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ABSTRACT

"So You Want to Know About Caregiving?": A Narrative Analysis on
Filipina Migrant Caregivers and Their YouTube Communities"

By

Crisdel M. Aguila

Filipina migrant caregivers are celebrated for numerous reasons. In the United States, they are sought after for their "innate" ability to care for the elderly. Whereas, in the Philippines, Filipina migrants are revered for their economic contributions to their families and government. In this thesis, I put forth that migrant Filipinas' "innate" ability to care is rooted in varying factors, such as colonialism, gender, race/ethnicity, class, and labor migration. Existing literature has found that these varying sociocultural factors work to maintain caregiving as the most accessible form of employment for Filipina migrants seeking to move to the United States. I add to this discussion by suggesting that Filipina migrant caregivers, themselves, are engaged in this globalization of care through the narratives they share on YouTube. Additionally, I am interested in uncovering how this group navigates their cultural relationships and constructs their individual perceptions as working migrants in the United States. Using YouTube, as a cultural site, and narrative analysis, I identified how Filipina migrant caregivers practice redefinition, empowerment, and community by looking at the individual stories they share through their YouTube vlogs, or video blogs. Through unpacking the content of 19 videos created by 9 individual Filipinas across the United States, I found that these Filipina migrants have used YouTube to provide intimate knowledge and support to an online community of Filipinas across the world who have questions about caregiving and migration to the United States. Additionally, I suggest that Filipina migrant caregivers on YouTube are actively endorsing a 'culture of caregiving' that demonstrates how their ability to do their job well does not come from their "innate" ability to care, but from their ability to build and navigate successful relationships with their communities in the Philippines and the United States.

ABSTRACT

COVID-19 Misinformation and Narrative Interventions:
A Communications Perspective on Countering Misinformation
By
Parker Phillips Allen

Over the course of the 2020 COVID-19 pandemic, misinformation regarding the origins of the virus and the efficacy of the vaccine as well as other emergency measures has made efforts to stop the spread of the virus less effective. The cost of allowing this kind of misinformation to spread freely is grave, and can often result in serious harm to those who believe it or the people around them. In light of this, my thesis project focused on researching methods to identify and understand misinformation, as well as how to counter it through a process called narrative interventions. While much of the information presented is theoretical, there are numerous potential practical applications of narrative interventions on small and large scales, as well as in topics unrelated to health communication or disease. My research found that by identifying the demographic characteristics and worldview of the intended target audience of misinformation, you can craft a counter-narrative that will have a stronger chance of being accepted since it aligns with the audience's values. In this project specifically, I look at two common misinformation narratives surrounding the COVID-19 pandemic and construct counter-narratives based on my own conclusions about the target audience informed by research.

ABSTRACT

Educational Stories for Urban Communities

By

Daniel J. Alvarado

This is a creative project that contains stories to teach students in urban communities standardized information using students' cultures. It is informed by Culturally Relevant Pedagogy (CRP), which I have learned about extensively at California State University, Los Angeles. CRP involves using students' cultures, backgrounds, and home languages in the classroom to better educate them; however, teachers are required to teach based off Common Core Standards. This project offers a teaching tool for educators working in urban communities (e.g.: Los Angeles) in the form of culturally relevant stories that teach the standards. These stories are designed to deeply engage students and pique their academic interests with relatable characters, settings, and scenarios. Students can have trouble learning standardized information as it usually includes contexts they are unfamiliar with, high stakes tests, and heavy repetition. Learning through stories is human and organic, which is why I chose storytelling as the main aspect of my project.

ABSTRACT

Using Technology for Clinical Process Improvement: An Organizational Level Review

By

Samantha K. Anzai

Poor health outcomes and rising costs continue to be significant issues in the United States healthcare system. Considering the increasing usage of technology, we reviewed its applications to clinical workflows and their effects on business performance. Electronic Health Records (EHRs) are an increasingly prevalent healthcare information technology implemented into healthcare provider workflows. Given EHRs' growing relevance, we analyzed a secondary National Electronic Health Records Survey (NEHRS) data set regarding Office-based Physician Health IT Adoption and Use. We operationalized the data set variables into business performance measurement dimensions defined by a seminal operations management work. Our literature review found the need for additional research because of the age of the existing works and the lack of adequate cost analyses of process improvement projects. We visualized the operationalized variables using standard data visualization software and then analyzed them for trends and patterns. We found that clinical process improvement and technology applied to these efforts will help alleviate issues with cost and improve patient outcomes, provider outcomes, and the overall delivery of care in the United States.

ABSTRACT

More Than Checking a Box: Depicting Identity in Narrative Film

By

Logan Bauer

The medium of short films provides an environment for artistic and introspective exploration that is difficult to capture elsewhere. As society moves towards the acceptance of more people with unique and beautiful identities, traditional media still sticks to old rules of representation, identity, and narrative structures. This paper details an original short film from its inception to its near completion and addresses the existing obstacles that impede narratives with nontraditional identities from being widely accepted. The understandings of queer identities in contemporary media are examined through the lens of its predecessors, while directly including the prevalence of addiction in these space as a key topic in the conversation. It positions the film alongside other status-breaking pieces of cinema and art as a commentary on the ideals artistic expression is held to, and as a guide to breaking the mold of contemporary standards along the processes of producing narrative films. Finally, insight upon the realities of filming a micro-budget project amidst a global pandemic is provided as an example of creating a safe environment for such projects to be made.

ABSTRACT

How to Promote Safe Exercise During the COVID-19 Pandemic

By

Faith Baumgartner and Kayla Orate

The COVID-19 pandemic has significantly impacted the way we maintain our health. Reduced physical activity during the pandemic has contributed to increased anxiety and depression symptoms and weaker immune systems. The goal of this project is to inform individuals how to safely exercise while following infection prevention protocols for COVID-19. Exercise is a major component to maintaining and preventing disease. For this reason, it is important for people to expand their knowledge on disease transmission to minimize the spread of COVID-19 and exercise safely. A literature review was conducted of applicable peer-reviewed articles and journals to conduct our research and used databases such as CINAHL, PubMed, and Medline. Results showed that performing physical exercise decreased symptoms of depression and anxiety and that the safety precautions we recommend are effective in decreasing transmission rates of COVID-19. Based on this research, we recommend 150 minutes of exercise per week while performing proper hand hygiene, being fully vaccinated with Moderna, wearing a mask, disinfecting workout equipment, and social distancing.

ABSTRACT

Pelvic Organ Image Analysis and Geometry Reconstruction using Artificial Intelligence

By

Ralph Christian Belleca

Medical imaging plays an essential role in allowing medical professionals to provide accurate information about a patient's anatomy. It is used to view the human body to diagnose, monitor, or treat medical conditions. An MRI scan is a medical imaging technique for producing images of the interior of the body noninvasively. The output image, i.e., an MRI image, is then processed to be more useful to medical doctors using image segmentation and 3-D model construction. This procedure of segmenting images and creating 3-D models of specific organs can be tedious and repetitive, hence needing enhancement. The current methodology requires numerous manual input and corrections which can be improved using advanced technology like artificial intelligence. The goal of this research project is to streamline the process of converting medical images, more specifically MRI images of pelvic organs, into 3-D model objects using artificial intelligence. In this project, the team and I extensively experimented on Nvidia AIAA (Artificial Intelligence-Assisted Annotation), an API (application programming interface) that allows users to conveniently create 3-D model objects using trained data. This API is utilized on top of an existing 3-D visualization software called 3D Slicer which altogether streamlines the process of 3-D object creation. This research is significant because it will simplify the creation of 3-D models that allow medical professionals to monitor, diagnose and treat medical conditions.

