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Book of Abstracts

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Spoken & Performance Panels

WorldCUR 1A

WorldCUR001
Health

The Effects of Transcutaneous Electrical Nerve Stimulation on Pain Perception During Isometric Exercise

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Abstract

The treatment of choice for chronic pain has been opioid drugs, a pharmaceutical agent that is highly addictive. Transcutaneous Electrical Nerve Stimulation (TENS) is an inexpensive, non-addictive, alternative therapy that uses low-voltage electrical current to provide pain relief. These electrical impulses ALTER how the nervous system transmits pain signals to the spinal cord and brain. In previous studies, TENS has also been shown to alter one's pain perception by stimulating the production of endorphins in the body. The purpose of this study was to gain a deeper perspective on the effects of several durations of TENS alone or in combination with exercise alter pain sensitivity. This study will focus on 20-25 female participants between the ages of 18-24. We chose female participants because women have a higher pain sensitivity than men when reacting to stimuli. Participants were familiarized to pain threshold testing, TENS application and the exercise protocols. Pressure pain threshold was determined by applying pressure to each person's upper leg until they deem it painful. This was performed before and immediately following one of four TENS/exercise protocols: 1) TENS only for 20 min, 2) isometric knee exertion exercise at 25% of their maximum voluntary contraction (MVC) until fatigue, 3) isometric exercise at 25% MVC plus TENS, and 4) high-intensity electrical stimulation at 25% of MVC time matched to voluntary exercise. Through these protocols, we hope to learn more about the factors that influence pain sensitivity and explore the efficacy of alternative treatments to opioids.

How Bacteriophages can Help the COVID-19 Crisis

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Abstract

COVID-19 has rapidly spread to all areas around the globe, already causing a high death toll. Since the initial cases, secondary infections have been associated with this viral infection. This prevalence of secondary infections has led to an increase in antibiotic use that is likely contributing to the growth of antibiotic resistance. Meaning that alternative therapies like bacteriophages (viruses infecting bacteria) have a new potential of targeting secondary infections associated with COVID-19 to reduce both the burden of resistance and severe disease.

We performed both a systematic review and a meta-analysis using a literature search. Searching for articles conveying the prevalence of secondary or coinfection with COVID-19. In addition, we looked at the use of bacteriophages as novel treatments for these secondary infections, plus other uses they may have.

Comparing our meta-analysis and published literature, the prevalence of secondary infection with COVID-19 was low at around 13.9% in hospital COVID-19 patients. But higher prevalence was found to be associated with COVID-19 patients with more severe disease. Additionally, we discovered numerous literature that showcases several mechanisms in which bacteriophages can assist in COVID-19 and secondary infections. Primarily, these were specific bacteriophages able to target secondary bacterial infections. And bacteriophage-inducing antiviral immunity against COVID-19. However, a limitation in these applications was the lack of clinical research to prove bacteriophage efficacy. Therefore, it was suggested plenty more clinical research is required before bacteriophages and the positive qualities of phage therapy can be applied to COVID-19 and future pandemics.

WorldCUR 1B

WorldCUR003
Power

"I couldn't do this job without it": Teachers' experiences of mandated collaborative lesson planning teams.

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Abstract

Teaching is often seen as an isolated profession. New teachers are entering the profession, after being encouraged to collaborate with their peers, mentors, and professors throughout their degrees, and being faced with planning for their lessons mostly in isolation. Previous research shows that this can have an impact on not only teacher wellbeing but also their students' outcomes (Baumann, 2015; Hargreaves, 2019).

This project aims to determine how teachers' experiences of collaborative planning teams, in an environment where it is encouraged and mandated by leadership, impacts their professional practice. This qualitative case study has been conducted via one-on-one, semi-structured interviews with 10 teachers across multiple year levels who are currently working in an Australian school with mandated collaboration.

This research has identified that teachers believe that collaborative planning has allowed them to develop shared knowledge built from other's different experiences and skills. It allows teachers to develop common goals for students and has provided them with more opportunities to be successful. Teachers identified that it helps to lessen their workload, and has helped them develop friendships so that work has become a social experience. Both of these factors have been seen to improve teachers' perceived wellbeing.

The results of this research could better improve teacher lesson planning practices, and in turn have a better impact on classroom practice, teacher wellbeing and student outcomes. This research could additionally have applications in other professions where collaboration could improve workflow and employee wellbeing.

The Criminalisation of Marital Rape in China: A Comparison Between Chinese and English Law and Society

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Abstract

A new wave of the feminist movement in China in the past decade has awakened more women to advocate for their own rights. However, women's rights in the domestic context are still largely vulnerable or even absent. Specifically, the court in judicial practice appears to only criminalize marital rape when the marriage is in an unusual situation. On the other hand, the English court fully rejected marital exemption in R. v R. [1991]. A comparison is thus to be taken between the two countries that are both heavily impacted by their historical and cultural backgrounds, and share a similar pattern of the development of the feminist movement. The author would use a socio-legal and comparative methodology to explore whether it is now the right time for Chinese law to consider an English law approach to marital rape. Both primary and secondary resources would be analyzed in order to obtain a full picture of the current situation. It is likely that the research would find that it is possible and preferable for the Chinese court to adopt a full abolition of marital exemption as the English court. If this is the case, the status of married women in China would be significantly improved. The result of this project aims to provide some insight into sexual offences in a domestic context from a comparative perspective. More broadly, it aims to raise public awareness of women's rights in current legal and judicial systems and encourage potential law reform in this area.

Marketing Paradise: Mexico Through Historical and Contemporary Photography

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Abstract

Beginning in the late 19th century, Mexican President Porfirio Díaz commissioned photographers to depict a modernized Mexico through the photography of railroad construction, expansion of electric energy, and promotion of commercial development in order to document the achievements of his presidency and to encourage tourism. During the Porfiriato (1876-1911), images of Mexico were commodified as postcards, contributing to the global circulation and collection of these photographs. Many of these images exploited marginalized indigenous communities against the backdrop of technological progress. Today, tourism in Mexico is a $26 billion industry that continues to market through the use of photography. Through a visual and historical analysis that compares early propaganda to recently published tourism images of Mexico, research will uncover how both eras have used photography to manipulate outside perception of the country. The Winfield Scott Photograph Album, circa 1900 from the Lou Emma Wilson Mexicana Collection at the University of Kentucky Libraries Special Collections Research Center contains examples of Porfiriato imagery of Mexico depicting railroads, indigenous people, and industry. Contemporary photographs, such as those on Instagram that are marketed by the Mexican Tourism Board, will allow us to see how modern-day Mexico markets itself as a tourist destination. The album and online images will be utilized to investigate how both time periods depict indigenous Mexicans in modern and premodern contexts. Moreover, this research will explore the ever-present conflict between tradition and progress and photography's role in curating current conceptions about Mexico as an exotic vacation destination.

