Thesis Library
2020-2021 Abstracts

1. Alonzo, Perla
   Thesis: A Descriptive Study of Current Veteran-Centered Curriculum and its Significance in Nursing Education
   Faculty: Ali R. Tayyeb

2. Alvarez, Lindee
   Thesis: Music-Listening Habits of College Students: Preventative Measures Needed to Decrease the Likelihood of Developing Music-Induced Hearing Loss
   Faculty: Peter Ivory

3. Baker, Rory
   Thesis: Spatial-Temporal Water Quality Study of Nitrates in Ballona Lagoon, California
   Faculty: Hassan Rezaie Boroon

4. Baluyot-Reyes, Nina
   Thesis: Novel Beta-Cyclodextrin Incorporated Mucoadhesive Hydrogel Drug Delivery Platform for Controlled and Sustained anti-STD/STI Drug Delivery
   Faculty: Yong Ba

5. Ben Ghorbal, Sarra
   Thesis: Muslim Immigrant Women's Intersectional Experiences Integrating into US Society
   Faculty: Katie Dingeman

6. Bhattarai, Sagun
   Thesis: Meeting the Mining Industry’s Water Demand
   Faculty: John Shamma

7. Ceballos Tellechea, Yadira
   Thesis: El Pueblo Unido: Grassroots Organizations Rise Up Against the Settler Colonial Projects of Gentrification and Policing in El Sereno
   Faculty: Alejandro Covarrubias

8. Charathram, Abhiravi
   Thesis: Depressive Realism in the Speed Dating Paradigm
   Faculty: Karen Wu

9. Chawla, Pavit Singh
   Thesis: MoonTrek Telescope
   Faculty: Weronica Cwir

10. Cheng, Eileen
    Thesis: Critical Review of the Chemistry of Singlet Oxygen with Phenolic Antioxidants
    Faculty: Matthias Selke

11. Chui, Charmaine
    Thesis: Assessing individual differences in application: Are some people more likely to make false identifications?
    Faculty: Mitchell Eisen

12. Connally, JohannaKate
    Thesis: The Death of Bipartisanship
    Faculty: Frank Cardenas

13. Corales, Stephanie
    Thesis: A Sociological Analysis of Consumerism, Minimalism, and Subjective Happiness
    Faculty: Katie Dingeman

14. Cruz, Samantha
    Thesis: The Role of Copper and Amyloid-Beta in the Neuropathology of Alzheimer's Disease
    Faculty: Yixian Wang

15. Deo, Natalie
    Thesis: ASME University Rover Challenge
    Faculty: He Shen, Michael Thorburn

16. DiRegolo, Rachael
    Thesis: Flight Control Algorithm For The Cal State LA Autonomous Mini-Drones Competition
    Faculty: Ofelia Quintero, Michael Thorburn

17. Dueñas, Lauren
    Thesis: Capillary Tube and Thread-Based Electrodes for the Detection of Glucose and Acetylthiocholine
    Faculty: Frank A. Gomez

18. Frank, Jennifer
    Thesis: The End of Cervical Cancer
    Faculty: Pamela Payne

19. Gan, Lu
    Thesis: Viridis: Business Plan
    Faculty: Veena Prabhu

20. Guardado, Ana
    Thesis: Sidewalk Slope Monitoring System, 2020-2021
    Faculty: Jungsoo Lim

21. Horii, Maya
    Thesis: Space Debris Deorbiter
    Faculty: Ted Nye

22. Jessie, Camille
    Thesis: Take the 210 East: The Only Home I Know
    Faculty: Joey Morris

23. Khanooki, Hatya
    Thesis: The Relationship Between Color Preference, The Concept of Freedom, and Mood
    Faculty: Gaithri A. Fernando

24. Laguna, Abigail
    Thesis: Thermal Analysis of Long-Endurance UAV
    Faculty: Michael Thorburn

25. Le, Tam
    Thesis: Investigating the Role of RBP2 for Circadian Rhythms In S. Elongatus
    Faculty: Susan Cohen

26. Lillis, John
    Thesis: An Examination and Application of John Rawls's A Theory of Justice
    Faculty: Jay Conway

27. Martin, Tom
    Thesis: Free Speech Issues For Public Employees
    Faculty: Martin Adamian

28. Mesa, Kaitlyn
    Thesis: Axial Muscle Development in the African House Snake (Boaedon capensis)
    Faculty: Raul Diaz Jr.

29. Metzler-Winslow, Charles
    Thesis: Evaluating a Smeared Model for Charge for Use in Classical Force Fields
    Faculty: Paul Nerenberg

30. Misa, Kayla
    Thesis: Crisis Management Communication in Higher Education: A Content Analysis of Emails sent by Cal State L.A's Administration Amidst the Crisis of the COVID-19 Pandemic
    Faculty: Nina O' Brien

31. Monsour, Charlotte
    Thesis: Singlet Oxygen: Quenching in the Presence of the Cation-π Interaction and Reactivity with Resveratrol Derivatives
    Faculty: Matthias Selke

32. Mouton, Annaell
    Thesis: On the Road: Homo Erectus' Journey
    Faculty: Michele Bleuze

33. Nasareldeen, Niyat
    Thesis: Motives and Factors That Influenced Consumer Buying Behavior Online Shopping During the COVID-19 Pandemic
    Faculty: Derrick Waters

34. Parra, Matiana
    Thesis: Policing and Surveillance in the United States and the Effects on Racial Inequality
    Faculty: Jeremy Busacca

35. Parres-Gold, Jacob
    Thesis: Real-time Characterization of Neuronal Membrane Disruption by Aggregates of Alpha-Synuclein
    Faculty: Yixian Wang

36. Percival, George
    Thesis: Coloring Distance Graphs
    Faculty: Sam Chyau

37. Perez Garcia, Jesus
    Thesis: Student Self-Efficacy and Grit: Links with GPA and Mental Health Outcomes
    Faculty: Heidi Riggio

38. Quon, Joyce
    Thesis: Density and Kappa Value Of Integral Sequences With Missing Separations
    Faculty: Daphne Liu

39. Rivers, McKenna
    Thesis: Creating Eco-Conscious Colleges: An Analysis of Food and Campus Sustainability Across the CSU System
    Faculty: Kathryn Hillstrom

40. Rosas, Gabriela
    Thesis: Examining the Need for Lesbian, Gay, and Bisexual Representation in Intimate Partner Violence: A Systematic Literature Review
    Faculty: Daisy Camacho-Thompson

41. Siedahmed, Abubakir
    Thesis: COVID-19 DATA VISUALIZATION AND ANALYSIS (CDVA)
    Faculty: Navid Amini

42. Taing, Kyle
    Thesis: Site-Directed Spin Labeling EPR Technique for Investigating the Dynamics of Antifreeze Proteins in Interaction with Ice and Water
    Faculty: Yong Ba

43. Tapia Torres, Lessly
    Thesis: Anatomy and Locomotion During Avian Development
    Faculty: Ashley Heers

44. Thai, Justin
    Thesis: Designing and Manufacturing a Membrane Inflation and Strain Measurement Device for the Evaluation of Synthetic Tissues for Biomedical Engineering Applications
    Faculty: Mathias Brieu

45. Ton-That, Ares
    Thesis: PDF Web Viewer
    Faculty: Keenan Knaur

46. Tran, Amanda
    Thesis: Investigating the Role of Rbp2 and the Conservation of RNA binding proteins in Cyanobacteria
    Faculty: Susan Cohen

47. Tran, Britney
    Thesis: Front Drivetrain of a 4WD Baja Vehicle
    Faculty: Christopher Bachman

48. Weatherell, Thomas
    Thesis: Want2Remember Mobile App Development Project
    Faculty: Zilong Ye

49. Weir, Erin
    Thesis: A Study on Which Socio-Economic Factors have the Most Impact on the Distribution of Wealth in the U.S. on a State Level Leading up to Covid-19
    Faculty: Marco Del Angel

50. Weissman, Alec
    Thesis: On the Hot Corner: Local Climate's Effect on Team Performance in Major League Baseball
    Faculty: Xiaohan Zhang

51. Zamora, Mayra
    Thesis: Mental Health and Polycystic Ovary Syndrome (PCOS): Examining Information Shared to Women of Color by Health Care Providers
    Faculty: Melanie Sabado-Liwag

ABSTRACT

A Descriptive Study of Current Veteran-Centered Curriculum and its Significance in Nursing Education

By

Perla Danielle Alonzo

Veterans deal with unique health issues related to their war era and military background. Currently, there are 18 million veterans living within the United States. It is well-recorded that the vast majority of veterans (12 million) visit civilian hospitals for their healthcare needs. In 2012, the Joining Forces project was enacted to support nursing providers in becoming more familiar with military culture and conditions specific to the veteran population. This descriptive study aims to address the need for veteran-centered education in nursing curricula. Using nursing journals, peer-reviewed articles, and retrospective evaluations, this study offers culturally relevant information aimed at increasing awareness for this need. To answer the research question, various web pages were analyzed to identify how many, of the top 100 schools and colleges of nursing in the country, incorporated veteran-focused information in their nursing curricula. The results revealed that very few schools have Joined Forces or integrated veteran-centered education into their programs. This suggests that there is a need for education reform, increased awareness of veteran needs, education about military culture, understanding of veteran health concerns, and knowledge of proper assessment strategies to better prepare future nurses in the U.S. to meet the unique needs of our veteran population.

