marks, and Annie Page
Faculty Mentor(s): Lauren Simonitis and Jamie Knaub
Presenters: **Lenny Hanisko**

Pygmy and dwarf sperm whales (Kogia breviceps and Kogia sima) have limited internal health data due to rare strandings. Necropsies often reveal stomach infestations by nematodes, parasitic worms that damage tissue and impair digestion. This project compares embedded nematodes in gastric tissue and unattached nematodes within stomach lumen. We aimed to document nematode interactions with stomach tissue, compare morphological traits, and assess bacterial presence. We examined forestomach, fundic, and pyloric stomach samples from 9 whales using stereoscopic microscopy, scanning electron microscopy (SEM), and histology. Stereoscopic microscopy characterized broad nematode morphology and developmental features, while SEM and histology characterized fine-scale nematode morphology and surrounding tissues. Embedded nematodes lacked spicules, were devoid of bacteria, and had rough, ridged cuticles. Unattached nematodes had spicules, smoother cuticles with bacterial colonization, and hexaradiate lips with sharp teeth. This multimodal imaging approach (stereoscopy, SEM, histology) comprehensively assesses nematode morphology across macro- and micro-scales in kogiid whales.

Health & Medical Sciences

29. Coaching to Improve Resistance Training and Protein Optimization in Middle-Aged Women at Risk for Sarcopenia: A Scoping Review

By: Maude Exantus-Taylor, Kelley Jackson, Candy Wilson, Sareen Gropper, Laurie Martinez, Janell Carroll, Tiffany Follin, and Charity O'Neal
Faculty Mentor(s): Maude Exantus-Taylor
Presenters: **Charity O'Neal**

Background: As women approach midlife, age-related sarcopenia becomes increasingly apparent due to metabolic, hormonal, and lifestyle changes influenced by multifactorial determinants. Individualized coaching interventions that emphasize nutrition optimization, behavior support, and/or resistance training strategies have the potential to play a significant role in preserving muscle health and reducing the risk of developing sarcopenia. Using Barbara Dossey's Integral Perspectives framework, this review explores how coaching interventions address physiological, psychological, relational, and environmental dimensions of muscle health. Methods: The Joanna Briggs Institute methodology will guide this scoping review, and the PRISMA-ScR guidelines will guide reporting. It will include papers relevant to sarcopenia prevention and muscle health promotion published from 2015 to 2025. Results: This review is currently in progress. Upon completion, findings will be displayed and synthesized into narrative summaries. Conclusion: This review will provide an understanding of interventions to prevent or prolong the onset of sarcopenia in middle-aged women.

Health & Medical Sciences

30. Anxiety and Depression in the Haitian Immigrant Experience

By: Samantha Leiva Cordova
Faculty Mentor(s): Cassandre Horne
Presenters: **Samantha Leiva Cordova**

First-generation Haitian immigrants hold cultural understandings of mental health that influence how they interpret anxiety and depression. This study used cognitive interviewing methods to explore how Haitian immigrants comprehend and respond to mental health language commonly used in clinical mental health nursing settings. By understanding this it can improve assessment accuracy, strengthen therapeutic relationships, and enhance the cultural responsiveness of mental health nursing practice. This approach allowed for an in-depth understanding of how Haitian immigrants understand mental health language. This presentation reflects data on how first-generation Haitian immigrants understand their personal mental health. Results revealed two themes: (1) mental health as emotional strength and (2) spiritual and cultural interpretation.

Business, Marketing, Finance & Public Administration

32. The Future of Educational Equity in Postsecondary Education: Student Loan Statutory Reforms Under the Big Beautiful Bill Act

By: Taylor Myers
Faculty Mentor(s): Anita Blowers
Presenters: **Taylor Myers**

Significant reforms to federal student loans, as outlined in the Big Beautiful Bill Act, will have a substantial impact on students pursuing secondary education, including loan limits, income-based repayment plans, and the elimination of specific deferment plans. Subsequently, those most affected by these changes will be low-income borrowers, middle-income borrowers, and graduate students. Recent changes to federal higher education loan policies, such as borrowing limits, income-based repayment plans, and elimination of certain deferments, can leave greater economic barriers within education. Although the policy aims to provide debt relief to borrowers, it raises unresolved constitutional questions, particularly regarding the government's responsibility to promote educational equity. This article evaluates the Act's reforms through the statutory framework of the Higher Education Act of 1965 and relevant case law, including Brown v. Board of Education and Abbott v. Burke, to analyze whether the revisions are consistent with the historical foundations of equitable educational access.