WorldCUR 1C

WorldCUR006
Data

Native-Speakerism: ideological phenomenon of English language at Kazakhstani university

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Abstract

Nazarbayev University is an educational institution, whose only official language of education is English, operates in a territory of Kazakhstan, where the majority of the population speaks Kazakh, Russian, or both. At the university, where students are taught by both local and foreign instructors, there is a chance of observing the native-speakerism phenomenon, a preference of L1 tutors over L2 ones just on the basis of the former operating in English from childhood. This research shows that social factors influence the presence of native-speakerism bias. To be precise, the students with less writing experience tend to choose L1 tutors as they suggest that only these tutors can give them the proper advice and only they can assist with language subtitles. On the other hand, more experienced writing students could identify the advantages of both L1 and L2 tutors. In contrast to that, L2 tutors with less experience showed more confidence and did not doubt language proficiency as much as more experienced L2 tutors did. The research demonstrated that there are real connections between the experience of the L2 tutors and tutees and the extent to which they are prone to native-speakerism. The relationship of the former was a positive correlation, with anxiety levels increasing with experience, whereas tutees had a negative correlation, with lesser influence by native-speakerism as their experience in writing increased. This is very first research native-speakerism ideology in Kazakhstan, which highlights that it is the language which transfers the ideology with itself, rather than historical/cultural background

A Phylogenetic Method for Estimating COVID-19 Transmission Rate Using Coronavirus Genomes

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Abstract

The COVID-19 pandemic produced an influx of genomic data, revealing gaps in currently utilized methods for phylogenetic interpretation. Current techniques for transmission rate estimation of viral infections often rely on transmission equilibrium between populations and are not suited to large datasets. transRate© is the first computational method to estimate transmission rates using a cladistic approach for genomic data. The R package is suited for transmission rate estimation on a very large data set in a non-endemic state. This method identifies groups, or clades, of whole genome sequences based on geographical origin and genomic similarity. The resulting clades come predominantly from one region with some geographical outliers. Geographical outliers are inferred to define possible transmission events. 40,028 high-quality sequences of SARS-CoV-2 in human hosts during the early SARS-CoV-2 pandemic underwent estimation. This analysis revealed that travel restriction mandates did affect transmission between populations in March 2020; however, at this time there was likely an increase in transmission events within populations. The development of transRate© allows scientists and public health officials to better understand the progression of the COVID-19 pandemic and any future viral infectious outbreaks. During the early stages of the pandemic, public health officials were required to take decisive action with limited information about the method of infection and transmission rates of the emerging threat. With a growing abundance of public databases for genomic sequences and its ease of use and novel approach, this methodology could become far more prevalent in tracking and preventing the spread of such diseases.

Post-Injury Probiotic Treatment May Impact Intestinal Microbiota and Epithelial Recovery In A Pig Surgical Model

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Abstract

Necrotizing Enterocolitis (NEC) is the most common surgical emergency in preterm infants, but the exact pathogenesis remains largely unresolved and clinical management is limited (Kim, 2019). Preventative probiotic administration has shown promise for preventing NEC though no critical evaluations of their therapeutic potential, administered following disease development, have been completed (Underwood, 2017). To determine probiotic impact on colonic microbiota populations, we induced ischemic intestinal injury in a neonatal pig's colon using vascular clamping (injury) followed by reperfusion.

There were four experimental groups: no injury, no injury with probiotics, injury with no probiotics, and injury with probiotics (paired n = 6). Probiotic experimental groups were administered Nature's Bounty Optimal Solutions Controlled Delivery Probiotic dissolved in phosphate-buffered saline to produce 35 million CFUs per ml, injected into isolated ischemic sections, and followed by reperfusion. Damage was evaluated using histological injury scoring, Using chambers permeability testing, cell culture to evaluate the regenerative capacity of colonic stem cells, and 16S analysis to classify microbes.

Unexpectedly, transepithelial electrical resistance (TEER) of the probiotic-treated, ischemically-injured colon (P60i) was lower compared to other conditions. P60i tissue had the highest percent epithelialization following ex vivo recovery. After 24 hours, ischemically-injured and probiotic-treated tissue enteroids had the largest areas, indicating a better-preserved stem cell population. The 16S analysis yielded no discernable differences in alpha diversity and beta diversity between microbial communities. We can conclude that probiotic treatment may accelerate colonic epithelial repair. Future endeavors should experiment with probiotic dosing, recovery times, and methods of inducing ischemia.

Effects of Alzheimer's Disease Risk Factor BIN1 on Calcium Channel Surface Expression and Resulting Calcium Flux in Neurons

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Abstract

Alzheimer's Disease (AD) is the leading cause of dementia, afflicting over 32 million individuals. Promisingly, genome-wide association studies identified *bridging integrator 1* (*BIN1*) as the second leading AD genetic risk factor. Yet, BIN1's contribution to AD is poorly understood. Traditionally, BIN1 transports L-type voltage-gated calcium channels (LVGCCs) in cardiac cells to the cell surface, increasing calcium intake through these channels. In neurons, increased calcium intake drives neuronal hyperexcitability – a hallmark of AD. Interestingly, BIN1-overexpressing neurons exhibit hyperexcitability, raising the question: as in cardiac cells, does BIN1 mediate LVGCC surface localization in neurons to induce calcium entry and resultant neuronal hyperexcitability?

Addressing this question, we overexpressed BIN1 in neurons to exaggerate BIN1's effects to detectable degrees. mCherry-expressing neurons with normal BIN1 levels represented a negative control. Neuron surface proteins were tagged with biotin and isolated using avidin beads that bind biotin. Then, LVGCC surface levels were compared across conditions via western blotting to determine if BIN1 mediates LVGCC surface localization. Finally, calcium imaging was performed to assess whether BIN1 increases calcium intake – evidence of neuronal hyperexcitability.

While western blotting is preliminary, we anticipate BIN1 overexpression to increase LVGCC surface expression. As revealed by imaging, BIN1 overexpression increased calcium intake via surface LVGCCs, thus inducing neuronal hyperexcitability. These data bolster BIN1-dependent neuronal hyperexcitability as a newfound mechanism of AD, empowering discovery of novel AD treatments. Next, animal testing is necessary to develop and translate BIN1 therapeutics. Indeed, targeting BIN1 will propel drug innovation for patients suffering from AD globally.

A Primary Pre-Processing Strategy for Coal Fly Ash to Enhance Its Performance and Usability

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Abstract

Coal fly ash (CFA) is a byproduct of thermal power plant combustion and has attracted significant attention from researchers owing to its material properties and ability to address waste management and wastewater treatment issues. CFA has the potential to be used in a variety of applications, including as a pozzolanic material, soil stabiliser, and structural fill. However, it is also a potential precursor for synthesising zeolites that are widely used in wastewater treatment. This study focused on pre-processing CFA for wastewater treatment using continuous washing cycles at various operating temperatures. We studied the pH and conductivity of the solution after washing over multiple cycles, as well as the mean diameter and mineralogy of the settled CFA. We analysed and optimised the results using response surface methodology to determine the optimal combination of the number of washing cycles and temperature for removing soluble ions and increasing the surface area of the CFA particles. Our findings showed that five washing cycles at 70°C were sufficient to minimise soluble ions, such as Ca, Mg, and Na, and maximise the mean surface area of the CFA particles. These results demonstrate significant improvements in CFA's physical and chemical properties as a precursor for zeolite synthesis. In addition, our results illustrate the potential for further processing of the extracted solution and floating particles to satisfy the concepts of "Waste to Wealth" and "Circular Economy." Based on these findings, we recommend further research to explore the potential of CFA for synthesising commercial zeolites for wastewater treatment.