ABSTRACT

Fabrication and characterization of nanoporous silica membrane modified gold sensor for non-contact plasmonic electrochemical microscopy

By

Miriam Benavides

Plasmonic electrochemical microscopy (PEM) is a new group of optical methods that rely on detecting surface plasmon resonance (SPR) on an electrode and offer high throughput and high temporal resolution in electrochemical single entity analysis. The most widely used PEM sensor is a glass chip coated with a thin layer of gold (~50 nm in thickness). Isolating the gold film from a sample (e.g., cells) is necessary to avoid the disturbance of cell functions by the electric bias applied to the gold film or the contamination of the sensor chip by membrane contact. This project aims to deposit a nanoporous silica membrane on a sensor chip that contains vertical nanochannels to achieve non-contact PEM detections. The channels would exclude molecules and impurities that are bigger than 10 nm. Using electrochemical methods, silica was deposited by varying the applied potential bias and deposition time. The formation of clear channels was demonstrated by cyclic voltammetry of redox species. Atomic force microscopy (AFM) was then applied to characterize the morphological features of the thin membrane. Optimal results were obtained with electrochemical deposition at a bias of -0.8 V for 5 s.

ABSTRACT

The Contrasting Impact of the Placement of Housing for the Homeless in the Communities of Lincoln Heights and Los Feliz

By

Jennifer Diana Benitez Portillo

This thesis aims to compare and contrast two different communities: Lincoln Heights and Los Feliz, to demonstrate how resources like land are used to propose housing developments like affordable housing and bridge housing placement. I will analyze the responses and support that these residents provided using environmental racism and capitalism that are intertwined and connected by the systemic racism theorized in critical race theory. In Los Angeles, policymakers used environmental racism tactics when the city decided to take land they claimed was "underutilized" from communities like Lincoln Heights and Los Feliz and neglected to include communities in the decisions (Office of the City Administrative Officer). The concepts of capitalism were expressed by Los Angeles city when they searched for sites that could be used for housing developments and took away the land from communities to make profits for the city. Critical race theory acknowledges that race shapes and affects housing and redlining policies that normalize racism. I will incorporate interdisciplinary analysis from the humanities and the social sciences to show my primary sources role in expressing the responses that Lincoln Heights and Los Feliz took when the city decided to place and propose housing in their communities. I conclude that both neighborhoods were affected by tactics of capitalism primarily through the use of their land. Los Feliz benefits from environmental racism because they have more land due to historical policies that preserve it. The low- income community of Lincoln Heights continues to be affected by historical environmental racist policies and has no open land. Future research needs to include more neighborhoods affected by housing developments to highlight the discrepancies within different communities.

ABSTRACT

Feathers Versus Flight

By

Jeremiah Jose Cabrera

Locomotion plays a central role in the lives of most vertebrates and understanding how morphology influences locomotor function is key to understanding the diversity of animal body plans. Flight is the most physically demanding form of locomotion, and birds possess many anatomical adaptations that presumably help meet these demands. One key innovation was the evolution of feathers, and since their appearance over 150 million years ago, birds have acquired many different types of feathers and ways of flying. While relationships between wing morphology (e.g., size, shape) and flight have been studied intensively, relationships between feather structure and flight style or performance are less known. My thesis aims to fill in this gap by examining how one metric of feather structure — density — varies across birds with different body sizes and flight styles. Feather density is not a metric that has been examined before but presumably, increases in feather density result from greater barb, barbule, and/or barbicel densities, which have been associated with decreases in feather transmissivity and corresponding improvements in aerodynamic performance. To examine relationships between feather density, body size, and flight style, I collected feathers in southern California and photographed and weighed them to calculate density. Feather density was then compared to feather location (primary or secondary wing feather, or tail feather), body size (based on the CRC Handbook of Avian Body Masses), and flight style (e.g., continuous flapping, intermittent flapping, soaring). I found that feather density increases with body size, that primary wing feathers are denser than secondary or tail feathers, and that for a given body size and feather type, feather density is greater in flapping birds than in birds that primarily soar or use intermittent flight. These results improve our understanding of how feather structure relates to the anatomy and habits of wild birds.

ABSTRACT

A Positivity Effect in the Use of Deliberate Ignorance: A Proposal for Research

By

Alicia Deyta

Abstract Not Available

ABSTRACT

Graphic Organizers and How They Can Help Middle School Students In Writer Experience, Motivation, And Mood

By

Alexander Escobar

A recent national survey in the United States of America reported 33% of middle school students were considered to be below average in writing performance as described by randomly selected middle school teachers (Graham et al., 2014). Based on recent studies, motivation and writer experiences were correlated with greater writer performance (Camacho et al., 2021). Computer based graphic organizers or CBGO's were also reported to increase writer's performance (Ewoldt & Morgan., 2017). We hypothesized that graphic organizers would increase easier writer experiences, greater motivation, and increased positive moods. Our participants consisted of four middle school students. A qualitative approach was taken. Our participants were given three forms to work on. Form one and two consisted of reading a historical passage and answering essay questions with and without a graphic organizer. Form three consisted of a three question, questionnaire that prompted participants to self report their opinion on graphic organizers and the affect it had on their writing experiences, motivation, and mood. Majority of participants reported positive impacts through the use of CBGO's across all three variables. A fourteen word increase was also found in one of our participants responses. Based on these results, CBGO's do provide easier writing experiences for students, increased motivation, and increased reports in positive moods. We recommend more quantitative and qualitative research with larger, randomized, sample sizes that further investigates other affective influences CBGO's have on middle school students and the impact it may also have on writers' performance.

ABSTRACT

An Adaptation of the BOPPPS Teaching Model as a Framework for Developing Video Lessons for High School Mathematics

By

Samya Faraj

Promoting mathematical literacy is vital for preparing high school students to succeed in the rapidly advancing world. Research shows that video lessons serve as effective tools for learning math because they are accessible to students and they increase comprehension. The video lessons that are currently available for high school math students lack an organized structure and they often present a procedural tutorial as opposed to a conceptual foundation of the material. This project aims to address this problem by developing video lessons for high school calculus topics that tailor to various learning levels and styles. The original collection of video lessons in this project uses an adaptation of the BOPPPS teaching model (Bridge-In, Objective, Pre-Test, Participatory Learning, Post-Assessment, Summary). The BOPPPS teaching model tailors to various learning levels by using the pre-test and post-assessment to gauge the students' comprehension of the material before proceeding to more complex topics. In addition, the original collection of video lessons applies a conceptual approach to the material that tailors to various learning styles by providing students with visual, analytic, and verbal representations of the concepts. The BOPPPS teaching model in addition to the conceptual approach can be used as a framework to develop video lessons in the future for more complex topics taught in advanced undergraduate math courses.

