Eighth Annual

Undergraduate Research Symposium

03.30.18

Paula Calvo

WELCOME

Welcome to the 8th 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.

The Office of Undergraduate Research and Inquiry (OURI) serves as a centralized support office of both faculty and students who are engaged in undergraduate research and inquiry. We offer and support university wide programs such as undergraduate research grants, annual undergraduate research symposia, and undergraduate research journals, to name a few. We also support all departments and all colleges across all campuses in their undergraduate research and inquiry initiatives.

The Undergraduate Research Symposium is part of our University's Quality Enhancement Plan (QEP) efforts aimed at expanding a culture of undergraduate research and inquiry at FAU.

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

SPECIAL THANKS

Council for Scholarship and Inquiry (CSI)

Distinction through Discovery Faculty Liaisons

Distinction through Discovery Peer Mentors

Division of Research

Division of Student Affairs

Faculty Judges

Faculty Mentors/Advisors

Graduate and Professional Student Association (GPSA)

Graduate College

Graduate Student Judges

Student Government

Student Volunteers

Undergraduate Studies

University Communications - Marketing and Creative Services

University Libraries

CONTENT

KEYNOTE SPEAKERS

DAWN C. SHAMBURGER

Costume Designer and Assistant Professor of Costume Design at Florida Atlantic University, Dawn Shamburger, has been teaching since 2004 and is now in her second-year teaching at FAU. She feels fortunate to have the opportunity to pursue her passion in design, teaching and history. Since arriving at Florida Atlantic University, she has designed several department productions, such as *The Rivals, The Government Inspector, Into the Woods,* and *The Last Days of Judas Iscariot,* as well as designing multiple productions for FAU's Theatre Lab including, *The Revolutionists, Motherland,* and *Three Sisters Of Weehawken.*

Professionally, Dawn has worked in various capacities from Design, Technology and Costume Management with many companies and universities such as Hartford Stage Company, Glimmerglass Opera (now Festival), Barrington Stage Company, Trinity Rep/Brown Consortium, Greensboro Ballet, and Theatre Mitu in NYC with Candida K. Nichols. She has held membership in multiple theatre organizations such as the New England Theatre Conference, South East Theatre Conference, Kennedy Center American College Theatre Festival and United States Institute for Theatre Technology.

Dawn holds an MFA in Theatre Design with an emphasis in Costume Design from the University of North Carolina at Greensboro, and a BA in Theatre Design and Production from Northwestern State University in Natchitoches, LA. More information about Ms. Shamburger's work can be found at www. dawncshamburger.com.

K. APRIL SOROKO

As an assistant professor of Scenic Design at Florida Atlantic University, Professional Chair of the Florida Theater Conference, and a professional scenic and costume designer, Ms. Soroko has worked on many projects throughout her career. Her off-Broadway credits include scenery for *Napoleon* at NYMF and costumes for *Marriage Blanc* at Playwrights Horizons. Her regional designs include scenery for *Collected Stories, A Long Day's Journey into Night* and *My Old Lady* for Palm Beach Dramaworks, scenery for *The Tempest*, *King Lear* and *Much ado About Nothing* and costumes for *The Merchant of Venice*, *Twelfth Night* and *A Midsummer Night's Dream* for NC Shakes. She has designed costumes for *Manifest* at Portland Stage and *The Cure at Troy* at Yale Rep. She has worked on scenery for *Pump Boys and Dinettes*, scenery and costumes for *Androcles and the Lion*, costumes for *Native Gardens*, *The Fabulous Lipitones*, and *Beehive: The 60s Musical* at Florida Studio Theater. Ms. Soroko is a member of USA Local 829 in both Scenery and Costumes, and holds an MFA from the Yale School of Drama. She was previously Associate Professor of Scenic Design at the University of Miami in Coral Gables.

www.aprilsoroko.com

ARTIST STATEMENT

Paula Calvo, originally from Colombia, is a Sophomore at Florida Atlantic University. She is currently studying in the Theater Design and Technology program in the College of Arts and Letters. Even as a young child, she knew she wanted to become a fashion designer. When she was afforded the opportunity to be a part of theater productions, she felt this was a more exciting and creative path for her to become a costume designer. She later registered for the Costume Rendering class at FAU- not knowing what to expect. As an admirer of fashion illustrators, she was excited to learn more about the skills and artistic abilities used to recreate fashion.

The design on the front cover of this program is the result of a project to render a dress from the Romantic period. Through research, she found a dress exhibited at the Metropolitan Museum of Art in New York City. This dress caught her eye, as she loved the fabric and the pattern of the dress. Using watercolor was the perfect medium to show the subtlety of the print on the fabric, and the foldings of the dress while accentuating the volume with light. She began this project with the proportions of the model, started drawing the basic shape of the dress, and then added details. When the silhouette was ready, color, pattern, and shading was added. Finally skin color and hair was incorporated, followed by adding other minor details to the dress. The entire process took weeks, but resulted in a project in which to be proud.

Furthermore, accepting challenges like this project helped Paula gain confidence and know she is capable of more than she imagined. Paula would like to thank her professor, Dawn Shamburger, who broadened her perspectives about the possibilities her future career offers, to develop new abilities, and who encouraged her strive for excellence in all her endeavors!

AGENDA

On-going Registration will happen outside of the Live Oak Pavilion from 8:00–2:00.

7:30 – 8:30 am	**Light Breakfast**	Live Oak Pavilion D
8:30 – 12:00 am	**Oral Presentations**	Live Oak Pavilion A–C
12:00 – 1:15 pm	**Lunch**	Live Oak Pavilion A–D

Lunch

- Welcome Message
- President John Kelly
- Provost Gary Perry
- FAURJ Co-editors

Keynote Speakers

- Dawn C. Shamburger
- K. April Soroko

1:30 – 3:30 pm	**Poster Presentations**	Grand Palm Room
4:00 – 7:00 pm	**Awards Ceremony and Social hosted by the Council for Scholarship and Inquiry**	Live Oak Pavilion A–D

ORAL PRESENTATIONS

A

Behavioral, Educational & Social Sciences

8:30-9:40 — Student's Reaction to Failure and Test Anxiety Through the Usage of an Eye-Tracking Device: How Much Does Stress Serve as a Negative Stimuli in School?
Molly Wooten, Miguel Suarez-Garcia, Shemar Maurice & Audra Birt
Faculty Mentor: Tammy Knipp

Effects of Gender on Levels of Tension in the Therapeutic Relationship
Amrita Ghaness & Nicole Fitzgerald
Faculty Mentor: Paul Peluso

Forgotten Women in Psychology: The Lost Second Generation
Sonia Baron
Faculty Mentor: Kevin Lanning

The American Perception and Ideology Towards Refugees
Onur Basman & Estaban Cardenas
Faculty Mentor: Monica Escalera

Behavioral, Educational & Social Sciences

9:50-11:00 — Voluntary Victim Intoxication in Sexual Assaults: A Summary of the Nation's State Statutes
Caralin Branscum
Faculty Mentor: Seth Fallik

A Recidivist Evaluation of Mandatory Minimums on Drug Offenses
Daniel Camacho
Faculty Mentor: Dukong Kim

How Does Party Affiliation Affect the Perception of Legitimacy Regarding Media Outlets?
Garrett Cox & Douglas Speed
Faculty Mentor: Monica Escaleras

Gender Differences in Adolescent Perceptions of Wartime Violence
Jessica Gushue
Faculty Mentor: Patricia Liehr

ORAL PRESENTATIONS

Basic, Health & Medical Sciences

8:30-9:40   Thermodynamic Analysis of Galectin-1,-3 Binding to Beta-galactosides and MUC1-TF Bearing Glycopeptides
Forrest FitzGerald
Faculty Mentor: Mare Cudic

Synthesis of the Glycosylated Amino Acid Bearing the Thomsen Nouvelle Antigen
Elizabeth Mercer
Faculty Mentor: Mare Cudic

Is Physician-Assisted Suicide Ethical in Non-Terminal Cases?
Arielle Schebovitz
Faculty Mentor: Ashley Kennedy

Progress toward Synthesis and Characterization of Novel Eglin-Based Matriptase Inhibitor
Dalia Soueid
Faculty Mentor: Maciej Stawikowski

Engineering

9:50-11:00   A Synthetic Sea Urchin Exoskeleton for Carbon Conversion to Environmental Calcium Carbonate Precipitates
Alexis Base
Faculty Mentor: Peng Yi

A Biodegradable Surfactant for Enhanced Oil Recovery: A Microfluidic Study
Kavita Braun, Derek Peters & Cesar Saldana
Faculty Mentor: Myeongsub Kim

A Novel Way of Utilizing Modular Arithmetic to Simplify Boolean Postulates, Theorems, and Relations
Michael Chung
Faculty Mentor(s): Maria Petrie

A Survey on Trust in Autonomous Systems
Luiza Menezes
Faculty Mentor: Mehrdad Nojoumian

Fraud Detection through Semi-Supervised Machine Learning
Zachary Schuknecht, Gavin Sadecki, Michael Chung, & Rumenigue Gustinvil
Faculty Mentor(s): Erik Lundberg, & Robert Bridges

Environmental, Ecological & Marine Sciences

11:10-12:00   Model Dwelling of Recycled Plastic for La Plaine, Haiti
Kestride Estil
Faculty Mentor: Jean Martin Caldieron

Investigation of Dissolved Metals Concentrations in Lake Worth Lagoon
Gino Garlaschi
Faculty Mentor: Tara Root

A Comparative Analysis of Shark Pectoral Fins
Wilmer Lopez
Faculty Mentor: Marianne Porter

ORAL PRESENTATIONS

Music, Art, Literature, Theater, History & Philosophy

8:30-9:40 Rationalizing Indian Removal: Representation of Indigenous Peoples and American Identity
Jeffrey Coltman-Cormier
Faculty Mentor: Adrian Finucane

The Political Power of Jazz as Protest: Plato, Nietzsche, Rousseau, Adorno, and How Jazz Music Threatens Authoritarianism/Totalitarianism as a Symbol of Freedom
Mauricio Garcia
Faculty Mentor: Rebecca LeMoine

Chinese Buddhist Nuns: Opportunities and Validations
Elizabeth Kushma
Faculty Mentor: Kenneth Holloway

"The Poetic Ground of Physiology": Aesthetic and Biological Unity in British Romantic Poetry
Anna Riso
Faculty Mentor: Gavin Sourgen

The Syntax of Chaldean Neo-Aramaic
Catrin Seepo
Faculty Mentor: Michael Hamilton

Business, Marketing, Finance, & Public Administration

9:50-11:00 Electoral College - To Ditch or Not to Ditch?
Sydney Elney & Fetzer William
Faculty Mentor: Monica Escaleras

An Analysis of US State Municipal Bond Yield Curves
Amaury Minino
Faculty Mentor: Hongwei Long

Empirical Evidence of the Negative Relationship between Social Capital and Corruption
Stefan Ragnarsson
Faculty Mentor: Kanybek Nur-tegin

Behavioral, Educational & Social Sciences

11:10-12:00 Who Done It? Source Memory Differences in Older and Younger Adults
Nicole McRostie
Faculty Mentor: Julie Earles

Is "Plan Mexico" the New "Plan Colombia"? The Evolution of U.S.-Latin American Security Agreements in the Fight Against Transnational Criminal Organizations
Andres Rodriguez
Faculty Mentor: Dukhong Kim

Being Sort of Muslim: An Auto-ethnographical Account of Living in the 'In Between'
Natasa Trisha
Faculty Mentor: Gina Carreño-Lukasik

Block vs. Text Coding Games: Comparing 4th Grade Students' Confidence, Interest, and Skill in Computer Science
Janet Weinthal
Faculty Mentor: Tricia Meredith

POSTERS

1. **Antibiotic Discovery in Bacteria from Palm Beach County Soil**
   Alexis Martin
   Faculty Mentor: Diane Baronas-Lowell

2. **No More DACA? An Uncertain Future under the Trump Administration**
   Alyssa Alvarez
   Faculty Mentor: Gina Carreño-Lukasik

3. **Could USOC and USA Gymnastics Pay the Price in Sex Crimes Case?**
   Elysha Savarese
   Faculty Mentor: Cheryl Arflin

4. **Tick Tock: The Effects of Time Constraints on Working Memory**
   Alexandra Rosas-Merritt
   Faculty Mentor: Julie Earles

5. **Effects of Mindfulness Meditation on Cued-recall Memory for Positive, Negative, and Neutral Stimuli**
   Alexandra Rosas-Merritt
   Faculty Mentor: Laura Vernon and Julie Earles

6. **Development of a Rapid Assay for ZIKV Detection**
   Sydney Yu
   Faculty Mentor: Waseem Asghar

17. **The Home Mortgage Interest Deduction: Should Reform Mean Fear?**

    Kira Wolak

    Faculty Mentor: Cheryl Arflin

18. **Use of Role-Based Access Control and Multilevel on basic devices**

    Anak Wannaphaschaiyong

    Faculty Mentor: Eduardo Fernandez

19. **Examining Seasonal Prey Abundance of Common Snook (*Centropomus undecimalis*) in the Indian River Lagoon**

    Matt Bristol and Lauren Kircher

    Faculty Mentor: John Baldwin

20. **Rescuing Msr Deficiency in Drosophila Melanogaster**

    Michael Iacobelli

    Faculty Mentor: David Binninger

21. **An Examination of the Morphosyntactic Structure of Verb Phrases in Chaldean Neo-Aramaic**

    Paul Barile

    Faculty Mentor: Michael Hamilton

22. **Alternate Synthetic Approach Towards Key Building Block in the Synthesis of Tumor-Associated Carbohydrate Antigen**

    David Blanco

    Faculty Mentor: Mare Cudic

23. **Synthesis of Organotin Polymers from 2-Ketoglutaric Acid and their Ability to Inhibit the Growth of Human Cancer Cell Lines**

    Dhruvin Patel and Sahar Jafri

    Faculty Mentor: Charles Carraher

24. **Developing a Software Tool for Characterization of Cardiac Signals in a 3D Heart Model**

    Marquita Scott

    Faculty Mentor: Benhaz Ghoraani

25. **Determining Origins of Vervet Monkeys in Dania Beach, Florida Through Phylogenetic Analysis**

    Sandra Almanza and Charlene Korchia

    Faculty Mentor: Kate Detwiler

26. **From Field Collection to the Lab: A Study of the Research Pipeline for Genetic Analysis of Wild Primate Populations**

    Sandra Almanza

    Faculty Mentor: Kate Detwiler

27. Impulsivity in Mice with Rum3/Rum5 Isoforms of Syngap1 Gene
    Minji Chae
    Faculty Mentor: Julie Earles

28. Who Helps More? Examining Gender Differences in Helping Behavior
    Cassidy Brydon
    Faculty Mentor: Julie Earles

29. Conducting a Biological Inventory of Mammalian Species Using Remote Sensing in the Lomami Basin Rainforest in the Democratic Republic of Congo
    Katherine Perez and Kayla Sloan
    Faculty Mentor: Kate Detwiler

30. The Effects of Person Centered Coaching on Physical Activity Levels of Older Adults with Osteoarthritis: A Pilot Study
    Jean-Joseph Rendel
    Faculty Mentor: Lenny Chiang-Hanisko

31. Establishment of an Optimal LPS Concentration to Investigate the Effect of the Marine ω-Conotoxin GVIA on the Inflammatory Response of Human THP-1 Derived Macrophage-like cells
    Oscar Fonseca
    Faculty Mentor: James Hartmann

32. An Evaluation of Productivity for Florida Burrowing Owls in a South Florida Population
    Zachary Blakeney
    Faculty Mentor: Evelyn Frazier

33. What Leads to Better Memory? Writing or Performing Action Pairs
    Nicole McRostie
    Faculty Mentor: Julie Earles

34. Development and Optimization of AlphaScreen Assay for Discovery of Galectin Inhibitors
    Yaima Rivero and Forrest FitzGerald
    Faculty Mentor: Mare Cudic

35. Molecular Characterization of Hepatozoon (Apicomplexa: Adeleorina) Blood Parasite within the Threatened Gopherus Polyphemus Species
    Johanna Eusse
    Faculty Mentor: Evelyn Frazier

36. Eyewitness Memory: Manner of Motion in Perpetrator Identification
Jonathan Perry
Faculty Mentor: Julie Earles

37. Biological Benefit of the mCAT Transgene in Progeroid Mice
Sylvia Frydman
Faculty Mentor: Ken Dawson-Scully

38. The Formation of Inhibitory Fields Surrounding Stationary Objects
Magdalena Kopec
Faculty Mentor: Howard Hock

39. We Had No Eye-dea; The Effect of Enchroma Glasses on the Experience of Art and Color Vision
Vrishan Seepersad
Faculty Mentor: Julie Earles

40. A Survey of Arthropod Species Found in Gopherus Polyphemus Burrows in South Florida Scrub Habitats
Gillian Hebert, Mohammad Syed, Lauren Melanson and Emma Cutkomp
Faculty Mentor: Evelyn Frazier

41. Determination of the Enzymatic Activity of Membrane Type-1 Matrix Metalloproteinase (MT1-MMP) at the Surface of Tumor Cells
Melissa Hart
Faculty Mentor: Anna Knapinska

42. Characterizing the Overactivation of Microglia During Development
Anna Riso
Faculty Mentor: Julie Earles

43. Everything that's Black and White
Britton Welliever
Faculty Mentor: Julie Earles

44. Microsatellite Loci Analysis of Gopher Tortoise (Gopherus polyphemus) Populations in Southeast Florida
Mallory Theurer
Faculty Mentor: Evelyn Frazier

45. Promoting Well-Being in Female Student-Athletes by Influencing Resilience and Empowerment through HeartMath, a Complementary Healing Modality Focused on Increasing Participants' Abilities to React to Stressful Situations

Alexandra Miller

Faculty Mentor: Nancey France

46. Investigating the Therapeutic Potential of Aceropterin A, Aceropterin B, Regio, and 13-Desmethly Eleutherobin on DU-145 and LNCaP Cells

Akeal Sheikh, Joubin Jebelli and William Trevino

Faculty Mentor: James Kumi-Diaka

47. Exploring the Anticancer Effects of Novel Marine Natural Products on Prostate Cancer Cells

Joubin Jebelli, William Trevino and Elizabeth Richard

Faculty Mentor: Lyndon West

48. Roll with Me: Trust and Interpersonal Leadership in Different Communication Modalities

James Adaryukov

Faculty Mentor: Julie Earles

49. Generational Differences in Viewpoints

Andrew Barak and Alexis McCurry

Faculty Mentor: Monica Escaleras

50. Eigenfaces vs. Fisherfaces: A Comparative Study Using Python

Cara Savoy

Faculty Mentor: Koray Karabina

51. Understanding Sport-Related Concussions

Kassi Coviello and Joseph Nasrallah

Faculty Mentor: Monica Escaleras

52. Food Offerings at Faith-based Activities for Children/Youth

Andrea Valentina Parra Jaimes

Faculty Mentor: Sareen Gropper

53. Tenses of Chaldean Neo-Aramaic

Sabine Elam

Faculty Mentor: Michael Hamilton

54. Using Supervised Machine Learning for Retail Fraud and Anomaly Detection

Alla Polisskaya

Faculty Mentor: Erik Lundberg

55. Pedestrian Conveyance Path Usage in a South Florida Campus Environment

Maya Khazem and Michelle Rodriguez-Gonzalez

Faculty Mentor: Tricia Meredith

56. The Labyrinth of Chance and Choices

Kristina Beluskov and Dhruvin Patel

Faculty Mentor: Ilaria Serra

57. Software Engineering: Social Impact and Perception

Erika Cardenas and Connor Shorten

Faculty Mentor: Monica Escaleras

58. Induction of Anti-inflammatory Acetylcholine Receptors on Human Macrophages Produced in the Laboratory as a Model System for Drug Screening and Development

Stefan Basilio and Veronica Hartmann

Faculty Mentor: James Hartmann

59. Hydrodynamics of Particle-Laden Flow in Hydrofracking: A Microfluidic Study

Natalia Linares and George Albrecht

Faculty Mentor: Myeongsub Kim

60. Quality vs Quantity

Kyle Ziegler and Derream Auguste

Faculty Mentor: Monica Escaleras

61. Views on Climate Change

Olivia Diaz, Henry Castillo

Faculty Mentor: Monica Escaleras

62. General Education Pre-service Teachers Familiarity and Observational Experience of Effective Practices that Support Students with Disabilities in Inclusive Classrooms

Aaron Weinstein, Jessica Greenwood and Kaley Robinson

Faculty Mentor: Lisa Finnegan

63. Home Range and Social Interactions of a Gopherus Polyphemus Population in S. Florida

Andrea Rodriguez

Faculty Mentor: Evelyn Frazier

64. Aqueous Two-Phase System Droplet Generation in Flow-Focusing and Co-Flow Microfluidics Devices

Nicholas Petrozzi

Faculty Mentor: Myeongsub Kim

75. Promoting Understanding Through Shared Human Connection in Photographs: An Exploratory Study on Stigma Surrounding Homelessness
Emily Schayes
Faculty Mentor: Andra Opalinski

76. Trabecular Structure through Ontogeny in the Florida Manatee (Trichechus manatus latirostris)
Laura Lindsey
Faculty Mentor: Marianne Porter

77. Effects of Nonpharmacological Interventions in Older Adults With Dementia: Chair Yoga, Chair-Based Exercise, and Participatory Music Intervention
Victoria Arcay and Yve Lopes
Faculty Mentor: Juyoung Park

78. An Investigation of Dual Inclusion in the Construction of Flexible Armor
Reinaldo Dos Santos
Faculty Mentor: Hassan Mahfuz

79. Seasonal Abundance and Spatial Distribution of Blacktip Sharks (Carcharhinus Limbatus) in Southeast Florida
Jordan Waldron
Faculty Mentor: Stephen Kajiura

80. Demographic Variables and Neuropsychological Performance in Bilingual Adults with Abnormal Aging
Daniella Ospina
Faculty Mentor: Monica Rosselli

81. Effect of Acute High-Intensity Interval Exercise vs. Continuous Moderate-Intensity Exercise on the BDNF, Lactate, and Cortisol Responses in Obese Individuals
Avraham Adelman
Faculty Mentor: Chun-Jung Huang

82. Hemifield Asymmetries in Visual Short-Term Memory with Orientation as a Feature in a Change-Detection Task
Mary Minore
Faculty Mentor: Summer Sheremata

83. **Variation in Sleep and Metabolic Function is Associated with Latitude and Average Temperature in Drosophila Melanogaster**

Joshua Torres

Faculty Mentor: Alex Keene

84. **Peripheral Vision Acuity in Video-Gamers vs Non-Video-Gamers**

George Wyche, Dylan Frehner and Jovanny Gallego

Faculty Mentor: Tammy Knipp

85. **Quantification and Analysis of Cancer-Cell Derived Exosomes**

Alexandra Urdaneta

Faculty Mentor: Vijaya Iragavarapu-Charyulu

86. **Timeline of John Hinckley, Jr. in the Criminal Justice System**

Scott Gardner

Faculty Mentor: Lincoln Sloas

87. **Monitoring and Modeling to Estimate the Impact of Hydrogen Sulfide Emissions and Dispersion Near Gas Wellheads In Florida Landfills**

Angel Martinez

Faculty Mentor: Daniel Meeroff

88. **Identification of Bottlenose Dolphin Prey Within the IRL, Utilizing Images Collected During Observed Dolphin Feeding Behaviors**