Behavioral, Educational & Social Sciences

33. Altered Metalloprotease Expression in Doxorubicin-Induced Chemobrain

By: Naima Allonce and Claudia Rodrigues
Faculty Mentor(s): Claudia Rodrigues
Presenters: **Naima Allonce**

Neurotoxicity is a common and often long-term side effect of chemotherapeutic agents. Doxorubicin, a widely used chemotherapeutic drug, has been strongly associated with cognitive impairment commonly referred to as chemobrain. Two groups of mice received either saline or doxorubicin (15 mg/kg body weight) administered in six injections over 2–3 day intervals. Behavioral and neuromuscular assessments, including the Barnes Maze, Rotarod, Strength Meter, and Dowel tests, were conducted. Doxorubicin-treated mice exhibited significant impairments in spatial memory and learning, increased anxiety-like behaviors, reduced muscular strength, and diminished neuromuscular coordination compared to saline controls. The study aims to demonstrate that doxorubicin significantly impairs cognitive and neuromuscular functions. We will further analyze metalloprotease expression in genetically modified mouse brain samples to understand the cellular mechanisms driving these neurological deficits.

Health & Medical Sciences

34. Phytochemicals and the Molecular Approach to Treating Triple-Negative Breast Cancer

By: Sara Nasif and Ajay Bommareddy

Faculty Mentor(s): Ajay Bommareddy

Presenters: **Sara Nasif**

Phytochemicals such as alpha-santalol, originating from the sandalwood tree have been shown to be effective against the development of various malignancies including breast cancer. Our proposed research will specifically focus on Triple-Negative Breast Cancer (TNBC), an aggressive form of breast cancer lacking estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER-2). Research surrounding the molecular pathways that contribute to TNBC growth and exploring novel treatment options has been the focus of our ongoing research. Among the various molecular pathways, the Notch signaling pathway has been shown to be a key regulator in tumor growth and maintenance of cancer stemness. The Notch signaling pathway plays an important role in cancer growth, assisting with such processes including survival, proliferation, morphogenesis, and stem-cell renewal. Dysregulation of Notch signaling further promotes carcinogenesis, tumor growth, cancer stem cell renewal, and contributes to chemoresistance.

Basic Sciences

35. 3D Scanning Workflow for Cultural Heritage Preservation

By: Valery Macena, Maria Escobar, and Katharine Napora

Faculty Mentor(s): Katharine Napora

Presenters: **Valery Macena** and Maria Escobar

Canoes are a vital part of both the history and cultural identity of the Seminole Tribe of Florida. The goal of this exploratory research is to develop and create a workflow for the Artec Leo 3D Scanner and Artec Studio software to establish a framework for digital preservation of cultural heritage, including canoes. We employed the Artec Leo to create a 3D-printed model of a canoe and developed models of archaeological structures. Digitizing cultural heritage enables high-quality archives of these pieces to be created and shared without moving the actual pieces, allowing researchers to study the artifacts remotely. These archives will provide a permanent digital resource of cultural heritage materials.

Behavioral, Educational & Social Sciences

36. AI Adoption and Its Perceived Impact on College Education

By: Alessandro Ortega

Faculty Mentor(s): Monica Escaleras and Eric Levy

Presenters: **Alessandro Ortega**

Artificial intelligence is the fastest-growing technological field of the twenty-first century and increasingly shapes how people work, learn, and communicate. As AI rapidly integrates across industries, important questions emerge about its impact on higher education. This research examines Americans' views on AI tool adoption and its influence on college education, while testing whether these views vary by age and educational attainment. I designed a fifteen-question survey and collected 447 responses using RepData. Results show that younger individuals use AI tools more frequently than those aged sixty-five or older. By education level, respondents with some college or higher are more likely to believe AI will significantly change the college education system than those with a high school education or less. These differences reveal clear generational and educational divides and raise concerns about the future workforce. Colleges must integrate AI literacy to prepare students and reduce inequality in an evolving labor market.