WorldCUR011
Health

Setting Up of an Automatic Hand Washing System Case of Covid-19

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Abstract

Hand washing is a process of removing the germs from the hands. It is a vital process after done doing any activities. It helps to prevent any diseases that spread through contact. A lot of hands transmitted diseases attack our societies by the lack of hygiene especially the handwashing which is the basis of many diseases caused by the decrease in technological and sanitary resources. Most of hospitals don't respect at all the strict measures of hand washing. The hand washing can keep healthy and prevent the spread of respiratory infections and diarrheic from person to person. So, Hand hygiene is a major requirement for human health. Many infectious diseases can emerge if proper hand hygiene procedures are not implemented. In order to eliminate most of the germs transmitted after hand washing, the automatic hand washing has been designed and simulated in order to prevent such diseases. which uses the Arduino Technology constituted by a bucket helps to contain water and The Arduino microcontroller help to switch on the relay module when the ultrasonic sensor detects a hand within some distance. The submersible water pump is switched on along with the relay module and begins to pump water through the tube connected to it. So, there is no need to touch from the user. The user can wash his hands safely and prevent hand transmitted diseases after hand washing operation.

Key word: Hand washing, Arduino Technology, Arduino Microcontroller, relay, water pump

Gum Essential Oil of Pistacia atlantica Induces Morphological Deformation in Multidrug and Pandrug-Resistant Gram-Negative Pathogens

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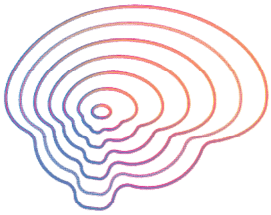
Abstract

Bacterial resistance is classified as multidrug-resistant (MDR), extensively drug-resistant (XDR), and pandrug-resistant (PDR), prompting researchers to seek effective, safe, and low-cost metabolites to combat them. As such, a thorough investigation into the chemical composition of mastic gum essential oil (MGEO) and its activity against MDR and PDR isolates was launched. This study also sought to investigate the mechanism of action of MGEO against gram-negative pathogens. *Acinetobacter baumannii* and *Klebsiella pneumonia* were obtained from local hospitals in Sulaymaniyah city, Iraq. MGEO was extracted from *Pistacia atlantica* gum and analyzed using GC-MS. Well diffusion, antigrowth, antibiofilm, minimum inhibitory concentration, antibiotic sensitivity, protein leakage, potassium, and phosphate ions efflux were studied in the presence of different MGEO concentrations. Alpha-Pinene was the main component in MGEO. TEM images showed the distortion of the morphology of the tested bacteria cells, leading to lysis of the cell wall, intracellular ingredient leakage, and consequently, cell death. Our findings conclusively show that MGEO has antigrowth and antibiofilm activities against MDR *A. baumannii* as well as other cellular targets. Lethal PDR *K. pneumonia*, which no antibiotic can harm, was successfully killed using MGEO.

This study's findings suggest that MGEO could be used as a potential alternative treatment for infectious diseases caused by multidrug and pandrug-resistant pathogens, shedding further light on the importance of MGEO in biomedical applications. Future studies aimed at producing clinically feasible sources of MGEO for testing in small animal studies are required to translate these findings to clinical use.



SUSTAINABILITY

WorldCUR 1G

WorldCUR014
Sustainability

A Comparative Study of Network Formation Models in Developing Areas: Differences and Policy Implications

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Abstract

This paper examines the most influential determinants of informal risk-sharing network formation in developing areas.

Most rural areas in developing countries are short of modern social security and commercial insurance. In this case, farmers who are exposed to income risks might face severe consumption fluctuation, leading to lower quality of life and serious welfare losses. However, farmers have developed a variety of mechanisms in practice to deal with income risks and ease consumption fluctuations. Among them, forming informal risk-sharing social networks appears to be effective. Therefore, it is important to understand the impact of risk-coping mechanisms behind these social networks.

Based on the analysis of data collected in Nyakatoke, Africa and Shaanxi, China, relations based on consanguinity and geography, wealth, and capital stand out to be the most important factors that affect network formation in both areas. We also find there are significant differences in the factors that determine the formation of links between these two areas. Suggestions including farmers' association and rural credit cooperatives are discussed so as to improve social welfare of local residents.

Growing Food In The Desert: Sorghum and The Importance of Salt Tolerance

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Abstract

Climate change is reducing the amount of cultivable land, while conversely increasing the amount of arid and semi-arid lands (ASAL). The majority of existing research has focused on growing crops in the hot and dry conditions of ASAL. However, another pending challenge will be the salinity of soils in ASAL. The objective of this study was to characterise the morphological and physiological characteristics of salt tolerance in Sorghum bicolor – a climate smart crop with a high salt tolerance that can survive the conditions of ASALs. Six sorghum genotypes were grown for 30 days in 4 concentrations of NaCl (0, 3, 5, 7 dSm-1) ; after which, plant height, root number, and total dry matter were recorded. We observed a significant difference across all morphological traits measured between genotypes and NaCl concentrations ($P < 0.001$). Our data demonstrate seedlings can be used to predict salt tolerance in adult S. bicolor with the number of roots being the most revealing trait. However, the creation of a standardised model to predict the salt tolerance of mature sorghum is advised, as root number alone is not sufficient in guaranteeing salt tolerance levels. Additionally, the fundamental mechanisms and genetic backbone of salt tolerance in sorghum are unknown and need to be explored.

WorldCUR 2A

WorldCUR016
Data

Effects of Organoantimony Compounds on Fungal Pathogens Cryptococcus neoformans and Candida albicans

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Abstract

Cryptococcus neoformans and *Candida albicans* are opportunistic fungal pathogens, which together account for over 4.4 million infections and over 400,000 deaths annually. *C. neoformans* begins as a pulmonary infection and progresses to meningitis in immune-compromised individuals. *C. albicans* can cause disease in the lung, genitourinary tract, oral cavity or bloodstream (candidemia). Few antifungal drugs exist to treat these infections, and high toxicity and increased resistance to antifungals make it crucial to develop new antifungal therapies. We hypothesized that a series of organoantimony compounds would have antifungal activity. For this, we tested compounds against *C. neoformans* and *C. albicans* in minimum inhibitory concentration (MIC) and minimum fungicidal (MFC) assays. In compounds with antifungal activity, we performed cytotoxicity assays. Anti-fungal and non-toxic compounds were further investigated to determine mechanism(s) of action using electron microscopy (EM) and RNA-sequencing. Results showed compounds A, B, E, I, F, and G were effective against *C. neoformans*, and compounds E and G were effective against *C. albicans*. Compounds I and G were also fungicidal against *C. neoformans*, and compound G was fungicidal against *C. albicans*. Antifungal compounds A, B, E, I, F, and G had low cytotoxicity. RNA sequencing identified several *C. neoformans* genes and pathways up- or down-regulated following treatment with compounds A, B, and E. EM studies show membrane/cell wall damage following treatment *C. neoformans* with compounds A & E. These studies show that organoantimony compounds are promising antifungal therapies, and studies are currently underway to test these compounds in an infection model.

AI for Autism: Use of Artificial Intelligence To Classify and Count Challenging Behaviors In Children With Autism Spectrum Disorders

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Abstract

Assessing challenging behaviors that are aggressive and self-injurious in children with autism can be difficult. These behaviors can also be physically dangerous to both the child and bystanders. Therefore, it is important for clinicians to account for these behaviors, in which to establish a baseline to measure goals of the implemented behavioral health plan. AI has been used to assist in the diagnosis, classification, and treatment of autism and can be an effective way to help characterize and count these behaviors. Convolutional Neural Networking (CNN) is an effective way to use AI to classify challenging behaviors. We found that the CNN model's adaptability would be suitable to recognize images of challenging behavior such as kicking, biting, and head striking. Characterizing these behaviors within their designated topography. In order to create an AI tool that recognizes challenging behaviors in children with autism, existing datasets need to be converted and grouped into distinguishable behaviors that are focused on specific actions. We collaborated with computational and behavioral scientist to increase the overall sensitivity and accuracy of the machine learning. In the future the model's algorithm can be revised and applied to larger datasets. AI can be beneficial in early childhood interventions for children who are experiencing severe forms of autism. It can provide clinicians a way to better understand this disorder and provide effective treatment by observing and quantifying the overt behaviors that are being displayed.