ABSTRACT

Music listening habits of college students: preventative measures needed to decrease the likelihood of developing music-induced hearing loss

By

Lindee Angeline Alvarez

This study revealed the music listening habits of 90 college students and examined the potential risks of unsafe listening habits. Participants completed a ten-question survey about their music listening habits. The responses from the survey were then analyzed to conclude whether or not the college students were practicing safe recreational listening. Results indicated that the majority of participants listened to their music at half volume or less, seven days per week. Most participants recorded using earbuds and their phones to listen to music. In conjunction with the survey responses, previous research was utilized to create safe listening strategies for avid listeners of music. It was determined that two of the most important strategies are, first and foremost, abiding by the allowable amount of exposure time based on the decibel level. Second, always wearing earplugs when attending any loud event, defined as a concert, club, or other settings where music played at a high volume. Finally, it was concluded that across college campuses, hearing conservation programs would serve as a valuable resource to mitigate the likelihood of developing music-induced hearing loss.

ABSTRACT

Spatial-Temporal Water Quality Study of Nitrates in Ballona Lagoon, California

By

Rory Baker

Approximately two-thirds of all of the estuaries and coastal zones in the contiguous United States are moderately to severely degraded due to nutrient pollution. Ballona Lagoon in Marina Del Rey, California is a coastal water body which experiences degradation from nutrient pollution, and it is a part of the larger Santa Monica Bay watershed which lacks data on smaller lagoon systems such as Ballona Lagoon. In this study, water samples were collected for analysis of the nutrient nitrate (NO3-) from Ballona Lagoon during the summer and winter at high tide and low tide. Concentrations were interpreted qualitatively by finding spatial and temporal patterns of nitrates in the lagoon. Peak nitrate concentrations were found to be higher during summer months than during winter months, and peak concentrations were found to be higher at high tide and lower at low tide. The results also showed that during high tide, marine water inundates the lagoon and concentrates the nitrates back inland. Conversely, the results showed that at low tide, the lagoon water flows out to the ocean, and nitrate concentrations are more evenly distributed throughout the lagoon. These results have implications for the nutrient pollution management of the lagoon as well as for the entire watershed. The major limitation on this study was the limited water sampling, and therefore future research should routinely conduct more water sampling over a longer period of time to confirm these results, as well as test stable nitrogen isotopes to determine the source of the nitrate pollution.

ABSTRACT

Novel Beta-Cyclodextrin Incorporated Mucoadhesive Hydrogel Drug Delivery Platform for Controlled and Sustained anti-STD/STI Drug Delivery

By

Nina Antonette Baluyot-Reyes

This thesis is intended to guide future students throughout prospective research in the development of drug inclusion complex infused Rf-PEG-Rf/Rf-PEG-PAA hydrogels. The procedures outlined were originally for a Caltech SURF research proposal, which was accepted by Dr. Julia Kornfield at Caltech. The protocols were intended for execution during the 2020 SURF period but did not occur due to the COVID-19 pandemic.

ABSTRACT

Muslim Women Intersectional Experiences Integrating in the U.S.

By

Sarra Ben Ghorbal

This research attempts to capture the intersectionality of gender, race, class, and religion in shaping the immigration experience, including its short to middle-term outcomes. The paper examines the complexity of interactions between various variables and their retro-amplifying, multidimensional effects on empowerment, the integration process by which migrants become a part of their new community, and the upward or downward movement of one social class or economic level to another of Muslim women immigrants in the U.S. Moreover, the study analyzes the institutional structures supporting and/or impeding the integration of Muslim women immigrants. To reveal factors influencing differential outcomes, thirty-two Muslim immigrant women participated in in-depth semi-structured interviews and an online demographic survey. The study focuses on immigration experiences that lasted from one to twenty years. The paper centers the voices of the underrepresented Muslim women and focuses on the personal interpretations of their socioeconomic status over time as it relates to their personal empowerment and disempowerment on one hand and their reception by the American society on the other hand. The study contributes to the growing body of literature about gender and immigration, while helping to inform policymakers about important factors shaping immigrants' experiences, particularly for Muslim women at this historic moment.

ABSTRACT

Meeting the Mining Industry's Water Demand

By

Sagun Bhattarai

This paper show cases the study and the research done to complete the senior design project by a civil engineering group. The scope of this project is to solve the insufficient water supply that the mining conglomerates are facing. They require water to spread in the ground during and their mining operations so as not to let dust fly in the air. Doing this not only prevents air pollution but is also a state/ local requirement. The water doesn't need to be a potable water. Buying water is expensive since mostly potable water is only available. So, to solve this problem, the owners of the mining companies are looking to build a dam in the Cajalco Creek and store the rainwater in the reservoir so as to use in their mining operations. This paper goes to show what constraints this project will come across to build this structure. Though going over all the list on technical and non-technical constraints and the ways to overcome it, it will be focus more on the environmental constraints.

ABSTRACT

El Pueblo Unido: Grassroots Organizations Rise Up Against the Settler Colonial Projects of Gentrification and Policing in El Sereno

By

Yadira Inez Ceballos Tellechea

To white in-movers with human capital, gentrification revitalizes and beautifies a marginalized working-class neighborhood. This project will investigate how gentrification results in the displacement and hyper policing of marginalized bodies. The physical, emotional, and continued violence of gentrification, such as that catalyzed by outside police forces, is not discussed as often as displacement. While displacement is not necessarily framed non-violently, it is framed dispassionately and in such a way that it eclipses vivid violence enacted by police forces sent into communities to effectively protect white in-movers from their discriminatory and imagined fear. In this project, I argue that organizations and autonomous spaces such as Reclaim Our Homes and Eastside Café critically intervene in gentrifying and policing efforts in these neighborhoods. Understanding gentrification as a whiteness project (Guzmán 2018), the postindustrial policing hypothesis (Laniyonu 2018), and settler colonialism (Hernandez 2017), I will investigate how the presence of in-movers and the rise in revitalization in these neighborhoods results in some of urban policing's most aggressive and controversial tactics.

ABSTRACT

Depressive Realism in the Speed Dating Paradigm

By

Abhiravi Charathram

Depression is a widespread phenomenon in the United States. This study aimed to evaluate the relationship between depressive symptoms and accuracy of second date offers. The researchers hypothesized that depressive realism will be observed in speed-dating, such that participants who are more depressed are more accurate about the proportion of date offers they receive. Participants were recruited from a large West Coast University (N = 262, 50% female). The key variables in this correlational study were depressive symptoms and inaccuracy of second date offers. Participants completed the 7-item CES-D, as well as an interaction questionnaire (where participants indicated if they would offer second dates) and post-interaction questionnaire (where participants estimated their own second date offers). There was found to be no relationship between depressive symptoms and accuracy of date offers received. Future studies should attempt to design a study to determine a causal relationship between depressive realism and accuracy.

ABSTRACT

MoonTrek Telescope

By

Pavit Singh Chawla

Sponsored by NASA Jet Propulsion Laboratories and modeled after NASA MoonTrek, a web portal developed to meet the needs of mission planners in a new era of lunar exploration, with the intention of being more easily accessible and user friendly. Our MoonTrek application will bridge the gap between a user provided telescope image and anyone's smartphone or laptop. It will allow anyone interested to explore the moon with ease providing amateur astronomers ample information to nurture their love of space.

The idea of modeling our project after the NASA Moon Trek was to create a more user friendly portal for it to be used by more amateur astronomers or anyone that took an interest in the moon. The idea was to create a similar tool to be used by someone who may know less about what they are looking at or looking for and to provide a fun easy way to learn more about the moon.