Behavioral, Educational & Social Sciences

37. General vs. Informed Student Opinions on Forensic Evidence

By: Mia Scalia, Lincoln Sloas, and Patrick McLaughlin

Faculty Mentor(s): Lincoln Sloas and Patrick McLaughlin

Presenters: **Mia Scalia**

Forensic evidence is key for solving various types of investigations in civil and criminal cases. Common forms of forensic evidence include direct evidence such as fingerprints and DNA or circumstantial evidence such as shoe prints or tool marks. Previous research on public belief towards forensic evidence has shown that the public acknowledges its importance but believes it is not perfectly accurate. In order to expand this growing knowledge base, we surveyed students from CCJ and other FAU colleges about their views on several types of forensic evidence, the effectiveness of each type for specific cases, if each type of evidence can be effectively used for a multitude of cases, and their familiarity with forensic evidence in general. In this study, we hope to find that public opinion towards forensic evidence remains positive and that a variety of forensic evidence is considered to be effective for multiple case types.

State College Poster Presentations

Poster Session 1: 9:00 – 10:00 AM

Engineering

46. Autonomous RC Vehicle as a Scalable Proof of Concept for Real-World Self-Driving Systems

By: Tom Cruz-Wilson

Faculty Mentor(s): Eva Suarez ,

Presenters: **Tom Cruz-Wilson**

This study investigated the safety and reliability concerns of autonomous vehicles. Current research estimates that over 350,000 deaths could be prevented over 10 years by introducing autonomous vehicles to the roads. There are numerous factors aiding this claim, but the crux of the projection hinges on vastly improved response time from technology over human senses. This study aimed to test the response time and reliability of the current technology via a scaled-down prototype RC car equipped with LiDAR, Ultrasonic, and IR sensors. Sensor fusion is the act of combining data from multiple sensors to have more accurate readings and reactions. Findings indicated the autonomous control prototype with sensor fusion outperformed the manual control (control group) through all testing methods. These results are consistent when compared with full-scale prototypes from Tesla and Waymo, showing strong support for the improved safety and reliability of autonomous technology.

Behavioral, Educational & Social Sciences

47. Filtered Realities: Media Framing, Algorithms, and the Rise of Political Polarization

By: Kamila Romero, Juno Quintana, Samuel Polanco, Josh Escobar, and Maria Gonzalez

Faculty Mentor(s): Anastasia Tamali

Presenters: **Kamila Romero**, Juno Quintana, Samuel Polanco, Josh Escobar, and Maria Gonzalez

Political polarization in the United States has intensified in recent decades, fueled in part by partisan media narratives and algorithm-driven social media platforms that amplify ideological divisions. While existing research focuses on polarization in Congress, fewer studies analyze how media framing contributes to division. This project explores the role of news outlets and digital platforms in shaping political realities, using both media analysis and survey research. Although many Americans believe they are exposed to diverse political perspectives, their media consumption is largely shaped by algorithmically curated social media content and biased news outlets, reinforcing ideological echo chambers and further entrenching political divisions. This research seeks to empower audiences to critically evaluate their news and media consumption, recognize biased reporting, and develop strategies for engaging with diverse perspectives. In doing so, this study aims to identify pathways for reducing political polarization and promoting more fact-based dialogue across political differences.