Checklist of the Dung Beetles of Singapore (Coleoptera: Scarabaeidae: Scarabaeinae)

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Abstract

Dung beetles provide a variety of ecosystem services and are functionally important in tropical ecosystems. They are an excellent proxy for monitoring ecosystem health and can act as surrogate indicators for elusive mammals. However, information on the distribution of dung beetles across Singapore, particularly in urban parks and green spaces is currently lacking as sampling efforts were previously concentrated in the Central Catchment and Pulau Ubin.

This study aims to create a species checklist to better understand present diversity, add value to taxonomic records, and support implementation of meaningful biodiversity conservation strategies. A dichotomous morphological key of local species was also created to support future dung beetle studies in Singapore and encourage citizen science. Increased sampling effort at green spaces was carried out in 2021 to supplement distributional records in previous studies focused on the Central Catchment.

In our recent sampling, 15 species across 4 genera were identified, and 9 morphospecies have yet to be identified. 12 species found in previous studies were not sampled in our direct collection. In total, we have identified 27 valid species and 9 morphospecies. Species not recollected in recent sampling may have become locally extinct, or the trap types or baits used are not suitable for collecting these species (e.g. arboreal species, specialist feeders).

Identification of most specimens, both historical and recently collected, are done via morphological traits. Future work may utilize integrated taxonomist approaches, such as DNA barcoding or identification by taxonomists to confirm species identity, to increase identification accuracy.

WorldCUR 2B

WorldCUR019
Health

Healthcare Utilization and Perceived Healthcare Status in a Primary Care Clinic: Looking at Patients' Perspectives

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Abstract

Emergency department (ED) care and hospitalizations are prevalent among economically disadvantaged populations. Primary care engagement may prevent hospitalizations and ED visits. This study explores healthcare utilization rates and perceived well-being in a sample of patients at a community-based primary care center. Participants were adult (N = 65, Mage = 41.08, SD = 12.39, 89% female) patients recruited as part of a larger, grant-funded study. Following variables were assessed via self-report (prior 12 months): primary care visits (PCV), ED visits, and hospitalizations. Emotional and physical well-being were examined on a 5-point Likert scale, with higher scores indicating worse health perception. Associations between utilization and perceived health were examined. Significant utilization of scheduled PCV (M = 6.69, SD = 14.83), 72.5% disclosed at least one unscheduled PCV (M = 1.12, SD = 2.75), 40% at least one ED visit (M = .80, SD = 1.33), and 18.46% reported hospitalizations (M = 1.25, SD = .62). Strong, positive correlation noted between physical and emotional health (Spearman rho = .70, n = 65, p < .001). Physical health was significantly associated with PCV (p < .05) and ED (p < .01) visits but not hospitalizations (p =.34). Emotional health was associated only with unscheduled PCV (Spearman rho = .38, n = 65, p < .01). Results indicate high utilization of both PCV and emergency medical services. Emotional and physical well-being appear linked. While worse physical well-being is associated with increased PCV and ED utilization, worse emotional well-being is associated with only unscheduled PCV use.

Availability of Dysphagia Assessment Procedures and/or Protocols for 2–6-Year-Old Children with Paediatric Traumatic Brain Injury in the Acute Care Setting

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Abstract

Paediatric Traumatic Brain Injury (PTBI) refers to non-congenital brain injury typically resulting in irreversible disruptions in brain functioning. Disruptions may manifests in impairments in various domains – notably in feeding and swallowing i.e., dysphagia, which is present in 10- 15% of children with moderate TBI, and 68-76% in children with severe TBI. In order to facilitate effective evaluation of dysphagia symptoms, the identification of what may constitute as acceptable assessment procedures and/or protocols may aid evidence-based management of feeding and swallowing problems prevalent in PTBI populations.

Use of a scoping review was employed to determine available dysphagia assessment and identify any research gaps within the field of dysphagia in PTBI patients in order to inform quality patient management. Information was retrieved from a total of 26 articles (n=26) that complied with the set criteria for the charting, analysis, and discussion of the data.

While no prescribed protocols were identified, ranging use of 60 non-instrumental and instrumental dysphagia procedures was noted. Use of the identified procedures largely depends on operational factors such as access to resources and clinician skill, which may become a barrier in middle-low-income countries where access to resources and opportunity for upskilling is limited.

In order to alleviate barriers in achieving comprehensive assessment, the promotion of a prescribed/set dysphagia assessment protocol remains a priority in dysphagia care for PTBI patients, with the essential inclusion of the MDT. This will aid in the facilitation of safe feeding and swallowing practices and quality care provision, particularly in middle-low-income countries.

The Effects of Mindful Islamic Prayer on Stress Management.

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Abstract

The religion of Islam has a following of 1.8 billion worldwide. Religiosity has been previously shown to be positively correlated with the management of emotional dysregulation and stress (Munsoor & Munsoor, 2017). The purpose of this study is to explore the relationship between mindful Islamic prayer, specifically, and stress management among university students. The variables being measured are frequency and quality of prayer, frequency of experiencing stress, causes of stress, and preferred stress management techniques. The study population consists of Zayed University students across both campuses, with no regard for gender. A consent form was included on the first page of the online questionnaire, informing participants of all the necessary information before proceeding to the questions, by clicking agree, participants, are indicating that they agree to participate in the study. The measurement instrument consists of a combination of 2 reliable scales to measure the objectives of the study along with a few modified questions to fit the subject at hand, the Perceived Stress Scale (PSS) and the Mindfulness in Salah Prayer Scale (MSPS). The best data collection method is an online survey mainly due to convenience and to obtain the largest number of participants possible. The inspiration behind this study was to illustrate the operant difference between Islamic prayer which is approached with mindfulness and one that is not. Data collection is ongoing with over 300 participants to date. Data analysis will soon begin and the results will be the focus of the conference presentation.

WorldCUR 2C

WorldCUR022

Community

Impact of Covid-19 Pandemic on the Utilization and Delivery of Healthcare Services Among Outpatients During the Early Phase of the Pandemic in Nigeria

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College Research and Innovation Hub, College of Medicine, University of Ibadan, Ibadan, Nigeria

Abstract

Introduction Some infection control measures were implemented with the emergence of the COVID-19 pandemic to keep people safe and control the spread of the virus. These measures have been observed to cause significant delay or interruption in the delivery and utilization of healthcare services.

Objective To determine the impact of the COVID-19 pandemic on the utilization and delivery of healthcare services to outpatients during the early phase of the pandemic in Nigeria

Methods A retrospective cross-sectional study design was utilized. We sampled 373 outpatients who had received healthcare services before and during the pandemic in the University College Hospital, Ibadan using convenience sampling. Descriptive and inferential statistics (t-test) were carried out and the level of significance was set at $P<0.05$.

Results Healthcare utilization was significantly impacted by the pandemic as there was a reduction in hospital visits by patients during the pandemic ($p < 0.0003$). Restriction of movement and fear of contracting the virus was identified as reasons for the reduction in healthcare services utilization in about 59% of the participants. Patients rated the quality healthcare services delivered to them as “average” during the pandemic as opposed to “good” before the pandemic.