ABSTRACT

A Kinder Curriculum: Queering California's K-5 Curriculum

By

Valerie Wynde Flores

This thesis aims to highlight the degree to which current California Common Core State Standards include opportunities for students to think critically about the material they are learning, specifically in regards to which voices are being left out of the curriculum altogether. While modern curricular demands do tend to encourage a degree of critical thinking, these mechanisms do not broach topics that ask students to consider who is being left out. Uncovering these "unknowable" subjects and voices is therefore integral to promoting students' critical thinking skills and improving upon the Common Core State Standards. To offer suggestions for the improvement of the standards, Queer Pedagogical strategies and theories were take into account. The use of these strategies resulted in the creation of a new body of lesson plans that educators can use to supplement the Common Core State Standards, thereby helping to close the gap between Queer Pedagogical theory and praxis. These lesson plans can be distributed to educators of all grade levels to prove that asking students to think beyond the confines of modern curricular demands is, in fact, possible.

ABSTRACT

The Impact of Physical Activity on the Quality of Life of Older Adults

By

Cristian Garcia

Aging and physical activity are inversely related, meaning that as people get older they are less likely to be physically active. The reasons for this phenomenon vary from person to person. Luckily, one doesn't need to exercise extensively to have a healthy lifestyle or be physically active. Physical activities can be as simple as playing sports with the kids/grandkids, swimming at the beach, walking with a friend, gardening and so much more. Physical activities provide health benefits, especially for older adults. Some important aspects of physical function that physical activities help with are strength, flexibility, mobility and balance. Studies show that staying physically active well into later years can promote health and increase lifespan. It is important to inform older adults about being physically active and what that can look like for them. Seniors who live a sedentary lifestyle experience a loss of independence much more quickly than those who stay physically active. The loss of independence leads to a lower quality of life which can also lead to mental health issues. However, older adults who are physically active on a daily basis can maintain and potentially increase their independence by improving physical function. Ultimately, older adults with high functional fitness are able to stay engaged in activities they love and preserve a high quality of life - both mental and physical.

ABSTRACT

Preserving Patterns of Racial Oppression: How Implicit Bias contributes to Hermeneutical Marginalization

By

Melissa Irene Hernandez

Implicit bias is our unconscious associations that allow us to make quick decisions outside of your explicit cognition. All humans have implicit biases that manifests in a myriad of ways from locking the car door at the sight of a Black male, to denying a housing application because the well-qualified couple is Hispanic and may be high risk. These outgroup associations are prevalent and contribute to the continued marginalization of minorities in the United States. Analyzing the data and applying techniques to bring these implicit associations to the forefront, may allow us to mitigate these types of unconscious behavioral decisions and create a more equal and just society.

ABSTRACT

The Interconnection of 1970s Disco and Feminist Fashion

By

Mia Jessie

Feminism and disco in fashion intertwine through culture. In disco culture, fashion is for freedom and movement on the dance floor. For feminists, fashion is a controlled medium of expression for freedom as well as liberation and rejection of norms. By creating a disco feminism collection, I am connecting the two concepts that are not fully recognized as connected. I am drawing upon history to take back disco to its original Black and Queer creators and deepening my connection to the genre and movement. I used my research on history and visual data and employed methods of sustainability to create a collection of five outfits for the modern disco feminist.

ABSTRACT

Facebook Tracking User Data

By

Brittany Lilly Lerian

My topic is important today because it is relevant and will continue to be an ongoing concern. My argument is that Facebook tracks user data and my theory for this argument is digital privacy. My methods included a knowledge, search, and selection process. I earned knowledge from courses and my literature review which allowed me to properly search for relevant key terms, which lead me to select appropriate sources. The theory of my project is data privacy, which is the proper ways of handling online data. My results are based on four solutions that alter existing policies in the form of the General Data Protection Regulation (GDPR) statement addition, changing the advertisement preferences pop-up, turning off or opting out of certain features recommendation, and the fourth amendment adjustment. In conclusion, data tracking is inevitable, but it needs to be better regulated and not continue to control users.

ABSTRACT

Storytelling Through Bilingual Children's Books

By

Sidney Amber Lim

Since bilingualism has many proven cognitive, social, and cultural benefits, the intent of the project was to create a bilingual children's book that would introduce first and second grade students in the United States to the language of Mandarin. The book's plot revolves around a first-grade student named Jianjian, who is an emerging English Language Learner (ELL) that has just moved to California. Taking the targeted demographic's age into consideration, the book is intended to serve as an interactive and engaging method for students to learn a second language. Aside from the formal intention of promoting bilingualism, the book includes purposeful yet subtle elements of multiculturalism, sexual equality, confidence, inclusion, immigration, and diversity. By incorporating these elements into the storyline and illustrations, this project will give students the opportunity to interact and begin critically thinking about these topics at an early age.

ABSTRACT

FIELD OF VIEW (FOV) TOOL FOR AUTOMATED SATELLITE HORN FOV OBSTRUCTION DETECTION

By

Aaron Christopher Lockett

This project's objective is to automate the process for verifying the ideal configuration of a horn installed on the outer surface of a satellite. The horn, or signal-generating beacon, needs to have a fully-aligned and unobstructed FOV path towards the reflecting surface to which it is projecting. The overarching task was to create a portable tool to detect alignment issues and physical obstructions within this FOV path. Throughout the 2021-2022 academic year, a design solution which utilizes a LiDAR-based approach was developed to automate Boeing's current manual distance-laser verification process.

ABSTRACT

The Realistic Consequences of a California Native C3 Perennial Grass Species Going Extinct

By

Leila Noel Low

We are currently experiencing the 6th mass extinction on planet earth, due largely to human activity. In the past, loss of biodiversity has mostly been studied in random biodiversity loss experiments, which have been the standard for the past twenty-five years. Unfortunately, these experiments may underestimate the consequences of specific non-random extinctions. Multiple experiments have found that data from nonrandom biodiversity loss experiments greatly differ from their previously randomized counterparts. This thesis addresses the gap between the old (random loss) and new (non-random loss) experiment types by analyzing the realistic consequences of a California native perennial grass species going extinct. I planted eight species in full polycultures and 8 versions of plant communities where one species was experimentally removed. I found that plots without Hordeum brachyantherum produced significantly less belowground biomass and total biomass than plots that included this species. More research must be done in order to quantify the amount of carbon storage lost when Hordeum brachyantherum is absent and its effect on other aspects of the ecosystem.

ABSTRACT

North Hollywood: A Case Study of Transit Oriented Development in Los Angeles

By

John Lupfer

In 2020 the Los Angeles Metro was approved for a 30 year, $80 billion plan to bring 200 new Metro stops covering 240 miles of public transit to the greater Los Angeles area (LA Metro, 2021). How will these Metro stops affect the communities which receive them? This thesis aims to answer that question by analyzing the North Hollywood real estate market and community demographics before and after the arrival of its Metro Red (B) Line station in 2000, and by measuring Measure JJJ's Transit Oriented Communities legislation against District NoHo, the largest planned Transit Oriented Development in Los Angeles. This information is then contrasted with research from more established transit oriented communities around the U.S. to provide insight into the possible future of Los Angeles' ever evolving transit oriented communities.