Poster Session 2: 1:30 – 2:30 PM

Behavioral, Educational & Social Sciences

42. Effect of Nutrition Label Awareness on Processed Food Consumption in Young Adults

By: Eilis Venereo, Miabella Alvarado, and Kayra Balci
Faculty Mentor(s): Olubisi Faoye
Presenters: **Eilis Venereo**, Miabella Alvarado, and Kayra Balci

Nutrition labels are a key public health tool to guide healthier food choices, yet many young adults continue to consume high levels of processed and high-sodium foods. This mixed-methods study investigates whether greater awareness and use of nutrition labels is associated with lower intake of processed foods among college-aged students (18 to 30). Prior research suggests individuals with stronger label literacy, particularly the ability to interpret serving sizes, added sugars, and daily values, tend to make healthier dietary choices. Using a food frequency questionnaire and custom label awareness survey, this study assesses the relationship between label usage and processed food intake among students at an urban college. Findings will inform future nutrition education strategies and public health campaigns targeting diet-related chronic disease risk among young adults. By addressing behavioral and structural barriers to label use, this research supports clearer labeling systems and targeted outreach to groups at higher risk of poor dietary outcomes.

Basic Sciences

43. Evaluating Egeria densa for Biofuel Production: Maximizing Soxhlet extraction Lipid Yield via Optimized Solvent Ratios

By: Tania Li and Marcel Manzor
Faculty Mentor(s): Juan Morata
Presenters: **Tania Li** and Marcel Manzor

The growing demand for sustainable sources of energy, a response to record high greenhouse gas emissions from fossil fuels, has spurred interest in biofuels derived from non-traditional biomass. Aquatic plants like Egeria densa present a promising source of energy due to versatility and rapid growth. This study examined lipid extraction from Egeria densa, focusing on solvent composition. Specimens cultivated in controlled conditions were crushed into pellets. Lipids were extracted using varying compositions of ethanol and cyclohexane in a Soxhlet apparatus, with a runtime of eight hours. The solvent was removed using a rotary evaporator. The flask was then weighed, and percent yield was calculated. Results demonstrated that a mixture of 20% ethanol and 80% cyclohexane generated a maximal lipid yield of 79.22%. This finding highlights the implications of solvent selection on lipid extraction efficiency of Egeria densa, supporting the potential of optimized systems to derive biofuels from aquatic plants.

Poster Session 3: 2:45 – 3:45 PM

Basic Sciences

39. Identifying Ideal Solvent Content for Soxhlet Extraction of Lipids from Lemna Minor for Biofuel Production

By: Giselle Iskandarani and Daniella Rothberg
Faculty Mentor(s): Juan Morata
Presenters: **Giselle Iskandarani** and Daniella Rothberg

Rising greenhouse gas emissions have driven efforts in developing renewable energy sources such as biofuels. Studies have presented Duckweed (Lemna minor) as a source for biofuel due to its high lipid content; however, solvents used in Soxhlet lipid-extraction process were not examined. This study aims to determine the utility of Duckweed as a sustainable biofuel source and provide information for optimization of Soxhlet lipid-extraction procedures. Duckweed samples cultured in a laboratory setting were used to create pellets, and lipids were extracted using the Soxhlet with varying concentrations of solvents (chloroform, ethanol, and hexane). A percent yield was calculated for each trial. Our two most recent trials using 250 mL and 175 mL of 20% ethanol and 80% hexane resulted in yields of 94.16% and 96.86%, respectively. The confirmation of Duckweed's utility in biofuel may serve as a step to reduce emissions and provide a cleaner future.

Health & Medical Sciences

40. Development of Chalcone-Based Carbon Dots for Potential Medical Imaging

By: Maria Viana
Faculty Mentor(s): Dr. Eduardo Veliz
Presenters: **Maria Viana**

Carbon dots are nanoscale carbon-based particles, typically less than 10 nm in diameter, that exhibit fluorescence when excited at specific wavelengths. Their emission properties depend on their precursor molecule and surface functional groups. Light in the near-infrared range (around 700 nm) is especially useful because it can travel deeper into tissues and produces less background interference. This project explores whether a synthetic chalcone molecule can be used to create carbon dots that emit light in the near-infrared range for use in future medical imaging applications. This project seeks to make carbon dots from a synthetic chalcone molecule, which have cytotoxicity toward normal cells and strong fluorescence near 645 nm, potentially making a promising carbon dot with near-infrared emission. This experiment was successful in the creation of carbon dots from the synthetic chalcone molecule; however, the carbon dot did not retain the expected near-infrared range emission, leaving room for future research.