Conclusion The findings of this study showed that the COVID-19 pandemic had a significant impact on patients’ utilization of healthcare services as well as the delivery of adequate healthcare services in the hospital. Therefore, we recommend that efforts be made to improve hospital and nationwide preparedness for future pandemics to prevent healthcare interference and delay.

Understanding the Complexity of Community: How can the values and preferences of a community be understood and measured empirically?

Michaela Ruth Mason
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Abstract

A unique combination of membership, experiences, and values within every community presents a key problem in trying to introduce methods that can be used across different types of communities. This research project seeks to identify a method of understanding every community, and its preferences, empirically, by combining key features of complexity theory, asset-based models of health, and discrete choice experimentation.

Self-directed testimony from community members informs a discrete choice survey, which consists of multiple questions where respondents choose between two groups of multiple attributes listed at different levels of prominence to mimic constrained choice. Mixed logit model econometric analysis produces results that indicate what the community values and preferences are and how much they are preferred, quantitatively. This method was piloted at a Church community local to Exeter.

The results indicate continuity between individual testimony and the survey results. The community chose to engage with the survey questions over opting-out and decision-making was largely driven by the opportunity to avoid undesirable outcomes. The survey allowed more individuals to partake in the research by improving accessibility to the project.

Empirical results clearly indicate preferences within the community, allowing experts and service providers to identify issues and address them efficiently to improve the welfare of the community. Additionally, the asset-based model identifies resources already present in the community, limiting costs and leveraging greater self-sufficiency within the population in the future.

The future of this project is to apply this methodology across a variety of contexts to assess its viability across communities.

Financiers and Gun Runners: Highlighting the Importance of Liverpudlian Businessman to the American Civil War

Alexander Grange
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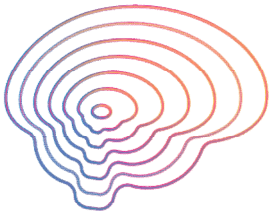
Abstract

The American Civil War is often viewed as purely an internal event, whose repercussions, dramatic as they were, were confined within the boundaries of North America. However, even seemingly internal conflicts reverberate around the world and with my research I have sought to highlight the deep connections between some of the most prominent British businessmen and the Confederate States of America. This aims to highlight the complex interrelationships and importance of non-state actors at times of war, even before the age of domination by massive transnational corporations. I examined the role of several prominent pro-Confederate businesses through the wealth of letters that are held by the Merseyside Maritime Museums. These letters revealed the extent to which the support of pro-Confederate factions within the UK was indispensable to allowing the CSA to prosecute its war and the sheer sophistication of this support make it difficult to believe that the British Government was unaware of these efforts. Thus, revealing that even when a state is supposedly neutral in a conflict there are still many non-state actors capable of influencing and prolonging it. As a result, the web of connections between various states was clearly as complex two hundred years in the past as it is today, and non-state actors could directly influence the outcome of a conflict across the ocean. This provides a stark warning as to the role that even comparatively minor businessmen can influence a seemingly independent conflict when the larger state turns a blind eye to such machinations.



SUSTAINABILITY

WorldCUR 2D

WorldCUR025
Sustainability

An Illustration of HYdroPOwer (HYPER) Toolbox for an Optimum Run-of-River Plant Design

Srijan Kumar Jha
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Abstract

In order to minimize the catastrophic impacts of climate change, there is a need to move away from fossil fuel to better alternatives such as hydropower, utilizing either a large dam or a small scale run-of-river plants. Although a large dam construction involves displacing populations and disrupting ecosystems, a run-of-river plant does not pose these problems. Despite this, hydropower potential of more than 66% of the world's run-of-river plants still remains untapped. The study is carried out using HYdroPOwer (HYPER), a toolbox for the optimal design of run-of-river plants. The aim of this research is to compare HYPER results to engineering practice on a real-world power plant located in Gurleyik River in Sakarya province, Turkey. The turbines designed using Net Present Value (NPV) and Benefit to Cost (BC) maximization were compared to the actual turbine operating at the site. I constructed different scenarios for future stream flows by changing flow statistics: median, variability and low flow quantiles. Then the turbine present on site, designed using NPV maximization and BC maximization were compared for these scenarios. The turbine designed using NPV maximization turns to be the best suited for a wet future. The BC turbine requires a lesser initial investment in comparison to NPV. In case of mild to very low flow it turns to give best value of NPV also. Hence best suited if the future is going to be dry. The study should be useful to stakeholders of hydropower projects.

Gratitude: Seeing the Good in Ugly Food

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Abstract

Food waste is a major drain on environmental resources. One of the major contributors of food waste is the discardment of ugly food. Ugly food is food that is of edible quality but has an unappealing appearance due to its shape, colour, size or the presence of blemish. Past research found that people higher in gratitude tend to focus less on their appearance when evaluating their self-worth. As such, we predict that consumers higher in gratitude are more likely to accept ugly foods. In this study, we aim to investigate the effect of dispositional gratitude on consumer's quality perception of ugly foods. Two studies were conducted to test our prediction (Study 1: n = 299, Study 2: n = 297). In both studies, participants were randomly assigned to one of three conditions and saw pictures of fresh food that were either pretty, has a deformed shape, or has some blemishes. Results across both studies consistently show that there is a difference between how consumers with different gratitude dispositions perceive the different types of ugly food. Specifically, for participants higher in gratitude, their perceived quality of the food was negatively affected by the presence of blemishes on the food but not by the deformity in shape of the food. Hence, the findings suggest that retailers can reduce ugly food waste by marketing ugly food in deformed shape to grateful consumers.

Charging Infrastructure in Germany - An Empirical Analysis of its Spatial Distribution

Thies Reisemann
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Abstract

While Germany aims to reduce its emissions by 65% until 2030, the last decade has revealed that the transport sector was the only sector not showing any reductions of CO2 emissions. One important aspect is the electrification of cars and light-duty vehicles, but market shares and adoption rates for electric vehicles (EV) remain too low to reach the set targets. Studies in the field indicate that the adoption rates of EV's are positively related to the existing charging infrastructure. My study aims to analyse distribution patterns of the existing charging stations to gain insights into their spatial distribution. Geo-Data on German Infrastructure and points that might influence the location of charging points was collected and grouped on postcode level. This data was then used in a regression analysis. My results suggest a clear difference in the distribution of normal and fast chargers. Fast chargers are more connected to highway entries which are important for longer journeys, while normal charges are highly correlated with several variables that indicate urban structures. My findings give provide insights into the distribution of EV chargers in Germany and identify factors that influence their placement. These insights could be used as a base to design a charging infrastructure concept that accommodates the needs of EV drivers and can be integrated into the existing infrastructure. EV charging infrastructure experiences enormous growth in order to provide for the increasing demand and it stays important to keep track of the development to reach an efficient grid.

WorldCUR 2E

WorldCUR028
Power

Maintenance Plan for Solar Energy Technologies and its Implementation with Rural Communities in the Region of Amazonas.

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Abstract

Access to electricity remains a significant challenge for many communities in Colombia, particularly in the region of Amazonas. To address this issue, governments and organizations have been implementing photovoltaic solar systems. However, the lack of investment and management in operation and maintenance (O&M) has been a major concern for the sustainability of these projects. This research, conducted in collaboration with the NGO Amazon Conservation Team, seeks to understand the importance of integrating local communities into the lifecycle of photovoltaic energy projects in the region.