ABSTRACT

Critical Review of the Chemistry of Singlet Oxygen
with Phenolic Antioxidants

By

Eileen Cheng

Singlet oxygen ($^1O2$) is the lowest energy excited state of molecular oxygen, $^3O2$. Singlet oxygen is formed when a photosensitizer absorbs light and intersystem crossings (ISC) to its triplet state. The triplet state photosensitizer interacts with $^3O2$ to make $^1O2$, causing $^1O2$ to adopt a spin paired electron configuration, an unstable higher energy state. Singlet oxygen is one type of reactive oxygen species (ROS), which also includes compounds with very different reactivities, i.e. free radicals. Singlet Oxygen reacts with electron rich biomolecules like DNA causing oxidative damage. Accumulated oxidative damage can result in the development of diseases like cardiovascular disease, and Alzheimer's disease. Oxidative damage can be prevented through the presence of antioxidants from dietary sources, as they readily quench ROS. Phenolic antioxidants are of particular interest because they have a high electron density. While phenolic antioxidants are known to quench ROS, it is not presently understood if they interact with $^1O2$ in the same way (as most ROS are free radicals, but $^1O2$ is a powerful electrophile). Such a paper has not previously been written, and a literary analysis was conducted to answer this question. The literature supports the assertion that $^1O2$ is quenched by phenolic antioxidants like resveratrol and α-tocopherols, both chemically and physically, but at the same rate, because the reaction is governed by thermodynamics not kinetics. In order to circumvent the issue of accumulated oxidative stress, antioxidant consumption should be increased.

ABSTRACT

Assessing individual differences in application:
Are some people more likely to make false identifications?
By
Charmaine Chien-Yu Chui

This study was designed to examine the interaction between personality and memory and was a replication of Jones (2017). Participants (N=625) were asked to complete the NEO PI-R prior to witnessing a staged robbery. They were then asked to make an identification of a suspect in a police showup identification procedure where a single suspect was presented to them in police custody. Participants were led to believe that they were actually participating in a police investigation and that their identification decisions would lead to the arrest and prosecution of the suspect. Results indicated that participants who scored lower in the Openness dimension and were considered more “closed” were more likely to make a false identification than those who had higher scores. Additionally, individuals who were more agreeable were also more likely to make false identifications in the identification task. These findings match previous findings that have found closed and agreeable individuals to be more suggestible than their more open and less agreeable counterparts.

ABSTRACT

The Death of Bipartisanship

By

JohannaKate Connally

There is undoubtedly a great divide felt amongst Americans today. Although there have been several explanations as to why this divide has come to be, they all fall short as they don't truly answer "why" and lack a psychological backing. The two main theories this thesis disproves are the influence of the modern media and a large shift in personal ideology. This thesis examines the psychological basis for polarization in America through examining what does not work and why. Then poses a theory to that adequately explains polarization, dubbed the Cycle of Antipathy. In essence, the Cultural Antipathy between the several cultures in America provides the basis for the Repulsion Effect, our natural reaction to be repulsed by opposing views, to be so effective. When politicians realize what an effective tool utilizing the Repulsion Effect and refusing to work with their opposing party in order to advance their career, they exploit it to the detriment of American Democracy. This tactic has been dubbed Guerilla Politics. As it gets harder and harder to maintain power politicians drive us further and further apart in a cycle of making claims and not fulfilling them. This is the bare bones of the Cycle of Antipathy. This thesis then goes into a brief history of modern polarization, 1950's to today, and looks into where polarization will go form here. Answering the question as to whether or not the gap is reconcilable.

ABSTRACT

A Sociological Analysis of Consumerism, Minimalism, and Subjective Happiness

By

Stephanie Yvonne Corales

Happiness is a significant component of well-being that is key to success in general health and relationships, providing significant benefits at the individual and societal levels. Scholars have called out against materialistic values and high consumption lifestyles as unreliable pathways to happiness, instead promoting simpler ways of living, such as minimalism, that uphold intrinsic values as more fulfilling alternatives. However, there is still limited research in the realm of happiness and minimalism. The objective of this thesis is to explore the research question, "How do college students' subjective happiness levels compare to their consumerist vs. minimalist practices?" Existing literature on predictors of happiness and minimalism were analyzed and a general research survey was administered to over 300 majority working-class college students of color, conveniently using referral sampling then examining survey data using statistical crosstabulations. Results upheld the belief that money cannot buy happiness but also contradicted the idea that minimalism contributes to increased levels of longer-lasting happiness in comparison to the consumerist lifestyle. It is recommended for future research to conduct a regression analysis exploring this relationship, involving more demographic diversity in its population of interest, considering the intersection of other social characteristics, and perhaps using qualitative interviews or an objective measure for happiness.

ABSTRACT

The Role of Copper and Amyloid-Beta in the Neuropathology of Alzheimer's Disease

By

Samantha Salvador Cruz

Alzheimer's disease (AD) is a neurodegenerative disease that is expected to affect a growing number of individuals worldwide in the coming decades with increases in life expectancy. Effective approaches in treatment and drug delivery are crucial to addressing the social and financial costs of this global issue, some of which involve the study of copper and the neurotoxicity induced by its interactions with amyloid-beta (Aβ) plaque found in the brain. Analyzing redox reactions between Cu and Aβ may lead to anti-inflammatory drug approaches that reduce the formation of toxic H2O2 and other reactive oxygen species. Meanwhile, understanding the structure of Cu-Aβ upon binding can lead to Cu-selective chelators which remove Cu from the brain and potentially correct Cu dyshomeostasis. To find additional approaches for AD drug development, the binding affinity (KD) of Cu(II) ions to SH-SY5Y neuroblastoma cells was analyzed using surface plasmon resonance microscopy (SPRM) and determined to be in the micromolar range. This moderate binding behavior provides a foundation for further studies on the effectiveness of Cu chelators and future applications of SPRM in AD drug development through its real-time monitoring of binding activity and the benefit of spatial resolution over traditional SPR techniques.

ABSTRACT

ASME University Rover Challenge

By

Natalie Shalini Deo

With the rise of space exploration, there have been many on-Earth attempts to recreate the space exploration experience as a way of introducing students to the concept. One of these recreations is known as the Mars Society's University Challenge. As a robotics competition aimed to mimic sending a rover to planet Mars and test its effectiveness in the form of four different missions, it cultivates a culmination of Mechanical, Electrical, and Software Engineering practices, which is how the team is broken down. While the team has made efforts in all areas, the personal contributions have been towards the Software Team, where I have been working on ROS, Linux, Master-Slave communication, and driving code. The progress made is documented in this report which indicates a strong head start as the work is handed off to the next senior design team working on the project, though not all goals were completed because of the limitations presented by the COVID-19 pandemic.

ABSTRACT

Flight Control Algorithm for the Cal State LA Autonomous Mini-Drones Competition

By

Rachael Elizabeth DiRegolo

I worked on a team of five students to compete in the Autonomous Mini drone Competition designed by the MathWorks Company for my Capstone Senior Project. For this project, the Capstone Director worked with the MathWorks Company to provide an additional objective and challenge. The main goal, produced by MathWorks, was to develop and deploy an algorithm onto a Parrot Mambo Mini drone, that enables the drone to autonomously follow a marked path and land on a target at the end of the flight. The second goal, established by the Capstone Director, as part of the Capstone Senior Project was to physically modify the Parrot Mambo Mini drone to enable it to retrieve a package. This paper will focus on the first goal set forth by MathWorks for the autonomous flight competition. The flight code algorithm was created using MATLAB, Simulink, Stateflow, Parrot Drone Toolbox, and Computer Vision Toolbox, among other programs and add-ons. Additionally, techniques of image processing and path planning were implemented for the construction of the flight code. The team was able to successful construct an autonomous line follower code. The team was unable to successfully deploy the autonomous algorithm onto the drone.

ABSTRACT

Thread-Based Electrodes for the Detection of Glucose and Acetylthiocholine

By

Lauren Dueñas

Chapter 1. An introduction to microfluidics and examples of its technology is described. Microfluidics has been integrated into electrochemical detection for point-of-care (POC) technology. POC diagnostic devices are significant in monitoring patient health. Therefore, the detection for glucose and acetylthiocholine (ATC) is described as a priority for preventative and maintenance care. This study utilizes electrochemical sensors to monitor analyte activity with microfluidic applications. An overview of cyclic voltammetry (CV) and electrochemistry are explained in its function for detecting analytes and its role in a three-electrode system.