ABSTRACT

Monitoring Membranous-Level Toxicity of Particulate Matter on A549 Epithelial Lung Cells Using Scanning Ion Conductance Microscopy

By

Artur Manasyan

The global issue of pollution most notably comprises of particulate matter (PM) emissions. Larger metropolitan cities (e.g. Los Angeles) generally are more affected by higher PM emissions, posing a health risk for proximal residents. Studies have previously linked respiratory and oncological diseases to harmful particulate matter exposure. As of now, most studies related to PM effects on health are based on biochemical assays, with minimal research on the anatomical perspective on cell structure. In response, this study analyzes the effect of incense smoke PM exposure on epithelial A549 lung cell membranes with a scanning probe imagine technique, scanning ion conductance microscopy (SICM). The results indicate that there is an increase in cell membrane roughness, disruption of microvilli, and membranous cavity formation, implying the cell membrane as a target of toxicity of particulate matter.

ABSTRACT

China's global reach: Casual, covert, and critical

By

Theresa McCarthy

This thesis explores the question of "What are the primary tools by which China attempts to secure its interests globally?". Extensive research was done in order to come to a conclusion. The evidence points to three main methods, hard power, soft power, and covert power. Hard power is military and economic power. Soft power is non-economic and military power. Soft power is typically spread through cultural exchanges. Covert power is power spread through covert means, such as backroom deals and political plants. To explore how each of these methods are used, specific case studies are used. To examine hard power, I looked at the government of China increasing economic involvement in Africa and the Senkaku/Diaoyu Islands dispute. To look into soft power and covert power, I examined the government of China infiltrating the Australian government and organizations.

ABSTRACT

USING GAUSSIAN ACCELERATED MOLECULAR DYNAMICS TO SAMPLE CIS-TRANS ISOMERIZATION OF PROLINE RESIDUES IN PEPTIDES

By

Muan Bradford Meurer

Attempts to accurately and efficiently simulate the cis-trans isomerization of proline (an integral aspect of protein folding) have been orchestrated using a variety of enhanced sampling molecular dynamics methodologies. Gaussian accelerated Molecular Dynamics (GaMD) is a relatively recently founded methodology that seems to hold sizeable potential with respect to simulating the surmounting of proline's isomerization potential energy barrier. In this paper, the effect of modifying specific parameters within the GaMD procedure, namely $\boldsymbol{\sigma}$D and $\boldsymbol{\sigma}$p, are examined for a rough mapping of the 2-dimensional array of variable possibilities for the peptide systems proline dipeptide and a phenylalanine-proline dipeptide. A standard GaMD procedure was followed using the *AMBER FB-15* protein force field and *TIP3P-FB* water model. It was found that GaMD can effectively simulate the proline residue cis-trans isomerization in proline dipeptide but not phenylalanine-proline dipeptide, though for what was found to be improper torsion angle parametrizations. This work serves to elucidate the ways in which the GaMD method can be useful, and outlines areas of improvement for future experimentation in this field.

ABSTRACT

Formula Society of Automotive Engineers

By

Kyle Misa

Formula SAE is an international competition requiring students to design and build an open-wheel race car. The goal of the electrical section was to design and implement an electrical harness that would allow the engine to run by delivering precise amounts of fuel and spark in precise timings. Throughout the year, research has been done in order to understand the needs and requirements of the project. For the electrical section, this includes understanding the rules of the competition, the hardware that is being used to build the harness, the working of a four-stroke engine, and understanding how to manufacture a harness. In addition to research, an updated schematic was drafted in order to understand all the electrical components of the harness. Time was also dedicated for properly sizing materials such as wire gauges, the length of the cables used to build the harness as well as the fuses that will be protecting the major electrical components. Lastly, the harness was manufactured using the schematic as a guide. Overall, the schematic and the harness were completed and tested. Although the components were functional, the timing of the fuel injectors and spark plugs were incorrect, which would be fixed with the implementation of a camshaft position sensor. Overall, the team and I learned more about the difficulties of the engineering process and were exposed to creating safe and effective design.

ABSTRACT

A computational pipeline to study the effects of viral mutations on the binding free energy of SARS-CoV-2 to the humane angiotensin converting enzyme-2

By

Nikita Mishra

COVID-19 is caused by the virus SARS-CoV-2 and has caused a great deal of grief in the past two years. New variants of the virus have been of increasing concern as the pandemic has progressed. The impact that changes in the virus – mutations – have on the transmissibility and severity of the disease can be predicted through analyzing the binding free energy, ΔGbind. The value of ΔGbind is difficult to predict through standard laboratory methods, so computational approaches can be employed for a more efficient way to quantitatively describe ΔGbind. Molecular Mechanics Generalized Born Solvation Surface Area (MMGBSA) is a computational approach to studying binding free energy that is efficient compared to other experimental and computational techniques. Herein, MMGBSA serves as the basis for a computational protocol built to predict how changes in the structure of the SARS-CoV-2 receptor binding domain led to changes in the relative binding free energy, or ΔΔGbind. Results showed that the protocol is accurate for the wild type and is quite efficient in calculating ΔΔGbind, but more work is required to improve the accuracy of the pipeline for the mutations. In its optimized form, the pipeline will predict the severity of mutations in SARS-CoV-2 and serve as a tool in fighting COVID-19.

ABSTRACT

Do parent-reported stress levels impact toddler vocabulary between 18- and 24-months?

By

Jessica Amanda Nagy

Current research on parental contributions to word learning often focuses on factors pertaining to socioeconomic and educational backgrounds. From a psychological standpoint, parental stress is known to impact the emotional and behavioral development of children, yet little is understood regarding its potential effect on children's language development. As research continues to broaden our current understanding of word learning in infants and toddlers, we continue to learn more about the environmental factors that contribute to their lexicon. This study aimed to determine if any relation existed between parent-reported stress and vocabulary skills in children. We analyzed data collected from 26 parents and their young children at 18- and 24-months to determine if any relation existed between parent-reported stress and vocabulary skills in children. Our preliminary results found that there were significant relations between parental stress and gesture use, along with comprehension, but not production. The findings from this study may inform our current understanding of parental factors that influence early language acquisition and provide further insight into this gap of knowledge.

ABSTRACT

Exploring The Photocatalytic Activity Of Porphyrinic Metal-Organic Frameworks In The Detoxification Of A Mustard Gas Simulant

By

Anna Nguyen

Sulfur Mustard (bis(2-chloroethyl) sulfide) is a toxic chemical warfare agent with stockpiles of it accumulated across the world. This lends to a need for an efficient method of safely neutralizing these sulfur mustard stockpiles. Oxidation of mustard gas by singlet oxygen has promise to be the solution as its reactive selectivity results in relatively nontoxic products after detoxification. By organizing photosensitizing porphyrins into stable structure frameworks, metal-organic frameworks (MOFs) are a class of materials that have proven to be effective photosensitizers of singlet oxygen. Therefore, a study to test the catalytic properties of the tin- and indium-doped porphyrinic MOF Zr PCN-222 in the photooxidation of a sulfur mustard simulant, 2-chloroethyl ethyl sulfide (CEES) by generation of singlet oxygen was conducted.

ABSTRACT

Characterizing a Classical Model of Charge Penetration in Different Dielectric Environments

By

Anson Noland

Accurate and efficient models of charge are essential for assigning partial charges in molecular simulations using classical force fields. We characterized a non-point charge model in which atomic charges are represented by a positive point charge at the particle center and a smeared negative charge surrounding the particle, in contrast to other common models in which partial charges are represented as point-charges. Previous work has focused on deriving the model we use and creating a Python implementation that allows us to perform these calculations computationally. The focus of this work is on determining how the parameters of our model change in different dielectric environments. Using a benchmark set of 45 molecules, we used the computational implementation of our method to determine the parameters and accuracy of our model in water and toluene. These results were compared to the standard gas-phase data for this set, to determine the effect of the environment.