Kaitlin Grell and Dan Albrecht

Faculty Mentor: Marilyn Mazzoil

89. **The Immediate Effects of Mindfulness on Stress, Anxiety, and Affect**

Yarinez Batista

Faculty Mentor: Laura Vernon

90. **Optimized Synthesis of a Bridged Bicyclic Compound for Late Stage Diversification Leading to Analogs with Potentially Improved Neuroprotective Activity**

Gurtejpal Ghuman

Faculty Mentor: Salvatore Lepore

91. **The Effect of Mindfulness Meditation on Free-Recall Memory of Emotionally Valenced Stimuli**

Grace Halstead

Faculty Mentor: Laura Vernon

92. **Cloud Based Smart Navigation**

Nazik Almazova

Faculty Mentor: Saeed Rajput

93. **The Prevalence of Butterfly Development Stages in Different Types of Cultivated and Uncultivated Areas at FAU's Boca Raton Campus**
Gabriela Gazaniga and Chloe Joseph
Faculty Mentor: Tricia Meredith

94. **Adult-born Dentate Granule Neurons Show Accelerated Maturation in a Transgenic Mouse Model of Adult-onset Spontaneous Epilepsy**
Meer Sajida Hossain
Faculty Mentor: Ceylan Isgor

95. **Tasteful Disgust: Oral Priming to Examine Emotional Cognitive Biases for Disgust**
Jennifer Irmiter
Faculty Mentor: Laura Vernon

96. **Surveying the Morphological Diversity of Elasmobranch Olfactory Organs**
Caroline Sullivan, Lindsey Hammond and Nicholas Hesley
Faculty Mentor: Tricia Meredith

97. **Seizure-Induced Deficit in Brainstem Arousal Function: Implications for Sudden Unexpected Death in Epilepsy**
Kezia Koroma and Meer Sajida Hossain
Faculty Mentor: Ceylan Isgor

98. **Impact of Functional versus Symbolic Signals on Initial Impressions: Implications for Designing the Look of a Website Homepage to Convey an Outdoorsy Brand Image/Personality for a Lifestyle Brand**
Danielle Gordon, Samin Nuhin and Katherine Llanos
Faculty Mentor: Allen Smith

99. **Design and Synthesis of Novel Analogues of Aza-Podophyllotoxin as Tubulin-Polymerization Inhibitors**
Charles Shearer
Faculty Mentor: Stephane Roche

100. **Meditation: Following the Wandering Mind**
Brandon Jean-Baptiste
Faculty Mentor: Laura Vernon

101. **Effects of Orientation on Mechanical Properties on Lionfish Dorsal Spines**
Noa Abiri
Faculty Mentor: Marianne Porter

102. **Exploring the Relationship Between Anxiety and HRV in Parents with Low Income**
Derricka Dixon
Faculty Mentor: Beth King

103. Assessment of the Long-Term Durability of Recycled Aggregate Concrete Using Thermal Sensing Based on the Maturity Method

Caique Martins

Faculty Mentor: Khaled Sobhan

104. Advertising Research and Strategy: The Role of Brand Association Using Lifestyle Relevance

Stasia Milios, Naim Mobley, Heather Baker and Eliezer Vega

Faculty Mentor: Allen Smith

105. Disgust Me or Disgust Me Not: Priming in Information Processing Biases for Disgust-Relevant Stimuli

Alyssa Michels

Faculty Mentor: Laura Vernon

106. Mineralization of the Cartilaginous Centra in Sharks at a Biologically Relevant Strain

Fedgy Charles

Faculty Mentor: Marianne Porter

107. Direct and Indirect Contribution of Immune Cells in Xenograft Rejection

Haley Katz

Faculty Mentor: Mahyar Nouri-Shirazi

108. Multiple Vehicle Detection Using Single Shot MultiBox Detector (SSD)

Samantha Johnson

Faculty Mentor: Hongbo Su

109. The Comparison Between African-Americans and European Caucasians with Mild Cognitive Impairments by Examining Cognitive Deficits in Their Daily Lives

Dana-Lee Bowes

Faculty Mentor: Monica Rosselli

110. Effects of Mission Trip Participation on Social Justice Attitudes and Behaviors

Courtney Noya

Faculty Mentor: Laura Vernon

111. Fin Morphology in Two Benthic Elasmobranch Species

Andrea Hernandez

Faculty Mentor: Marianne Porter

112. Dimension Perception

Sebastian Vergara

Faculty Mentor: Tammy Knipp

113. **Cell Viability with Granulocyte Stimulating Factor in Models of Alzheimer's Disease**
Natalia Perez
Faculty Mentor: Howard Prentice

114. **Experimental and Theoretical Investigation of the Electronic Structure of Methylenecyclohexane**
Kimarah Lamothe
Faculty Mentor: Patricia Snyder

115. **Comparing Mindfulness and Anxiety at Pre-Treatment and 1-Week Follow-up**
Zim Ouillette
Faculty Mentor: Laura Vernon

116. **Activating the Appeal of Voice Activated Digital Assistant: Insights from Advertising Research and Persuasion Theory**
Maria Trajano, Rachel Cumming, Sarah LaFemina, Samantha Campana and Katie Richter
Faculty Mentor: Allen Smith

117. **Spreading Dynamics of Water Film on a Vibrating Glass**
Garry Kendrick, Robert Wilson and Jimmy Chau
Faculty Mentor: Tsung-Chow Su

118. **A Study on Quantifying Kinematics in a Free-Swimming Black Tip Shark (Carcharhinus limbatus)**
Madison Nelski
Faculty Mentor: Marianne Porter

119. **Modulation of Fear Memory Extinction by Prelimbic SK Channels**
Ronithe Senatus
Faculty Mentor: Robert Stackman

120. **The Role of the Nucleus Reuniens of the Thalamus Projections to the Medial Prefrontal Cortex in a Working Memory Task**
Alexandria Athanason and Amanda Rojas
Faculty Mentor: Robert Vertes

121. **First Arctic Under-ice Ocean Walking Laboratory (FAU OWL)**
Hanifah Prescod and Cameron Parson
Faculty Mentor: Tsung-Chow Su

122. **Novel and Scalable Network Flow Algorithm for Evacuation Route Planning**
Connor Shorten
Faculty Mentor: Kwangsoo Yang

123. Microglial Dynamics in Huntington's Disease
Johanna Bensalel and Nicole Rosa
Faculty Mentor: Jianning Wei

124. Winter After the Spring: The Dormancy of Democracy in the Post-Mubarak Era
Briana Nirenberg
Faculty Mentor: Dukhong Kim

125. Identifying Kinesin-Associated Cargoes During Learning in Aplysia californica
Amina Ali
Faculty Mentor: Laura Vernon

126. Florida Local Voter Turnout
Daniela Larez
Faculty Mentor: Kevin Wagner

127. Light Perception and Seafinding of Green Sea Turtle Hatchlings
Angela Field
Faculty Mentor: Michael Salmon

128. Politics vs. Necessity: Investigating Florida's Water Rates
Riley Nielson-Baker
Faculty Mentor: David Switzer

129. Diagnosis of Citrus Greening Disease by qPCR Analysis
Fernando Rocha
Faculty Mentor: Xing-Hai Zhang

130. Retaining and Repurposing Nutrient-Rich Runoff Water
Antoinette Peterson
Faculty Mentor: Tsung-Chow Su

131. Air B&B versus Hotel Industry
Vladislav Grant and Jordan Glaser
Faculty Mentor: Ravi Behara

132. Air BnB Trends in New York City
Royal Hayes, Omari Moench and Michelle Lai
Faculty Mentor: Ravi Behara

ABSTRACTS

Effects of Orientation on Mechanical Properties on Lionfish Dorsal Spines

Noa Abiri, Katherine Galloway and Marianne Porter
Faculty Mentor(s): Marianne Porter

Lionfish are a well-known invasive species present along the eastern Florida coastline. Previous research has focused on their population sizes, distributions, and behaviors. However, there is very little research addressing the anatomy and mechanics of their venomous spines. These spines have an anchor-like cross-sectional shape unique to lionfish. We aim to determine the effects of spine orientation on the mechanical properties. Two point bending tests were performed and compared with mechanical tests of I-beams, which are commonly used in engineering and construction. We hope to understand the impacts of shape on the mechanical properties of lionfish spines and gain insight into their functionality as a defense structure. For example, how likely are they to break in the process of an attack? The distinctive shape of lionfish spines may also aid in the development of bioengineered materials in medical devices for humans.

Roll with Me: Trust and Interpersonal Leadership in Different Communication Modalities

James Adaryukov, Hannah Tarleton, Jolie Reisner, Sonia Figueroa and Julie Earles
Faculty Mentor(s): Julie Earles

This experiment aimed to identify whether virtual communication, as opposed to face-to-face interaction, led to increased or decreased performance and trust between partners in a collaborative task. Twenty Wilkes Honors College students participated in a stage of Katamari Forever, where they directed a confederate using a stage outline. Half of the participants directed their partners from the same room, while half communicated with them through video chat.

A pre-test and post-test were administered to measure task effects on trust and emotional valence. In addition, participants played a trust game with their partners, providing quantitative trust measures. Participants who communicated virtually were expected to perform lower, and display less trust, than those who communicated face-to-face. The results indicated that there were no significant effects of communication modality on trust or task performance. However, this study can still act as a basis for future research in cyberpsychology and trust.

Effect of Acute High-Intensity Interval Exercise vs. Continuous Moderate-Intensity Exercise on the BDNF, Lactate, and Cortisol Responses in Obese Individuals

Avraham Adelman, Alexandra Rodriguez, Michael Whitehurst, Brandon Fico, Katelyn Dodge, Peter Ferrandi, Gabriel Pena and Chun-Jung Huang

Faculty Mentor(s): Chun-Jung Huang

Obesity is associated with increased risk of cognitive dysfunction, possibly due to dysregulation of brain-derived neurotrophic factor (BDNF). High-intensity interval exercise (HIIE) has shown to be more time-effective to produce BDNF expression than continuous moderate-intensity exercise (CME). This study's purpose was to investigate obesity's role in modulating BNDF expression following acute HIIE and CME. 6 obese and 6 normal-weight subjects participated in HIIE and CME. Blood samples were collected for serum BDNF, blood lactate, and plasma cortisol prior to and following exercise. Obese subjects exhibited a greater BDNF response following acute HIIE than CME. Although acute HIIE-induced lactate and cortisol were higher than CME, obese subjects showed lower level of lactate, but no difference in cortisol compared to normal-weight subjects. Acute HIIE could be as effective as CME to elicit BDNF expression to promote a transient neuroprotection in obesity, independent of increased lactate and cortisol levels.

Identifying Kinesin-Associated Cargoes During Learning in Aplysia californica

Amina Ali, Supriya Swarnkar, Kerriann Badal and Sathyanarayanan Puthanveettil

Faculty Mentor(s): Laura Vernon and Sathyanarayanan Puthanveettil

Aplysia californica is a simple model organism that exhibits associative and non-associative learning that is demonstrated with behavioral paradigms such as classical conditioning, sensitization, and habituation. These learning conditions can be expressed as long-term facilitation (LTF) and long-term depression (LTD), which are modulated by serotonin (5-HT) and FMRFamide (FMRFa), making it an ideal model for studying learning and memory. 5-HT and FMRFa mediate intracellular changes that influence cargoes that are anterogradely transported with the molecular motor protein kinesin. Identified cargoes include RNA, protein and organelles, and are specifically transported based on learning conditions. Following in vitro stimulations of the Aplysia nervous system, we conducted immunoprecipitation, mass spectrometry and western blotting assays. We have identified cargo-protein specific changes that occur during facilitation, habituation and basal conditions with 5-HT and FMRFa. Following stimulation to mimic learning conditions, we found cargoes that are uniquely transported that are not present during control conditions.

From Field Collection to the Lab: A Study of the Research Pipeline for Genetic Analysis of Wild Primate Populations

Sandra Almanza, Itzel Sifuentes-Romero, Deborah M. Williams and Kate M. Detwiler

Faculty Mentor(s): Kate Detwiler

This study documents the molecular primatology research pipeline established at the FAU Primatology Lab. The process is divided into four main steps. 1) Administrative: field researchers must complete research compliancy to collect and export non-invasive fecal and tissue samples. 2) Biorepository: our lab receives and checks the quality of the source material. Samples are labeled with a unique lab identifier and entered into the biorepository database. 3) Molecular genetics bench work: we extract DNA from collected tissue or fecal samples. We amplify the target DNA through polymerase chain reaction (PCR). After visualizing the PCR product through gel electrophoresis, the products are sent off for sequencing. 4) Bioinformatics: obtained sequences are checked for accurate base calls and aligned with published sequences from GenBank for phylogenetic analysis using Bayesian and maximum likelihood approaches. This pipeline assists the lab to expand its' research opportunities and maximize the scientific value of field collected samples.

Determining Origins of Vervet Monkeys in Dania Beach, Florida Through Phylogenetic Analysis

Sandra Almanza, Charlene Korchia, Itzel Sifuentes-Romero, Deborah M. Williams and Kate M. Detwiler

Faculty Mentor(s): Kate Detwiler

The purpose of this study is to determine the genetic origins of the introduced vervet population in Dania Beach, Florida. This research contributes to the Dania Beach Vervet Project started in January 2014. We collected non-invasive tissue and fecal samples (n=7) and then extracted DNA from these samples. We amplified and sequenced two mtDNA gene markers: 1) 658 bp fragment of the cytochrome oxidase I (COI) and 2) complete cyt b gene (1,140 bp). Additionally, using male samples we amplified and sequenced two gene markers from the Y-chromosome: 1) 695 bp of the last intron of the zinc finger (ZFY) and 2) 783 bp fragment of the sex-determining region (SRY). We ran a Bayesian and maximum likehood (ML) analysis to reconstruct phylogenetic trees. Phylogenetic analysis results confirm that the vervets are Chlorocebus sabaeus. Our study provides important insight into the genetic diversity and evolutionary history of this population.

Cloud Based Smart Navigation

Nazik Almazova, Liam Dugan, Zhengyi Luo and Austin Small

Faculty Mentor(s): Saeed Rajput

With all the technical advancements, the robots become more and more intelligent every day, but most of them require a powerful processor to process all the intensive algorithms and respond immediately. Our research was aimed to have a processor that minimizes computations

locally while keeping the latency at the minimum. We developed a robot that was capable of recognizing objects, and then tracking them while following verbal commands. It streams the video as well as verbal commands to the cloud, uses cloud's resources for natural language and image processing, parsing, as well as navigational algorithms. Our "CloudChaser" can recognize objects, follow the user's spoken commands to target and follow the object. This illustrates an approach to robotics when it is desirable to have lower on-board computing resources with a smaller processor and longer battery life while keeping it smart, and resourceful.

No More DACA? An Uncertain Future under the Trump Administration

Alyssa Alvarez
Faculty Mentor(s): Gina Carreño-Lukasik

The Deferred Action for Childhood Arrivals program (DACA) provides temporary relief from deportation and legal work authorization for eligible unauthorized youth in the U.S. In September of 2012, the Obama administration began to allow individuals that entered the country as minors be granted the opportunity of deferred action from deportations and work permits. In 2014, the motion for covering additional immigrants under the act was blocked by the courts, and as of 2018, President Trump plans on disbanding DACA as well as the DREAM act, changing the lives of millions who have shaped America. For this research, I conducted a literature review that examines the benefits and limitations of DACA, the emotional and mental effects of being an "illegal" immigrant, and the political views of members of the current U.S. administration that will threaten the lives of many. Finally, I propose a possible research project to further explore this issue.

Effects of Nonpharmacological Interventions in Older Adults With Dementia: Chair Yoga, Chair-Based Exercise, and Participatory Music Intervention

Juyoung Park, Magdalena Tolea, Amie Rosenfeld, Victoria Arcay, Yve Lopes, Jennifer Karson and Kimberly Small
Faculty Mentor(s): Juyoung Park

This pilot study evaluated the feasibility of having older adults with dementia participate in a nonpharmacological treatment—chair yoga, chair-based exercise, or participatory music intervention—and assessed the effects of the interventions on physical, behavioral and psychological symptoms, general quality of life, and sleep patterns throughout the course of the study. The study employed a three-arm cluster-randomized, longitudinal design. Sites were randomly assigned 1:1:1 to chair yoga, chair-based exercise, or music intervention. Twenty-seven participants completed 24 sessions in 12 weeks. We administered evaluation measures at baseline, midline (6 weeks), and post intervention (12 weeks). Repeated-measures analysis of covariance (ANCOVA) was conducted to examine group differences at the collection points, controlling for baseline variability (i.e., gender, age, race/ethnicity) in outcomes.

The Role of the Nucleus Reuniens of the Thalamus Projections to the Medial Prefrontal Cortex in a Working Memory Task

Alexandria Athanason, Amanda Rojas, Kara Harris, Max Schreiber, Mary Gorora, Stephanie Linley, Tatiana Viena and Robert Vertes

Faculty Mentor(s): Robert Vertes

The nucleus reuniens (RE) in the thalamus mediates information between the medial prefrontal cortex (mPFC) and the hippocampal formation (HF). These areas are involved in cognition. We previously demonstrated RE inactivation impairs working memory and behavioral flexibility using a delayed spatial alternation task (DSA). However, it is unknown whether RE's projections to the mPFC plays a role in this behavior. This experiment uses DREADDs to selectively inhibit this RE → mPFC pathway. Rats were trained to alternate arms of a T-maze following delays of 30 or 120s. Following, DREADDs were microinjected into RE; indwelling cannulas were implanted in the mPFC. Rats were infused with either clozapine-N-oxide or saline (control). CNO inhibition of RE decreased accuracy (M=67.5) in comparison to saline (M=77.15) following 30s delays, but not following 120s. This provides evidence for the role of the RE in working memory by mediating the RE → mPFC pathway.

Generational Differences in Viewpoints

Andrew Barak and Alexis McCurry

Faculty Mentor(s): Monica Escaleras and Eric Levy

In today's society, different age groups seem to think and behave differently. Generational differences have influenced many controversial opinions discussed today. Not much research has been conducted on these differences, but in the studies which have been conducted, it has been concluded that there are substantial differences that exist between generations. In the limited amount of research that has been conducted, the sample was relatively small, making the survey incomprehensive. In order to understand these differences and where the opinions of generations differ, we developed an online survey about people's opinions on controversial issues debated about in modern society. We found that there are statistically significant differences between age groups and their views on social issues such as religion, sex before marriage, same sex marriage, and abortion. Our results have shown that people are beginning to move away from the more traditional values and into more liberal viewpoints.

An Examination of the Morphosyntactic Structure of Verb Phrases in Chaldean Neo-Aramaic

Paul Barile

Faculty Mentor(s): Michael Hamilton

This research is an examination of the morphological and syntactical features found within verb phrases of Chaldean Neo-Aramaic, a Semitic language which originates from Mesopotamia. From this examination, a configurational model is proposed, which depicts the grammatical arrangement of these morphosyntactic features during verb phrase formation. Additionally, accompanying this description of the language's verb phrases, a dependency-based approach is taken for the analysis of the language's sentence structure. Such a method departs from traditional perspectives which posit that the concept of a sentence is the compositional result of two distinct linguistic elements: a subject and a predicate (the verb phrase). However, from

the analysis of the language, an argument is presented for a reconsideration of the conceptualization of a sentence that would position the verb as the primary element, or nucleus, on which all other occurring elements are either directly or indirectly dependent.

Forgotten Women in Psychology: The Lost Second Generation

Sonia Baron amd Melissa Lopez
Faculty Mentor(s): Kevin Lanning

The advancement of science should be studied with an awareness of gender (Furumoto, 1980; Rutherford & Garnek, 2010). We will present the lives of four female psychologists; each one is an archetype of the different experiences of women in science. As the first female APA president, Mary Calkins set a precedent for subsequent generations. Christine Ladd-Franklin's work is during the transition between the first and second generation of female psychologists (Johnston and Johnson, 2008). Franklin's influence centered on advocating for women in science through her work. Although a contemporary, Lucy May Boring's life is the antithesis of Franklin's conceptions of women in academia. Boring was carried by the social pressures of her time and stopped her academic work once she started her family life. Leta Hollingworth, on the other hand, observed the way that women were treated and dedicated her career to disprove the misconceptions of women's intellectual capabilities.

The Network Structure of the SAGE Handbook of Personality and Individual Differences

Sonia Baron
Faculty Mentor(s): Kevin Lanning and Gergory Webster

This project delved into structure of personality psychology. With a network analysis from the SAGE Handbook of Personality and Individual Differences, we found three distinct clusters: basic and applied research, cognitive and developmental perspectives, and the theoretical approaches of cognition, health, and evolution. The networks were constructed with the citations from each chapter of said handbook. We collected and extracted the DOIs from the citations of 77 chapters (out of 80) from the handbook. Chapters that share citations in common are considered more connected. The interconnectedness of these references enabled us to assess how related is the recent literature of personality psychology and to create visual networks accordingly. The networks were set using the R package igraph and the visualizations were coded in the open source statistical package Gephi.

A Synthetic Sea Urchin Exoskeleton for Carbon Conversion to Environmental Calcium Carbonate Precipitates

Alexis Base
Faculty Mentor(s): Peng Yi and Myeongsub Kim

According to NOAA, "the ocean absorbs about a quarter of the CO2 we release into the atmosphere every year." This increase in anthropogenic carbon dioxide (CO2) results in ocean acidification. It has been known that Sea Urchins' biomimicry allows CO2 to be converted to calcium

carbonate precipitates via catalytic activities of nickel nanoparticles (NiNPs) to form their skeletal structure. The focus of this research is on utilizing NiNPs immobilized by silica aerogel to accelerate the hydration reaction of CO_2 in water, thereby stimulating the mineralization process of CO_2. The calcium carbonate precipitates would then be deposited in the ocean to regulate the pH in areas that are at risk. A NiNP aerogel would be cost effective because of its reusability as opposed to carbon anhydrase. If successful, this research will provide a unique solution for rapidly absorbing CO_2 and forming a precipitate that would be able to regulate ocean acidification.

Induction of Anti-inflammatory Acetylcholine Receptors on Human Macrophages Produced in the Laboratory as a Model System for Drug Screening and Development

Veronica Hartman, Stefan Basilio, Patricia Keating, Alberto Padilla and James Hartmann

Faculty Mentor(s): James Hartmann

Our goal was to determine the optimal means to induce nicotinic acetylcholine receptors on the surface of macrophage in vitro. Macrophages are negatively regulated by these receptors -previously believed to be present only on neuronal cells. Stimulation of acetylcholine receptors in inflamed macrophages reduces the production of highly inflammatory cytokines such as tumor necrosis factor alpha thus limiting joint inflammation in models of rheumatoid arthritis. We tested a phorbol ester derived from the croton plant, vitamin D, retinoic acid, and ingenol mebutate for their capacity to induce these key regulatory receptors while inducing the conversion of monocytes to macrophages. Our data provide the optimal method to produce macrophage that can be utilized to screen for novel anti-inflammatory molecules that can be used to alleviate pain and tissue damage.

The American Perception and Ideology Towards Refugees

Onur Basman and Esteban Cardenas

Faculty Mentor(s): Monica Escaleras and Eric Levy

The number of refugees entering the United States has been increasing greatly throughout the years due to unfavorable conditions in different regions of the world. Recently there has been public discussion regarding the large number of refugees immigrating into the United States. About 3 million refugees have resettled into the United States since 1980 and refugees have an impact on the U.S. in various areas: social, political and economic amongst others. This study investigated the American views towards refugees and their role in the United States. An online survey on 523 Americans across the United States was designed and administered. There is statistically significant evidence at the one percent level that education level, age, and party affiliation impact our views on refugees. These findings should be considered by politicians and government officials when making different policy decisions regarding refugees.