The study focuses on the indigenous communities of Monochoa and Andoke de Aduche, where solar lamps and off-grid photovoltaic systems have been implemented. The research question guiding this study is, "How can solar energy be effectively implemented and maintained in the Amazon, while engaging and benefiting local communities?" Through observation and semi-structured interviews with community members, NGOs, and solar energy companies, the research aims to investigate the impact of solar energy on the communities, their level of knowledge about photovoltaic systems, and their interest in the topic.

The findings of this research can help identify solutions to O&M challenges and create educational opportunities for the communities, starting with the creation of the logbook for the field trip with observations and their respective analysis and continuing with maintenance booklets for specific and critical solar systems. By engaging the community in the project, the methodology developed by this research aims to reduce energy poverty and improve the living conditions of the communities in the long run.

What, if anything, can repair the harm of slavery and Jim Crow in the United States of America? An argument for Duboisian education and reparations.

Jessica Kincaid
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Abstract

In this essay, I argue that the harms of slavery and Jim Crow can be best repaired by a combination of culturally enriching education and reparations. In the first section of my essay, I outline the history of slavery and Jim Crow segregation in the United States, and detail the harms that they caused to African Americans who lived under them. In the second section, I examine the arguments given by W.E.B. Du Bois about the value of education, and contrast them to the vision of education presented by Booker T. Washington. After that, I consider whether Du Bois's writing could be construed as elitist, Eurocentric, and as working under, rather than challenging a racist notion. In the third section, I discuss two prominent arguments for reparations given by Bernard Boxill, coming to the conclusion that these arguments can work in tandem with Du Bois's emphasis on the values of Truth, Knowledge and Justice. In my conclusion, I acknowledge that while certain harms may never be undone, a combination of a DuBoisian education and reparations could make significant improvements to the lives of African Americans in the U.S. Moreover, I suggest that the Black Lives Matter movement seems to be drawing attention to the importance of both education and reparations.

'Cognizing Freedom Within Oneself': Kant's Introduction of the Fact of Reason

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Abstract

Central to Kant's strategy in the Analytic of the second *Critique* is the enigmatic doctrine of the 'fact of reason' [*Faktum der Vernunft*]: the claim that our consciousness of the moral law is a 'fact' given *a priori*. (KpV 5:31) Although constituting the focal point of Kant's mature project of moral justification, precisely what Kant holds the *Faktum*'s introduction to accomplish, and its situation within the Critical project, remain neglected themes in the existing literature. Remedying these deficiencies through a close reading of Kant's introduction of the *Faktum* in §§6–7 of the Analytic, I argue that the structural organisation and division of these sections serve to disentangle two threads in Kant's approach: firstly, a recapitulation of *Groundwork* III's earlier worry, concerning a 'hidden circle' in the concepts of freedom/morality (G 4:453); and secondly, the moral law's establishment as a synthetic *a priori* proposition. From the proposed interpretation, a picture emerges on which the rational moral consciousness disclosed by the *Faktum* is of a peculiarly Kantian flavour, simultaneously issuing a challenge to 'deflationary' readings of the *Faktum*, and contributing positively to existing exegetical controversies by clarifying the doctrine's source, scope, and formality. Recommending the pursuit of a 'continuity' reading of the moral works of Kant's Critical period, this project encourages the continued contribution of Kantian moral philosophy to contemporary debates surrounding the structure/conditions of rational agency, while facilitating further research into both Kant's moral psychology, and the peculiar force of moral obligations in general.

WorldCUR 2F

WorldCUR031
Community

Examining intercultural competence among pre-service teachers at a Pakistani university

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Abstract

In today's globalized world, professionals are likely to interact with people from different cultures and countries. Intercultural competence is the ability to function effectively across cultures, to think and act appropriately, and to communicate and work with people from various cultural backgrounds. School teachers are expected to be knowledgeable about various ethnic groups, to teach in a multiethnic classroom, and to prepare all pupils for life in a multicultural society. This investigation examines the intercultural competence of undergraduate students in the Education Faculty at the Baluchistan University of Information Technology Engineering Management and Sciences (BUITEMS). The researchers hypothesized that the students in the Education department at BUITEMS University would be polarized in their orientation toward persons of cultures different than theirs. In the BUITEMS Education Department, investigators randomly selected 10% of students from each of the four classes. Each student completed the Intercultural Development Inventory (IDI). The findings suggest that the BUITEMS students have little life experience beyond their own home cultures. The BUITEMS students do have a clear sense of their own values and practices, as well as a desire to preserve their own traditions. They see other persons as "others" without much definition or understanding. With intercultural competence skills, the prospective teacher is prepared to address specific differences from an adaptation perspective and achieve an inclusive learning environment. Faculty may want to revise and rebuild the curriculum and policies in order to intentionally incorporate teaching and learning strategies to foster intercultural competence among their students.

Informality and Production of Alternative Space: A Study of Informal Economic Practices in Cairo's Metro System.

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Abstract

Cairo's Metro system is considered a fast and affordable transportation option, especially for those from lower socio-economic status. For decades, informal vendors have created informal economic practices and reproduced Cairo's Metro carriages to sell various commodities, from tissue packs and socks to food. Informal spaces refer to daily activities of socio-spatial and economic production of spaces, which members or groups establish outside the scope of State regulation. This paper investigates the concept of informality by analyzing the socio-spatial and economic practices produced by the underprivileged and marginalized communities in the Metro system of the capital of Egypt, Cairo. Benefiting from Henri Lefebvre's theory on the production of space, the dimensions of informality are investigated through the lens of his spatial triad of perceived space, conceived space, and lived space. The birth of "informal" economic practices and the ability to profit from a place designed to transport people constitute a new form of socio-spatial transformations and produce spaces of resistance and counter-hegemony, where these economic and socio-spatial practices go against the State's endeavors to control the public space. In this context, this paper aims to envision informality by taking a practical case of informal spaces in Cairo's Metro, focusing on the informal economic practices produced by Metro vendors and investigating the overlooked interactions of space and power. Therefore, this paper examines informality and its capacity to produce spaces where groups with no control over the space begin to connect, group together, and challenge the power dynamics.

Exploring the use of Standardised Tests and Non-Standardised Testing Methods used by Occupational Therapists working with Children in a South African Context

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Stellenbosch University, Cape Town, South Africa

Abstract

There is a paucity in the available research that relates to assessment methods used by occupational therapists (OT) working with children in South Africa. This study aimed to determine the use of various testing methods frequently used by South African OTs working with children, the reason(s) for selecting and using standardised tests as well as investigating non-standardised testing methods they utilise in their practice.

The research is situated within a post-positivist orientation, using a descriptive design within a quantitative research paradigm. The data was collected by means of an electronic survey that was sent to OTs in South Africa using the OTASA, INSTOPP, and WCPPG databases. The target population included all OTs working with children in South Africa. Convenience sampling was used. The quantitative responses were analysed by a biostatistician using Stata (Version 17), and the qualitative questions were analysed through descriptive analysis.

Overall, a preference for the combined use of standardised tests and non-standardised testing methods when assessing children was observed to ensure that assessment is both accurate and holistic in nature. OTs consider various factors when selecting the most appropriate testing method, and that this often proves to be a challenge as many standardised tests have not been standardised to the South African population, are expensive, and are time-consuming. However, there is an urgency for further research to be conducted on this topic to further explore this phenomenon, with the goal of improving the effectiveness of assessment and therefore treatment of children by OTs in South Africa.