ABSTRACT

How to Promote Safe Exercise During the COVID-19 Pandemic

By

Faith Baumgartner and Kayla Orate

The COVID-19 pandemic has significantly impacted the way we maintain our health. Reduced physical activity during the pandemic has contributed to increased anxiety and depression symptoms and weaker immune systems. The goal of this project is to inform individuals how to safely exercise while following infection prevention protocols for COVID-19. Exercise is a major component to maintaining and preventing disease. For this reason, it is important for people to expand their knowledge on disease transmission to minimize the spread of COVID-19 and exercise safely. A literature review was conducted of applicable peer-reviewed articles and journals to conduct our research and used databases such as CINAHL, PubMed, and Medline. Results showed that performing physical exercise decreased symptoms of depression and anxiety and that the safety precautions we recommend are effective in decreasing transmission rates of COVID-19. Based on this research, we recommend 150 minutes of exercise per week while performing proper hand hygiene, being fully vaccinated with Moderna, wearing a mask, disinfecting workout equipment, and social distancing.

ABSTRACT

A Proposal for the Estimation of the Postmortem Interval by the Analysis of Articular Cartilage with Raman Spectroscopy

By

Paloma Alexandra Padilla Uribe

Scientists are continuing to make advancements, whether it be new discoveries or new procedures. In the forensic science community, scientific advancements play a crucial role in discovering what has occurred in a case and achieving justice for the victim. One of the most important details of an investigation is the postmortem interval (PMI). The determination of the time since death can be crucial in solving homicide cases, and therefore, the forensic community is continuously examining improved methods to obtain a more narrow and accurate PMI range. This paper examines some previous methods of determining the PMI while additionally proposing a new approach. Articular cartilage is proposed as a potential sample because of its isolated environment, which is suspected to be less impacted by putrefaction. The proposed method of analysis is Raman spectroscopy to analyze the global changes in chemistry that occurred over time, such as the depletion of chondrocytes. Water from the cartilage would not interfere with the analysis when using Raman spectroscopy. For these reasons, research on using Raman spectroscopy to examine cartilage as a method of determining time of death should be conducted.

ABSTRACT

Bienvenidos al Mundo del Español:

A Mixed-Media Curriculum Model for Middle School Spanish

By

Andrea Perez

Bienvenidos al Mundo del Español is a mixed media approach to curriculum planning. Existing curriculum books were used as a reference and starting point for the creation of the model. The guideline provides an outline for teaching Spanish through differentiated instructional strategies, including vocabulary words, a Spanish cheat sheet, an interactive notebook, and music specific to the content covered. It is intended to serve as a middle school preparatory elective. Despite being intended for use at the middle school level, the guideline can be simplified and divided into smaller parts in order to serve the K-5 population. Alternatively, it can be expanded upon by the inclusion of more complex concepts to serve the high school population as a foreign language course. Furthermore, the curriculum structure can be used to map other foreign language modules or general curriculum planning. The purpose of this guideline is to teach students the Spanish language, give students the opportunity to develop cultural competence, and engage students in their own learning.

ABSTRACT

Healing From Sexual Trauma with Poetry: An Autoethnography

By

Xiana Mireya Posada

This thesis explores how writing poetry can create a path towards healing for individuals with sexual trauma. This paper understands the cathartic nature of writing and hopes to shine light on the connection between healing and sexual trauma. An autoethnographic approached was used to conduct this paper. The idea of connecting my own personal experiences and my lived "epiphanies" from writing poetry to poetry therapy is prevalent throughout these pages. I also wanted to inform readers specifically how to reach similar "epiphanies" and feelings of catharsis. I created new art pieces such as poetry, photography, video, and sculpture by retrospectively choosing past moments and applying components of poetry therapy. Each piece revolves around the topics of sexual trauma, abuse, violence, and ultimately, healing. These projects were organized and compiled into a magazine title My Box of Fire. I hope to encourage other survivors to write and remind them that their stories, minds, and bodies are important.

ABSTRACT

Plasmonic Imaging of Lead Underpotential Deposition at Gold Nanoparticles

By

Sathya Raminani

Gold nanoparticles (AuNPs) have shown promise as catalysts for electrochemical reactions. Understanding the correlation between the particle surface structure and the electrochemical activities is essential in designing better catalysts. Underpotential deposition (UPD) is an efficient way of identifying particle surface structures and utilizing plasmonic electrochemical microscopy (PEM), an optical imaging technique, can provide information at individual NPs. This work aims to address the issue of background signal resulting from electrochemical reactions taking place at the PEM working electrode, a gold surface. Our approach uses self-assembled monolayers (SAMs) composed of various alkanethiols to insulate the gold surface from the electrolyte solution before depositing the AuNPs onto the PEM electrode. To determine the most efficient SAM composition for blockage of the surface, cyclic voltammetry (CV) was used to analyze SAMs prepared with various alkanethiols. It was found that the surface coating consisted of equal concentrations of dodecanethiol and octanethiol provided the best blockage. PEM test with AuNPs on SAM coated electrode showed ideal blocking of the background, but no trace of UPD signals at the AuNPs. Further studies will focus on improving the sensitivity of PEM to single NP electrochemistry with the presence of SAM coating.

ABSTRACT

Human Rights: Moral and Political

By

David Joseph Randall

The problem of whether human rights are moral or political objects, sometimes referred to as the foundational problem of human rights, is among the most contentious problems in the philosophy of human rights today. Philosophers of human rights generally endorse theories supporting one position or the other. Unfortunately, both moral and political theories fall prey to valid criticisms. To give two examples, moral theories struggle to give us the human rights we currently enjoy under international law, and political theories have trouble justifying human rights' universality. However, moral and political theories are deeply complementary, and not much work has been done showing how they might be integrated in order to avoid the major criticisms that undermine them individually. In my thesis, I argue that there are a number of important criteria that a successful theory of human rights must meet, and that John Tasioulas' moral theory from universal human interests and Charles Beitz's political theory based on the way human rights function in international human rights practice, when properly integrated, are best suited to meeting these criteria.

ABSTRACT

Proposed Art Therapy Intervention Study To Measure

Personal And Academic Success In Nursing Students

By

Mary Marbee Rico

Researchers have reported an escalation in burnout rates among nurses during the COVID-19 pandemic. Mental health consequences of perceived stress, anxiety, and depression among nurses were reported. Nursing students also experienced increased personal and academic burnout due to the pressure to complete their nursing program and join the nursing workforce. Art therapy has been utilized as an intervention to decrease burnout. A search was conducted using CINAHL, PubMed, and Medline under PRISMA guidelines (n = 95), and thirteen studies met the inclusion and exclusion criteria. The included studies were cross-referenced resulting in seventeen research articles. Studies reported there was a decrease in burnout rates and perceived stress among nurses with the use of art therapy. Furthermore, nurses reported decreases in mental exhaustion, overall emotional well-being improvement, and positive outlook after art therapy sessions. While art therapy has been explored among professional nurses, it has not been studied enough among the nursing student population. The aim of this research is to propose art therapy as an intervention to alleviate signs and symptoms of personal and academic burnout among nursing students.