The Immediate Effects of Mindfulness on Stress, Anxiety, and Affect

Zim Ouillette, Amina Ali, Brandon Jean-Baptiste, Laura Vernon and Julie Earles

Faculty Mentor(s): Laura Vernon and Julie Earles

Mindfulness has been found to be effective in relieving stress, particularly for college students. This study examined the effects of a single mindfulness session that included activities such as a mind wandering meditation, guided meditation, coloring activities, and connect the dots activities. Participants were asked to complete question-naires at pre-test, post-test, and follow up one week later. Scores on questionnaires measuring mindfulness, stress, and anxiety will be compared from pre-test to post-test. It is hypothesized that the mindfulness session will decrease stress, anxiety, and negative affect while simultaneously increasing mindfulness and positive affect. The implica-tions of a mindfulness treatment on college students will be discussed.

The Labyrinth of Chance and Choices

Kristina Beluskov, Karla Freyre, Sabrina Kaplan, Juan Miranda, Dhruvin Patel, Logan Shafer and Kyle Ziegler

Faculty Mentor(s): Ilaria Serra

The general theme of our LIT2100 course was based on the study of the labyrinth, a dramatic and playful metaphor for a life dilemma that is present since the dawn of time in every thinking man and woman. The labyrinth – as a myth, as a drawing, as a game, as a garden – is a universal symbol. It expresses the idea that life must be travelled, that decisions must be made at a very crossroad, that a

path must be walked – sometimes traced by chance – and that a change always occurs in the traveler. This group, in particular, considered the Inner Labyrinth. How does this type of labyrinth become a metaphor to read and interpret World Literature?

Microglial Dynamics in Huntington's Disease

Nicole Rosa, Johanna Bensalel and Jianning Wei

Faculty Mentor(s): Jianning Wei

Huntington's disease (HD) is characterized by a high level of activated microglia in the striatum when compared to the normal brain. This study investigates physical interactions between activated microglia and synaptic nerve terminals, specifically focusing on phagocytic microglial activity and determining to what extent this contributes to synaptic loss. Striatal sections from transgenic wild-type and HD mouse models will be stained with markers specific for microglia and synaptic nerve terminals and imaged via confocal microscopy to build a three dimensional reconstruction of their physical associations and identify phagocytic activity. We expect to see higher levels of phagocytic microglia in HD models than in wild type models at all stages, thus indicating microglial contribution to synaptic loss in HD from early stages before significant neurodegeneration occurs. Further understanding of these interactions at a cel-lular level will expand treatment options and provide new opportunities for early intervention for patients with HD.

Assembly of an Infrared Detection System for Avian Operant Conditioning Experiments

Benjamin Blakely

Faculty Mentor(s): Rindy Anderson

The goal of this project was to upgrade 12 acoustic chambers with a system capable of automating and parallelizing operant conditioning experiments with songbirds. The project entailed building the majority of the parts for this system from the ground up, both to cut down on costs and create a custom product. The parts consisted of a controlling software written in MATLAB, bird perches inset with infrared occlusion detectors, a sound system for audio playback, and all of the wiring in-between. With this system in place, initial tests using individual sparrows are currently underway with full experiments using larger sets of birds to follow shortly thereafter.

An Evaluation of Productivity for Florida Burrowing Owls in a South Florida Population

Zachary Blakeney, Evelyn Frazier and Dale Gawlik

Faculty Mentor(s): Evelyn Frazier and Dale Gawlik

Athene cunicularia floridana is a threatened subspecies that relies heavily on burrows and open habitats for survival and reproduction. Habitat loss and fragmentation are the main factors limiting A. c. floridana populations. Previous literature suggests that nest density and fledgling success increase until 45-60% development is reached. Our objectives were to survey burrow dynamics and productivity, with an emphasis on reproductive success, in a fragmented S. Florida habitat. Burrow distributions and status from 2012-2017 showed a decrease in the total amount of present burrows. Our 2017 observations found the population at

FAU has decreased in both total adults as well as chicks produced when compared to McKie (2003), a previous study conducted at this location. We will further the study by conducting surveys for the 2018 breeding cycle. Understanding burrow dynamics and productivity will determine if FAU has reached its developmental threshold and is essential for conservation of this subspecies.

Alternate Synthetic Approach Towards Key Building Block in the Synthesis of Tumor-Associated Carbohydrate Antigen

David Blanco

Faculty Mentor(s): Mare Cudic

The Thomson-Friedenreich (TF) antigen is a tumor-associated carbohydrate antigen expressed in many carcinomas, contributing to cancer cell adhesion and metastasis. Our goal was to find a more efficient synthetic approach towards a key building block (2-azido-2-deoxy-4,6-O-benzylidine-1-O-methyl--D-galactose) of the TF antigen. Our modified synthetic approach involved the replacement of a two-step process, an azido nitration and subsequent chlorination, with a one-pot azido chlorination step. We have successfully completed the large scale synthesis of the desired TF precursor. This achievement will allow us to proceed with the synthesis of the Ser and Thr O-glycosylated building blocks bearing TF antigen for use in the solid-phase peptide synthesis. These MUC1-based glycopeptide models bearing TF antigen will be used to study structural and biophysical characterization of low affinity glycan-protein interactions, and development of synthetic prophylactic glycopeptide-based cancer vaccines.

The Comparison Between African-Americans and European Caucasians with Mild Cognitive Impairments by Examining Cognitive Deficits in Their Daily Lives

Dana-Lee Bowes

Faculty Mentor(s): Monica Rosselli

Alzheimer's disease is a progressive brain disorder that destroys an individual's memory, which leads to difficulty performing simple tasks. The exponential growth in the diagnosis of Alzheimer's disease serves as an epidemic that affects individuals from a range of demographic backgrounds. However, early detection of cognitive deficits can lead to preventative steps towards reducing the effects of Alzheimer's disease. The objective of this study is to examine the cognitive deficits, specifically related to function between elderly European Caucasians and African-Americans with mild cognitive impairment. An already establish protocol to assess MCI will be used to examine the African-American population at a memory clinic. This population will be compared to the European Caucasians with MCI from the Louis and Anne Green Memory and Wellness Center. A patient's performance on the cognitive batteries such as the MMSE and MoCA will be used to measure their impairments.

Voluntary Victim Intoxication in Sexual Assaults: A Summary of the Nation's State Statutes

Seth Fallik and Caralin Branscum

Faculty Mentor(s): Seth Fallik

Case attrition is common in sexual assault cases, especially in regard to survivors who were voluntarily intoxicated at the time of their victimization. An approach to decrease case attrition is through legislative reform, yet this is often inconsistent state-by-state. This study addresses a gap in sexual assault literature by analyzing how intoxicated survivors are acknowledged in the Nation's laws. Through a systematic, content analysis of the Nation's laws, this research aims to highlight where inconsistencies exist in relation to these survivors. Preliminary findings suggest a lack of acknowledgment of voluntarily intoxicated survivors overall. This includes, but is not limited to, a lack of differentiation between voluntary and involuntary intoxication and to what constitutes intoxication. In some instances, there is evidence of overt undermining of intoxicated survivors. Implications should aim to align legislation with this type of sexual assault perpetration.

A Biodegradable Surfactant for Enhanced Oil Recovery: A Microfluidic Study

Derek Peters, Kavita Braun, Cesar Saldana, Seokju Seo and Myeongsub (Mike) Kim

Faculty Mentor(s): Myeongsub Kim

Surfactant-assisted enhanced oil recovery (EOR) enables us to extract additional 40% of oil from traditional processes. However, current surfactants used in EOR are harmful to the environment. To make this technology sustainable, the focus of this research is to test viability of an inexpensive and harmless biosurfactant. Interfacial tension (IFT) and a sweep efficiency, which are one of important indicators for recovery enhancement, were quantified with different oils (crude, intermediate, and heavy) using a high-speed microfluidics technology. The results show that IFT reduction by a biodegradable surfactant is remarkable when compared to that of a conventional chemical, ensuring a further increment of recovery efficiency. This behavior was well aligned with the experimental results of a sweep efficiency

in an oil-saturated porous micromodel. Collectively, this finding suggests that the eco-friendly surfactant could be an effective alternative for a sustainable EOR technology solution.

Examining Seasonal Prey Abundance of Common Snook (Centropomus undecimalis) in the Indian River Lagoon

Matt Bristol, L. Kircher, J. Sheridan Tucker, A. Trotter, M. Ajemian and J. Baldwin

Faculty Mentor(s): John Baldwin

Snook are an ecologically and economically relevant species, bringing in millions of dollars to Florida's economy each year through sport fishing. Unlike many species, common snook have a wide range of tolerance for changes in their environment. This project will use common snook (Centropomus undecimalis) as a model for large predatory fishes in examining the abundance of prey species available. The goal of the research is to correlate the preferred prey of snook and the ontogenetic changes throughout their lifespan, as well as, environmental factors that affect their prey assemblage. Current connections with Florida Fish and Wildlife will be utilized to collect common snook stomachs and perform gut analysis. These data will be compared to seine catches of prey species and snook. Understanding these shifts in prey assemblage and abundance can inform our interpretation of predatory fish distributions, including how to manage and protect these important species.

Who Helps More? Examining Gender Differences in Helping Behavior

Cassidy Brydon, Yarinez Batista, Julie Jean-Baptiste and Julie Earles

Faculty Mentor(s): Julie Earles

Research addressing gender differences and rate of bystander intervention is extensive; however, there is limited research looking at the gender of both the bystander and the victim. The present study hypothesized that women are more willing to exhibit helping behavior than men and that women receive more assistance than men. Using a six-question survey, where ratings were measured on a 5-point Likert scale, 35 participants were asked the likeliness they would intervene through direct intervention, calling a friend, calling the police, and taking no action for each of six scenarios. The gender of the victim varied across scenarios. The results suggest that female victims are more likely to receive direct intervention and least likely to receive no intervention, while men are more likely than women to assist a woman by calling a friend.

A Recidivist Evaluation of Mandatory Minimums on Drug Offenses

Daniel Camacho

Faculty Mentor(s): Dukong Kim and Marshall DeRosa

The purpose of this study is to evaluate the efficacy of mandatory minimums on individual recidivism rates. A quantitative analysis will be utilized to compare the effect of mandatory minimums or lack thereof, on recidivism rates in California and Florida. Particularly, through California's Proposition 47, mandatory sentencing on drug

offenses were repealed and replaced with misdemeanors. Florida, contrarily, maintains mandatory minimums as established state statute. The rationale behind collocating these two states is that both states have distinct sentencing policies with similarly diverse populations. I expect to see lower recidivism rates in California than in Florida. Also, a separate analysis of recidivism levels over time will be conducted to highlight Proposition 47 as a catalyst to individual recidivism rates in California. With factors, such as individual demographics, varying economic environments, and other contextual factors considered, I expect to see descriptively lower recidivism levels in California after Proposition 47.

Software Engineering: Social Impact and Perception

Erika Cardenas and Connor Shorten
Faculty Mentor(s): Monica Escaleras and Eric Levy

New software technologies are rapidly changing the economy. These changes have presented problems such as job displacement, high barrier to entry, and a gender gap in the engineering communities. In order to see the views of Americans regarding the challenges of software technologies, we conducted an online survey, gathering 500 responses. In recent news stories, it has been shown that there is a gender gap in the tech industry, but the women that participated in our survey are interested in learning software engineering as much as men. Additionally, our research found that younger people are not only required to use software tools more frequently but are the most interested in learning how to build them. Finally, we found that a majority of people do not have any experience developing software. Our survey highlights some of the challenges of software technologies in the economy.

Impulsivity in Mice with Rum3/Rum5 Isoforms of Syngap1 Gene

Minji Chae, Thomas Creson, Gavin Rumbaugh, Massimilano Aceti, Emin Ozkan, Murat Kilinc, Cristopher Hubbs, Camilo Rojas and Sheldon Michaelson
Faculty Mentor(s): Julie Earles and Thomas Creson

Syngap1 gene mutation causes an intellectual disability (ID) which can result in autism (or autistic behaviors) and epilepsy. The Rumbaugh Lab ran six basic behavioral tests that include elevated plus maze, modified cliff avoidance that measures impulsivity level, open field test, Morris water maze, remote fear conditioning, and spontaneous alternation. The first three mentioned are unlearned behaviors, the innate behaviors that do not necessarily use any type of memory. The latter three are the learned behaviors that use working, spatial and associative memories to complete the tasks. There are two major isoforms of the Syngap1 gene which were created to be tested—Rum3 and Rum5 isoforms. There were heterozygous mutation and homozygous mutation in both Rum3 and Rum5. One of the genetic differences between the two is that Rum5 has a specific point of mutation that prevents the alpha-1 and 2 from binding to PSD-95.

Mineralization of the Cartilaginous Centra in Sharks at a Biologically Relevant Strain

Fedgy Charles, Marianne Porter and Danielle Ingle
Faculty Mentor(s): Marianne Porter

The shark cartilaginous vertebral column behaves as a spring and brake during swimming; individual vertebral centra strain between 3.5-8% in vivo, which stores and

releases energy. Mechanical properties of vertebral centra correlate with the amount and arrangement of mineral; properties were higher in posterior regions due to higher mineral content and it also vary (stiffness and resilience) among shark sizes and species. For the present study, we are quantifying mineral morphology and placement in centra along the length of the vertebral column, over a range of developmental stages, and among species. We sampled from two orders of sharks: carcharhiniforms and lamniformes. Among all species, as mineral contents increased, distances between unmineralized and miner-alized centra' cartilage decreased. The posterior region had more mineral compared to the anterior region. These data suggest that vertebrae in the posterior region will be stiffer and stronger to generate thrust forces required for swimming.

A Novel Way of Utilizing Modular Arithmetic to Simplify Boolean Postulates, Theorems, and Relations

Michael Chung
Faculty Mentor(s): Maria Petrie

Boolean Algebra is an algebraic formalization of logic that has important application in the design of logic circuits, amongst many other things. Traditionally, Boolean Algebra, especially in the context of logic design, is presented as a set of relations between propositions, one that demands the understanding of a new and unnecessarily abstract math-ematical formalism. This work, utilizing simple modular arithmetic, introduces a Boolean equation and subsequent formal structure that synthesizes the two algebras. To demonstrate the elegance and reach of this new method, we undertake the proof of several classic theorems, such as the DeMorgan Theorems. Additionally, we consider the natural extension of XOR to more than two literals encapsulated within this formalism and application to the simplification of logic statements, where we have new algebraic tech-niques at our disposal.

Municipality Security Network Infrastructure Protocols: Who is Knocking on the Door?

Patricio Coicou
Faculty Mentor(s): Clifford McCue

The purpose of this research is to examine the dynamics of information technology security protocols utilized by local governments' in the United States. The prevalence and ever changing technological sophistication of malware develop-ers, hackers, and individuals/groups wanting illegal access to sensitive information (about people, place, policy, and/or environment) makes the need for cyber security a critical component of local government policy. Accounts of attacks on government networks is beginning to permeate the space government responsibility and accountability. A stagnant and strong firewall over a regulated intranet is generally perceived as a remedy to malware and other forms of illegal entry, but the best defense may be an active and adaptable security presence. Based on a structured analysis of local government security protocols, this research will attempt to identify a model that would best mitigate the infection of malware on the network infrastructure of local government.

Rationalizing Indian Removal: Representation of Indigenous Peoples and American Identity

Jeffrey Coltman-Cormier

Faculty Mentor(s): Adrian Finucane

How is state violence against marginalized groups justified? It is possible to understand the desires for power undergirding such violence, but is more difficult to understand how motives turn into what is considered legitimate behavior. With primary sources from the Spirit of America Collection at Florida Atlantic University, I argue that early American historians increasingly promulgated dehumanizing representations of indigenous peoples in contrast to positive characterizations of white colonists so as to justify Indian Removal. This reveals that the representation of marginalized groups by dominant entities is key to justifying their subjugation, a finding which remains relevant to this day.

Understanding Sport-Related Concussions

Kassi Coviello and Joseph Nasrallah

Faculty Mentor(s): Monica Escaleras and Eric Levy

In 2012, the amount of reported concussions doubled in the past ten years to 3.8 million. Concussions and head-related injuries caused by contact sports can lead to long term traumatic brain injuries. With the increasing presence of these injuries, the National Football League and the National Hockey League have implemented extensive concussion protocols. This questions the underlying uncertainty of the future of contact sports. Our project addresses the question of hypothetically, if you had children, knowing what we know today about concussions/head related injuries, would you allow them to play contact sports. The decision to allow your child to play contact sports was motivated by

the gender and age gap. The different levels of education had a statistically significant impact on the knowledge surrounding the current professional football and hockey concussion protocols.

How Does Party Affiliation Affect the Perception of Legitimacy Regarding Media Outlets?

Douglas Speed and Garrett Cox

Faculty Mentor(s): Monica Escaleras and Eric Levy

As of recently, the integrity and reputation of news outlets have come into question. Since the recent election, the term "fake news" has been affiliated with notable news sources such as CNN, Fox and MSNBC. The purpose of our study is to analyze a person's party affiliation and its correlation, if any, to the way a person views the legitimacy of their preferred news outlets. To test this we surveyed over 500 people on a national scale, asking specific questions regarding their trust in the media and the way they preferred to receive their news information. We found that the variables of party affiliation and age were statistically significant in relation to whether the person trusted media sources or not. Our research shows that younger people who affiliate as a republican or independent tend to question media legitimacy more than someone who is older and affiliates as a democrat.

Vignettes and Their Role in Bullying Research

Christopher Demezier

Faculty Mentor(s): Joy Longo and Michael DeDonno

Transportation is the concept that readers become engaged when they read a story. The level of transportedness may

impact the emotional response of the reader. Research shows that stories can be used to transport readers but there is a failure to identify vignettes as a viable medium. The ability of vignettes, a brief narrative without a conclusion, to transport readers is unknown. The purpose of this study is to determine if vignettes can be used to transport readers into a narrative and also to explore the link between transportation and negative affect. Each participant was presented 11 bullying vignettes sequentially and were asked to respond to the Transportation Scale and the Negative Affect Scale. Descriptive and inferential analysis were performed. The results showed that readers were transported into the bullying vignettes and that there is a slight positive correlation between transportation and negative emotions (r=.339).

Views on Climate Change

Olivia Diaz and Henry Castillo

Faculty Mentor(s): Monica Escaleras and Eric Levy

Climate change is defined as the change of the global climate patterns which is caused by natural occurrences and human activities facilitated by the increased use of fossil fuels. Climate change is a prominent issue today, with people having conflicting viewpoints about it. Government intervention on the subject of climate change is widely debated. To understand the differing perspectives on climate change, we developed an online survey consisting of 12 questions. We gathered 500 responses from people all over the United States. Overall, our findings showed that people believe in climate change. However, there is a statistically significant difference on the views of climate change based on people's party affiliation. Republicans were the highest group of all the political parties surveyed to say that the government should not have a concern for climate change. This survey depicts the conventional view that Republicans hold on the issue of climate change.

Exploring the Relationship Between Anxiety and HRV in Parents with Low Income

Derricka Dixon, Beth King, Karethy Edwards, Charlotte Barry and David Neuman

Faculty Mentor(s): Beth King

Over 40 million people in the United States are living in poverty today. The effects of living in disadvantaged circumstances increases the individual's likelihood of experiencing persistent anxiety, which can lead to chronic health conditions. Studies have associated persistent anxiety with cardiovascular compromise as a result of decreased levels of heart rate variability (HRV). The purpose of this study is to explore the relationship between anxiety and heart rate variability in parents or guardians of children in Head Start, a federally funded program for families with low-incomes. A descriptive correlational design comparing the scores on the PROMIS anxiety tool with HRV as measured by the emWave biometric instrument will be used. The sample consists of 32 participants. Data will be analyzed using bivariate correlations. Increased levels of anxiety and decreased heart rate variability are anticipated outcomes of this study. Findings will assist in identifying health risks in this vulnerable population.

An Investigation of Dual Inclusion in the Construction of Flexible Armor

Hassan Mahfuz and Reinaldo Dos Santos

Faculty Mentor(s): Hassan Mahfuz

Traditionally body armor has been limited to the protection of head and torso from ballistic protection using ceramic plates and other back-up layers. The goal of this research is to develop flexible body armor by impregnating Kevlar fabric with a matrix reinforced by silica nanoparticles and carbon nanotubes. A cross-linking fixative polymer, Glutaraldehyde will also be added to develop amide linkages between particles and Kevlar. This flexible armor would then provide protection for extremities like hands, arms, neck, etc. Protection of extremities can reduce the number of casualties due to deep laceration injuries and infection. The development of this flexible armor has countless applications throughout the military, law enforcement, first responder, and even healthcare. With the addition of Single Walled Carbon Nanotubes (SWCNT), we believe amide moities will be created between the silica, glutaraldehyde, and SWCNT to further increase connections between nanoparticles and Kevlar fabric.

Tenses of Chaldean Neo-Aramaic

Sabine Elam

Faculty Mentor(s): Michael Hamilton

The research explores the tenses of the Chaldean Neo-Aramaic language – a language spoken throughout regions in the northern Middle East. The consultant, a native speaker, was given a set of target verbs – the patterns of which were analyzed in the present, past, and future tenses. Emphasis was placed on the simple and progressive verb forms, leading to the discovery of some of the perfect forms as well. The statement or utterance changed in accordance with the tense that was being spoken, the gender of the speaker, as well as the gender of the receiver in the conversation. The use of prefixes, suffixes, infixes, and copula were utilized where appropriate. The data provides a strong foundation, allowing for further research and a greater understanding of this lesser-known dialect of the Chaldean Neo-Aramaic language.

Electoral College - To Ditch or Not to Ditch?

Sydney Elney and William Fetzer

Faculty Mentor(s): Monica Escaleras and Eric Levy

Historically, the Electoral College is comprised of electors, who should reflect the popular opinion of their state. The 2016 presidential election was won by the winner of the Electoral College, although the results differed by two million votes from the consensus of the popular majority; an occurrence that has happened for two of the last three presidents elected. With an interest in finding out what system Americans feel should be used to elect the President, we developed a survey about the Electoral College and collected responses from 497 people. We found there is a statistically significant difference between voter's registration status as well as by political affiliation. Our study shows that there is an increasing concern in regards to the legitimacy of the political voting system and the need for open discussion about the possibility of constitutional reforms in regards to the current voting system.

Model Dwelling of Recycled Plastic for La Plaine, Haiti

Kestride Estil and Jean Caldieron

Faculty Mentor(s): Jean Martin Caldieron

This research focuses on studying alternative construction methods for Haiti, using recycled plastic as the main building material. As the country doesn't have an appropriate recycling program, plastic is the main waste material causing strong environmental challenges. After experimenting with several approaches to transform plastic into a suitable building material, this study proposed a structural system where plastic bottles are configured to work as structural walls when loaded with sand and construction debris. A poor cement mixture is used as a binder. With the help of a wall mock-up the system has proven to work and could be used as a dwelling prototype. This construction technique could be used in countries were plastic pollution is a challenge towards applications in resilience projects. This proposal solves two problems at once, by dealing with issues of waste management problem and at the same time providing dwelling for the poor.