WorldCUR 2G

A case study of the costs and benefits of aquaponic farming in the United Arab Emirates.

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Abstract

A growing global population has resulted in the increased demand for natural resources. This has created a strain on the environment which impacts the quality of life for people around the globe. The ever-increasing demand for resources is depleting the planet's natural sources extensively. Both water and marine life are under serious depletion due to commercial agriculture and fishery. Aquaponic farms has arisen an alternative to traditional farming, and are offering new possibilities for more sustainably producing food in inhospitable climates, such as in the United Arab Emirates (UAE), a largely desert country that experiences extreme heat for much of the year and limited rainfall. This case study research explores the operations of one aquaponic farm and weighs its positive and negative characteristics. In addition, the results of this case study are compared to the production, waste, maintenance, and costs of traditional farming to conclude as to whether aquaponics farming has the potential for larger scale application in the UAE.

Identifying Supernova Remnants in NGC 6946

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Abstract

When some stars reach the end of their life, they explode in rapid events known as supernovae. The galaxy NGC 6946 is the most prolific supernova host that we know of, but many of its supernova remnants (SNRs) are unconfirmed as detections only exist at radio wavelengths. Despite having such unique data, a high-resolution search for SNRs has not been carried out for NGC 6946 at optical wavelengths.

In order to produce an optical catalogue of SNRs in NGC 6946, we use spectroscopy, which involves analysing the patterns of light from each source. A series of (4 million) spectrographs from the SIGNAL survey is used to measure the properties of every point in the galaxy. This includes the ratio of certain sulphur and hydrogen fluxes. Where this ratio exceeds a minimum threshold, the site is proposed as an SNR candidate. We test these results against candidates identified using other methods, allowing the most complete distribution of SNRs to be mapped.

The result is important as it broadens our knowledge of the distribution of supernovae within galaxies. SNRs are important reference points within galaxies, and transient phenomena like these are increasingly significant in astronomy as we aim to follow up gravitational wave events.

This method can be applied to other galaxies within the SIGNAL survey, in order to test how typical NGC 6946 is, and to expand our understanding of supernova distribution across the whole observable Universe.

Constraining the Formation Time and Depth of Magnetic Sources Within the Martian Crust

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Abstract

Mars was once believed to have a rich atmosphere and large bodies of surface water which possibly hosted life. The primary reason these were lost was because of the demise of its planetary magnetic field, or dynamo. The precise timing of the dynamo's demise is still debated, with estimates ranging from 4.2-3.0 billion years ago (bya). Large meteor impacts provide insight on the dynamo's early history because they cause sudden heating/compression of iron-bearing minerals, introducing a thermal/shockwave remanent magnetization which reflects the background field at the time of formation and can be preserved for billions of years. Here, we analyze high-resolution magnetometer data from NASA's MAVEN orbiter in/around craters between 70-500 km diameter, then contextualize the impact in Mars's geological history. Out of 857 craters, we only find 24 that exhibit clear impact-induced demagnetization, suggesting crustal formation mechanisms that deeply buried the magnetic layer. The earliest case of unambiguous (~90%) demagnetization is Henry crater, putting a lower bound on dynamo cessation at 3.6-bya. Although Lyot crater exhibits strong magnetization after the formation of Henry (3.4-bya), we calculate Curie depths and impact-induced shock wave pressures to show that a previously existing magnetized layer could have persisted in spite of the impact, validating the 3.6-bya dynamo cessation estimate. We also provide a generalized method/code for constraining the depth of magnetic sources within the crust at sites of heavy impact cratering, which can be extrapolated to larger surfaces to cross-validate spherical harmonic models through forward modeling of power spectra.

WorldCUR 3A

WorldCUR037
Power

Canonization of Irish Authors: Nationalism and the Popularization of 1920s Irish Literature

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Abstract

Literature can provide information about an author's society, either through its content or public reception. The original manuscripts of Liam O'Flaherty's Irish language play, Dorchadas: A Tragedy in Three Acts, held at the University of Kentucky Special Collections Research Center in the U.S. offer a starting point to consider how the political landscape of the Irish Free State affected the dissemination and success of Irish literature. While early 20th century Irish authors such as James Joyce and W. B. Yeats are revered in the canon of Irish literature, Liam O'Flaherty remains relatively obscure despite enjoying critical acclaim and seeing his work debut at the historic Abbey Theatre in Dublin, Ireland. Political turmoil in Ireland coincided with the height of the 1920s literary boom, the Irish Literary Revival, and certain works were promoted over others by Irish censorship boards established to support the Free State government. The prevalence of Irish nationalism is of particular interest when considering the institutional opposition O'Flaherty faced. Examining personal correspondence, op-eds, and newspaper reviews contemporaneous with Dorchadas and O'Flaherty's other works will uncover their literary themes, subject matter, and critical reception—factors that reveal O'Flaherty's character as a writer and reputation among Irish publishers, literary critics, and audiences. Research will explore how and why other Irish authors' works published at the same time enjoyed substantial success, while Dorchadas is unmentioned by literary scholars. An examination of the relationship between 20th century Irish politics and literature will reveal lasting cultural effects visible in the 21st century.

A Comparative Study on Romantic Jealousy Between Individuals Who Have and Have Not Experienced Infidelity: Do Gender Differences Exist Between Infidelity Types and Rival Attractiveness?

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Abstract

The evolutionary "jealous as a specific innate module hypothesis" (Harris 2005) reinforced that women are more distressed over emotional infidelity while men are more upset by sexual infidelity. The imagination hypothesis, contrarily, suggested that "differences in infidelity responses stem from men's explicit sexual imaginary and women's explicit romantic imagery" (Kato 2014a, 2014b). Prior research examining JSIM and imagination hypothesis only used participants who are (Guadagno & Sagrin, 2010) and had been in a committed relationship (Kato, 2019), without considering infidelity experiences. No related studies have been done in HK context. To re-examine the validity of JSIM versus imagination hypothesis, HK Chinese participants with and without infidelity experiences (18-26years;N=153) were compared. A 2x2x2x2 mixed factorial design was employed, which included two between-subject variables: sex (male/female) and infidelity experience (yes/no), and two within-subject variables: infidelity type (emotional/sexual infidelity) and rival attractiveness (attractive/unattractive). A questionnaire was administered. Results revealed that JSIM is robust. Interestingly, women's infidelity imagination was more vivid than men, thus the imagination hypothesis was not valid in our sample. Our study neither confirm or deny the evolutionary explanation of gender differences in rival attractiveness. When partner infidelity experience was considered, JSIM became not significant. This study not only filled research gap, but also projected a clearer picture of the dynamic interaction between sociocultural influences, infidelity types, infidelity imagination, and infidelity experiences. It also sheds light onto future research as to whether partner infidelity experience should be included when examining gender differences in romantic jealousy.

Power, Educational Outcomes, and Disparities: An Intersectional Examination of the Central Oklahoma Special Education System

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Abstract

In the United States, Oklahoma's subpar public education system is ranked 49th out of 50th in the nation. When we begin to dissect this worrisome statistic, we must examine those at several intersections of education that have been historically marginalized. The intersections include race, class, gender, (dis)ability, religion, ethnicity, nationality, and many more. My research hones in on the special education system of publicly funded K-12 schools in Central Oklahoma. Through an intersectional approach, I will identify and examine these four structures of power (i.e. interpersonal, disciplinary, cultural, and structural) in K-12 classrooms. With this approach, I aim to answer key questions regarding which identity markers are most likely to receive a diagnosis/referral to special education.