Chapter 2. A nylon thread-based electrode sensor within a capillary tube was developed for the detection of analytes to test for reproducibility and incorporate reusable, low-cost, lightweight, and easily accessible materials an alternative option to more expensive sensors. The three thread-based electrodes were painted with conductive inks and placed into 1 or 2 mm capillary tubes. This electrode system was utilized to detect increasing concentrations of glucose (0 – 20 mM) in a vial. Cyclic voltammetry (CV) was used to apply a scanning voltage of 0.45 V to measure the oxidation of glucose by GOx. The concentration of the solution was determined by graphing the voltage applied (V) vs. current output (A) which yielded oxidation and reduction peaks. The glucose concentrations were observed to be proportional to the current output as an increased iv peak height of the oxidation peak ($R2 = 0.9664$). The low cost, replicability, and accessibility of the materials of the electrodes make for a good sensor to test the reactivity between different glucose concentrations and enzymes used.

Chapter 3. The nylon thread-based electrodes within capillary tubes were developed for the detection of glucose and acetylthiocholine (ATC) on two different systems: wax-printed circles on chromatography paper and bubble wrap. This electrode system was utilized to detect increasing concentrations of glucose (0 - 20 mM) and ATC (0 - 9.84 mg/mL) on the chromatography paper using minimal solution (12 μL). Cyclic voltammetry (CV) was used to apply a scanning voltage of 0.45 V to measure the oxidation of glucose by GOx and 0.60 V for ATC by acetylcholinesterase (AChE). To determine the concentrations of the solution, the voltage applied (V) vs. current output (A) were graphed and yielded oxidation and reduction peaks. Glucose concentrations were observed to be proportional to the current output as an increased peak height of the oxidation peak was tested ($R^2 = 0.966$). In addition, ATC concentration was observed to be linearly proportional to current output ($R^2 = 0.985$). The bubble wrap platform provided a detection site with the three-electrode system for the detection of glucose and ATC. For glucose detection, solution (30 μL) was inserted inside the bubble and measured against voltage applied vs. current output. Glucose concentrations were plotted against current output ($R^2 = 0.991$). Similarly, ATC detection was tested against current output ($R^2 = 0.986$). The paper platform is a simple detection site that requires small reagent volume, is low-cost, and is disposable. Bubble wrap serves as a sanitary site for detection, is easily accessible, and removes the need for preparation techniques.

Chapter 4. A continuous-flow system for the detection site of the thread capillary tube-based electrodes designed for the detection of glucose and acetylthiocholine (ATC) is described. Two v knotted and twisted nylon threads to serve as the base for the continuous flow system. For glucose detection, the nylon thread platform was dipped into a solution containing glucose oxidase (GOx), potassium ferricyanide ($K_3[Fe(CN)_6]$), and increasing concentrations of glucose

(0-15 mM) in PBS. Using cyclic voltammetry (CV), a scanning voltage was applied to yield a graph of voltage applied (V) vs. current output (A) at 0.40 V. A linear graph resulted between glucose concentration and current output ($R^2 = 0.980$). Similarly, ATC concentrations (0-9.84 mg/mL) were measured with a solution of AChE (0.08 U/mL) in PBS. Increasing concentrations were observed to be linearly proportional to the current output (0.60 V) as demonstrated by the increased height of the oxidation peaks ($R^2 = 0.981$). The continuous-flow system integrates real-time activity of analytes, rapid detection, and reproducible results.

ABSTRACT

The End of Cervical Cancer

By

Jennifer Ann Frank

Cervical cancer is the 4th deadliest cancer for women worldwide; it will claim the lives of over 300,000 women in 2020 alone. Almost every single diagnosis is the result of an HPV infection, a virus that is spread mainly through sexual contact. The effect this illness has on the women who are diagnosed is not merely a financial one, but emotional as well. Widespread distribution of various HPV vaccines has drastically reduced the cervical cancer rates in high-income countries, but low- and middle-income countries have languished behind. Some countries are in the verge of eliminating cervical cancer, while others will see tens of thousands of deaths every year. Through examination of the screening and prevention techniques utilized by different countries, one with a high rate of cervical cancer and one with a low rate, I will formulate suggestions that the United States can implement to be on track to eliminate cervical cancer as a public health issue.

ABSTRACT

Viridis: Business Plan

By

Lu Gan

Executive Summary/The Mission

My yogurt business, Viridis, offers a variety of yogurt flavors. I want to advocate for a healthy lifestyle. I see an opportunity to educate young adults on healthy lifestyles through the sale of yogurt and organic based yogurt products to promote sustainable diets and to decrease the rate of obesity in the city of Monterey Park in California.

Company and Management

Viridis is a small start-up business, but I plan to expand even further once the store makes enough profit. The first employees of Honey Yogurt will be my small team and I before I hire other employees. I will have investors supporting the business and I will manage operations and activities closely by reviewing costs and revenues every month.

Services

Viridis provides yogurt drinks and soft serve yogurts in a variety of flavors. It also has non-dairy and diary options for people of all ages. Viridis even sells bottles to reduce the use of plastic and paper cups. Members of Viridis will enjoy exclusive benefits as well.

Financial Projections

Based on annual sales, the estimated business valuation is $142,345. I expect at least 15 purchases per day. It would just be a small team and I for the first 6 months. My team and I will work everyday and monthly income will range from $0 - $1,000 because this a start up. I expect to have a positive cash flow within a year as Viridis expands.

ABSTRACT

Sidewalk Slope Monitoring System, 2020-2021

By

Ana Guardado

The City of Los Angeles runs a sidewalk repair program that launched in 2016. As part of the program, the Bureau of Engineering (BOE) developed a scoring system to assign numerical scores to sidewalk segments. This allows them to determine which sidewalks require immediate attention for repairs. As part of their analysis, city employees must visit the sidewalk in person and assess the damage. Starting in 2017, Computer Science senior design teams have assisted BOE in their efforts to automate their manual analysis. For 2020-2021, the senior design team was assigned to work on five tasks: web application, image processing scripts, rover user interface, backend database, and rover build. The web application team created the wireframe for a site that helps visualize sidewalk data. The image processing team wrote Python scripts to eliminate noise in sidewalk images and calculate sidewalk displacement. The rover user interface team created a user interface that helps control the rovers used to collect sidewalk data. The backend database team created a relational schema to efficiently store the collected data and images. The rover team built two new rovers that were purchased by BOE. The team used work from previous year efforts to continue the project. It is expected that future senior design teams will also use this years' completed work to maintain the project.

ABSTRACT

Space Debris Deorbiter

By

Maya Horii

The growing debris population in Low Earth Orbit is a threat to current and future active space missions. To reduce debris, our project aims to create a SmallSat active debris removal design, with the requirements of deorbiting at least two pieces of 10cm or greater debris within 25 years. A design of a 12U CubeSat has been created, incorporating a rigid net capture method, an electrodynamic tether for deorbit, and a mixed green propellant and cold gas propellant propulsion system. CAD models, mass and power budgets, a Day in the Life power analysis, and a Concept of Operations have been created to communicate and analyze the design. Additionally, dynamic simulations of collision, propulsion, and deorbit were used to assess and refine the design. Overall, the design is able to meet most requirements.

ABSTRACT

Take the 210 East (The Only Home I Know)

By

Camille Elizabeth Jessie

Take the 210 East (The Only Home I Know) is a creative project exploring youth, memory, intimacy, and public spaces in a suburban town. It is made up of a series of photographs highlighting moments that felt like a coming of age. The goal of this project is to share what it visually looks like when these different ideas intersect. The impact of this project is the sentiment that we take places with us long after we leave them and people with us even when we no longer have any kind of relationship with them. While these locations and moments are specific to my personal experiences, the themes the images are exploring allow for the viewer to recall their own moments of growth that have shaped their life.