Molecular Characterization of Hepatozoon (Apicomplexa: Adeleorina) Blood Parasite within the Threatened Gopherus Polyphemus Species

Johanna Eusse, Brian Cooney, and Evelyn Frazier

Faculty Mentor(s): Evelyn Frazier

The gopher tortoise (Gopherus polyphemus) is a threatened burrowing chelonian endemic to the Southeastern United States. Gopher tortoises are classified as a keystone species due to their construction of extensive burrows, providing shelter to approximately 362 commensal species. Haemogregarines are the most common hemoparasite species found within reptiles. The genus Hepatozoon sp. (Apicomplexa: Adeleorina) has been discovered within gopher tortoises at Jonathan Dickinson State Park (Jupiter, Florida). Our research focus is to conduct molecular analysis on the 18S rRNA region of Hepatozoon sp. within blood samples and to determine how this species found is related to other known Hepatozoon species. This molecular characterization study will provide us a better understanding of the existing Hepatozoon blood parasite species within gopher tortoises in South Florida.

Light Perception and Seafinding of Green Sea Turtle Hatchlings

Angela Field, Caroline Sullivan and Lisa Celano

Faculty Mentor(s): Michael Salmon

Hatchling turtles "seafind:" determining the location of the ocean by utilizing visual stimuli (horizon elevation, light intensity) under natural conditions. However, the light wavelengths that hatchlings may use has not been properly documented. Previous studies have not tested visual stimuli at equal intensities (phototaxis thresholds inconsistent). Here, we determined phototaxis thresholds and compared them to light intensity at a nesting beach, allowing us to decide what wavelengths hatchlings can perceive while seafinding. To discover if the hatchlings preferred certain light wavelengths, UV and visible stimuli were presented at perceptually equal intensities in a Y-maze. Phototaxis thresholds were lower than irradiance recorded; hatchlings can use all wavelengths for seafinding. UV beach measurements exceeded visible light, correlating to hatchlings' heightened sensitivity to shorter wavelengths. Hatchlings most often chose visible light; however, this was reversible by changing intensities. Seafinding has evolved for

sensitivity to shorter wavelengths that are prevalent at nesting beaches.

Thermodynamic Analysis of Galectin-1,-3 Binding to Beta-galactosides and MUC1-TF Bearing Glycopeptides

Forrest FitzGerald

Faculty Mentor(s): Mare Cudic

Recognition of cell surface glycans by endogenous glycan-binding proteins mediates many important aspects of cell-cell recognition integral to inflammation and tumor cell metastasis. The Thomsen-Friedenreich (TF) tumor-associated antigen has been found in a majority of tumor cell types, often occupying the extracellular surface of the transmembrane protein MUC1. Given the evidence that human galectins can interact with mucins and also weakly with the free tumor-associated TF antigen, we have studied the interaction between galectin-1,-3 and the TF antigen presented by MUC1, as a step to characterize the molecular origin of the high selectivity of endogenous lectins to their natural counter-receptors. We have used isothermal titration calorimetry to determine the thermodynamic parameters of binding, noting observed selectivity amongst galectins highlights the significance of model studies of human lectins with synthetic glycopeptides. Our long-term goal is to potentially use galectin inhibition to develop therapeutic agents to modulate tumor metastasis and inflammatory diseases.

Establishment of an Optimal LPS Concentration to Investigate the Effect of the Marine ω-Conotoxin GVIA on the Inflammatory Response of Human THP-1 Derived Macrophage-like cells

Oscar Fonseca, Alberto Padilla and James Hartmann

Faculty Mentor(s): James Hartmann and Alberto Padilla

A chronic inflammation is associated with autoimmune disorders in which the body fails to recognize its own cells causing a significant damage to body systems. Inflammation such as seen in rheumatoid arthritis, multiple sclerosis, and other inflammatory diseases can result in the destruction of normal tissues. Our goal is to establish an optimal LPS concentration to assess the pro-inflammatory benefit of a marine peptide-ω-conotoxin GVIA by reducing TNF-α in rested THP-1 derived macrophage-like cells (MDM). Successful THP-1 differentiation was achieved with 50ng/mL PMA. Differentiation was observed morphologically over three days. The MTS viability assay performed on MDM showed that LPS at experimental concentrations of 100ng-100μg was not cytotoxic. An optimum expression of TNF-α was determined by ELISA at 4 hours by treating MDM cells with 100 μg/mL of LPS. We predict that treating LPS stimulated macrophages with ω-conotoxin will reduce the inflammatory response by downregulating TNF-alpha expression of MDM cells.

Biological Benefit of the mCAT Transgene in Progeroid Mice

Sylvia Frydman

Faculty Mentor(s): Ken Dawson-Scully and Laura Niedernhofer

Aging is associated with chronic diseases and is attributed to increased morbidity, mortality, and healthcare costs globally. Controversy exists over the root cause(s) of aging, nonetheless, extensive research links increased oxidants and reduced antioxidant buffering capacity with aging. The free radical theory of aging posits that the toxic build-up of free radicals and reactive oxygen species (ROS), promotes oxidative stress and enhances aging. Investigations involving the effect of mitochondrial-targeted catalase, have proven to be beneficial in reducing ROS and increasing lifespan in naturally aged mice. My project involves investigating the biological benefit of the mCAT transgene and rescue of age-related functional decline in progeroid Ercc1-/Δ mice, an accelerated mouse model of aging. mCAT expression was shown to be largely restricted to the brain, heart, and muscle of mice. mCAT+/-;Ercc1-/Δ mice showed improvements in behavioral tests and health evaluations relative to controls.

The Political Power of Jazz as Protest: Plato, Nietzsche, Rousseau, Adorno, and How Jazz Music Threatens Authoritarianism/Totalitarianism as a Symbol of Freedom

Mauricio Enrique Garcia

Faculty Mentor(s): Rebecca LeMoine and Duhkong Kim

Since its inception and subsequent exploding global popularity, jazz music was banned by authoritarian and totalitarian regimes like no other music in history. From fascist regimes in Germany, Italy, and Spain, to the communist regimes of USSR, China, Cuba, and even South Africa under Apartheid, jazz was banned as a genre even though the themes and lyrics in the music were overwhelmingly non-political. Philosophers such as Plato, Nietzsche, Rousseau, and Adorno have ascribed moral and political significance to music and several of its properties which parallel many of the defining characteristics of jazz. This presentation will argue that the qualities of dissonance, improvisation, and populism - as exemplified in jazz's embrace of popular tunes as source material as well as its popularity due to its dance-ability and its incorporation of other popular genres - are what make it dangerous to undemocratic regimes.

Timeline of John Hinckley, Jr. in the Criminal Justice System

Scott Gardner

Faculty Mentor(s): Lincoln Sloas

For this research project, I examine the procession of John Hinckley, Jr's case through the criminal justice system. John Hinckley, Jr. is the infamous individual who attempted to assassinate President Ronald Reagan. Specifically, the purpose of this research is to bring greater attention to this pivotal moment for our criminal justice system. I start off by creating a timeline leading up to the attempted assassination, continuing to his apprehension, time in the court system, followed by his sentencing and treatment. This project is meant to demonstrate how Hinckley Jr.'s case was processed through the criminal justice system by examining the roles played by the police, courts, and corrections.

Investigation of Dissolved Metals Concentrations in Lake Worth Lagoon

Gino Garlaschi and Tara Root
Faculty Mentor(s): Tara Root

Lake Worth Lagoon (LWL) is an urban estuary located in Palm Beach County, FL that is affected by anthropogenic activity. This project's goal is to investigate dissolved metal concentrations throughout LWL. Objectives include discovering dissolved metals relationships to tidal and temporal variation, and discovering correlations with rainfall, canal stage and canal discharge. Data collection took take place from June 2016 through May 2017. Water samples were collected throughout the lagoon, and analyzed with an ICP-AES in the FAU Water Analysis Lab in Davie, FL. Stable water isotope data is currently under investigation to further understand flow patterns in relationship to metals distribution. Sample sites show some relationship with rainfall and canal discharge, but further investigation is needed. Tidal and temporal variation show metals range greater during wet and high tide respectively. We hope the year-long study will shed light on the magnitude, distribution and transport of metals throughout the LWL.

The Prevalence of Butterfly Development Stages in Different Types of Cultivated and Uncultivated Areas at FAU's Boca Raton Campus

Gabriela Gazaniga, Chloe Joseph, Oasis Husband and Alexander Sullivan
Faculty Mentor(s): Tricia Meredith and Amy Tift

Due to declines of multiple butterfly species in Florida caused by a shortage of host plants, researchers investigated the prevalence and species of butterflies, the butterflies' life stages, and locations on host plants in cultivated and uncultivated locations. The locations determined to be low in cultivation included the Slattery Nature Area and Henderson athletic fields, while the Slattery butterfly garden and the area behind FAU High School were categorized as medium cultivation. Butterflies, caterpillars, and eggs were counted and identified over the course of five weeks for 30-40 minute sessions and the prevalence of host plants was recorded. Results demonstrated an average of 3 butterflies in cultivated areas compared to 2.66 butterflies in uncultivated areas. The results supported the hypothesis that a greater population of butterflies inhabited the cultivated locations that contained host plants. Adding butterfly host plants to urban landscapes could improve the quantity and diversity of butterflies.

Capabilities of Machine Learning for BCI and EEG Feature Detection

Anthony Sanchez, Alex Clark, Sarah Geevarughese, Megan Black, Harrison Rudd, Katy Pugh and Taslim Bhuiya
Faculty Mentor(s): Elan Barenholtz

The purposes of this research are centered around the capabilities of machine learning algorithms applied to medicine. Brain-computer interfaces (BCI's) are technologies that allow humans to interact with an external device connected, in various way, to their brain. The first goal (phase 1) is to use a BCI that will allow a user to control an electric wheelchair using thought. This BCI will be monitoring electroencephalogram (EEG) activity from the user, which will then translate into movement commands for the wheelchair. The machine learning algorithm will be trained using EEG data generated in our lab. Our second goal (phase 2) is to see if a machine learning algorithm can detect, and

eventually predict, what a human was seeing based on EEG signals. EEG activity is recorded during all trials and separated by stimuli. A machine learning algorithm is then trained on the various EEG recordings and visual stimuli.

Effects of Gender on Levels of Tension in the Therapeutic Relationship

Amrita Ghaness and Nicole Fitzgerald
Faculty Mentor(s): Paul Peluso

Analyzing verbal and nonverbal communication is one way to determine the quality of a therapeutic relationship. The purpose of this research is to determine if gender influences the quality of the therapeutic relationship, and if correlations exist between gender and specific affects. The Specific Affect Coding System (SPAFF) was used to determine the number of seconds of tension and neutral affects displayed during twenty-eight forty-five minute therapy sessions at the Counseling and Psychological Services Center at FAU. Situations where clients both dropped out and returned for four sessions of therapy were coded. We have found there are differences in tension and neutral affect based on the gender of the therapist and client when clients return for more than one session of therapy. Counselors can potentially utilize these findings to improve retention rates and ease levels of tension in therapy.

Optimized Synthesis of a Bridged Bicyclic Compound for Late Stage Diversification Leading to Analogs with Potentially Improved Neuroprotective Activity

Gurtejpal S. Ghuman, Samantha L. Maki, Elijah J. St.Germain, Wes Bollinger, Ken Dawson-Scully and Salvatore D. Lepore
Faculty Mentor(s): Salvatore Lepore

We are engaged in a program to develop neuroprotective agents based on the structure of a natural product known as vitisinol D, which contains a unique bridged bicyclic core. From this effort, an analog, known as fly2, was identified as a potent neuroprotectant using a fruit fly model (Drosophila melanogaster). In this presentation, we report the optimized synthesis of a close analog of fly2, one that lacks a methyl substituent. This analog possesses nearly identical bioactivity as fly2; however, it can be produced in higher yield, thus making possible late-stage diversification. Details of the optimized synthesis and bioactivity information will be described.

Qualitative Study into the Perspectives of Alzheimer's Caretakers and Experts on the Role of Diet in Cognitive Decline

Tanya Goldberg, Amaan Khan and Aroosa Chaughtai
Faculty Mentor(s): Jo Ann Bamdas

Due to the rising geriatric population and the lack of effective treatments for Alzheimer's disease, diet becomes an important factor to consider. This qualitative multiple-case study used a purposeful sampling of Alzheimer's disease caretakers and experts, to gain an in-depth understanding of their perspectives on the role of diet in cognitive decline. Three central themes were found: 1)

caretakers are knowledgeable about the dietary needs of Alzheimer's patients, 2) dietary habits are a growing interest in Alzheimer's research, and 3) experts and caretakers in the field of Alzheimer's care think that dietary habits are contributors to brain health and cognitive decline. These findings indicate that diet may have an impact on cognitive decline; in addition, these findings also revealed that participants consider diet to be an important factor. In future research, perhaps gathering data from the patient's relatives along with caretakers can provide a more thorough and in-depth investigation.

Impact of Functional versus Symbolic Signals on Initial Impressions: Implications for Designing the Look of a Website Homepage to Convey an Outdoorsy Brand Image/Personality for a Lifestyle Brand

Danielle Gordon, Katherine Llanos and Samin Nuhin
Faculty Mentor(s): Allen Smith

As competition among brands escalates, marketers seek emerging opportunities to differentiate and position brands and grow a customer base by offering lifestyle brands. Lifestyle branding adds value to consumers by integrating superior functional performance, enabling fuller engagement in lifestyle activities with emotional appeals satisfying psychological desires, such as adventure, excitement, camaraderie, and self-expression. While the importance of both functional performance and emotional brand meaning have been justified in the marketing literature, an advertising maxim claimed successful communication required emphasis on one dominant message to create the most persuasive initial impression. Knowing that initial impressions impact consumer judgments of product design form, this study investigated whether functional or symbolic signals

created more persuasive initial impressions when used to create the look of a website homepage for an outdoorsy lifestyle brand. The right look of a homepage creates a mood facilitating persuasion. Consent forms and APA Style complied with ethical research standards.

Air B&B versus Hotel Industry

Vladislav Grant and Jordan Glaser
Faculty Mentor(s): Ravi Behara

This is an explanatory research study. The purpose of the research is to evaluate performance of the traveling industry through statistical analysis. In the developing world of global economies, people travel on a regular basis. Travelers tend to complain about the Hotel Industry and how it is manipulating prices for their clientele. AirB&B is disrupting the hotel industry by allowing private owners to rent out their properties for short periods of time with less risk. Currently, we have obtained data to prove that AirB&B is satisfying their customers better than regular hotel industry. We will be comparing how does the number of bedrooms, the accommodations, the price and minimum stay requirements affecting the overall satisfaction of the traveling clientele. We will attempt to compare this data to how the room type effects the reviews and overall satisfaction to all other hotel ratings.

Identification of Bottlenose Dolphin Prey Within the IRL, Utilizing Images Collected During Observed Dolphin Feeding Behaviors

Kaitlin Grell, Dan Albrecht, Jordan Waldron, Dana Katz, Brandy Nelson, Elizabeth Murdoch Titcomb and Marilyn Mazzoil
Faculty Mentor(s): Marilyn Mazzoil and Brandy Nelson

Identification of dolphin prey is fundamental to understanding the ecological function of dolphins within the Indian River Lagoon (IRL), and useful in determining shared resources and associated health risks among dolphins and humans. This study utilized 62 images of dolphin prey documented during observed feeding behaviors from 2003 to 2015 to determine prey of significance. Dolphin prey were comprised of: 44% mullet (Mugil spp.), 11% jack (Caranx spp.), 10% pinfish (Lagodon sp.), and 6.5% menhaden (Brevoortia spp.). The remaining 28.5% of prey were comprised of 11 genera, and no spatial or temporal differences among prey were found. The majority (87%) of the genera of fishes documented as dolphin prey are also targeted by local fisheries for human consumption, bait, and sport. Understanding the prey habits of this apex predator can be useful in determining management and conservation strategies for local fisheries and ecosystems, and identifying possible vectors for bioaccumulation of contaminants.

Gender Differences in Adolescent Perceptions of Wartime Violence

Jessica Gushue
Faculty Mentor(s): Patricia Liehr

Violence often surfaces in places where people expect to be safe. The impact on American youth is yet to be fully realized and little is known about gender differences in processing societal violence. The purpose of this study is to explore gender differences in adolescent word use in response to stories of wartime violence. This is an analysis of existing data consisting of three written reflections over three days following an out-loud reading of traumatic experiences shared by Hiroshima and Pearl Harbor survivors. Linguistic Inquiry and Word Count was used to assess positive and negative emotion word use in 59 9th graders. Analysis was done using repeated measures ANOVA. Findings showed significant differences overall, where girls used more positive emotion words than boys. Regardless of gender, positive emotion word use was highest on the third day of reflections. This was a day when participants spoke of pursuit of peace.

The Effect of Mindfulness Meditation on Free-Recall Memory of Emotionally Valenced Stimuli

Grace Halstead, Johana Carrillo and Alexandra Rosas-Merritt
Faculty Mentor(s): Laura Vernon and Julie Earles

This study aimed to investigate whether mindfulness-meditation has a significant effect on memory, and used a free-recall memory test based on positive, neutral, and negative images to look for differences in memory performance between the experimental and control groups. We gathered our data from undergraduate college students, and our experimental group received a mindfulness-meditation exercise, while our control group received a mind-wandering meditation exercise. After undergoing these exercises, both groups were presented with the same set of positive, negative, and neutral images for 4s each, and then were administered the free-recall test. We additionally used four questionnaires to measure levels of state and trait mindfulness in both groups. We anticipate the results to

be indicative of whether there was a significant effect of mindfulness on memory encoding and performance, or an interaction between mindfulness and stimuli valence on memory.

Determination of the Enzymatic Activity of Membrane Type-1 Matrix Metalloproteinase (MT1-MMP) at the Surface of Tumor Cells

Melissa Hart and Anna Knapinska
Faculty Mentor(s): Anna Knapinska and Gregg Fields

MT1-MMP is a member of a family of enzymes that catalyze the hydrolysis of collagen. MT1-MMP plays a critical role in the highly metastatic nature of melanoma cells. This study seeks to examine MT1-MMP expression and activity in melanoma cells at various stages of metastasis. It is thought that by accurately measuring the timing of expression and activity of MT1-MMP in melanoma, the role of MT1-MMP can be better understood, and ultimately aid in the refinement of inhibitors developed specifically for this enzyme. Expression of MT1-MMP was measured by western blot analysis of cell lysate samples prepared from 2D and 3D cell cultures of primary site, metastatic site, and invading melanoma cells. In addition, the activity of MT1-MMP was detected and compared in live cells growing in 2D, 3D, and metastatic environments.

Air BnB Trends in New York City

Royal Hayes, Omari Moench and Michelle Lai
Faculty Mentor(s): Ravi Behara

This is an exploratory research study to investigate how many facets of different Air BnB's in New York City have changed since 2013. We will be looking to find how everything from prices to customer satisfaction has changed in the different sections of New York City, such as Harlem or West Village. We hope to find some trends within this to see if certain areas such as Harlem, which has seen much gentrification in the past few years, has had a noticeable increase in either customer satisfaction or prices of the Air BnBs. This study will also explore the more fashionable areas within the city as well as SoHo or Tribeca, and see how Air BnBs have changed in those areas as well.

Development of a Protocol for Acoustic Analysis of the Bachman's Sparrow Vocal Repertoire

Willow Hearne and Rindy Anderson
Faculty Mentor(s): Rindy Anderson

Songbirds are a model system for understanding how complex behaviors develop. We analyzed 18 hours of automated recordings of a single Bachman's sparrow male to document his vocal repertoire and establish daily singing patterns and repertoire use. We built a library of exemplars of each song type, including the frequency with which each was sung. This data will be analyzed to test whether the song repertoire is composed of functionally redundant units or whether there are "favored" songs or singing patterns. This study will establish a protocol for analyzing the vocal repertoire of male Bachman's sparrows, which will be applied to recordings of the entire study population. The overarching goal is to test the hypothesis that song sharing (overlap in the song repertoire among males) correlates positively with distance between territories such that neighboring males share more song types than non-neighbors.

A Survey of Arthropod Species Found in Gopherus Polyphemus Burrows in South Florida Scrub Habitats

Gillian Imrie, Lauren Melanson, Mohammad Syed and Emma Cutkomp

Faculty Mentor(s): Evelyn Frazier

Gopherus polyphemus is a keystone species that provides shelter to over 350 organisms, including 60 vertebrate and 290 invertebrate species. The invertebrate species were documented in 1939, and to our knowledge, no other record of their existence has been published. This study will survey arthropods that inhabit gopher tortoise burrows at two scrub sites, FAU Preserve and Jonathan Dickinson State Park, and compile a record of species. Although our main objective is to document the arthropod species associated with gopher tortoise burrows, we must primarily develop arthropod collection methods for use within the burrows. Sampling methods include yellow pan traps, pitfall traps, vertical flight traps, blacklight, hand capture and vacuum aspiration. Vacuum aspiration is discussed in greater detail because it's a novel experimental technique without record of use in Gopherus polyphemus burrows. We expect to record more species at JDSP than at FAU and to encounter numerous invasive arthropod species.

Fin Morphology in Two Benthic Elasmobranch Species

Andrea Hernandez and Marianne Porter

Faculty Mentor(s): Marianne Porter

Benthic shark species have flexible fins to navigate through irregular structures within their habitats. The epaulette shark (Hemiscyllium ocellatum) is unique in its ability to walk in and out of water using specialized pectoral and pelvic fins. A similar form of aquatic walking has been noted, but not quantified, in the bamboo shark (Chiloscyllium punctatum). These two species are related, and differ in habitat. The epaulette shark is restricted to in-shore reef habitats compared to the off shore reef habitats of the bamboo shark. Thus, we hypothesize that epaulette sharks will have a more flexible fin morphology to effectively navigate those in-shore reefs compared to bamboo sharks. We compare the functional morphology between these two species and quantify the development of skeletal structures in pectoral and pelvic fins. These preliminary findings suggest that the fin morphology of H. ocellatum may allow the fins to produce more specialized movements than C. punctatum.

Adult-born Dentate Granule Neurons Show Accelerated Maturation in a Transgenic Mouse Model of Adult-onset Spontaneous Epilepsy

Meer Sajida Hossain, Renata Lemos and Ceylan Isgor

Faculty Mentor(s): Ceylan Isgor

Dentate granule neurons (DGNs) of the hippocampus gate neuronal information coming into the hippocampus, and are hypothesized to play a role in blocking propagation of seizure hyperexcitability. Cortical spread of hyperexcitability is associated with tonic/clonic seizures with loss of consciousness. It is not well understood how adult born DGNs contribute to seizure prone circuits or how seizure neuro-environment can impact the maturation of DGNs. In this experiment we used a transgenic mouse model of adult-onset spontaneous seizures to assess the maturation of newly born granule cells. We bred an epileptic strain of mice with a strain that transiently (3 wks post mitosis) expresses GAD67-GFP in the adult born DGNs to assess dendritic development of incoming neurons. Our data shows that newborn DGNs mature faster in seizure prone

mice evidenced by increased dendritic complexity and spinogenesis. These findings suggest newborn DGNs could critically enhance net excitability of hippocampus, magnifying seizure propagation.