ABSTRACT

The Internet and its Peril to Democracy

By

Daniela Stacie Risner

The Internet is deeply ingrained in today's society; there is no denying the influence that social media has on the general public. While the Internet fosters widespread communication, there is a danger that it poses too. The use of algorithms on social media websites is incredibly dangerous: their use can create echo chambers, as well as push forth the agenda of the modern-day conglomerates that run these websites. Internet users are being deceived. They are not truly being exposed to nor engaging in open communication. This kills critical rational debate, and undermines the very essence of self-governance. The implications for our democracy are dire. This thesis seeks to answer the questions of why cohesive and coherent regulation on the Internet does not exist, and how to begin creating regulatory policies to create a safer Internet while also protecting free speech. In order to pursue these questions, this thesis includes the study of First Amendment theory, case law, regulatory law, and antitrust law. Ultimately, we find that the answer to regulation on the Internet is not simple, and there is not one perfect path. But we do find this: we must devise a flexible, legal definition of the Internet in order to piece together a new First Amendment theory that is adequate enough to address the scope and power of the Internet. To this end, we must modify Section 230 of the Communications Decency Act of 1996, and we must work at creating and enforcing new Antitrust laws to break up these modern-day conglomerates and disperse market power. Most importantly, we must pursue all of these efforts at once in order to move forward.

ABSTRACT

Leadership Through The Age of a Pandemic

By

Dolores “Natalia” Rodriguez

In my qualitative research project I dive into the challenges leaders and managers faced during the pandemic. In addition this research looks toward identifying key skills that these leaders deemed important and crucial toward gaining the confidence of their employees and colleagues. This attempts to answer the complicated question of how leaders and companies can better prepare for future unforeseen events. I collected information by interviewing four nurses who either had a management title or leadership roles within their companies. Two of the individuals are of older age and the other two are significantly younger. In fact, three out of the four nurses were women. The results of my research connected common themes that nurses vocalized. Older leadership individuals see a need to change and adapt their leadership style to fit different situations. Whereas younger leaders tended to have a looser leadership style that they felt did not need to change in terms of situations. In addition, listening skill was deemed most important during a crisis like this one. This allowed them to understand employee concerns and better problem solve. In addition, they were also better able to find ways to support and help their employees. Finally, I gave recommendations that would help companies evolve their training and development programs to begin creating the leaders they need within their companies. A few of the suggested methods were to implement coaching and mentorship to guide and prepare leaders for roles of influence and management.

ABSTRACT

Religiosity: Links with Major Personality Traits

By

Eileen Beatrice Rodriguez

This study examines the question of authoritarianism as a personality trait, exploring correlations with negative gender perceptions and religiosity. The first part of the study is qualitative in nature and entails a literature review of relevant scholarship and theory related to the principal topic, beginning with the origins of theories of authoritarianism from thinkers such as Adorno (1950). The second part of the study is quantitative and involves a survey of 305 voluntary participants using the HEXACO personality trait measurement model (Ashton & Lee, 2009). The survey found that higher scores in religiosity are linked with higher scores in authoritarianism and social dominance orientation. Overall, the study results indicated that multiple indicators of religiosity may be linked not only to greater extroversion but also to significantly lower scores in Openness to Experience, Conscientiousness, and Honesty/Humility. At the same time, the results also indicated that there appears to be a correlation between a high degree of religiosity and authoritarianism, which combined with the qualitative component, suggests that religiosity may be correlated with negative views of gender minority and women's equality. Religion is one of the most significant elements of society. It entails observing guidelines, principles, and practices linked with a specific belief system. Notably, different communities have different religious traditions, depending on the nature of the people and their relationships. People usually associating iv with a specific religion, including its practices, beliefs, and doctrines. Notable faiths include Christianity, Islam, Hindu, and Judaism. Most people do this to avoid getting labelled as non-believers or outsiders. Although it is good to have a religious identity, it also brings adverse outcomes. A notable correlation to religiosity is authoritarianism. Religion preaches peace, love, tolerance, and understanding. Widely equated with morality and goodness in American culture (Shoemaker & Bolt, 1977), and 42% of Americans think that belief in God is necessary to have good values (Pew Research, 2019). Thus some view Atheists and agnostics quite negatively, because people think they are immoral, and spiritual but not religious people are also viewed as low in morality (Edgell et al., 2016) Although this is an exploratory study, if religiosity is linked to "goodness," we expect positive links between religiosity and positive personality attributes.

ABSTRACT

Therapeutic Claims Related to Regenerative Medicine Among U.S. Naturopathic Doctors

By

Melina Vianney Rodriguez

Stem cell therapy has gained rapid momentum as a promising regenerative medicine treatment in recent years. However, despite ongoing advancements within the field of stem cell research, most stem cell treatments have yet to be scientifically validated. Naturopathic practitioners have recently started incorporating these inadequately tested treatments into their services under the general umbrella term “regenerative medicine.” The role of naturopathic practitioners in the marketing of regenerative medicine and stem cell-related treatments has received little scrutiny. Using publicly available information online, the frequency and characteristics of stem cell-related marketing claims made on websites of naturopathic clinics were identified. The scope of their involvement is investigated in this thesis. The finding showed that a substantial proportion of naturopathic practitioners are claiming they can treat conditions with regenerative medicine treatments. This insight calls for a diverse approach to identifying and evaluating potential policy responses to regulate this rapidly expanding market more effectively.

ABSTRACT

The Role of Neoliberalism Impacting Housing Availability in Sweden

By

Ivan Angel Rodriguez Garcia

Housing is essential to all of humanity for a multitude of reasons. It allows us to take shelter, reduce stress, and improve our physical and mental well-being. In a country like Sweden, which emphasizes an ideology of social democracy, it is important to explore how an ideology like social democracy is influential in terms of housing availability. The Swedish constitution and initiatives in Sweden like the Million Programme, established in the 60s supported the idea of making sure everyone had the opportunity to have housing in the country. With the change in government in the early 90s from social democracy approaches to a more neoliberal approach to power, this thesis will explore how the current Swedish government establishing and partaking in neoliberal housing policies will impact the housing system, established initiatives like the Million Programme and housing availability in Sweden.

ABSTRACT

The arqive: LGBTQ+ Storytelling App - Expanding Mobile and Gamification

by

Erica Liezel Santos

The arqive is an app that serves as an online safe space for lesbian, gay, bisexual, transgender, and queer (LGBTQ+) individuals to share their stories, resources, or anything they find meaningful as pins on an interactive map. It combines three purposes: to outlast forums with outdated resources that have since been abandoned, to preserve queer history in a digital archive as its physical landscapes change, and to connect people through storytelling. *The arqive* tasked its third Senior Design team to expand on its existing website and mobile app, adding new features and improving performance and its subsequent user experience. As a Senior Design team, we accomplished over 20 improvements and installments, in areas ranging from the frontend and the UI/UX, the databases, content moderation, security, and an augmented reality proof of concept. Overall, our contributions to *The arqive* were significant to the innovative platform, and we saw 49 new users and 60 new stories during our time. We hope that the next year's Senior Design team will continue to build over the foundation we laid and continue practicing writing readable and scalable code.