ABSTRACT

The Relationship Between Color Preference, The Concept of Freedom, and Mood

by

Hatya Khanooki

The concept of freedom is complex and abstract, but its enactment can be a powerful motivator of change. In the current study we attempted to ascertain whether this abstract concept is associated with a more sensory experience such as color. Additionally, currently there is no published research on whether simply thinking about the color of freedom may enhance one's positive mood and/or reduce one's negative mood. The purpose of the current study was to examine people's ideas about the "color" of freedom, and whether thinking about the color of freedom is associated with a positive mood. A total of 698 participants (women = 75.2%, mean age = 21.84 years) responded to a brief online survey in which the primary question was "What is your 'color' of freedom?". Participants were also asked to write in their current mood and estimate its strength on 5-point scales (1 = *not strong at all* and 5 = *extremely strong*) prior to being asked to free-associate to their color of freedom, and to write in their mood and its strength after they discussed their 'color of freedom.' The most common single color associated with freedom was blue (38.1%), followed by yellow (14%). A repeated-measures ANOVA (F = 17.25, $p < .001$) indicated that participants' mood significantly changed in a positive direction after thinking about their color of freedom, even within the space of a few minutes. In these uncertain times of a pandemic and political chaos, it is heartening that people have definite ideas about what 'freedom' looks like, and that even for a brief time, one's mood can change in a positive direction by engaging in creative ways of imagining abstract concepts.

ABSTRACT

Thermal Analysis of Long-Endurance UAV

By

Abigail Laguna

Unmanned Aerial Vehicles (UAV), most commonly known as drones, are one of the most important technologies that were developed in the 21st century. Their size and capabilities make them ideal to complete a wide range of missions. In recent years, however, there has been a need to develop drones that are capable of flying during long periods of time. This project from The Aerospace Corporation, therefore, aims at designing a long-endurance UAV that is designed to measure emissions from ships at The Port of Long Beach. Given a patent and initial concept, the task was to design a ducted fan UAV. Under the structure sub-system, the goal of this project was to thermally analyze a UAV to study the heat loads generated. This was done through Finite Element Analysis (FEA), whose results indicated what the areas of concern were within the system, and what parts of the drone required additional cooling.

ABSTRACT

Investigating the role of Rbp2 for circadian rhythms in *S. elongatus*

By

Tam Le

Circadian rhythms, a roughly 24-hour biological clock, contribute to fitness in numerous organisms by enabling preparation for environmental changes. Cyanobacteria are the simplest organisms known to possess a circadian clock. *Synechococcus elongatus* PCC 7942 is an organism with temporal rhythms of gene expression, a model organism to study cyanobacterial circadian rhythms. The interactions of the KaiA, KaiB, and KaiC oscillator proteins dictate the *S. elongatus* circadian clock.

Our lab identified Rbp2 (RNA binding protein 2) as a significant contributor to the *S. elongatus* clock. Rbp2 belongs to a class of eukaryotic-like RNA binding proteins and notably was found to interact with KaiC. Deletion of *rbp2* displays a long period phenotype, 26.71 ± 0.30 hours, as opposed to the wild type 25.17 ± 0.29 hour periodicity. I determined that expression of *rbp2* from a non-native locus rescued the long-period phenotype displayed in the mutant *rbp*2 strain. Meanwhile, overexpression of *rbp2* via an exogenous promoter also induced a long period phenotype, suggesting careful regulation of Rbp2 levels may be required for normal circadian rhythmicity. Additionally, key amino acids in Rbp2 involved in RNA binding were identified via homology with other RNA binding proteins within the same protein family. Homology modelling demonstrated these key amino acids are positioned on adjacent β-sheets, well located for RNA interaction. Molecular docking prediction with KaiC suggested Rbp2 may interact with the CI domain of KaiC. Future exploration into Rbp2 functionality may include identification of KaiC residues that interact with Rbp2, and repetition of overexpression experiments.

ABSTRACT

An Examination and Application of John Rawls's *A Theory of Justice*

By

John Joseph Cleveland Lillis

This is a wide-ranging analysis of some key concepts from *A Theory of Justice*. In my treatment of the original position, I reject claims that it necessitates a stark conception of human nature and that its veil of ignorance is functionally incoherent. Though the original position cannot account for basic social relationships or problems of racial justice, I maintain that it does not need to, and that these inabilities do not distort the contractors' findings. I also defend reflective equilibrium against claims that it only serves to entrench pre-existing biases, instead seeing it as our most promising means of moral justification. Dismissing arguments that Rawls's denial of preinstitutional desert is untenably damaging to the individual psyche, I describe how it can promote positive social behavior. Lastly, I bolster Rawls's argument for the arbitrariness of life's outcomes by incorporating insights from the biological sciences, and subsequently use this understanding to reject retributive punishment.

ABSTRACT

Free Speech Issues For Public Employees

By

Tom Martin

The freedom for private citizens to engage in free speech in this country was guaranteed by the Founding Fathers in the Constitution's Bill of Rights because they saw the harms of censorship. However, for employees both public and private, this was not always the case, and it was not until the twentieth century that certain employees were considered to have the same access to protections of those rights. News outlets cover stories of public employees having been fired for certain viewpoints they held and shared with the public. In an effort to determine where the legal line for disciplinary action is, various legal texts, secondary sources, and case decisions from courts across the country were analyzed. Courts have to determine whether the employee's speech is more important than the organizations interest in maintaining efficiency, whether their job requires the Court to hold them to a higher standard, and if the public has a real interest in hearing what is being said. The research conducted demonstrated that the government can well protect public employees, but not those in the private field. What they do off the clock should not be able to affect their professional careers when it simply involves speaking their mind in an unharmful manner.

ABSTRACT

Axial Muscle Development in the African House Snake (*Boaedon capensis*)

By

Kaitlyn A. Mesa

Snakes are members of the Order Squamata. As snakes lost their forelimbs, hindlimbs, and elongated over time, their dependence on axial muscles for locomotion increased while tetrapod amniotes primarily rely on limb muscles. Axial muscles span most of a snake's body and differing species of snakes use them for movements such as sidewinding, lateral undulation, slide-pushing, concertina, and rectilinear and a combination of several modes have been found in several species depending on locomotor requirements. Comparing the embryonic development of squamates with other amniotes can provide insight into how muscle differentiation and morphogenesis are both conserved and divergent, leading to unique body plans and locomotor styles. In this thesis, African House Snake (*Boaedon capensis*) embryos at five different stages of development were preserved and stained using an immunohistochemistry method. The primary antibody used is known as MF20 and it targets the myosin protein within muscle cells. The important muscle precursor structures were labeled and described. Somites, hypaxial muscle, epaxial muscle, and the beginnings of axial muscles that overlap, interconnect, and serially repeat were able to be seen in our developmental series, the first time this has been documented in snakes. This study helps further the field of snake axial muscle development and provides valuable preliminary data for future studies.

ABSTRACT

Evaluating a Smeared Model for Charge for Use in Classical Force Fields

By

Charles Metzler-Winslow

Classical MD simulations determine the time evolution of the positions of atoms by numerically integrating Newton's equations of motion, $m\frac{d^2\vec{x}(t)}{dt^2} = \vec{F}(\vec{x}(t))$, using a differentiable potential energy function, $U(\vec{x})$, that is composed of multiple empirical functions that represent the various possible physical interactions between atoms. (Note that $\vec{F}(\vec{x}(t)) = -\nabla U(\vec{x}(t))$.)

Most potential energy functions (also called force fields) are inspired by classical physics (both in the interest of simplicity and low computational cost). For example, the interactions between two bonded atoms are represented as a harmonic potential energy (i.e., a spring) acting along the bond length between them. Electrostatic interactions, a critically important source of both short- and long-range interactions between atoms, are typically represented using a Coulomb potential energy, $U(r_{ij}) = \frac{kq_iq_j}{r_{ij}}$, where q_i and q_j are the partial charges of the atoms and r_{ij} is the distance between them. This potential assumes that the atoms can be treated as simple point charges, which is a major approximation given that atoms consist of a small positively charged nucleus surrounded by a comparatively large, diffuse negatively charged electron "cloud". While the point charge approximation may be accurate when the two atoms are far away from each other, fundamental physics dictates that this approximation will be break down when the atoms are at smaller distances such that their electron distributions begin to overlap substantially.

The primary research questions underlying this thesis are the following: does a more sophisticated charge model (inspired by quantum mechanics) that includes a central positive point charge surrounded by an exponentially distributed negative charge density predict the electrostatic potential surrounding atoms more accurately than the point charge model? What are the expressions necessary to apply an existing optimization technique for the point model to the smeared model? For that technique, what are the appropriate weights on a restraint function on model parameters which appears in the objective function to be optimized?