Rescuing Msr Deficiency in *Drosophila Melanogaster*

Michael Iacobelli and David Binninger
Faculty Mentor(s): David Binninger

Oxidative stress causes damage that has been linked to certain age-related diseases. Specifically, oxidation of amino acids in a protein's primary structure causes damage and loss of functionality. Methionine amino acid residues are particularly susceptible to oxidation. Naturally, methionine sulfoxide reductase (Msr) is an enzyme that reduces oxidized methionine residues into functional methionine. There are two Msr genes in Drosophila melanogaster: MsrA and MsrB. The Drosophila in this study are the first documented animal model that is completely Msr deficient and demonstrate delayed development among other robust phenotypes. Msr deficiency is responsible for the developmental delay. Transgenic expression of Msr via the Gal4/UAS system holds potential for examining the tissue specific consequences of Msr deficiency. Here, this Gal4/UAS system is examined. Future studies along this path of inquiry could elucidate the underlying biochemistry surrounding Msr.

Tasteful Disgust: Oral Priming to Examine Emotional Cognitive Biases for Disgust

Jennifer Irmiter, Alyssa Michels, Laura Vernon and Julie Earles
Faculty Mentor(s): Laura Vernon and Julie Earles

Our study examined cognitive biases for disgust-related stimuli after priming for disgust orally. This is one of the first cognitive process studies to elicit emotion through taste. For the oral prime, identical looking jelly beans were used as either neutral (caramel corn flavor) or disgust (moldy cheese flavor) stimuli prior to a modified emotional Stroop Color-naming Task. We hypothesized that a cognitive bias would occur for disgust words in the modified emotional Stroop Task, with individuals showing longer response latencies for these words relative to neutral words. We expected that this cognitive bias would be positively correlated with disgust sensitivity scores, as well as trait and state anxiety levels. The implications for the acquisition and maintenance of phobias and anxiety disorders will be discussed.

The Impact of the One Child Policy on the Environment

Daniel Izadirad
Faculty Mentor(s): Kenneth Holloway

In China, one surprising factor in mitigating the growth of fossil fuel consumption has been the widely criticized One Child Policy. Without this unpopular policy, the demand for foreign oil would actually be dramatically higher. According to the Chinese defense scientist Song Jian, before the one child policy was implemented, the average fertility in China was 3 children per woman and that the population would reach 4 billion by 2080. By forcefully restricting fertility to 1 child per woman, the government

managed to slow the nation's population growth. With 1.4 billion people today, China still has attained the status of the largest oil importer in the world, and this correlates with their surpassing the US in automobile sales. Nations often face difficult challenges in deciding how to balance development goals with other factors. This poster will demonstrate the importance of an expanded scope of factors in weighing these decisions.

Meditation: Following the Wandering Mind

Brandon Jean-Baptiste, Amina Ali, Zim Ouilette, Yarinez Batista, Laura Vernon and Julie Earles

Faculty Mentor(s): Laura Vernon

Mindfulness interventions have been found to be useful for psychopathology as well as stress, mental health concerns, and physical pain, providing psychological insight and emotional healing for participants. Typical interventions usually last more than twenty hours, however, a single mindfulness session has been found to be beneficial for college students. The current study examined the effects of a single session treatment involving mind-wandering meditations and mindfulness tasks on mood, mindfulness, and anxiety. Participants completed the Positive and Negative Affect Schedule, Toronto Mindfulness Scale, and State-Trait Anxiety Inventory-State at pre-session and immediately post-session. We calculated within-session change scores for these three variables. Correlations between personality and coping measures and change scores were computed. Improving and understanding college student treatments are crucial and can help improve students' overall mental health.

Exploring the Anticancer Effects of Novel Marine Natural Products on Prostate Cancer Cells

Joubin Jebelli, William Trevino, Elizabeth Richard, Paul Scesa, Saheed Oseni, Toluleke Famuyiwa, James Kumi-Diaka and Lyndon West

Faculty Mentor(s): Lyndon West and James Kumi-Diaka

As of 2018, prostate cancer (PCa) still retains its rank as the second most common form of cancer found in American men. Current research into natural products of marine origin has proven to be extremely beneficial in the field of cancer therapeutics. In this study, novel marine natural products were extracted and purified using a series of reverse phase chromatographic separations. Characterization was then performed using Nuclear Magnetic Resonance (NMR) and Mass spectroscopy (MS). The anticancer effects of these isolated secondary metabolites were then investigated on androgen dependent (LNCaP) and castration resistant (DU-145) prostate cancer cells. Various bioassays (MTT, LDH, and NBT assays) were utilized to determine treatment-induced effects on PCa cells. Fluorescent microscopy was performed to determine the treatment-induced mode of cell death. The results generated from this study have laid the platform for future in-depth studies on marine natural products as potential drug candidates for prostate cancer treatment.

Multiple Vehicle Detection Using Single Shot MultiBox Detector (SSD)

Samantha Johnson, Debojit Biswas and Hongbo Su
Faculty Mentor(s): Hongbo Su and Debojit Biswas

Did you know that a commuter in Miami, FL spends around 64 extra hours on traffic per year? And that nation-wide, more than eight billion extra hours! (INRIX.com). To address this traffic problem, we are developing an efficient adaptive traffic signaling system to reduce travelling time. The aim of this research is to optimize the traffic signaling system using one of the Convolutional Neural Network (CNN) based algorithms, Single Shot MultiBox Detector (SSD). This weather-proof computer vision system can detect and count vehicles automatically and estimate traffic density. We used SSD on over 50 live traffic cameras located on multi-lane expressways in Broward and Palm Beach counties. Preliminary data has shown 85% accuracy. Once the system is refined to detect and count cars accurately, it can be further developed to optimize traffic signals, redirect traffic to sparsely dense roads, calculate the total income from tolls and more.

Direct and Indirect Contribution of Immune Cells in Xenograft Rejection

Haley Katz, Zack Ramilevich, Lisa Victor and Mahyar Nouri-Shirazi
Faculty Mentor(s): Mahyar Nouri-Shirazi

The imbalance between organ supply and demand could be addressed via xeno-transplantation. To date, research in this area has addressed xenograft rejection mediated by host anti-gal and anti-nongal antibodies and the complement system activation. In order to prevent the acute and chronic phases of xenograft rejections, we need to better understand the recognition of xenoantigens by the recipient immune cells, as this has been a contributing factor in allograft failure. Therefore, we explored the contribution of immune cells in xenoantigen recognition using murine and human in vitro co-culture systems. Our data indicates that the mouse CD4+ T cells can recognize xenoantigens through an indirect pathway while the human CD8+ T cells can recognize xenoantigens by direct pathway as evidenced by their proliferation and cytokine production, namely INF-γ and IL-2. This study suggests that host immune cell contribution to recognition of xenoantigens depends on the species of the recipient.

Spreading Dynamics of Water Film on a Vibrating Glass

Garry Kendrick, Robert Wilson and Jimmy Chau
Faculty Mentor(s): Tsung-Chow Su

We examine experimentally, the spreading dynamics of a wetting water film on plate glass when subjected to vibrations. Both mechanical and acoustic sources of vibrations are considered. The water is wetted on a simply supported rectangular piece of plate glass. Several glass inclinations are tested, with different exciting frequencies. Furthermore, we add different chemicals on the glass surface. This changes the contact angle of the water droplets. Doing this allows the examination of the effect of adhesion versus cohesion, in regards to the behavior of the water spreading on the plate glass. Our attempt to elucidate the relevant physics is driven by the goal of providing a basis for replacing windshield wipers of future automobiles.

Pedestrian Conveyance Path Usage in a South Florida Campus Environment

Maya Khazem, Michelle Rodriguez-Gonzalez, Sam Hazamy and Lotoya Willis

Faculty Mentor(s): Tricia Meredith

A portion of FAU students traverses the Boca Raton campus using pedestrian conveyances (PCs) (i.e. human-powered vehicles that traverse pedestrian and motorized vehicle lanes). With the push for greener transportation, students are more inclined to ride bikes, thus requiring suitable multimodal pathways, like sidewalks. This study evaluated transportation pathway usage on the FAU Boca Raton campus in relation to safety prioritization by PC riders. PC riders were coded for their location, distractions, and PC type at four intersections. More PC riders traversed the sidewalk than the road (p≤0.00) and bike lane (p≤0.00). Most PC riders did not wear helmets (p≤0.00). Overall, the lack of students traversing the bike lane highlights the ineffectiveness of bike lanes on campus. Establishing bike lanes on roads throughout the inner-campuses can discourage bikers to travel on sidewalks, dedicated to pedestrians and skateboarders, and roads, dedicated to cars.

The Formation of Inhibitory Fields Surrounding Stationary Objects

Magdalena Kopec and Howard Hock

Faculty Mentor(s): Howard Hock

When a visual object appears in front of us, a neural representation of the object is formed in the visual cortex of our brains, allowing us to perceptually experience the object.

Surrounding the object is an invisible inhibitory field that makes it difficult to detect other objects that are close to it. The following experiments measure the strength of this inhibitory field. The purpose of this project is to show that the representation of a stationary object does indeed occur in the brain. Within the experiments presenting the amount of time it takes to form inhibitory field presentation, as well as the measured size of this inhibitory field. The results will be depended on the duration of the stimuli presented. The excitatory effect will increase until it asymptotes, this reflects the time of the inhibitory field acted on the stimuli and therefore, presentation of neuro motion fields.

Seizure-Induced Deficit in Brainstem Arousal Function: Implications for Sudden Unexpected Death in Epilepsy

Kezia Koroma, Renata Lemos, Sajida Hossain and Ceylan Isgor

Faculty Mentor(s): Ceylan Isgor

Sudden unexpected death in epilepsy (SUDEP) is common in epileptic patients yet its mechanisms are largely unknown. SUDEP may result from seizure-induced suppression of brainstem arousal systems with adverse effects on arousal/consciousness and cardiorespiratory functions. Our lab used a transgenic mice model of spontaneous seizures that overexpresses the brain-derived neurotrophic factor (BDNF) in the forebrain postnatally (TgBDNF mice). We surgically implanted EEG skull electrodes at 8 wks of age. At 10 weeks of age, mice were video/EEG monitored for seizure induction once a week. Seizure EEG data were assessed for total seizure duration, duration of EEG flattening, peak frequency/amplitude and duration of epileptiform discharge. Repeated seizures caused an increase in the duration of postictal EEG flattening as the mice graduate to chronic epileptic status, suggesting increased death risk associated with impaired

consciousness. These mice also showed severe alterations in their sleep architecture providing further evidence towards arousal deficits.

Chinese Buddhist Nuns: Opportunities and Validations

Elizabeth Kushma
Faculty Mentor(s): Kenneth Holloway

Buddhist nuns face the dual challenges of maintaining an ancient tradition and fighting gender discrimination. Recent studies have shown that one thousand years ago where a period of important political, economic, and social power they are now working to reclaim. In contemporary China, nuns encounter restrictions from misogyny within ordination and by the eight Dharmaguptakavinaya. Another, challenge nuns face is the prerequisite for religions to be compatible within the People's Republic of China. Whereas, contemporary Taiwan represents a continuation of religious freedom and power Chinese nuns once had one thousand years ago. The religious capabilities of nuns one thousand years ago help to explain the ideologies behind today's 'scientific Buddhism' and the global recognition of the institution itself.

Experimental and Theoretical Investigation of the Electronic Structure of Methylenecyclohexane

Patricia Snyder and Kimarah Lamothe
Faculty Mentor(s): Patricia Snyder

An alkene chromophore is basic to better understanding of ubiquitous molecules with a carbon-carbon double bond. A good way to better understand these chromophores is by observing its electronic chemistry and looking at excited states generated through absorption spectra. Absorption spectrum is not sufficient to determine the number of transitions in a given energy region because the absorption spectrum can either be zero or positive. In order to be assign transition states magnetic circular dichroism in addition to the absorption spectrum was used to obtain more information about the number of electronic transitions in the region of gaseous methylenecyclohexane. Gauss View and Gaussian 09 software was used to compare theoretical predictions with experimental measurements. The experimental results and theoretical calculations both show at least three electronic transitions in the region of the spectrum often assigned as only one electronic transition. This presentation will compare the experimental and theoretical results.

Florida Local Voter Turnout

Daniela Larez
Faculty Mentor(s): Kevin Wagner and Dukhong Kim

Voter turnout in both presidential and local elections has been depleting. For the last eight years voter participation in presidential elections hover between 40-50 percent while participation in local elections is half of that percentage, and only 18-25 percent of registered voters came to the polls to cast votes in primary nominating elections. Why is it that nearly two of three registered voters stay home in Florida? Is Florida suffering from a high degree of civic disinterest? This thesis paper follows the steps of Zoltan L. Hajnal, Paul G. Lewis, and Hugh Louch by documenting and surveying voter involvement in municipal elections by gathering evidence from a questionnaire that has been emailed and mailed to all city clerks in the Florida State asking about most recent elections in the community.

Hydrodynamics of Particle-Laden Flow in Hydrofracking: A Microfluidic Study

Natalia Linares, George Albrecht and Meyongsub Kim
Faculty Mentor(s): Myeongsub Kim

Hydraulic fracturing (hydrofracking) has enabled recovery of natural gas and oil embedded in low permeability reservoirs. Despite its advancement in significant recovery of hydrocarbons not previously accessible from low permeability reservoirs, understanding the particle interactions and injected fluid retraction is lacking. The goal of this project is to investigate fluid dynamics of the fracking fluid (particle-laden flow) under instant fluid injection and withdrawal. We will use a microfluidic-based approach in order to visualize a fluid displacement as well as particle-particle interactions in a micromodel that mimics the flow in actual reservoirs. Nanoporous spherical silica particles in diameter of 0.1 mm are going to be utilized in this project. A high-speed visualization tool will characterize the dynamic and complex nature of particle transportation, deposition and their interactions under dynamic flow conditions. In addition, the role of surface properties on these behaviors will be tested.

Trabecular Structure through Ontogeny in the Florida Manatee (Trichechus manatus latirostris)

Laura Lindsey
Faculty Mentor(s): Marianne Porter

Manatees, who use their vertebral column to propel themselves in swimming, are the product of a major evolutionary shift from land to water. This project explores the structure of trabecular (spongy) bone, which changes with force direction and magnitude, from the vertebral column of manatees. The goal of this research is to investigate the structural properties of manatee vertebral trabecular bone to better understand this animal's development and swimming mechanics. Vertebrae were dissected from four regions of the vertebral column and scanned with micro-computed tomography. Images were analyzed in BoneJ to quantify trabecular width, number, length, bone volume fraction (amount of bone/total area) and degree of anisotropy (orientation bias). Results from this project will be paired with mechanical data in future work to better understand forces on the vertebral column in a swimming mammal throughout development, and how these properties may have diverged from those found in their terrestrial counterparts.

A Comparative Analysis of Shark Pectoral Fins

Wilmer Lopez, Sarah Hoffmann and Marianne Porter
Faculty Mentor(s): Marianne Porter

Shark pectoral fin morphology differs among species, and little is known about variations in skeletal (radial) morphology. The goal of this study was to compare radial cross-sectional morphology among sharks from four habitats. We calculated second moment of area and percent calcification along the longest radial for twelve species. We found that the angel shark (a benthic shark) had the most dorso-ventrally compressed radials suggesting fins are flexible. We also found that inshore species had the most calcified radials whereas oceanic species the least calcified and most laterally compressed radials. We hypothesize that inshore species have more calcification to support dorso-ventrally compressed radials while maintaining fin flexibility, and oceanic species have laterally compressed radials shaped to resist bending such that radial calcification may be energetically expensive. We propose that these differences in calcification and radial shape exemplify an evolutionary

tradeoff between the stiffness and maneuverability of shark pectoral fins.

The Impact of Logistics on the Services and Trade Industry in the International Market

Sarrhay Louis and Arnim Garcia
Faculty Mentor(s): Ravi Behara

This is an explanatory research study to investigate the role of logistics in the service industry. Our research is based on information provided in the Trade Import/Export: U.S. International Trade in Goods and Services data source. Logistics has a significant impact on customer service. Recently a sub-company of the German logistics company Deutsche Post DHL has caught media attention due to their contract with Kentucky Fried Chicken. DHL failed to deliver KFC products on time, which forced KFC to temporarily close more than half of their stores in the UK leading to customer dissatisfaction. Since services have a direct impact on competitiveness, knowledge in the different factors that affect it are important to the success of the international market. This research will discuss the importance of logistics in the trade and service industry, define the trade dimensions for logistics, and discuss how international regulatory issues are a barrier to competitiveness.

Determine the Efficacy of a Combination Treatment of 3-Bromopyruvate and Paracetamol on MCF-7 Breast Cancer Cells

Leila Lucas
Faculty Mentor(s): James Hartmann

According to the American Cancer Society, breast cancer is the second leading cause of death, killing over 40,610 women in the United States per year. Breast cancer affects both males and females, though the statistics are lower in males. The precise causes for breast cancer are unknown but the risk factors include aging, family history, obesity and the frequent consumption of alcohol. Breast cancer cells predominantly produce their energy through a high rate glycolysis even in the presence of oxygen and this phenomenon is known as the Warburg Effect. 3-bromopyruvate is a new, anticancer treatment that antagonizes the Warburg effect and induces apoptotic cell death. Paracetamol is a non-opioid drug that suppresses cancer cell proliferation. When combined with 3BP, Paracetamol killed chemotherapy treated melanoma cells. The purpose of this research will be to test a combined treatment with 3BP and Paracetamol to measure the toxicity towards MCF-7 breast cancer cells.

Airbnb: Miami and Los Angeles

Chelsey MacLaren and Anthony Casale
Faculty Mentor(s): Ravi Behara

This project reviews the correlation of pricing, supply and demand and guest information concerning Airbnb in the cities of Miami and Los Angeles. Many property owners now use Airbnb to rent out their real estate when it will sit vacant as a way of subsidizing their income. In Los Angeles

and Miami, in 2017, there were 22,127 and 8,105 Airbnb properties, respectively. Even with the large difference in the number of properties, their rental rates differ by only 2 percent with Los Angeles at 71% and Miami at 73%. However, the average price of the rentals differed much more with Los Angeles averaging $143 and Miami averaging $181. Tom Slee Airbnb Data Collection shows in both Miami and Los Angeles there is a correlation between the number of reviews on a rental and degree of satisfaction; that is the rentals with the most reviews generally have the highest overall satisfaction.

The Impact of E-commerce on the Cardboard Industry

Alvaro Valarezo, Zack Pham and Sarah Mark

Faculty Mentor(s): Ravi Behara

With the advancement of technology and globalization, specifically ecommerce, the cardboard box industry has been greatly affected. The more consumers are buying online, the more goods need to be shipped worldwide. The cardboard box industry has been positively affected by this, and we plan to analyze exactly how this growth in ecommerce is affecting the cardboard box industry and its productivity, employment, and outsourcing. With this research project, we will answer the following questions by using multi-factor productivity data and the IBISWorld database: What affect is the increase in ecommerce having on the cardboard box industry? How are technology advancements affecting processes of employment in the cardboard box industry? How has the productivity changed within the past 5 years?

Antibiotic Discovery in Bacteria from Palm Beach County Soil

Alexis Martin, Paul Scesa, Shweta Singh, Alex Copeland, Lyndon West and Diane Baronas-Lowell

Faculty Mentor(s): Diane Baronas-Lowell and Shweta Singh

Bacteria isolated from Palm Beach County soil by undergraduates in the Small World Initiative (RI: BSC 1005L) were assayed for their ability to kill safe relatives of the ESKAPE pathogens (Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa and Enterobacter species). ESKAPE pathogens are the leading cause of nosocomial infections named for their ability to "escape" death by common antibiotics. Soil bacteria that killed the safe relatives were characterized by microbiology assays and bioinformatics to determine their identity. Bacteria that kill both Gram-negative and -positive safe relatives were selected for further analyses. Chemical investigation of the ethylacetate/methanol extract of one of these bacteria afforded a new cyclic lipopeptide, related to the bananamides, previously found to be produced by Pseudomonas fluorescens collected from the banana rhizoplane in the wetlands of Galagedara, Sri Lanka. The compound's structure was determined on the basis of extensive spectroscopic analysis.

Monitoring and Modeling to Estimate the Impact of Hydrogen Sulfide Emissions and Dispersion Near Gas Wellheads In Florida Landfills

Angel Martinez
Faculty Mentor(s): Daniel Meeroff

Landfill owners must monitor onsite landfill gas (LFG) wellheads to ensure that fugitive emissions do not occur in the gas collection system. This study gauges the effect of the age of landfill gas wellheads and waste age on ambient H2S concentrations. The local landfill in this study has three main disposal sites with different waste age compositions. Eighteen LFG wellheads were selected and categorized by a color code "green-yellow-red" scheme according to their initial construction date. Ambient Hydrogen Sulfide H2S concentrations and meteorological conditions (stability class, wind direction and speed, temperature, etc.) will be collected for each LFG sample point with the Jerome Hydrogen Sulfide Analyzer and Kestrel 3500 Weather Meter. Measured data will be used with Gaussian plume variables to calculate H2S emission rates near the selected gas wellheads. The hypothesis to be tested is that wellheads installed under a year period will produce the highest H2S emissions.

Assessment of the Long-Term Durability of Recycled Aggregate Concrete Using Thermal Sensing Based on the Maturity Method

Caique Martins
Faculty Mentor(s): Khaled Sobhan

This study tests the long-term durability that can be developed in concrete batches made with recycled aggregate concrete. Durability is a broad term used to define the resistance of a material to weathering effects, but in this scenario, durability will be defined as a drop in the compressive strength of the concrete. To test this, thermal sensing was used to determine the maturity of the concrete, or in other words how far along the curing process the concrete is. This was then plotted against the corresponding concrete compressive strength to create a relationship that can be exploited to project the later age strength of the concrete. This data is paramount in determining the viability of recycled concrete aggregate because it is a sustainable alternative to other coarse aggregate material, an essential part to making concrete, but its' properties are largely unknown since they can be highly variable.

Utilization of Multi-Factor Productivity to Analyze Labor Growth Productivity

Britney McKenzie, Latoya Edwards and Natasha Patterson
Faculty Mentor(s): Ravi Behara

This is an exploratory research study that will analyze the changes in labor growth productivity since the Great Recession. The purpose of this research is to give insight as to why the labor growth trends showed tremendous increases through its expanded labor growth productivity since 2007. Questions relating to the hypothesis will see the effect of how input affects our daily lives and economy, the various factors that contributed to the uprising growth of productivity during the period of 2007-2016 and the specific industry that showed the most labor growth. The data tool that will aid in this research is the Multifactor productivity tool provided by the Bureau of Labor Statistics. Vast amount of changes in the labor force has trickled into aspects of the economy due to the Great Recession.

Our research will be geared towards addressing why these changes occurred and how they have affected the economy.

What Leads to Better Memory? Writing or Performing Action Pairs

Nicole McRostie, Julie Earles, and Alan Kersten
Faculty Mentor(s): Julie Earles and Alan Kersten

In this study, we examined young adults' ability to remember verbs compared to nouns. Participants included ninety undergraduates between the ages of 19-25. All participants saw 65 verb-noun pairs (e.g., scan- newspaper) and were asked either to write the word pair or to image the action being performed. Individuals were tested on their ability to remember both the verb and the noun, but most importantly, the collective word pair. We hypothesized that verbs are harder to remember than nouns and recall would increase when participants imagined performing the action compared to writing it. The number of verb-noun pairs correctly identified during retrieval was compared to the incorrect responses. The results suggest that verbs are harder to recall and no significant interaction occurred between task and noun change, while there is a significant interaction between task and verb change.