ABSTRACT

The Effects of Future Time Perceptions on Goals and Emotion Regulation:
Discrete Emotions Perspective

By

Ulas Aaren Sarisoy

Relative preference of older adults towards positive over negative information in attention and memory compared to younger adults is known as the positivity effect. The predominant theory that explains the positivity effect is the socioemotional selectivity theory. According to the socioemotional selectivity theory, when future time is perceived as limited, as in older adults, present time will come under focus and emotional well-being is prioritized. Although the SST explains the relative preference of older people gravitating towards positivity, it falls short to explain why older adults engage in negative emotions in certain situations. The goal of this research proposal is to address this issue. One-hundred-twenty participants will be randomly instantiated to either limited time, expansive time, or control conditions. Participants then will be shown fear and/or disgust inducing movie clips and subsequently rate their affective reactivity to the stimuli. It is expected that participants in the limited time condition will report more emotionally-meaningful goals whereas participants in the expansive time condition will report more information-seeking goals. Older adults are expected to have greater reactivity to fear and less reactivity to disgust whereas younger adults are expected to have greater reactivity to disgust and less reactivity to fear. Implications are discussed.

ABSTRACT

The Emotional Impacts of Film Scores on Audiences

By

Allahna Shabaf

Have you ever been watching a sad movie scene that is so emotionally powerful, that it almost brings you to tears? Were you able to hold those tears back, but when the music started playing, you started sobbing? Did you wonder why you were able to keep it together until the violins piped in? Was the music put in the movie just to pull at your heartstrings? Yes, it was. Film scores, the music created to play with the film, use the emotions displayed in the scenes of a film to properly convey certain emotions to the audience. The film composers need to make their scores emotionally impactful enough to work with the film to draw emotions out of the audience. Is there a secret to composing film scores to be impactful? Not necessarily. Using music theory can go a long way when composing scores with a certain emotion or feeling in mind. However, composing a score to be emotionally impactful to the audience does take a bit more thought than which intervals or keys sound happy or sad. Analyzing scores from different Oscar Award winning film scores gave insight into what exactly made those scores so emotionally impactful. Furthermore, the instruments used also played a role in why certain scores evoked a certain emotion. Yet, how are music theory and instrumentation put to use when creating an emotionally impactful score?

ABSTRACT

American Indian/Alaska Native-Related Content in Undergraduate Social Work Education: A Study

By

Ronson Souza

Social work as a profession sets its sights on aiding and empowering individuals and communities to attain social, environmental, and economic justice. In practice, social workers encapsulate a dual focus on creating and fostering positive changes in both individuals and the systems of power within society. However, social workers and their institutions have had a harmful impact on Indigenous communities within the United States through their active participation in unjust child removals, forced placements in Indian Boarding Schools, and performing eugenics on the population. The effects of these actions are still prevalent today as evidenced by intergenerational trauma and the absence of mentions of the community within social work higher educational curricula – leading to further harms occurring within the population by educated social workers. We suggest that it is imperative to include AI/AN-specific literature within social work educational curricula to educate future social workers on the topic as it may prevent further harms from occurring within our Indigenous communities. Therefore, this study examined current levels of AI/AN-specific content in undergraduate social work curricula through measuring the experiences of both students and professors in an undergraduate social work program at a Southern California public university. Findings match that of previous studies completed on a national level: lecturers have a hesitancy in teaching the subject, thus the undergraduate social work program contains little-to-no AI/AN-specific content – unless the lecturer elects to include it within their courses. However, both students and professors are aware of this current gap in their educational literature and requested such content be provided in the future by school administration to further enhance their social work practice.

ABSTRACT

Inhuman

By

Kathryn Starnes

There has been an outcry for more diversity within television and film content. While having a diverse cast of characters can reflect the nature of our diverse world, ensuring that different racial/ethnic, religious, and queer groups are represented in a true light is even more important. There is nothing more disappointing than seeing someone meant to reflect a part of you on screen only for that character to be nothing more than a prop or caricature. Diversity and representation are important within media. However, there are stories that become less impactful if the creators opted for diversity rather than the demographics the script called for (i.e., *Get Out*, *Dear White People*, *Crazy Rich Asians*, *Sorry to Bother You*). In animation, it can be easier to have visual representation (main characters or background) and diversity. But, whether they are voiced by people of the shown demographic or whether the showrunners and writers consult people of that demographic is never guaranteed. Good representation requires consultation and collaboration with those being represented. With my script I created a diverse cast of characters written for people of various demographics to bring to life and I will take the time to properly research and later consult with other diverse creators in order to create accurate depictions of cultures other than my own.

ABSTRACT

Portable Electric Vehicle Charger

By

Kemyl Tadeo

As electric vehicles start to become mass produced, consumers are worried that they are going to run out of range while driving their vehicle, which is a phenomenon known as range anxiety. One way to solve this problem is to extend the range of a vehicle with a backup charger that can be taken on the go. I was tasked with using Mathwork's suite of mathematical computing software to design a portable electric vehicle charger that would be capable of providing a car with enough range to get the driver safely to the next destination. To do this I first did research on battery chemistry, size, cost, charging types, and Mathworks software. Next, I successfully helped design a portable charger where I specifically worked on the proximity pilot circuit, control pilot circuit, and conducted the thermal analysis on the model. The model completed will serve as a framework for future engineers to implement into a practical setting in order to help cure range anxiety and future the adaptation of EVs.

ABSTRACT

Investigating Serotonin Receptor Levels during Neural Inflammation:
Effects Of Ashwagandha On Depression In Rats

By

Angelica Vandekerkhoff

Previous studies have shown significant changes in serotonin (5-HT) signaling in the prefrontal cortex in both depressed humans and animals. Abnormal 5-HT neurotransmission contributes to the progression and onset of depression and other disorders, including schizophrenia, bipolar disorder and anxiety. Since past studies have shown ashwagandha (WS) to have neuroprotective and anti-inflammatory properties, this thesis will investigate the medicinal herb WS's abilities to help maintain or increase serotonin signaling through its anti-inflammatory properties, within the prefrontal cortex of rats with lipopolysaccharide (LPS) induced neural inflammation. Western blotting analysis was utilized, looking at 5-HT3A (serotonin receptor) protein levels in rats that have been treated with WS and LPS, as the outcome measure. The results of the experiments found that WS has no direct effect on serotonergic signaling in the prefrontal cortex in rats.

ABSTRACT

"Fantasy in the Stars": A Study on Diversity and Representation within the Fantasy Genre

By

River Vargason

Across media the fantasy genre has been long used as a space to tell stories of myth and magic. Often broaching the subject of war, this genre classically speaks on struggles of race and class. However, with the most popular creators of this genre historically being some of the most privileged in society, it has almost become a trope of the genre for these stories to be riddled with inaccuracies on these struggles. Fantasy writers are able to use the distance their audiences feel from their characters being mythical creatures as a buffer between them and claims of these inaccuracies. They have long used the idea of "fakeness" within the genre as a wall to hide behind. Writing diversity involves more than just character creation. The representation needs to be more direct and grounded within the genre Marginalized characters need to be centered within fantasy stories and accurately portrayed. This kind of change can not be created by one person, however. It takes teams of people to accurately represent a diverse, intersectional audience. Most importantly, that there needs to be a fundamental change to how Hollywood addresses representation.