ABSTRACT

Crisis Management Communication in Higher Education: A Content Analysis of Emails sent by Cal State L.A's Administration Amidst the Crisis of the COVID-19 Pandemic

By

Kayla Misa

In 2020, COVID-19 established itself as a major crisis, effecting virtually every institution across the globe, including institutions of higher education. This study draws on Smith's (1990) three-step framework for organizational crisis communication to analyze how the California State University Los Angeles administration communicated with student stakeholders via email format during the initial and Operational stages of the COVID-19 pandemic crisis. The results of content analysis of 116 of emails sent by the University to students between April 3rd, 2019 to March 3rd, 2021, found that the University performed only adequately in its communication strategy, particularly in the arena of clear and consistent messaging across different organizational departments. The results of the study suggest that there needs to be more collaboration and that other campus departments might adopt approaches from the Office of Students with disabilities to best fulfill stakeholder needs, and in total, retain a stable reputation. Results of the study also suggest that the campus update their campus communication plans in anticipation of a future crisis.

ABSTRACT

Singlet Oxygen: Quenching in the Presence of the Cation-π Interaction and Reactivity with Resveratrol Derivatives

By

Charlotte G. Monsour

Singlet oxygen ($^1O_2$) is the first excited state of molecular oxygen (O_2). It is more reactive than ground-state oxygen (triplet oxygen, $^3O_2$); in particular, it is an especially electrophilic reactive oxygen species (ROS). It can react with several classes of biomolecules, including lipids, amino acids, and the DNA base guanine. Since these reactions can harm and/or kill cells, it is important to investigate potential protective mechanisms that organisms use to defend themselves against singlet oxygen. The cation-π interaction was hypothesized to have a protective effect against singlet oxygen damage, since it makes the aromatic amino acids that participate in it less electronegative, and therefore less attractive targets for singlet oxygen. We synthesized a model complex in which the cation-π interaction could be induced and observed a decrease in the reaction rate with singlet oxygen when the cation-π interaction was present. This suggests that the cation-π interaction may in part be as prevalent as it is in biological systems because of the protective effect it offers against singlet oxygen damage. Antioxidants are also suggested to play a role in preventing damage from ROS, but due to the diverse chemical properties of ROS it is important to evaluate antioxidants' protective effects against specific ROS. For this reason, we studied resveratrol, which has been advertised to protect cells against singlet oxygen, as well as some of its derivatives. We found that their reaction rates with singlet oxygen are not fast enough to effectively compete against other biomolecules discussed earlier, and further work should be done to elucidate the exact mechanisms through which singlet oxygen reacts with these derivatives.

ABSTRACT

On the Road: Homo erectus' Journey

By

Annaell Laureline Marie Mouton

Homo erectus exited Africa around 1.8 million years ago. This was most likely the very first significant migration toward the Eurasian continent. Migration routes in the current literature are hypothesized based on known localities and environmental forces that would have determined the most likely route used by Homo erectus. However, studies linking physical traits with migration patterns are scarce. Using paleodemes to represent known localities of Homo erectus in East Africa (EA), Central Asia (CA), East Asia (EAS) and Southeast Asia (SEA), this study looks at genetically canalized traits on the skull to assess interpaleodeme variations. Results showed some clear differences between the Central Asian material and the Southeast Asian and East Asian material. There were few significant differences between East Africa and the other paleodemes. Patterns in the data support the hypothesis of a founder's event for Central Asia which would imply two different routes from East Africa to Central Asia and from East Africa to East Asia and Southeast Asia. Results also support the hypothesis that East Africa is the origin of Homo erectus. Further studies should focus on adding more localities to the analysis and to link known cultural sites of Homo erectus to a potential migration route.

ABSTRACT

Motives and Factors That Influenced
Consumer Buying Behavior Online Shopping During the COVID-19 Pandemic

By

Niyat Nasareldeen

The Covid-19 epidemic has created an opportunity for a recent measurable effect on customer purchasing behavior. The paper aims to obtain a quantitative description affecting consumers buying behavior during the coronavirus disease. The research paper is constructed on the applicable literature and observations of consumer behavior through interviews, surveys, and observations. From September 01 to October 01, 2020, the researchers collected data via a standardized Multiple-Choice questionnaire by an online survey process, containing 100 online consumers based in the United States. Data were analyzed to investigate the respondent's online shopping experience during Covid-19 lockdown; and the relationship between customer value experience perceived benefits, normative, utilitarian, hedonic motives, and online shopping factors during the pandemic. The findings show the economic situation is linked to consumers' purchasing intentions and that all factors, specifically to the product and time-saving factors, had a significant correlation. Moreover, according to the results of this report, women considered meaning and adventure shopping to be the greatest motivators for online shopping on the hedonic subscale. Previous studies reported that gender influences shoppers' hedonic and utilitarian purchasing motives. This research validates previous studies that found statistically important variations between male and female shopping motives.

ABSTRACT

Policing and Surveillance in the United States and the effects on Racial Inequality

By

Matiana Doris Parra

This research will discuss policing and surveillance in the United States and the relation to racial inequality. The purpose of this paper is to analyze the implications of racism and racial bias and the problems of racism in the country particularly related to police practices. Police relations with communities of color have historically been violent posing a significant public health and public safety threat in these communities. Police violence and use of force, particularly lethal force, has been a point of growing and ongoing concern, particularly in Black and brown communities which are the highest-policed neighborhoods. Growing concerns among the public, activists, and scholars also has emerged regarding police access to personal identity information with the rise of "big-data policing" and predictive analytics in which law enforcement agencies have access to large amounts of information and surveillance tools which they can use to surveil, incarcerate, and harass people of color, in a country that incarcerates people of color in mass. This discussion will present the importance of research on surveillance, over-policing and mass incarceration in communities of color, the effects of policing on racial disparities in America, and offer recommendations for reform necessary to improve public safety through efficient policing and police reform.

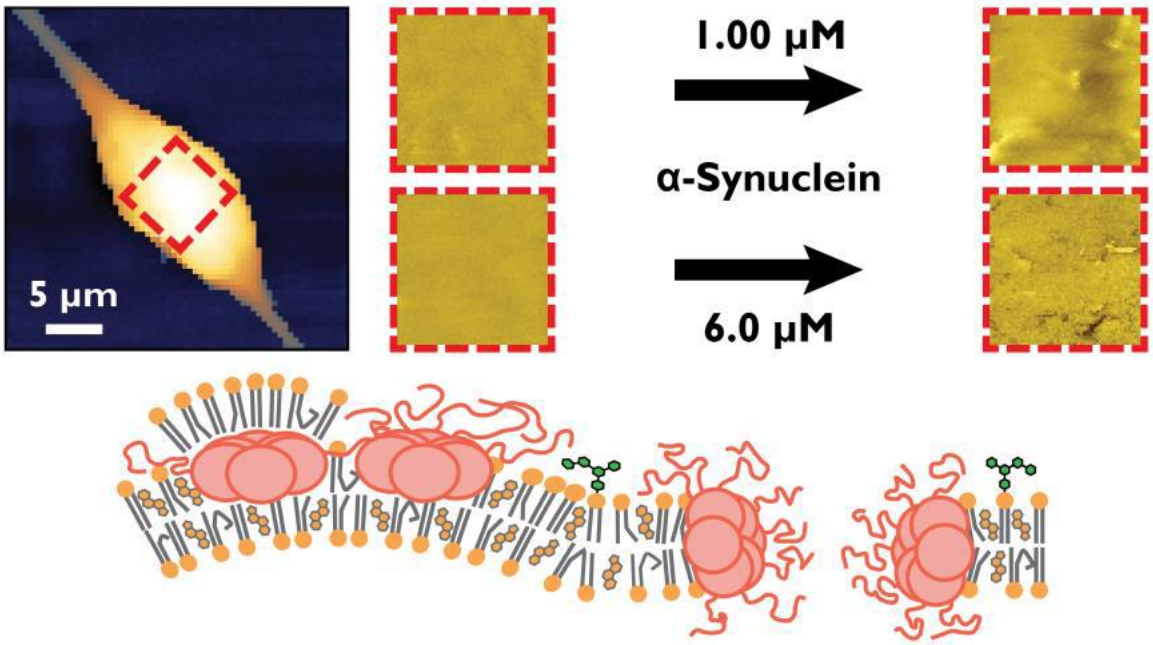
ABSTRACT

Real-time Characterization of Neuronal Membrane Disruption by Aggregates of Alpha-synuclein

By

Jacob Parres-Gold

Aggregation of the natively unfolded protein alpha-synuclein is associated with neuronal death in Parkinson's disease. Mutations and protein overaccumulation can promote the aggregation of alpha-synuclein into oligomers and fibrils. Recent work has suggested that alpha-synuclein oligomers can permeabilize the neuronal plasma membrane, promoting calcium influx and cell death. However, the mechanism of this permeabilization has yet to be characterized, especially in live cells. This work uses scanning ion conductance microscopy (SICM) to image, without using chemical probes, the topographies of live SH-SY5Y neuroblastoma cells treated with alpha-synuclein oligomers over time. Substantial morphological changes were observed, with micrometer-scale hills and troughs observed at lower alpha-synuclein concentrations and large, transient pores observed at higher alpha-synuclein concentrations. These findings suggest that alpha-synuclein oligomers may permeabilize the neuronal membrane by destabilizing the lipid bilayer and opening transient pores.