Who Done It? Source Memory Differences in Older and Younger Adults

Nicole McRostie, Cassidy Brydon, James Adaryukov, Julie Earles and Alan Kersten
Faculty Mentor(s): Julie Earles and Alan Kersten

This study examined age differences in source memory. Younger and older adults watched two series of videos involving actors performing simple actions. For one series, participants were asked to remember both the actors and their actions. For the other, participants were asked to remember the actors. Older adults had greater difficulty than young adults distinguishing old from conjunction videos, in which an actor was seen performing an action that had previously been performed by somebody else. Older adults may have increased difficulty binding sources with actions because of age-related associative deficits. Older adults performed better on a feature memory task, in which they just had to remember the actors, when compared to a source memory task, in which they had to remember which person had performed each action. This suggests that older adults remembered the people and actions they had seen but had difficulty remembering which people performed which actions.

A Survey on Trust in Autonomous Systems

Luiza Menezes, Mehrdad Nojoumian and Shervin Shahrdar
Faculty Mentor(s): Mehrdad Nojoumian

As a result of the exponential growth in technology and computing in recent years, autonomous systems are becoming more relevant in our daily lives. As these systems evolve and become more complex, the notion of trust in human-autonomy in- teraction becomes a prominent issue that affects the performance of human-autonomy teaming. Prior studies indicate that humans have low levels of trust in semi and fully autonomous systems. In this survey, we review a wide range of technical papers and articles and go over the related experimental techniques in the literature of trust. We also explain limitations that are present in existing research works, and discuss open problems in this domain. It is apparent that trust management is critical for the development of future artificial intelligence technologies.

Synthesis of the Glycosylated Amino Acid Bearing the Thomsen Nouvelle Antigen

Elizabeth Mercer, Donella Beckwith and Mare Cudic
Faculty Mentor(s): Mare Cudic

Changes in protein glycosylation patterns have been associated with malignant cell transformations. Mucin 1 (MUC1), a transmembrane protein, is aberrantly glycosylated and overexpressed in a variety of epithelial cancers. These cancer-related changes include expression of tumor-associated carbohydrate antigens (TACAs) which are often comprised of shorter, less complex O-glycan chains such as Thomsen Nouvelle antigen (Tn: N-acetylgalactosamine). The expression of these TACAs is usually associated with cancer aggressiveness and poor prognosis. Our objective was to prepare gram quantities of glycosylated amino acids (serine and threonine) bearing Tn antigen for use in the solid-phase peptide synthesis of glycopeptide models of tumor-associated MUC1. The synthesis of these Tn-containing building blocks was completed through three key reactions: one-pot azidochlorination, glycosylation of Thr/Ser residues, and reductive acetylation of the azide to an N-acetyl group. Final products were confirmed using NMR, RP-HPLC, and MALDI-TOF MS analysis.

Disgust Me or Disgust Me Not: Priming in Information Processing Biases for Disgust-Relevant Stimuli

Alyssa Michels, Jennifer Irmiter, Laura Vernon and Julie Earles
Faculty Mentor(s): Laura Vernon and Julie Earles

The present study examines attentional and memory biases for disgust-related stimuli after an oral or audio/visual disgust-eliciting prime. Although contemporary research examining the role of emotions in specific anxiety psychopathologies have determined fear as a critical component, recent research indicates disgust too, as a fundamental factor. Researchers have theorized cognitive biases for these emotions as important elements contributing to certain anxiety disorders. The aim of the present study is twofold, first to examine the role specific trait characteristics (i.e., disgust propensity and sensitivity, fear sensitivity, and anxious arousal) have on the manifestation of cognitive biases for disgust-relevant words and second, to determine the effect of different emotion-eliciting primes on these biases (i.e., oral or audio/visual). We predict cognitive biases for disgust words rather than neutral words, in a modified emotional Stroop Color-naming Task and free-recall task, which we expect to be influenced by trait characteristics and priming.

Advertising Research and Strategy: The Role of Brand Association Using Lifestyle Relevance

Eliezer Vega, Heather Baker, Naim Mobley and Stasia Milios
Faculty Mentor(s): Allen Smith

As Vans' market increases, marketers depend on advertising to reinforce competitive advantage. Our research-in-progress demonstrates the methods we used to research. The information gathered from our focus group suggests that durability and comfort are the main factors when making a purchase. Competitors like Converse and Nike use their market share to persuade their buyers to pay a premium price while Vans focus on durability and the lifestyle the shoes brings to the consumers. Our secondary research revealed that millennials are considered the least conservative generation, which implies the rash nature of our target market. With the large growth rate of millennials, their preference pool is strongly influenced by the new wave. In regards to rebranding, vans began using "off the wall" to

distance themselves from primarily skating to athleisure wear. Vans are mostly worn in cities with warmer climates to maximize comfort and a feeling of relaxation throughout the day.

Promoting Well-Being in Female Student-Athletes by Influencing Resilience and Empowerment through HeartMath, a Complementary Healing Modality Focused on Increasing Participants' Abilities to React to Stressful Situations

Alexandra Miller and Nancey France
Faculty Mentor(s): Nancey France

College female student-athletes are competitive striving for excellence on and off the field placing competition at center stage and caring for self on the back burner. The purpose of this study was to examine the effect of HeartMath on college female student-athletes' resilience and empowerment. HeartMath is an intervention to aid participants in enhancing their heart-brain communication thereby increasing their ability to react to stressful situations (HeartMath, 2016). Using a mixed methods design, HeartMath sessions were conducted over an 8-week period. The Connor-Davidson Resilience Scale (CDRS) and Barrett's Power as Knowing Participation in Change Tool (PKPCT) were administered three times during the study. Data collection is completed and data are currently being analyzed. Although there have been studies on the impact of HeartMath on stress and health risks of police officers, no studies have been conducted to explore the impact of HeartMath on resilience and empowerment of female student-athletes

An Analysis of US State Municipal Bond Yield Curves

Amaury Minino, Sher Chhetri and Hongwei Long
Faculty Mentor(s): Hongwei Long and Sher Chhetri

The aim of this project is to create a model that will predict US recessions by forecasting State recessions using municipal bond yield curves. Forecasting recessions gives policymakers more time to adjust and minimize the length and depth of upcoming recessions. While current studies focus on how US Treasury Bond yield curves can be used to forecast recessions, we will begin a novel study into how state municipal bonds can be analyzed to predict nation-wide recessions. Current literature regarding yield curve analysis in municipal bonds is scarce in the US. For this reason, we will carry out our research based on Hattori and Miyake's study on the par yield curve of Japanese municipal bonds (2016). Through our study we will compare the effectiveness of municipal bonds and Treasury bonds in forecasting yield curves, and we will develop a new model to forecast yield curves.

Hemifield Asymmetries in Visual Short-Term Memory with Orientation as a Feature in a Change-Detection Task

Mary Minore and Summer Sheremata
Faculty Mentor(s): Summer Sheremata

Visual short-term memory (VSTM) actively maintains perceptual representations for the duration of a task and is limited by capacity. These representations are easily replaced by new, incoming information. VSTM provides insight into other cognitive processes since these transient representations can last beyond a maintenance delay and be compared with new information, as in a change-detection

task. Change-detection paradigms have demonstrated visual hemifield asymmetries as more items may be retained in VSTM after displayed in the left-visual-field. A set size of three oriented bars was shown to the right- or left-visual fields. Following a brief delay, the bars reappeared with one in a different orientation. The original orientation was then reported. With a continuous-report paradigm, we were able to measure error and guess rates to determine how well the items were kept and found that the left-visual-field had more precision in visual encoding and maintenance.

American Fear and Mental Illness: the Perpetuation of Isolation, Misinformation, and Public Health Declination

Tessa Moody

Faculty Mentor(s): Gina Carreño-Lukasik

This research paper is a literature review regarding the relationship between fear of mentally ill persons and American society. This paper specifically addresses where this fear comes from, how the source of the fear changes public perception, and how this isolates the mentally ill from society and ultimately limits their rights and decreases their sense of humanity. The results show that fear of the mentally ill creates a larger social problem regarding public health and influences the decline of mental wellness in the United States. Further research could be done to gauge the extent of the correlation between fear of mentally ill persons and the increasing prevalence mental health issues in these factors.

The Impact of Technological Advances on the Future of Accounting

Katherine Murphy, Mohammed Nasser and Veda Ramdhyan

Faculty Mentor(s): Ravi Behara

This is an exploratory research study aimed to explore the effect of technological advancements on the field of accounting in a globalized world. Technology is continually changing the world we live and work in. As a group of accounting students, we are interested to see the effect it will have on the profession of accounting. By analyzing industry reports, we hope to gain insight into which fields within accounting are expanding and contracting in response to technology's influence, how growth has been affected in comparison to other industries, and how revenue has been affected. With this knowledge, we can make better informed decisions about our future.

A Study on Quantifying Kinematics in a Free-Swimming Black Tip Shark (Carcharhinus limbatus)

Madison Nelski

Faculty Mentor(s): Marianne Porter

Quantifying swimming kinematics of fishes often occurs in a lab setting using flumes, water treadmills, to examine movement. These methods rely on researchers to pick the animals swimming speed. We have been focusing on voli-tional kinematics in the lab where we quantify swimming as determined by the fish. However, our volitional swim-ming experiments are still limited to the space available in a lab setting. In this study, we examine swimming kine-matics of black tip sharks (Carcharhinus limbatus) during their annual winter aggregations in South Florida. Using

an aerial drone, video of sharks can be obtained through noninvasive methods in the wild, and examined frame-by-frame using the Loggerpro software. We track points along the shark's midline to examine body curvature, tailbeat frequency, tailbeat amplitude, and whole-body swimming velocity. These data represent the first time we have been able to quantify kinematics in a free-swimming shark in the wild.

Politics vs. Necessity: Investigating Florida's Water Rates

Riley Nielson-Baker
Faculty Mentor(s): David Switzer

This project seeks to determine what influences Florida water utility rates, specifically the adoption of conservation water rates. Florida is in a unique position environmentally and politically given the threat of climate change on the low-lying state and the juxtaposing political climate from county to county. This combination makes the state an excellent subject to study the significance of different influences on utility policy. This project will measure several variables, including political preference, location relative to the coast, water source, and local government operations including executive institutions and elections to determine which has the largest effect on the adoption of conservation water rates, and hypothesizes that environmental and local government practices will outweigh political pressures in whether a city adopts conservation-oriented water policies. Using election data, climate moisture measures, census data, and data on local government structure, this project performs a multivariate analysis to investigate Florida water policy.

Winter After the Spring: The Dormancy of Democracy in the Post-Mubarak Era

Briana Nirenberg
Faculty Mentor(s): Dukhong Kim and Renat Shaykhutdinov

The purpose of this research is to account for Egypt's return to authoritarianism following the apparent success of the 2011 Revolution, which ousted President Hosni Mubarak. In 2013, after two years of democracy, Egypt's Minister of Defense, Abdel Fattah el-Sisi, launched a coup d'état. He is currently President, reigning with a regime that closely models that of Mubarak's. By analyzing the groups that emerged in the Revolution and immediately after, along with the democratization that occurred from 2011 – 2013, an inverse "authoritarianization theory" can be proposed, which can be strengthened by comparing 2011 and its aftermath to earlier revolutions and coup d'états within Egypt, as well as to the Arab Spring uprisings seen in Libya and Tunisia.

Effects of Mission Trip Participation on Social Justice Attitudes and Behaviors

Courtney Noya and Laura Vernon
Faculty Mentor(s): Laura Vernon

Research on the effects of mission trips on social awareness, attitudes, and behaviors towards social justice has been limited. In the current study, we examined whether volunteers going on a weeklong art camp in Guatemala with a non-profit, Athentikos, would show positive changes in their social justice attitudes and behaviors. Current trip participants (n=6) completed questionnaires before and immediately following their trip, whereas trip alumni (n=10) completed questionnaires regarding one previous

trip. We hypothesized that participants will report an increase in social awareness as well as feelings about and plans for social action immediately following the trip. On average, all variables showed some increase from pre-trip to post-trip with confidence increasing significantly and interest in social justice related activities, evaluation of social justice obstacles and support, and empathic awareness showing trends towards statistically significant increase. Overall, trip attendees showed correlations within a number of positive social justice attitudes and behaviors.

Representation of Dominican Identity in *In the Name of Salomé* (2000) by Julia Álvarez

Paulina Oporto Céspedes
Faculty Mentor(s): Carmen Cañete Quesada

This study explores Julia Álvarez's representation of Dominican identity throughout her historical novel *In the Name of Salomé* (2000). This book develops aspects about gender, sexual and ethnic identity through the character of Camila Henriquez, who navigates in two cultural spaces: the Caribbean and the U.S. The Henríquez Ureña Dominican family, considered a national icon within the country, moves in different geographic and cultural spaces, such as Cuba (in the case of Camila), Argentina (in the case of Pedro) and the United States (in both cases). Álvarez surpasses the spatial limits by placing in the center Salomé Henríquez Ureña (recognized as the "poeta nacional"), and her daughter Camila, whose voice is intertwined with that of the author. This transnational approach towards Dominican identity that I find in In the Name of Salomé leads me to question the following: Who is the target audience of Julia's novel?

Demographic Variables and Neuropsychological Performance in Bilingual Adults with Abnormal Aging

Monica Rosselli and Daniella Ospina
Faculty Mentor(s): Monica Rosselli

Understanding the variables that affect Alzheimer's disease progression such as bilingualism is an important step in developing prevention methods. Bilingualism has been identified as a cognitive reserve for healthy aging, specifically in Alzheimer's disease and dementia. However, education level and migration status, which may serve to inhibit dementia, are not as well understood as factors protective of cognitive decline. This study aims to understand the cognitive influence of education level and years of U.S residence (immigrants) in bilingual subjects. Data gathered from participants (65-90 years old) will be analyzed by multivariate statistics to determine the relationship between these factors. Cognitive performance will be measured with a neuropsychological battery, and it is expected that a significant ($p<0.005$) positive relationship will be found. By studying these variables, we may influence the development of better prevention or management strategies for individuals suffering from Alzheimer's disease.

Comparing Mindfulness and Anxiety at Pre-Treatment and 1-Week Follow-up

Zim Ouillette, Yarinez Batista, Brandon Jean-Baptiste, Amina Ali, Laura Vernon and Julie Earles
Faculty Mentor(s): Laura Vernon and Julie Earles

Prior studies on mindfulness treatment have found significant reductions in stress, anxiety and depression following mindfulness treatment. Based on work by

previous HC researchers, we developed a single session treatment including mind wandering meditations and mindfulness tasks. Surveys measuring characteristics such as mindfulness, anxiety, and meditation experience were administered before treatment, immediately after treatment, and one week after treatment. Data analysis will compare the changes that occurred from pre-treatment to the week following treatment on the Five Facet Mindfulness Questionnaire, the Toronto Mindfulness Scale, and the State-Trait Anxiety Inventory-State. The implications of our findings for mindfulness and related treatments will be discussed.

Food Offerings at Faith-based Activities for Children/Youth

Andrea Parra, Sareen Gropper and Andra Opalinski
Faculty Mentor(s): Sareen Gropper and Andra Opalinski

Obesity/overweight affects one-third of U.S. children. While the causes are multifactorial, increased consumption of away-from-home (versus at-home) meals has been shown to contribute to higher calorie and fat intakes. This study's objective was to examine food/beverage provisions at faith-based children/youth events. Direct observation methodology was used for data collection from 10 churches (two to five observations/church) in Southeast FL. Food/beverages served on 31 occasions (26 meals, 5 non-meals) were documented/analyzed for nutrient content (Food Processor software). Main dishes were mostly pizza and pasta-based casseroles (45%) with white bread/rolls (side dish) (27%). Vegetables (non-potato) were served twice, and fruits five times but seldom eaten. Provided beverages were primarily sugar-sweetened (87%). Desserts/snack-foods were served at 55% of events. Foods were generally high in fat and/or sugar and contributed little to needed

fruit / vegetable servings. These findings provide nutritional evidence to initiate dialogues within faith-communities about healthier food provisions at children/youth-related activities.

Synthesis of Organotin Polymers from 2-Ketoglutaric Acid and their Ability to Inhibit the Growth of Human Cancer Cell Lines

Charles E. Carraher, Jr., Dhruvin Patel and Michael R. Roner
Faculty Mentor(s): Charles Carraher

The reaction of organotin dichlorides with the salt of 2-Ketoglutaric acid is rapid forming organotin polyether polymer in a decent low to moderate yield within 15 seconds or less employing the interfacial polycondensation process. The average chain length generally decreases as the alkyl chain length on the organotin increases. Infrared spectroscopy shows bands characteristic of both reactants and the formation of the linkage ester linkage. MALDI MS shows a formation of ion fragments characteristic of 5 to 8 repeat units and good isotopic abundance matches consistent with the presence of the organotin moiety in these ion fragments. NMR is also consistent with the formation of the organotin polyester. The polymers exhibit good inhibition of all of the cancer cell lines tested including two breast and two pancreatic cancer cell lines.

Sex Specific Alterations in Cocaine-Dependent Behaviors in DAT Val559 Mice

Rodeania Peart, Adele Stewart, Keeley Speiss and Randy Blakely

Faculty Mentor(s): Randy Blakely

The Attention Deficit Hyperactivity Disorder (ADHD)-associated mutation in the dopamine transporter DAT Val559 is known to cause elevations in extracellular dopamine in vivo. Given the known male/female bias in ADHD, we sought to identify sex differences in psychostimulant-induced behaviors in DAT Val559 mice. Both male and female mutant mice lack a locomotor response to cocaine; however, the blunted response to amphetamine and methylphenidate observed in males is absent in females. Despite alterations in the behavioral impact of these drugs, cocaine is able to bind and inhibit uptake, but AMPH is less potent in male synaptosomes but not those isolated from females. Further, when the rewarding properties of cocaine were assayed both male and female DAT Val559 mice exhibited cocaine place preference, but DAT Val559 males displayed delayed extinction whereas extinction was accelerated in females. Our data provides new insight into how sex influences the clinical manifestation of DA dysregulation.

Conducting a Biological Inventory of Mammalian Species Using Remote Sensing in the Lomami Basin Rainforest in the Democratic Republic of Congo

Katherine Perez, Kayla Sloan, Daniel Alempijevic and Kate Detwiler

Faculty Mentor(s): Kate Detwiler

The Congo Basin rainforest is the world's second largest, yet one of the least studied tropical forest systems. The use of camera traps in wildlife research has grown significantly over the past few decades, as they are effective in studies of endangered and cryptic mammals. Camera trap surveys targeting a single species produce "bycatch" data, which include a wide range of non-target species. This study used camera trap data from 7 surveys targeting primate species in and around the new Lomami National Park (LNP) in the Democratic Republic of the Congo. A team of FAU undergraduates and Congolese biologists trained in animal identification viewed over 19,000 video captures to develop a reference video library and mammal species list. To date, the team has identified 49 mammal species. The reference video library will be used in species identification training and offers valuable information for conservation efforts in the LNP.

Cell Viability with Granulocyte Stimulating Factor in Models of Alzheimer's Disease

Natalia Perez, Carolyn Coles, Howard Prentice and Jang-Yen Wu

Faculty Mentor(s): Howard Prentice and Jang-Yen Wu

Granulocyte Stimulating Factor (GCSF) is an endogenous neuronal factor that displays neuroprotective effects in vitro

and in vivo. The objective of the study was to test whether GCSF gene therapy would be effective at preventing and diminishing Alzheimer's disease (AD) effects. The first aim was to determine if the survival of amyloid beta (A-beta) exposed PC 12 cells would increase with the implementation of GCSF gene therapy. The second aim was to further evaluate the role of mitochondrial markers, OPA1 and DRP1, in PC 12 protection. The cell culture data expressed GCSF's ability to nearly double the PC 12 cells concentration when exposed to a toxic culture containing A-beta; this culture mimicked the environment a neuron would experience in the brain of individual at a later stage of AD. In the future, studying the mitochondrial markers stated above will identify the exact mechanism and pathway GCSF uses to protect cells.

Eyewitness Memory: Manner of Motion in Perpetrator Identification

Jonathan Perry, Alan Kersten, Julie Earles and Mark Tunick
Faculty Mentor(s): Julie Earles and Mark Tunick

Eyewitness testimony is a common form of evidence in the legal system. People generally identify suspects based on characteristics such as their appearance, clothes, voice, and even writing style. But what if you could identify someone based on the way they move (e.g., the way in which they walk)? To determine if identification based on movement would be practical and legally allowed, I examined the legal implications of identification that pertain to the Fifth Amendment, as well as the appropriate scientific applicability test, based on movement and conducted an experiment to evaluate the reliability of such identifications based on movement.

Retaining and Repurposing Nutrient-Rich Runoff Water

Antoinette Peterson
Faculty Mentor(s): Tsung-Chow Su

If the nutrient-rich water used in agriculture could be retained and repurposed, it would benefit the farmer, as well as nearby bodies of water at risk of runoff pollution. Restructuring the landscape of a crop field into a staircase-like landform, in which crops grow on the outer tiers, would allow excess water to flow into a retention area in the center of the field. This design entails a sloped portion between the tiers to prevent erosion. Plants require a certain amount of water and sunlight, meaning the grade of these intermediate slopes as well as the height of each tier will affect the plant's accessibility to these resources. To optimize this accessibility, research should be conducted on the mechanics of water flowing down a tiered structure and into a sink, and how the soil of which it is constructed might affect the flowing process.

Aqueous Two-Phase System Droplet Generation in Flow-Focusing and Co-Flow Microfluidics Devices

Nicholas Petrozzi, Kevin Algay, Mohammad Mastiani and Myeongsub (Mike) Kim
Faculty Mentor(s): Myeongsub Kim

Aqueous two-phase system (ATPS) droplet generation has demonstrated great potential in biomedical applications such as drug delivery, cell encapsulation and biomaterial synthesis. The purpose of this research is to investigate fundamental mechanisms of ATPS droplet generation in terms of mapping flow regimes and characterizing droplet properties such as droplet size, droplet uniformity and generation frequency. This research was carried out using continuous

and dispersed phases of two incompatible polymers, poly-ethylene glycol (PEG) and dextran (DEX), respectively, through polydimethylsiloxane (PDMS) flow-focusing and co-flow microfluidics chips. The effects of inlet flow rates, inlet pressures, different ATPS and different geometries on the droplet generation mechanisms and droplet properties were studied. Different flow regimes including dripping, jetting and stratified flows were observed at various inlet flow conditions. It was found that the droplet size and generation frequency strongly depend on the inlet flow rate and pressure and ATPS properties.

Using Supervised Machine Learning for Retail Fraud and Anomaly Detection

Alla Polisskaya, Armaan Sobhan, Dudley Jackson and Abraham Lee

Faculty Mentor(s): Erik Lundberg

Retail fraud is a major source of revenue loss, and there is demand for robust non-proprietary fraud and anomaly detection techniques. Using synthetic data-sets generated by PaySim Retail Simulator, we aim to utilize supervised machine learning to develop an anomaly detection technique that accurately identifies fraudulent transactions. The proposed method is a multi-step analysis of each data point using a logistic regression model and the k-Nearest Neighbors algorithm, which will ultimately assign a confidence score to each data point that reflects how likely that point is to be fraudulent. Data points above a set threshold will then be flagged for further investigation. Current results obtained using this approach correctly identify fraudulent data points with over 99 percent accuracy.

Customer Satisfaction: A Closer Look at Airbnb

Allison Pond, Joseph Menniti and Brian Kiley

Faculty Mentor(s): Ravi Behara

Are customers more satisfied using Airbnb for temporary stays or long-term stays? Which locations are Airbnb customers more satisfied staying at? Are customers that spend more money on their stay less satisfied or more than those who do not? Diving into the data from Air BnB's customer feedback, current articles, recent reviews, and other relevant sources, we answer these three questions in depth. These answers show which factors significantly impact overall customer satisfaction for different aspects of the offerings of Airbnb. After walking through how we pinpointed this information, we also will convey how this knowledge can be used to sustain, strengthen, and expand Airbnb's current market share.