ABSTRACT

Use of Plasmonic Electrochemical Microscopy to Study Electrochemical Reactions at Individual Prussian Blue Particles

By

Kinsley C. Wang

Prussian blue is an iron-cyanide-based pigment steadily becoming a widely used electrochemical sensor in detecting hydrogen peroxide at low concentration levels. Prussian blue nanoparticles (PBNPs) have been extensively studied using traditional ensemble methods, which only provide averaged information. Investigating PBNPs at asingle entity level is paramount for correlating the electrochemical activities to particle structures and will shed light on the major factors governing the catalyst activity of these nanoparticles. Here we report on using plasmonic electrochemical microscopy (PEM) to study the electrochemistry of PBNPs at the individual nanoparticle level. Prussian blue was synthesized with the assistance of polyvinylpyrrolidone (PVP), a surfactant, to create regularly shaped and sized nanoparticles. First, the particles were characterized with Xray diffraction and atomic force microscopy to confirm the identity and topography of the particles. Second, the particles were tested with PEM and only exhibited electrochemical activity after the PVP was removed with ethanol. Finally, the sensitivity to hydrogen peroxide at individual PBNPs was investigated.

ABSTRACT

The Development of Microfluidic Paper-based Analytical Devices and Thread-based Electrodes for the Colorimetric and Electrochemical Detection of Glucose

By

Alyssa Stephanie Wong

Many microfluidic-based platforms now form the foundation for many point-of-care (POC) diagnostic devices due to their ease of fabrication, portability, and low cost. The incorporation of paper and thread in microfluidic devices has been shown to reduce the time and reagents required for biological assays, such as in the glucose bioassay. Herein, the development of microfluidic paper-based analytical devices and corresponding thread-based electrodes is described to detect glucose via colorimetric analysis and cyclic voltammetry (CV). The paper-based devices were composed of multi-wax-printed paper and generated saturation curves via the vertical capillary action of reagents, subsequent drying, and scanning. Upon analyzing the results, a correlation was found between yellow color intensity and glucose concentration for the microfluidic paper-based multiple inlet device (R^2= 0.992) and single inlet device (R^2= 0.978). In addition, the use of thread in electrochemical sensors has allowed for the detection of glucose. The thread-based electrodes were composed of nylon thread, glass capillary tubes, and conductive inks. The electrochemical sensors quantitated glucose via CV using two different systems, a bubble wrap platform (R^2=0.9908) and a continuous flow system (R^2= 0.9800). These sensors electrochemically detected glucose while incorporating reusable, inexpensive materials that required minimum quantities of reagents.

ABSTRACT

Beyond Recent Memory: Current Representations of Alzheimer's Disease and Dementia in American Films

By

Lauren Brittney Yamada

Popular media, like news, television, and film, has the potential to influence the way audiences see various conditions and events due to the way they are portrayed on screen. What they are afflicted with, how it happened, and who is affected are some questions that arise. In the past thirty years, American produced, written, and directed films have created a narrative of Alzheimer's disease and dementia that encompasses a certain focus and story. It changes based around genre and tone, but still has a narrow view on what these conditions are, how they progress, and most importantly, who is afflicted. Many films are backed in person experiences but lacks the representation that is seen in medical research and populations in the United States. It is important to create narratives that have representation to show a more accurate picture on screen. Additionally, eleven films were analyzed in their portrayals of Alzheimer's disease and dementia. The project associated with this paper is a script based around scientific and medical research along with my own experience through various family members and prior portrayals.

ABSTRACT

Augustinian Influence on American Politics: An Analysis of De Civitate Dei and The Federalist

By

Ryan Jihoon Yoo

There is a looming cloud of discontent haunting American political institutions today. Politicians are perceived as greedy, power-hungry, unconcerned with the plight of the ordinary American, for they are so enraptured at the prospect of personal benefit. In The Federalist, the most comprehensive document in American political theory, James Madison and Alexander Hamilton argue that government is merely a reflection on human nature. Therefore, if our politicians are selfish and ambitious, the American populace exhibits the same traits. They argue that the only way to create good governance is to redirect people's ambitions against one another to discourage tyranny. Their diagnosis of human nature and proposed government is not unique, as Saint Augustine had argued in favor of a similar re-channeling of vices more than 1300 years earlier. Because of this, I argue in my thesis that The Federalist is fundamentally an Augustinian document. I explore the history and political thought of both Augustine and Publius and analyze any underlying commonalities found in The City of God and The Federalist. I then review some possible objections regarding the genealogical roots of The Federalist, specifically pertaining David Hume and Montesquieu. Finally, I analyze the practical applications of my thesis to contemporary American politics.

ABSTRACT

The Search for Happiness

By

Brandon Yueng

Happiness — defined by Dictionary.com as the “state of feeling happiness.” Any discussion around happiness will eventually broach the following topic—How does one actually be happy? To answer this question, this thesis first organizes happiness into categories (being the biopsychosocial model) that make for easier discussion and analysis of a feeling as abstract as happiness. The biological factor focuses on how the human body responds and creates the sense of happiness through hormones. The psychological factor focuses on the concept of “positive psychology” with the effects of personality on happiness. Lastly, the sociological factor will analyze how social factors like one's relationship with the media they consume may influence their ability to feel content. From these perspectives, the researchers formulated a survey similar to the Happiness Index and Oxford Health Questionnaire. Though the current survey was not able to pass through the IRB, the expected results are— the general population should trend towards being happy. However, the “Search for Happiness Survey” reports 51% of the individuals being satisfied with life. This matches the other studies, like Howell et al. which state 51% of the participants are satisfied with life. From our findings a more fitting definition of happiness will be the following— a fleeting feeling that can be sustained by setting small goals leading to a bigger picture.

ABSTRACT

Effects of Popular versus Therapeutic Music on College Students' Stress Levels

By

Audrey Zhang

The purpose of the present study was to further investigate the effects of music on the reduction of stress among college students. Recently, Dr. Francis Collins, former Director of the National Institutes of Health (NIH), and Rénee Fleming, renowned opera singer, introduced Sound Health, a project for researchers to explore the connection between music and the mind. A major area of study is stress. It is known that the college years are characterized by increased stress levels which have pronounced effects on academic performance, mental health, and overall well-being. The present study provided survey-based research on changes in college students' stress levels when exposed to either therapeutic or popular music. The study results indicated that listening to music for one week led to a reduction in stress levels, but the difference was not statistically significant. Further studies in a controlled environment or in select high-risk populations or situations may be needed to elucidate the role of music in reducing college student stress levels.

ABSTRACT

Protective Ability of Beetle Antifreeze Protein DAFP-1 on ADH at Low Temperatures

By

Ziyi Zou

Antifreeze proteins (AFP), such as DAFP-1, the beetle antifreeze protein from the *Dendroides canadensis* beetle, have been found to protect the activity of proteins through multiple freeze-thaw cycles, which allows it to be used in cryopreservation. In particular, there have been studies that have shown DAFP-1 could be used as a potential ingredient in cryopreservation solutions. Cryopreservation is important because it allows biological components to be stored for long periods of time and under circumstances with little to no contamination, which is important for both research and medical purposes. In this study, the enzyme alcohol dehydrogenase (ADH) is used to test the protective ability of DAFP-1, so DAFP-1 and ADH were mixed together at different ratios and kept at 4℃ before running an activity assay to test for the concentration of functional ADH after being stored in low temperatures. However, the results were inconclusive because of scattered data points that were most likely due to human error and the lack of three sets of data to show the reproducibility of the results. From past studies, further testing of ADH with DAFP-1 should yield concrete results once human errors are eliminated or kept at a minimum, which could provide more feasible data for the study.