ABSTRACT

Coloring Distance Graphs

By

George Percival

So, imagine this. You are in charge of ensuring that the integers abide by COVID social distancing policies where no integers can be 1, 2, 3, 4, or 5 apart. You must then determine the sequence of numbers such that we can maximize the number of integers within a given space while following these guidelines. What you are now doing is a simple form of determining the density of an optimal sequence given a forbidden distance set. We can interpret this problem by delving into graph theory by creating an edge (line) between vertices (points in a graph) if they are a forbidden distance apart, forming what is known as a distance graph. Furthermore, a proper coloring of a graph assigns each vertex a 'color' (red, blue, orange, etc.) whereby if two vertices are connected by an edge, they cannot share the same color. A graph's chromatic number is simply the minimum number of colors needed to create a proper coloring. This work explores three key papers that study how we can conceptualize such distance graphs and determine their chromatic numbers for various forbidden distance sets. This work aims to make these papers more accessible to a general audience through defining key terms and explaining every line of logic omitted from the original papers.

ABSTRACT

Student Self-Efficacy and Grit: Links with GPA and Mental Health Outcomes

By

Jesus Perez Garcia

College brings about numerous stressors and challenges alongside the pressures of emerging adulthood. Many factors contribute to success in the classroom, including attitudes of one's abilities and obstacles outside the classroom. Many traditional measures meant to assess future success such as high school GPA and standardized test scores are being challenged. These traditional measures fail to fully capture the educational experience of the student, particularly when numerous obstacles are present. By examining the attitudes and emotional well-being of these students, we are becoming better equipped to address the inequalities and challenges they face. Self Efficacy (Bandura, 1997) and Grit (Duckworth et al., 2007) measure the attitudes of students' belief in their ability to perform tasks as well as their ability to persevere despite obstacles. First-Generation college students are believed to face considerably more challenges and have less experience navigating the college environment. Mental health factors of depression and stress are believed to be mediators of this relationship between attitudes and academics. An IRB approved study was administered online through Qualtrics including measures of the aforementioned factors. Self-Efficacy was highly associated with mental health outcomes. Grit was highly associated with mental health outcomes, but lost all predictive ability when Self-Efficacy was introduced in a regression analysis.

ABSTRACT

Density and Kappa Value of Integral Sequences with Missing Separations

By

Joyce Yan Quon

The density and kappa value of integral sequences with missing separations is a classical number theory problem that has close connections to graph theory and geometry. Let D be a set of positive integers. The exact values of density and kappa value are known when $|D| \leq 2$. However, little is known about the density for sets D with $|D| \geq 3$. In this thesis, we investigate the density and kappa value for the family of 3-element sets $D = \{1, j, k\}$ for which k is small relative to j. We determine the exact values of density and kappa value for $D = \{1, j, k\}$ where j is even, $k = m(j + 1) + l$, and $1 \leq m \leq j - l$ where $l \in \{5, 7\}$. We also determine the kappa value for $D = \{1, j, k\}$ where $k = j + 3$.

ABSTRACT

Creating Eco-Conscious Colleges:

An Analysis of Food and Campus Sustainability Across the CSU System

By

McKenna Rivers

The purpose of this project was to analyze the current food and campus sustainability plan at California State University, Los Angeles (Cal State LA) in accordance with the goals outlined in the CSU Sustainability Policy plan. Also discussed are programs and changes that the school could introduce to meet the objectives. This was done by comparing the campus's current sustainability programs to other schools in the CSU system as well as reviewing the success of sustainable food systems at universities throughout the United States that have successfully moved towards more environmentally friendly campuses.

Cal State LA, along with the other 22 CSU campuses, is currently working to not only meet the needs of their students but to do so without compromising the ability of future generations to meet their own needs.

The project identified that certain sustainable programs, including an edible garden and education center, were not only able to assist universities in aligning their practices with those presented in the Sustainability Policy plan, but also helped address other issues facing university students such as food insecurity. The development of these programs would not only positively affect Cal State LA, but also their students and the community/environment surrounding the campus.

ABSTRACT

Examining the Need for Lesbian, Gay, and Bisexual Representation in Intimate Partner Violence Research: A Systematic Literature Review

By

Gabriela Judith Rosas

Lesbian, gay, and bisexual (LGB) relationships are historically left out of intimate partner violence (IPV) research, despite holding a prevalence rate of IPV that matches or exceeds that found in heterosexual relationships. The lack of inclusion in IPV research is exacerbated when one considers the unique threats that LGB face, such as the threat of being outed and the fear of bringing further stigmatization against the LGB community.

The purpose of this study is to review existing literature on lesbian, gay, and bisexual intimate partner violence, through the process of a systematic literature review. Upon reading through the articles used, I highlight four main points that need addressing regarding LGB IPV. The results show that LGB IPV survivors are faced with inadequate resources compared to their heterosexual counterparts. Particular attention is centered on three resources including shelters, law enforcement assistance, and therapeutic care. The literature also brings forth attention to the need for an intersectional approach towards IPV research, calling for attention to ethnicity and sexuality sensitivity. The creation of existing programs and resources stems upon research that currently exist regarding IPV. Therefore, to create programs and resources that better aid LGB, there must be adequate LGB representation in future IPV research.

ABSTRACT

COVID-19 DATA VISUALIZATION AND ANALYSIS (CDVA)

By

Abubakir Siedahmed

Vodafone Group Plc is a leading technology communications company that is based in Britain. Vodafone uses telecommunication to connect people worldwide and helps businesses generate more revenue through mobile payments and other financial services. Due to the COVID-19 pandemic, Vodafone decided to begin using its technology to identify a pattern in the virus's patience and use those data to help policymakers navigate these unprecedented times. The purpose of this project is to use 4 COVID-19 datasets (1 classified dataset) from Vodafone to identify a pattern in the COVID-19 cases, recoveries, and deaths, by utilizing Data Analytic and Machine Learning Algorithm techniques. Once a pattern is identified, the next step is to use Data Visualization techniques to create visualizations which illustrate patterns in COVID-19 cases, recoveries, and deaths.

Another component of the project is an Android Mobile Application to show the user their risk of recovering, dying, or catching the virus. The app will also show the general public the number of cases, recoveries, deaths, and the number of vaccinated residents in their town. The user will have the option to view COVID-19 stats in different part of the United States, and there will be a section which will the latest COVID-19 news from reliable sources such as New York Times and John Hopkin University.

ABSTRACT

Site-Directed Spin Labeling EPR Technique for Investigating the Dynamics of Antifreeze Proteins in Interaction with Ice and Water

By

Kyle Rich Taing

Antifreeze proteins (AFPs) protect organisms living in subzero environments from freezing injury, which render them potential applications for cryopreservation of living cells, tissues, and organs. Cryoprotective agents (CPAs), such as glycerol and propylene glycol, have been used as ingredients to treat cellular tissues and organs to prevent ice crystal formation at low temperatures. Specific northern fish species were discovered to produce glycerol in addition to AFPs at subzero temperatures; therefore, we sought to assess the function of AFPs in CPA solutions as potential additive effect in the overall process of cryopreservation. We applied the site-directed spin labeling (SDSL) technique to a Type I AFP, and a two-step process to prevent bulk freezing of the CPA solutions was observed via cryo-photo microscopy: (1) thermodynamic freezing point depression by the CPAs, and (2) inhibition of the growth of seed ice crystals by the AFPs. Spin-labeled AFPs in CPA solutions were studied through electron paramagnetic resonance (EPR) spectroscopy experiments, which were executed from room temperature to 97 K and vice versa. The EPR results indicate that the spin-labeled AFP bind to ice surfaces and inhibit ice growth through the bulk freezing processes in the CPA solutions. The ice-surfaces bound AFP in the frozen matrices could also prevent the formation of large ice crystals during the melting processes of the solutions. Our study illustrates that AFPs can play an active role in CPA solutions for cryopreservation applications.