Socialization and Eye Location Focus: An Eye Tracking Study Examining Word Association and Eye Gaze Fixation

Adriana Portobanco and Bianka Pupek

Faculty Mentor(s): Tammy Knipp

The theory of socialization is the process of internalizing the norms and ideologies of society. Previous studies have shown that people who are multilingual take longer to comprehend words. The association a person has with certain words may be influenced by universal knowledge or cultural factors. Using an eye-tracking device, the study will analyze how long it takes participants to fixate on a quadrant of a blank video screen when a word is spoken. Participants will range from the ages of 18 to 30 with different ethnic backgrounds. There will be two groups

of words: control words and dependent words. The list of dependent terms will be words that sound the same but have definitions [flour: flower]. The study will be conducted to determine if eye gaze fixation is influenced by cultural backgrounds.

GC-MS Investigation of Fecal Sterols as Indicators of Pollution

Christopher Price
Faculty Mentor(s): J. William Louda

The goal of this experiment is to perfect the method of trimethylsilyl derivatization of fecal steroids Coprostan-3-one and Coprostanol using pyridine & N,O-bis-(trimethylsilyl)-trifluoroacetamide (BSTFA) containing 1% of Trimethylchlorosilane (TMCS). The extraction method for sediments involves Soxhlet extraction followed by saponification. The extraction of water samples will be done by XAD-2 resin or SPE with C18 cartridges and extracted with $MeCl_2$. The primary instrument of this experiment was a Gas Chromatography- Mass spectroscopy (GC-MS). In addition, a Perkin-Elmer Autosystem GC coupled to a Perkin-Elmer TurboMass Gold mass spectrometer was used, with Helium as the carrier gas. Lastly, this experiment required a computer with Turbomass software version 5.4.2. to analyze samples after derivatization. The results of the GC-MS analysis showed that the methods of derivatization were correct.

First Arctic Under-ice Ocean Walking Laboratory (FAU OWL)

Tsung-Chow Su and Hanifah Prescod
Faculty Mentor(s): Tsung-Chow Su

This study is to design an autonomous underwater robotic laboratory for different missions within the Arctic environment. Missions involve locating natural resources such as oil deposits, determining if the area is a feasible location for deployment of sea and air systems for many operations, and to obtain water and mineral samples to study and monitor the changing Arctic environment. Thus far, we demonstrated the feasibility of an autonomous walking robot that can be used to explore the Arctic by walking under a sheet of ice. A key component of this is that by controlling the robot's buoyancy the robot will be capable of walking upside down under a wooden plank. We water proofed a commercially available model robot and carried out the experiment in the Hydrodynamics Laboratory. The preliminary investigation contributes to an internal proposal submitted to I-Sense Internal Fund Program.

Synthesis and Structural Characterization of Organotin Polyethers from Chloramphenicol

Zachary Rabinowitz and Charles Carraher
Faculty Mentor(s): Charles Carraher

Our emphasis is on the creation of polymeric materials that exhibit the ability to inhibit cancer growth including pancreatic cancer. An overall approach is to react an organometallic that itself exhibits biological activity with a Lewis base that also exhibits biological activity hoping for a synergetic effect. Chloramphenicol is an antibiotic employed in the treatment of a number of bacterial infections including

conjunctivitis, cholera, typhoid fever and meningitis. From chloramphenicol, organotin polyethers were synthesized in moderate yield employing the interfacial polycondensation technique. The yield decreases while chain length increases as the size on the alkyltin moiety increases. Infrared spectral results shown the presence of units from both reactants. Bands assigned to the formation of the Sn-O linkage are found and bands characteristic of the R-OH linkage are absent consistent of the organotin polyether formation.

Continuous Cell Sorting by Dielectrophoresis in a Straight Microfluidic Channel

Katrina Ramsamooj, Yuhao Qiang, Jia Liu, Darryl Dieujuste and Sarah Du
Faculty Mentor(s): Sarah Du

Dielectrophoresis (DEP) provides an effective mechanism for cell sorting in microfluidic settings. Many existing methods employ sophisticated microfluidic designs that complicate fabrication processes and procedures. In this experiment, a microfluidics-based cell sorter capable of continuously sorting microparticles in a simple straight channel is presented. The usage of this mechanism facilitates easier fabrication and operation. To generate a DEP force field, an array of indium-tin oxide (ITO) electrodes are embedded on the bottom surface of the straight channel. The field produced in this channel permits particles with different dielectric properties to diverge from their hydrodynamically focused paths. Using COMSOL, particle trajectories at different flow rates and field strengths are predicted by numerical simulation. Separation of red blood cells from polystyrene beads is demonstrated and numerical prediction is validated experimentally. High separation efficiency for both particle types is confirmed by recording

the concentration of amassed particles at their respective collection outlet.

The Effects of Person Centered Coaching on Physical Activity Levels of Older Adults with Osteoarthritis: A Pilot Study

Jean-Joseph Rendel
Faculty Mentor(s): Lenny Chiang-Hanisko

Exercise is a non-pharmacological intervention to alleviate symptoms of osteoarthritis (OA) but many people diagnosed with this disease do not stick to their exercise therapies. Person centered coaching (PCC) is an intervention in which the interventionist pays attention to what "matters most" to pursue understanding and increase the self-knowledge about a health challenge. The purpose of this study is to determine the effectiveness of PCC on the physical activity levels of older adults diagnosed with OA. A true experimental between-groups repeated measures design will be used. A sample of 10 participants diagnosed with OA will be recruited; five will receive the PCC intervention and the rest will receive health education. Physical activity will be measured using daily step counts recorded by Fitbit trackers. Data will be collected over four weeks; baseline and post-intervention. A between-groups repeated measures ANOVA will be used to analyze the data.

Cathelicidin-Related LL-37 Peptide Causing Cellular Differentiation Among Human Leukemia Monocytes Following 1,25(OH)2D3 Treatment

Gabrielle Rind and Samantha Wallshein
Faculty Mentor(s): James Hartmann

The immune system of acute monocytic leukemia patients suffer due to the overproduction of monocytes. The objective of this study was to measure the level of LL-37, a human cathelicidin anti-microbial peptide involved in cellular differentiation, produced after exposure to the active form of vitamin D, 1,25(OH)2D3. The LL-37 peptide is noticeably downregulated in studies involving acute monocytic leukemia patients and so our goal was to restore its presence. In our study using an LL-37 ELISA kit, acute monocytic leukemia cells treated with 1,25(OH)2D3 secrete LL-37 after 24 hours of incubation. After 48 hours of 1,25(OH)2D3 treatment, the LL-37 peptide was internalized for differentiation purposes, resulting in successful differentiation and the return of extracellular LL-37 peptide after 72 hours.

Characterizing the Overactivation of Microglia During Development

Anna Riso, Zhi-Xiang Xu, Baoji Xu and Julie Earles
Faculty Mentor(s): Julie Earles and Baoji Xu

Besides their well-known role as immune cells in the brain, microglia have been shown to actively participate in synaptic pruning during development. Evidence suggests that the overactivation of microglia leads to abnormal synaptic connectivity, and that the resulting hyperconnectivity can cause the development of autism spectrum disorders (ASD), which are characterized by social deficits, repetitive behaviors, and restricted interests. In this project, we used a novel mouse model, a temporally-induced Cre/loxP mouse that overexpresses the eIF4F gene, which regulates mTOR, and we characterize both microglial activation during development and the development of autistic behaviors. Finally, we identify the cytokine(s) primarily responsible for overactivation.

"The Poetic Ground of Physiology": Aesthetic and Biological Unity in British Romantic Poetry

Anna Riso
Faculty Mentor(s): Gavin Sourgen

British Romantic poets adapted the natural-philosophical idea of "organicism", a framework that explained life as a formative, generative power that pervades all organisms and provides unity to the parts that make the whole, as a way to judge art. The uniquely Romantic idea of organicism was defined by Samuel Taylor Coleridge as "unity in multeity" (Theory of Life, 42), which was the aesthetic ideal many poets strove to meet. I will explore how certain works in the Romantic era exemplify various aspects of organic theory, specifically: The Sensitive Plant, by P. B. Shelley, describes a personified organic force; The Botanic Gardens, by Erasmus Darwin, demonstrates how natural philosophers came to view the organization of life as a network, rather than a taxonomic hierarchy; and the ode encapsulates the organic ideal of synthesis. Understanding organic theory helps us to understand the ideal that the Romantics aspired to meet.

Development and Optimization of AlphaScreen Assay for Discovery of Galectin Inhibitors

Yaima Rivero, Forrest FitzGerald and Mare Cudic
Faculty Mentor(s): Mare Cudic

Galectin-1 is a beta-galactoside-binding protein implicated in regulating apoptosis, cell proliferation and cell differentiation. The objective of our research was to develop and optimize an assay format for the discovery of new inhibitors of galectin-1 using AlphaScreen technology in a competitive binding configuration. Our efforts were hampered by the weak binding affinities of galectin-1 for its binding ligands (μM range). Consequently, the AlphaScreen assay could not have been developed at the level that would satisfy the guidelines from the National Chemical Genomics Center. Nevertheless, we have optimized the AlphaScreen assay for galectin-3, another member of galectin family, and screened an FDA approved oncology drug library (n = 101) from the NIH. We identified three possible inhibitors of galectin-3. These compounds showed a positive activity in dose response experiments: bleomycin (IC50 = 25.7 nM), cisplatin (IC50 = 127 nM), and mitoxantrone HCl (IC50 = 662 nM).

Diagnosis of Citrus Greening Disease by qPCR Analysis

Fernando Rocha and Xing-Hai Zhang
Faculty Mentor(s): Xing-Hai Zhang

Citrus greening, also known as Huanglongbing disease, is a phloem restrictive disease that affects orange as well as other citrus trees. The disease is caused by the gram negative bacteria Candidatus Liberibacter asiaticus. The bacteria is transmitted by the Asian psyllid, Diaphorina citri. The bacteria causes the tree to produce small and bitter oranges, the roots shrink and the leaves molt. There is currently no cure for this disease. The best way to manage citrus greening is by removing infected trees, implementing healthy planting material and controlling the psyllid population. Quantitative real time PCR (qPCR) was used to verify whether or not a given orange tree had citrus greening disease. DNA was extracted from leaves from eight trees. A qPCR analysis was performed using a primer with the bacteria DNA. Three trees were successfully diagnosed with citrus greening using this method.

The Impact of Uber on the Taxi Industry

Thereza Rodrigues, Nathaly Glass and Diana Mazo
Faculty Mentor(s): Ravi Behara

The combination of technological automation with a sharing economy business model has disrupted several industries, with Uber being one of the first platforms to create a significant impact on both its competitors and the economy. This is an exploratory research study that will focus on investigating the following: 1. What effect has Uber had on the income of taxi drivers and how does it compare to the income of Uber drivers? 2. How has Uber influenced employment among workers in the taxi industry and the general employment rate of the geographic areas in which it operates? 3. What challenges has Uber created for the taxi business and will they end the industry? Data will be gathered through IBIS World, the Census Bureau, the Bureau of Labor Statistics, and professional research reports, allowing for an in-depth evaluation of Uber's effect on the taxi industry and the economies in which Uber operates.

Is "Plan Mexico" the new "Plan Colombia"? The evolution of U.S. - Latin American security agreements in the fight against transnational criminal organizations

Andres G. Rodriguez
Faculty Mentor(s): Dukhong Kim

Plan Colombia, conceived by U.S. President Bill Clinton and Colombian President Andres Pastrana, was a U.S.-Colombia bilateral security agreement signed into law in 2000. The Merida Initiative is an ongoing U.S. - Mexico bilateral security agreement first ratified by U.S. president George W. Bush in 2008. Although critics of both plans claim that the programs are a fig-leaf for an extension of the U.S. military presence in Latin America, both plans have achieved at least moderate successes in accomplishing their intended goals. Further, there is evidence that lessons learned from Plan Colombia were considered during the initial implementation and extension of the Merida Initiative. Best results are achieved when policy-makers avoid a one-size-fits-all approach to anti-TCO security agreements, and instead draft policies which are responsive to the individual needs and concerns of partner nations and are fully respectful of human rights.

Home Range and Social Interactions of a Gopherus Polyphemus Population in S. Florida

Andrea Rodriguez, Jessica Huffman and Evelyn Frazier
Faculty Mentor(s): Evelyn Frazier

Gopherus polyphemus is a threatened reptile native to the southeastern USA. Previous research suggests the South Florida (SF) climate may allow tortoises to reproduce year-round. Our goal was to evaluate the social interactions and home range of the Florida Atlantic University Preserve (FAUP) tortoise population, with an emphasis on reproductive behavior since minimal information is available. In this study, 12 FAUP tortoises had radio-transmitters attached and game cameras placed at their burrows. We hypothesized, 1) Gopher tortoise home ranges would differ between males and females, and between vegetation types and 2) Intraspecific gopher tortoise interaction frequencies would differ between vegetation types. Movement data has been mapped for 10 tortoises to reveal home ranges differ between sex and vegetation type. Camera data illustrates mounting as the most frequent interaction in the scrub vegetation. This research can be used to improve conservation efforts for the FAUP population.

Tick Tock: The Effects of Time Constraints on Working Memory

Alexandra Rosas-Merritt, Johana Carrillo, Randhikaa Neelavannan and Karly Hauser
Faculty Mentor(s): Julie Earles

There has been a vast amount of research conducted examining the effects of acute stress on working memory (WM) performance. Using the Backwards Digit Span Test (DSB), we examined the effects of time-constraint, a type of acute stressor, on WM performance because of its applicability in educational settings where time-constraints are extremely common and could be impacting performance. Forty-seven participants were randomly assigned to the time constraint group or the control group (with no time-constraint). The results did not indicate a significant difference in their DSB performance. However, the results did indicate that the average post-stress levels of participants in the time constraint condition were significantly higher than those in

the control condition. Further research is recommended to expand our understanding of working memory performance under timed versus non-timed constraints.

Effects of Mindfulness Meditation on Cued-recall Memory for Positive, Negative, and Neutral Stimuli

Alexandra Rosas-Merritt, Johana Carrillo and Grace Halstead
Faculty Mentor(s): Laura Vernon and Julie Earles

This study was designed to evaluate the effects of mindfulness meditation on memory by using a cued-recall memory test on positive, neutral, and negative images. We looked for differences in recall memory performance between the experimental and control condition. We collected our data from undergraduate students. Participants were randomly assigned to two conditions - the experimental condition received a mindfulness meditation, and the control conditions performed a mind-wandering meditation. The experiment for both conditions consisted of presenting a set of positive, negative, and neutral stimuli, followed by a cued-recall test which included a series of visual and cognitive distractors. We used four questionnaires (FFMQ, FMI, MAAS, and TMS) to measure levels of state and trait mindfulness in both conditions. We anticipate the results to indicate if there is a significant effect of mindfulness on memory encoding, performance, and image valence on memory.

Is Multi-factor Productivity Being Properly Measured in this Generation's Service Based Economy?

Robert Roxas, Nathan Vetter and Michael Grogan
Faculty Mentor(s): Ravi Behara

This is an exploratory research study to investigate how accurately multifactor productivity is being measured. From 1970 to 2010 the United States has seen a consistent rise in levels of GDP, in other words, the output of goods and services has increased at a steady rate. This makes us question, if the measure of goods and services produced is increasing, why has multifactor output decreased roughly 12%? It is clear that we have shifted to a more service based economy, but why does nondurable and durable manufacturing see a steady decline while the general economy sees greater output. We will be using data collected from the Bureau of Labor Statistics multifactor productivity research. We will explore the idea that inaccurate service inputs are distorting the measure of general multifactor productivity.

Could USOC and USA Gymnastics Pay the Price in Sex Crimes Case?

Elysha M. Savarese
Faculty Mentor(s): Cheryl Arflin

In December of 2016, USA Gymnastics doctor, Dr. Lawrence Nassar, was arrested for child pornography, amongst other various sex crimes. However, it was not until 2017 and 2018, when over 160 women came forth and told their stories in court of the sexual abuse they faced, committed by Dr. Nassar. While it is no question that Nassar is guilty, the victims of his crimes have pointed their fingers claiming that the USOC and USA gymnastics are just as

guilty. Athlete after athlete reported Nassar's abuse, and both USA Gymnastics and the USOC continued to employ Nassar. The continuous employment of Dr. Nassar, despite the allegations of abuse, falls under negligent retention. Under negligent retention, a tort, USA Gymnastics and the USOC could very much be held civilly liable for the injuries Nassar's victims sustained, while under his "care".

Eigenfaces vs. Fisherfaces: A Comparative Study Using Python

Cara Savoy and Koray Karabina
Faculty Mentor(s): Koray Karabina

In a world of increasing cybersecurity risks, there is a growing need for secure facial recognition software, with its many practical applications in all aspects of life. Two well-known facial recognition algorithms, eigenfaces and fisherfaces, have very similar procedures but also significant differences that make them suited for specific situations. The eigenface method utilizes a procedure referred to as Principal Component Analysis, or PCA, and is known for being a method that is easier (for beginners) to learn. The fisherface method, an enhanced version of the eigenface method, takes into account changes in lighting and facial expression, which allows for lower false acceptance or rejection rates, the main flaw of modern facial recognition algorithms. Using the AT&T database, we demonstrated this decrease in errors and other benefits of using fisherfaces, but because each method has flaws balancing out their benefits, there is no method that is clearly superior.

Promoting Understanding Through Shared Human Connection in Photographs: An Exploratory Study on Stigma Surrounding Homelessness

Emily Schayes
Faculty Mentor(s): Andra Opalinski

Despite the nursing code of ethics, nurses may stigmatize persons experiencing homelessness, and this can impact the quality of care given. Visual art has the potential to create dialogue and promote social change. However, there is little existing research on how art impacts those observing it. The purpose of this descriptive pilot study was to explore nurses' perceptions surrounding homelessness by exposing participants to an artistic representation depicting homelessness and shared human connection. A deductive, qualitative approach was used to examine positive and negative word use in writings completed by graduate nursing students before and after viewing a photographic exhibit. Findings revealed little change in negative word use and an increase in positive word use. These findings suggest that visual art may have the potential to increase empathy and humanization toward the people depicted.

Is Physician-Assisted Suicide Ethical in Non-Terminal Cases?

Arielle Schebovitz
Faculty Mentor(s): Ashley Kennedy

In this thesis, I begin by describing various historical views of physician-assisted suicide. I then review the current laws in the United States and other countries as well as provide a brief overview of religious views on the practice. Next I outline the differences between terminal and non-terminal

cases and discuss the relevant ethical principles that must be considered when evaluating this issue in each type of case. I argue that physician-assisted suicide is ethical in certain instances, in particular those in which a significant loss in quality-of-life has occurred. Finally I suggest guidelines that physicians should follow if a patient requests physician-assisted suicide.

Fraud Detection through Semi-Supervised Machine Learning

Zachary Schuknecht, Gavin Sadecki, Michael Chung and Rumenigue Gustinvil

Faculty Mentor(s): Erik Lundberg and Robert Bridges

As people rely more on online banking systems for their financial needs, new means of attack are constantly introduced by fraud-committing individuals. In order to model and predict fraudulent behavior, sufficient data is necessary. While gaining access to a transaction database has many drawbacks such as cost and privacy concerns regarding customer data, we can run a machine learning model on a simulated transaction data set that imitates real data to allow easy testing and implementation of our model. Using semi-supervised machine learning techniques, such as neural networks, we evaluate fraud detection learning algorithm performance on a synthetic data set. This classroom project is proposed and completed in conjunction with Dr. Robert Bridges of Oak Ridge National Laboratory and Dr. Erik Lundberg.

Developing a Software Tool for Characterization of Cardiac Signals in a 3D Heart Model

Marquita Scott

Faculty Mentor(s): Benhaz Ghoraani

Atrial fibrillation, constitute a cardiac condition in which the electrical conduction pathway within the heart misfires leading to abnormal heart rhythm. Cardiac ablation is the preferred approach, to treat this disease, a catheter is navigated inside the heart through the peripheral vasculature and delivers high radio-frequency energy to the myocardium. This research will involve developing a customized MATLAB program that automates the characterization of such cardiac signals in a 3D heart model. We start with a 3D computer simulated heart model, which will have a catheter place on it using a center and corresponding cardiac signals, then find the corresponding point in 2D. This will enable us to perform cardiac signal analysis in 2D and then transfer the information back to the 3D model. Using this knowledge this is ran through a catheter guidance algorithm that will run until it detects an arrhythmic site in the 3D heart model.

We Had No Eye-dea; The Effect of Enchroma Glasses on the Experience of Art and Color Vision

Vrishan Seepersad, Britton Welliever, Noah Kersten and Julie Earles

Faculty Mentor(s): Julie Earles and Laura Vernon

This study examines how the use of Enchroma glasses affects the color perception of individuals with color blindness. Differences in color vision were measured with the Farnsworth-Munsell 100 Hue Color Vision Test and the

Ishihara test. This study also looks at how the Enchroma glasses change a colorblind individual's viewing experience of color within images such as paintings and photographs. 14 images were selected, and for each image a set of questionnaires were developed focusing on the dynamics of color, aesthetics, and the overall engagement with the image. The participants were individuals of varying ages with color blindness and individuals with normal color vision (matched by their age). The questionnaires were scored and each participant's information was organized on SPSS.

The Syntax of Chaldean Neo-Aramaic

Catrin Seepo
Faculty Mentor(s): Michael Hamilton

This research looks deeply into the syntax of the Alqoshi dialect of the Chaldean Neo-Aramaic language, an endangered language from the Semitic family. Specifically, it addresses grammaticality judgments in regards to word order and presents a model of the language's syntax. In linguistics, word order typically refers to the way in which essential sentence elements such as a subject (S), verb (V), and object (O) are arranged within the sentence itself. The data for this research was primarily collected by audio-recorded elicitation sessions with native speakers of Chaldean. Examination of the data showed that the word order was selectively flexible, for which often SVO order is preferred over VSO (e.g. the sentence 'Mary is sleeping' can be expressed in Chaldean Neo-Aramaic as 'Mary is sleeping', 'is Mary sleeping', or 'is sleeping Mary'). Using the Null-Subject, VP-Internal Subject, and Inner-Aspect hypotheses, a model of the language's syntax was constructed.

Modulation of Fear Memory Extinction by Prelimbic SK Channels

Ronithe Senatus, Claire Rice-Kuchera and Robert W. Stackman
Faculty Mentor(s): Robert Stackman and Claire Rice-Kuchera

Memory encoding is dependent upon synaptic plasticity, triggered by changes in neuronal firing frequency of action potentials. The rate of memory encoding depends on the strength of these actions potential. Small conductance $Ca2+$ activated $K+$ (SK) channels play a role in the duration of action potentials by modulating afterhyperpolarization, or the inhibitory refractory period following the action potential, through the regulation of $K+$ efflux. Blocking SK channels has been shown to facilitate memory encoding in mice. Here, apamin, an SK channel antagonist, was infused into the pre-limbic cortex (PLC) of mice to determine if memory formation during extinction would be enhanced. Extinction is the formation of a new memory to alter the expression of a fearful memory. The results showed no enhancement in extinction trials after administration of apamin in the PLC, suggesting that blocking SK channels does not enhance behaviorally triggered synaptic plasticity necessary to improve fear extinction.