ABSTRACT

Anatomy and Locomotion During Avian Development

By

Lessly Aremy Tapia Torres

Flight is the most challenging form of locomotion. Traditionally, scientists have assumed that specialized anatomical features are required to meet the demands of flight, and that animals that lack these "flight adaptations" are flight-incapable. However, juvenile birds challenge this idea because even though they have underdeveloped anatomies and lack flight adaptations, they can still perform flight-like behaviors such as wing-assisted incline running (WAIR), vertical takeoff or wing-assisted jumping, and short level flights. To investigate how juvenile birds compensate for their underdeveloped wings during wing-based behaviors, we quantified flapping kinematics using X-ray Reconstruction of Moving Morphology (XROMM). Skeletal kinematics for 2-3 birds in four ontogenetic stages (7-8 days post-hatch (dph), 12 dph, 18-22 dph, and adult (> 100 dph)) were measured during wing-assisted incline running (WAIR), vertical takeoff, and level flight. Our results show that all birds increased their level of effort during more challenging behaviors and that for any given behavior, juvenile birds typically showed greater effort than adults. This suggests that developing birds compensate for their underdeveloped wings by exaggerating their flapping movements, and reiterates that juveniles provide important insight into animal body plans.

ABSTRACT

Designing and Manufacturing a Membrane Inflation and Strain Measurement Device for the Evaluation of Synthetic Tissues for Biomedical Engineering Applications

By

Justin Thai

The purpose of this project was to design and manufacture a device to biaxially load and test synthetic tissues for biomedical applications. This was accomplished by designing a hermetically-sealed pressure chamber, a syringe-based pressure application system, and an optical strain measurement technique. The combination of these components allowed, in theory, a membrane to be loaded biaxially via hydraulic pressure and the deformation to be recorded and calculated over time without contacting the sample. The author's contribution to the project consisted of primarily hardware and software solution to address the strain measurement and evaluation component of the project.

ABSTRACT

PDF Web Viewer

By

Ares Ton-That

QTC is a medical organization tasked with providing state-of-the-art medical services to government agencies and private companies. Because they work with thousands of PDFs stored within their database, they need an efficient way to pull PDFs from the database and quickly find the information that they are looking for. The goal of our project was to grab sets of PDFs by using a category search filter. The filter is a dropdown menu that can search for any PDFs relating to physicians, pediatricians, psychiatrists, etc. Once a search has been executed, the app will automatically search the database for all PDFs related to the search and display them in a continuous stream within the viewer.

In addition to displaying the PDFs, the viewer also provides the user with tools to select and edit text within any of the PDFs. To aid users in finding information, the viewer also provides a search box that allows users to type in any word or phrase. Once a keyword or phrase has been submitted, the viewer will automatically take the user to the first PDF containing that word or phrase and will automatically display the section of the PDF containing the match. Find next and find previous buttons are also provided, allowing users to find other matches, provided that they exist. If no match is found within any of the PDFs, the viewer will tell the user that no matches were found.

ABSTRACT

Investigating the Role of Rbp2 and the Conservation of RNA binding proteins in Cyanobacteria

By

Amanda Lai Tran

Circadian rhythms, driven by circadian clocks, are important in regulating 24-hr biological cycles in organisms across the world. The cyanobacterial strain Synechococcus elongatus is a model organism for studying the circadian clock through its core oscillator, which consists of the proteins KaiA, KaiB, KaiC. Recently, RNA-binding protein 2 (Rbp2) has been identified as an important factor for clock function in S. elongatus as deletion of rbp2 results in a long period circadian rhythm. The S. elongatus genome codes three RNA-binding proteins (Rbp) which each contain a single RNA recognition motif (RRM) that allows them to recognize and bind to RNA. These three proteins are subsequently called Rbp1, Rbp2, and Rbp3. Deletion of rbp1 and rbp3 does not result in the same long period phenotype, though deletion of rbp1 results in cold-temperature sensitivity. I found that deletion of endogenous rbp2 can be complemented by expressing rbp2 from its native promoter, Prbp2, from a neutral site in the chromosome. Additionally, in a bioinformatics search of 166 cyanobacterial strains, Rbp1, Rbp2, and Rbp3 were all highly conserved, which suggests that RRM containing Rbps have important functions to the cell.

ABSTRACT

Front Drivetrain of a 4WD Baja Vehicle

By

Britney Lam Tran

California State University, Los Angeles competes annually in the international Baja SAE competition with their own student designed and manufactured Baja vehicle. The competition rules have changed such that the team is required to modify the current 2WD vehicle into a 4WD vehicle. Specifically, the power delivery from the front differential to the front wheels was focused on. Literature research was conducted on the hydraulic, drive shaft and chain drive systems to determine the most suitable method of conversion. Of the three, the chain drive system was selected. The engineering design process was then used to provide a framework to define requirements, sketch concept designs, and eliminate designs based on their feasibility and practicality. At the end of the design process, the finalized mounting system consisted of two rectangular members, two side brace members, two holders, and a one singular opposing member. The entire system withstood a tension force of 1890 lbf at 51 degrees with a FOS of 2.43. The CV axles were lengthened by 12.75 inches with a sleeve that resulted in a FOS of 3.2. Lastly, a single Aluminum 0.125-inch plate was used to house the spinning differential and sprocket. The results of these FEA studies were obtained from SolidWorks and verified with hand calculations. Although these designs have been finalized and implemented into a theoretical model, they have yet to enter the verification and validation phase. To fully complete the engineering design process, these designs should be manufactured, integrated into the final car for modifications, and tested to verify all requirements are met.

ABSTRACT

Want2Remember Mobile App Development Project

By

Thomas Weatherell

Want2Remember is a mobile phone application currently being developed as a collaborative project by senior computer science students from Cal State LA. The project is owned by We2Link, a mobile software application company founded and owned by CEO Michael Malone. The Want2Remember app was designed to help people with cognitive impairment keep track of important information. Users can input their information into the app in the form of memories. There are a wide variety of templates for memories, such as templates for storing website passwords and bank account information. Users can input their appointments or to-do lists and be reminded by the app in the form of notifications. The app also serves as a way to connect caretakers and patients, and includes medication tracking so that users can be reminded when to take their prescriptions.

Overall, Want2Remember is designed to be a clear, simple, and helpful tool for anyone who needs extra assistance keeping track of important information, appointments, or their medication schedule. This paper summarizes the design philosophy behind the application and the development processes and frameworks used by the team. Additionally, this paper also outlines the remaining features that still need to be added and how the developers plan to implement them.

ABSTRACT

A Study on Which Socio-Economic Factors have the Most Impact on the Distribution of Wealth in the U.S. on a State Level Leading up to Covid-19

By

Erin Weir

This study analyzes the topic of income inequality and the distribution of wealth in the United States with a concentration on the Hispanic population. In 2020 the U.S. has experienced a staggering disproportionality of the Black and Hispanic Covid-19 unemployment, poverty, and morbidity rate. This observation leads to questions of why these minority groups have been particularly affected in the country. There have been previous empirical studies to bring out differences in socio-economic status that contribute to these factors of health inequality, however they have not specifically been used with the Gini-coefficient and Lorenz Curve method to determine the direct effect that each socio-economic factor has on the distribution of wealth in the U.S., especially for the Hispanic population. This paper will use predetermined Gini coefficients for each state in the U.S. to set a base for income inequality and will be evaluated against socio-economic cross-sectional data from the U.S. Census Bureau by method of regression to see if there are significant differences between different populations in the U.S. and the Hispanic population. This information gathered majorly in 2019 will help give an understanding of the socio-economic status of the Hispanic population leading up to the Covid-19 pandemic.

ABSTRACT

On the Hot Corner: Local Climate's Effect on Team Performance in Major League Baseball

By

Alec Miles Weissman

This paper analyzes the effect of temperature in comparison to a team's local climate on the visiting team's performance in Major League Baseball as a possible explanation of home-field advantage. Dummy variables were generated to represent whether a game's temperature was considered relatively "hot" or "cold" for the visiting team and were analyzed using multiple regression. I find that visiting teams perform better when games are relatively hot for them and worse when games are relatively cold for them. Visiting teams are expected to score an additional 0.268 points in hot games and 0.230 fewer points in cold games. This research contributes to the understanding of human performance in drastic temperatures and can be applied to other sports to better understand the mechanism through which temperature effects human performance.

ABSTRACT

Mental Health and Polycystic Ovary Syndrome (PCOS):

Examining Information Shared to Women of Color by Health Care Providers

By

Mayra Zamora

Abstract not Available