Design and Synthesis of Novel Analogues of Aza-Podophyllotoxin as Tubulin-Polymerization Inhibitors

Charles L. Shearer and Stéphane P. Roche
Faculty Mentor(s): Stéphane Roche

The aim of this study was the synthesis and lead structure selection of some anti-leukemic agents from a library of 4-aza-podophyllotoxin analogues (APTs). To this end, a

comparison of several modified multicomponent reactions with various catalysts was performed to increase yield efficiency in the synthesis of APT-derivatives. Herein we report a scalable, modified multicomponent reaction using a novel aniline catalyst as a more general route to rapidly construct a library of APT analogues. Using these novel reaction conditions, a series of APTs with a thiocarbonyl modification of the lactone ring was synthesized in high yields. Additionally, novel APT derivatives have been crafted with linkers and capped with binding motifs to interact with the GTP-magnesium phosphate site of the alpha-tubulin. The results of these modified multicomponent reactions in tandem with the novel synthetic routes can lead to unexplored APTs with enhanced antimitotic potency and specificity for the development of anticancer drugs.

Investigating the Therapeutic Potential of Aceropterin A, Aceropterin B, Regio, and 13-Desmethly Eleutherobin on DU-145 and LNCaP Cells

Joubin Jebelli, Akeal Sheikh, Allen Reilly, Elizabeth Ramirez, Saheed Oseni, William Trevino, Toluleke Famuyiwa, Paul Scesa, Lyndon West and James Kumi-Diaka

Faculty Mentor(s): James Kumi-Diaka and Lyndon West

Prostate cancer is the second leading cause of cancer death in American men. The marine habitat serves as a prolific source of bio-active secondary metabolites with the potential to serve as drug candidates for cancer therapeutics. In this study, LNCaP and DU-145 cells were cultured and incubated under humidified conditions (37°C and 5% CO_2) until they reached 80% confluency. Treatment of the cells was then performed utilizing varying concentrations (0.01-1000 µM) of the following marine compounds: Aceropterin A, Aceropterin B, Regio, and 13-Desmethyleluthorobin.

After treatment, the cells were incubated for an additional 72 hours and analyzed using the MTT assay to determine the anti-proliferative and growth inhibitory effects of these secondary metabolites. Fluorescence microscopy was then performed to evaluate the treatment-induced mode of cell death. Preliminary data revealed dose-dependent anticancer properties by some of these compounds, which demonstrates the discovery of potential drug leads in prostate cancer treatment.

Novel and Scalable Network Flow Algorithm for Evacuation Route Planning

Connor Shorten and Kwangsoo Yang

Faculty Mentor(s): Kwangsoo Yang

Our research project focuses on developing a novel and scalable, network flow algorithm for evacuation route planning. Hurricane IRMA in Fall 2017 was a reminder that evacuation planning is an essential component of civic emergency preparedness. The problem is challenging because of the large size of network data, the large number of evacuees, and the need to account for capacity constraints in the road network. In this project, we investigate a novel and scalable approach that explicitly exploits the spatial structure of road networks to minimize the computational time for route planning. We design the web-based evacuation route planning systems based on spatial network database systems and GIS server. Additionally, this project is an interdisciplinary study between Computer Scientists and Civil Engineers working in the Adaptive Traffic and Road Networking lab. The following link shows the web-system what we developed: http://spatial.eng.fau.edu/MyServer/

Determination of Lead Concentration in Water using UV-Visible Spectroscopy

Steven Soini

Faculty Mentor(s): Jerome Haky

Determining the concentration of toxic materials in water is a necessity in modern society where thousands of people share the same source of drinking water. Among these toxins is lead, which can cause brain damage and other negative effects. The concentration of lead is usually determined by atomic spectroscopic methods such as inductively-coupled plasma. These methods are expensive and may not be readily available in places where analysis of water samples is required. Ultraviolet-visible (UV-vis) spectroscopy is a much cheaper, and more widespread type of analysis. A method for detection of lead using UV-Vis would enable more agencies to evaluate the quality of water supplies. To accomplish this an existing method was modified to allow the determination of lead content in a water solution using UV-Vis. This method, involves formation and analysis of a lead complex, exhibits similar detection limits and linear response to that of the atomic spectroscopy methods.

Progress toward Synthesis and Characterization of Novel Eglin-Based Matriptase Inhibitor

Lauren Schmidt, Dalia Soueid and Maciej Stawikowski

Faculty Mentor(s): Maciej Stawikowski

Matriptase is a cell-membrane bound protease that participates in epithelial tumor metastasis and considered a potential drug target for breast cancer. It has been found that matriptase overexpression in breast cancer cells is related with higher metastatic potential. Eglin C is a thermally stable, potent inhibitor for proteases from the subtilisin family. We have attempted to modify Eglin C inhibitor structure to make it more synthetically accessible inhibitory scaffold for design of novel matriptase inhibitors. Based on molecular modeling simulation results we have transformed the original 70-residue Eglin C scaffold into novel 26-residue Eglin inhibitor that maintains its stability through two disulfide bonds. Synthetic challenges associated with formation of two disulfide bonds in our inhibitor has prompted us to develop a novel thiophenol-based cysteine sidechain protecting group. We believe that this novel cysteine protecting group can be used orthogonally with other established cysteine protecting groups in solid phase peptide synthesis.

Comparing Artificial Intelligence to Human Intelligence in Financial Markets: Finding the Optimal Way to Invest

Sage Stryczny and Bhanmatie Ramnarine

Faculty Mentor(s): Ravi Behara

The main operation issue we want to address and create an exploratory research study on is based on finding the optimal way to invest. The two types of data we are looking at are human intelligence and artificial intelligence. To better understand the capabilities of AI in financial markets, we will research decision theory and the data around AI. After gathering data from AI, inside and outside of financial markets, we will compare it with the results of human intelligence in financial data. Narrowing down the data, we will focus on ETF's along with a benchmark index for human intelligence and compare it with a few of the top Robo Advisers that use different strategies. The goal is to put artificial and human intelligence on a timeline for financial markets, and to forecast what will be the optimal trading strategy over the next ten years.

Surveying the Morphological Diversity of Elasmobranch Olfactory Organs

Caroline Sullivan, Lindsey Hammond, Nicholas Hesley and Tricia Meredith

Faculty Mentor(s): Tricia Meredith

Elasmobranchs (sharks, skates, and rays) are known to possess a highly acute olfactory sense. They exhibit remarkable interspecific diversity in their olfactory organ morphology, though the reason has yet to be discovered. This study aimed to characterize the morphological variation present in elasmobranch olfactory rosettes in a diverse group of species, representing 11 different families. Preliminary results show significant differences in the olfactory organ length, width, depth, interlamellar distance, olfactory organ volume, central raphe width, lamellar thickness, and number of lamellae among elasmobranch families. Species with a smaller interlamellar distance possess more lamellae and a greater fineness ratio than species with a greater interlameller distance, fewer lamellae, and a smaller fineness ratio. Olfactory anatomy directly impacts the flow of odors through the nose, and so our results will provide insight how morphological variation inside elasmobranch noses affects their sense of smell.

Microsatellite Loci Analysis of Gopher Tortoise (Gopherus polyphemus) Populations in Southeast Florida

Michael Iacobelli, Mallory Theurer, Bryan Neal, Soriah Soler, Evelyn Frazier and David Binninger

Faculty Mentor(s): Evelyn Frazier and David Binninger

At least eight distinct genetic assemblages of gopher tortoise (Gopherus polyphemus) populations exist throughout Florida. Nine highly variable microsatellite loci were identified in gopher tortoises. These microsatellite loci were utilized to assess the genetic diversity of populations in these regions. Unique alleles were found in several of the populations. The purpose of this research is to utilize the established microsatellite loci to identify the genetic structure of four populations in southeast Florida. Microsatellite alleles from different gopher tortoise populations have been generated using genomic DNA isolated from blood samples and polymerase chain reaction (PCR). Further microsatellite fragment analysis may provide useful data for developing more regulated management programs of gopher tortoise populations. Currently, little to no consideration is given to the genetic uniqueness of tortoise populations during translocations of individuals. Proper management would maintain distinct assemblages and limit translocations to sustain the genetic integrity of this threatened species.

Variation in Sleep and Metabolic Function is Associated with Latitude and Average Temperature in Drosophila Melanogaster

Joshua Torres, Ariana Kerbs, Valerie Rozzo, Elizabeth Brown and Alex C. Keene

Faculty Mentor(s): Alex Keene

Neural regulation of sleep, appetite, and energy homeostasis is critical to an animal's survival and is under stringent evolutionary pressure. Species display a remarkable diversity in sleep and metabolic phenotypes, yet little is known about how natural variation contributes to sleep and metabolic differences within an individual species. The fruit fly, Drosophila melanogaster, is a powerful model for investigating the genetic regulation of sleep. Screening of inbred fly lines has led to the identification of novel genetic regulators of sleep. Nevertheless, little is known about the contributions of naturally occurring genetic differences to sleep and metabolic phenotypes as well as their relationship with geographic and/or environmental conditions. Here, we have quantified sleep and starvation resistance in 24 D. melanogaster lines collected from diverse geographic localities. These studies reveal remarkable diversity in sleep and metabolic phenotypes, some of which are associated with latitude and average annual temperature.

Activating the Appeal of Voice Activated Digital Assistant: Insights from Advertising Research and Persuasion Theory

Maria Trajano, Rachel Cumming, Sarah LaFemina, Samantha Campana and Katelynn Richter

Faculty Mentor(s): Allen Smith

The largest, most tech-savvy generation, Millennials, are the most attractive market for Amazon Echo, a voice-activated digital assistant. To capture market potential, the systematic research process profiled Millennials using 1) secondary research and descriptive statistics, 2) focus group interviews, and 3) survey research. The findings, once juxtaposed with persuasion theory, revealed four persuasive advertising appeals. They were rational claims, brand image/personality association, feelings-based appeal, and promise of social rewards. Each appeal became independent variables in a pretest experiment of advertising effectiveness to determine which appeal was most likely to be persuasive. Conforming to the Facets Model of Persuasive Effects and the DAGMAR Model, the dependent variables were perception, cognition, emotion, association, persuasion, and behavior. Creative thinking techniques, layout techniques, and principles of copywriting were used to execute the magazine advertisements. The investigation used consent forms and complied with the FAU Code of Academic Integrity to conform with ethical research conduct.

Society's Influence on Rape Culture

Annalisa Tran
Faculty Mentor(s): Gina Carreño-Lukasik

In today's society, the investigations of the causes and patterns of rape incidents tend to focus on the actions or qualities of the individual victim or perpetrator. This literature review will analyze how society as a whole plays a role in positively or negatively influencing rape culture. Currently, society's stereotypes and attitudes about rape negatively influence rape culture by promoting rape myths that put blame on the victim or excuse perpetrators for their actions. The media also plays a significant role by promoting the romanticization of rape in pornography or the implicitly encouraging the action of rape in mainstream songs, books, etc. However, society has also influenced rape culture positively by creating social movements that raise awareness about rape and the solutions to combat it.

Being Sort of Muslim: An Auto-ethnographical Account of Living in the 'In Between'

Natasa Trisha
Faculty Mentor(s): Gina Carreño-Lukasik

It is 2018 and I have been living in the United States as a second- generation Muslim American for about sixteen years. Post- 9/11 America is a difficult place to grow up Muslim but it has fostered a new space for second-gen- eration Muslim Americans to negotiate and renegotiate their identity. A space that is neither fully American nor fully Muslim but was carved out for us, by us. Yet little is known about the experience of living "within the hyphen". Recently, however, a glimpse into the lives of young Muslim women was presented in Bar Bahar (In Between)

in 2016. Despite the fact that the women were living in Tel Aviv, I resonated with their struggle of constructing their identities under the control of similar social institutions. I will use both content analysis and an auto-ethnographical approach to explore the construction of the identity that lives "in between".

Quantification and Analysis of Cancer-Cell Derived Exosomes

Alexandra Urdaneta, Vijaya Iragavarapu-Charyulu and Patricia Keating
Faculty Mentor(s): Vijaya Iragavarapu-Charyulu and Patricia Keating

Over 90% of cancer-related deaths are due to metastasis. Tumor-cell derived extracellular vesicles or exosomes are thought to contribute to metastasis. However, there is no standardized method to isolate exosomes. We hypothe- size that polymer-based kits, in particular ExoQuick-TC (EQTC), may be better for isolating exosomes when compared to ultracentrifugation. In this study, we used three different methods to isolate exosomes from 4T1 murine mammary tumor cells. Samples isolated through ultracentrifugation (UC), EQTC, and Total Exosome Isolation Reagent (TEIR) were analyzed to assess quantity and quality of exosomes by nanoparticle tracking analysis (NTA) and flow cytometry (FC). Using NTA, we found that each method yielded samples with varying average concentration and particle size. FC analysis revealed UC to be the most effective method in yielding a high number of verified exosomes. Standardizing the isolation method and assessment will help in determining the role of exosomes in cancer metastasis.

Dimension Perception

Ian Pitters, Sebastian Vergara and Tristan White
Faculty Mentor(s): Tammy Knipp

Three-dimensional computer-generated imagery (CGI) has been the animation industry standard for about two decades. There has been increased research in non-photorealistic rendering (NPR) techniques by industry leaders such as Walt Disney Animation Studios. NPR is computer-generated imagery that is augmented to replicate a distinct art style that deviates from what you would expect to see in a 3D rendering. In this study, subjects are tasked to determine whether a series of animated clips are two-dimensional or three-dimensional. Student participants are pooled into two groups, based on visual art majors and non-visual art majors. Using eye-tracking software, the data will observe if an individual uses visual cues to draw distinctions between two-dimensional and three-dimensional forms, along with how their viewing patterns change for each particular animation as the line between 2D and 3D gets blurred.

Seasonal Abundance and Spatial Distribution of Blacktip Sharks (Carcharhinus Limbatus) in Southeast Florida

Jordan Waldron and Stephen Kajiura
Faculty Mentor(s): Stephen Kajiura

Southeast Florida's marine ecosystem experiences an influx of blacktip sharks (Carcharhinus limbatus) in the winter due to a large-scale annual migration. As they migrate, blacktips form dense aggregations along Florida's coastline. Although these large aggregations of sharks attract significant public interest, surprisingly little empirical data have been collected on the shark abundance and the factors driving their migration. Aerial surveys of coastal waters from Boca Raton-Jupiter (2011-2014), and Miami-Jupiter (2015-2018) were analyzed to determine shark abundance, and shark densities within inlet-bound sections of the coastline. Water temperature was also recorded to determine correlations with shark abundance. Results indicate that the highest average shark densities were in Palm Beach County in February-March, when water temperature was at its lowest. Water temperature was a significant factor in shark abundance, raising the concern that warming oceans might shift the migration towards higher latitudes, causing ecological imbalances along the US Eastern seaboard.

Use of Role-Based Access Control and Multilevel on basic devices

Anak Wannaphaschaiyong
Faculty Mentor(s): Eduardo Fernandez

IoT has emerged as one the most promising future technologies and has already found applications in various domains. The control of the millions of devices connected to the Internet requires a combination of cloud and fog computing. Fog computing implies smaller and simpler clouds near the devices they intend to control. We are studying the security issues introduced by the combination of clouds, fog systems, and IoT devices. These may be due to inconsistencies in their security models as well by the continuous evolution of the IoT devices. Models such as Role-Based Access Control and Multilevel can be combined to provide some control for devices that may not have advanced security mechanisms as is the case with most IoT devices.

General Education Pre-service Teachers Familiarity and Observational Experience of Effective Practices that Support Students with Disabilities in Inclusive Classrooms

Aaron Weinstein, Kaley Robinson, Jessica Greenwood and Lisa Finnegan
Faculty Mentor(s): Lisa Finnegan

The goal of this project was completed using a survey to gain insight into general education pre-service teachers' familiarity and observation opportunities of inclusive education practices in action within their course observation hours' requirement. The researchers hypothesize that general education pre-service teachers do not have many opportunities to observe inclusive practices in action in the general education classroom during their observation requirement leaving a gap in understanding their role as inclusive general education classroom teachers as they support students with disabilities. The survey focuses on five selected instructional strategies or interventions to support learners with disabilities in the general education classroom. The five instructional practices are: response to intervention, differentiated instruction, social skills instruction, accommodations, and practice of self-determination.

Block vs. Text Coding Games: Comparing 4th Grade Students' Confidence, Interest, and Skill in Computer Science

Janet Weinthal and Tricia Meredith
Faculty Mentor(s): Tricia Meredith

In a world dominated by computers, the need for effective computer science education has grown. Educators, parents, and researchers are engaged in a debate over the efficacy of block-based (dragging and dropping code blocks) versus text-based code (typing out syntax) to teach coding to K-12 students. Our study compares the effects of block versus text based coding games on 45 4th grade students' confidence, interest, and ability in computer science. We developed and validated a survey to measure confidence and interest and an assessment to measure skill in computer science with 43 5th grade students. The validated survey and assessment were then administered to three groups of 4th grade students. Each group has recently started approximately eight one-hour sessions of computer science education after which the post-survey and assessment will be given. The results of this study may aid educators and parents in choosing the best curriculum for their students.

Uncovering Areas of Improvement for Human/Humanoid Interaction Using Eye Tracking Software

Danielle Weiss, Eliana Roman, Melissa Pagan and Tammy Knipp
Faculty Mentor(s): Tammy Knipp

Ray Birdwhistell's theory of Kinesics states we humans look to certain facial features for non-verbal cues. This research will explore what regions of the face subjects look at the most for non-verbal cues when communicating. We hypothesize that unlike with normal human to human communication, when a human subject is presented with a robotic counterpart, the subject's gaze will focus more on the area(s) that seem less human or unrealistic. Participants will be shown videos of humans speaking which will act as the control. Then will then be shown videos of robots speaking, and the resulting data will be analyzed. All subjects will be shown the same muted videos in order to remove any unneeded variables and focus solely on the

visual aspects. Afterwards, subjects will be given a short questionnaire to determine how each video made them feel, which aspects of the robots they felt needed the most improvement.

Everything that's Black and White

Britton Welliever, Vrishan Seepersad, Noah Kersten and Julie Earles

Faculty Mentor(s): Julie Earles and Laura Vernon

People who are colorblind may be better at search tasks than people with normal color vision. In particular, individuals with colorblindness might be better at black and white image search tasks due to the smaller spectrum of color they see. Adults participated in a black and white image search task. This task measured how quickly a participant could locate a hidden image within a black and white photo. A 30 second time limit was set for each image to test the speed of each participant. It was hypothesized that people with color blindness would find the hidden image faster than people without color blindness.

The Home Mortgage Interest Deduction: Should Reform Mean Fear?

Kira Wolak
Faculty Mentor(s): Cheryl Arflin

This project will examine the controversial home mortgage interest deduction (MID) detailed in 26 U.S. Code § 163 and investigate the new benefits and detriments posed to future homeowners by the modifications made in the 2017 Tax Reform passed by Congress. Specifically, the project will focus on whether or not the original MID truly benefited low- to moderate-income families and contributed to the rise of homeownership as it is lauded to have done, or whether the nation's tax dollars were simply returning to the hands of the upper-class due to their higher value mortgages. Furthermore, this project will analyze how the new clauses attached to the MID may affect not only homeownership rates, but which household income-levels benefit most.

Student's Reaction to Failure and Test Anxiety through the usage of an Eye-Tracking Device: How much does Stress Serve as a Negative Stimuli in School?

Audra Birt, Tammy Knipp, Shemar Maurice, Miguel Suarez-Garcia and Molly Wooten
Faculty Mentor(s): Tammy Knipp

Robert K. Merton's theory of the self-fulfilling prophecy predicts that those who perceive oneself to fail or have a false definition of a situation will perform according to their false perception. This research explores the self-fulfilling theory in the context of academia. We hypothesize students with a higher GPA will demonstrate longer fixations and/or will reexamine test questions. There will be two groups of college students where each group will be given the same test. The first group will be informed they failed the test while the second group will take the test without interruptions. With the use of the GazePoint eye-tracking device, data will be collected on the duration, fixations, and rereading for each test question for both groups.

Peripheral Vision Acuity in Video-Gamers vs Non-Video-Gamers

George Wyche, Dylan, Frehner, Jovanni Gallego and Melissa Turco

Faculty Mentor(s): Tammy Knipp

Does the act of playing video games enhance peripheral acuity? As recent studies have proven the positive effects of video games on the legally blind, will video games have a greater effect on the eyesight of individuals with normal to perfect vision? Avid gamers are predicted to have enhanced peripheral vision compared to those who do not play video games often. Additional measures will be recorded as it pertains to response time, elements of detail, recognition of subliminal objects, and mental imagery. Realistically determine via data gathered by the Gazepoint Eye-Tracking software, whether or not video games affect peripheral acuity. Determine whether video games affect the recognition of subliminal cues within an image. Determine whether video games affect a user's attention to detail and response time.

Development of a Rapid Assay for ZIKV Detection

Sandhya Sharma, Sydney Yu and Waseem Asghar

Faculty Mentor(s): Waseem Asghar

Zika virus (ZIKV) infection, caused by a mosquito-transmitted flavivirus, has been closely associated with neurological defects in newborns with infected mothers. However, since infected individuals typically have no or only flu-like symptoms, ZIKV can be mistaken for other arboviruses, including Dengue and Chikungunya. For these reasons, detection methods that can distinguish between viruses are necessary to protect public health. Polymerase chain reaction (PCR) is considered the current gold standard of amplification methods, as it is highly specific and sensitive. However, PCR requires thermocycling, trained technicians, and expensive equipment. Conversely, loop-mediated isothermal amplification (LAMP) requires minimal equipment, allowing use in resource-limited settings. After aligning 50 ZIKV sequences to find the most conserved region, LAMP primers were designed and tested for accurate target amplification. Moving forward, a successful assay can be utilized in a point-of-care Zika detection device that produces an easy-to-interpret colorimetric signal visible to the naked eye in 30 minutes.

Proper Use of Crosswalks on the FAU Boca Raton Campus

Malak Ahnich, Lauren Dunn, Sagan Potenza, Emily Whu and Yasmine Zerrouki

Faculty Mentor(s): Tricia Meredith

The purpose of our study was to observe and characterize pedestrians' behavior in nearby crosswalks on the FAU Boca Raton campus and quantify jaywalking rates. We ultimately found that jaywalking happened more often than not. The characteristics that were positively correlated with the jaywalking rate were the use of relatively faster forms of transportation, such as bicycles or skateboards, rather than distractions or location. Although no statistical significance was found, the data shows a remarkably high frequency of jaywalking done by pedestrians while urgently and distractedly crossing the road. Overall, our results show that this is a necessary area of future research in order to protect the safety of pedestrians in FAU crosswalks.

Quality vs Quantity

Kyle Ziegler and Derream Auguste

Faculty Mentor(s): Monica Escaleras and Eric Levy

As the demand for food increases, food makers must increase production; however, there comes a point when one must consider what is sacrificed for such an increase in mass production of food. Food is now evolving, preferences are varying from natural tastes to unnatural alterations due to chemical additives. We felt more research is needed to understand what motivates consumers to purchase varying types of foods. To understand consumers' views on food preferences, we developed an online survey with fifteen questions and collected responses from 498 people. Our findings show a statistically significant difference between people of different gender, age, and regions regarding motivations to purchase food and food labeling. With this knowledge, we may better understand what people of different demographics feel regarding the current state of food wellness, and why they might prefer certain actions over others due to their diverse backgrounds.