For students of color, specifically young males, their behaviors have historically been heavily monitored and harshly judged. As students who may be dealing with many Adverse Childhood Experiences their behaviors are met with little sympathy. Recent intersectional disability research has emphasized the importance of taking into account Adverse Childhood Experiences and the urgency of using it to examine our educational systems.

My research provides crucial insight on the interconnectedness of power, intersecting identities, and educational outcomes. My research can assist legislators and administrators create effective education policies, reporting systems, and plans to better support students. Furthermore, this research has the potential to help alleviate segregation in classrooms based on intellectual capability or trauma-informed behaviors. I hope to continue this research by examining educational legislation pertaining to special education systems in Oklahoma

WorldCUR 3B

WorldCUR040
Data

Employee Resistance to Artificial Intelligence: Exploring Employee Perceptions Towards Artificial Intelligence and Resistance to Change

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Abstract

Artificial Intelligence (AI) is perceived more negatively by non-experts as its highly technical nature inhibits transparent understanding of the technology. This fosters mistrust towards AI's output which, alongside a fear of losing one's job to AI, may fuel resistance towards AI in the workplace. Change management theories identify resistance as an antecedent for failed change however little research has analysed the impact of employee perceptions towards AI in the workplace and anticipated resistance. This research explores that relationship by evaluating employee perceptions of AI alongside their intention to adopt AI at work.

Semi-structured interviews were conducted with employees of an MNC to uncover deep insights into employee perceptions towards AI adoption in their own role, and within the wider organisational context. Thematic analysis uncovered themes where resistance to AI may occur, including a mistrust for the "black box" of AI decision-making, and a perception that AI's output may unethically lack emotion and context.

This research bridges two areas of literature; public perceptions of AI and resistance encountered during managed change. This supports managers seeking to realise AI's benefits (cutting costs and improving decision-making) by highlighting where resistance is likely to be encountered. Understanding potential resistance and proactively collaborating with employees can aid managers develop acceptable AI adoption strategies, allowing sceptical employees the opportunity to develop expertise, which may lower mistrust and facilitate successful change. Future research might consider these findings to develop a roadmap for strategical, staggered implementation of AI technologies to support managers operationalise AI.

Bitcoin: The Emergence of a Global Financial Asset

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Abstract

This article attempts to answer the following questions: to what extent are bitcoin, gold, the U.S. dollar, and the stock market interdependent? Moreover, how do the nature and direction of the effects reflect their interdependence? My research paper examines the relationship between bitcoin and traditional investment assets in times of global crisis. The methodology used weekly return covariance to measure how the co-movement between bitcoin and other financial assets (S&P500, gold, and the USD) is affected by CBOE VIX while holding bitcoin volatility (GARCH (1,1) model) and bitcoin global attention constant. The result, at a 99% confidence interval, suggests that bitcoin behaves similarly to a speculative investment asset based on its significant positive correlation with the S&P 500. Furthermore, under extreme market uncertainty, the US dollar is a better hedge for bitcoin than gold. This research paper analyzes how bitcoin is affected by investor flight to safe behavior during extreme market uncertainty. The study aims to identify potential patterns and trends between investment assets and discuss these findings' implications for investment strategies. Overall, the analysis provides insight into the benefits and risks of investing in bitcoin and may inform future research on this topic. Potential research can replicate this paper using other currencies.

Investigating the Cardiotoxic Effect of the Immune Checkpoint Inhibitor Ipilmumab using In VitroHuman Cardiomyocyte Model

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Abstract

Background: Ipilimumab (IPM) is an immune checkpoint inhibitor recently used as immunomodulatory therapy for treating solid cancer. IPM blocks effects of the negative T-cell regulator CTLA-4, which may augment T-cell responses to tumor cells. Several cases of myocarditis and heart failure have been reported in patients with cancer treated with ipilimumab; however, the molecular mechanism of cardiotoxicity of IPM remains uninvestigated.

Objectives: the main goal of the current research is to investigate the cardiotoxic effect of IPM and the molecular mechanisms involved in using the human cardiomyocyte cell line

Methods: AC16 cells were treated with different concentrations of IMP for 24 h. Thereafter, total RNA and protein were isolated, and the mRNA and protein expression levels of cardiac hypertrophic (β-MHC), anti-hypertrophic (α-MHC), immune checkpoint (CTLA-4), and antiapoptotic (BCL-2) genes were quantified by real-time polymerase chain reaction and Western blot analyses, respectively.

Results: Treatment of AC16 with increasing concentrations of IMP significantly inhibited that cardiomyocyte growth at higher concentrations. Mechanistically, IPM treatment significantly decreased the expression of the immune checkpoint, CTLA-4, which was accompanied by a proportional induction of cardiac hypertrophy markers as evidenced by the increased β-MHC/α-MHC ratio in a concentration-dependent effect. Furthermore, we realized that IPM induced cardiomyocyte apoptosis, a programmed cell death, by inhibiting the expression of BCL-2, an antiapoptotic marker.

Conclusion: IMP induced cardiac toxicity through cardio hypertrophy and apoptosis induction in human cardiomyocyte AC16 cell line. These findings will increase our understanding of the mechanism of IPM-induced cardiotoxicity and help design a novel therapeutic protector

WorldCUR 3C

WorldCUR043
Health

Mechanism of Action of Antifungal Peptoids

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Abstract

Due to the rise of drug resistant strains of fungal pathogens such as *Cryptococcus neoformans* and *Candida albicans*, there has been a need to identify new antifungal agents. In comparison to naturally produced antifungal peptides, antifungal peptoids, which are like peptides but with side chains on the backbone nitrogen instead of carbon, are not recognized by proteases, giving higher bioavailability. Previous studies have shown that peptoids are effective fungicides. RMG8-8 and RMG9-11, two peptoids recently discovered in the Bicker Lab, have proven to be effective antifungal agents against *C. neoformans* and *C. albicans*, respectively. Reported here will be studies to determine the mechanism of action and other vital therapeutic properties of RMG8-8 and RMG9-11 using various biochemical and microbiological assays. Preliminary testing of critical micelle concentration, the minimum concentration of a compound needed to form micelles, indicate that RMG8-8 as well as RMG9-11 do not exist as micelles at their minimum inhibitory concentrations, but rather function unimolecularly, which may be therapeutically beneficial. Using a parallel artificial membrane permeability assay, it was found that RMG8-8 is likely unable to penetrate the blood brain barrier. However, RMG9-11 demonstrated good permeability, indicating that it may be able to penetrate the blood brain barrier to treat dangerous neurological infections of fungi. Subsequently, assays will be conducted in order to further understand the mechanism of action of both peptoid compounds to address the rising concern of drug resistant strains of fungal pathogens.

Acute effects of blood flow restriction during warm-up on sports performance in GAA athletes.

Jia Wei Siow
South East Technological University, Carlow, Ireland

Abstract

Blood flow restriction (BFR) has been commonly used as an adjunct to resistance training, yet evidence is lacking regarding its acute effect on sports performance. This study aimed to determine the acute effects of BFR during warm-up in GAA athletes through subjective (muscle soreness, physical fatigue, perceived effect on agility performance) and objective (505 agility test) variables. Similar study reported vertical jump performance was improved from BFR trial (Doma et al., 2020). Twenty collegiate GAA players (males, n=14; females, n=6; age = 21.25 ± 1.21years; height = 176.57 ± 6.51m; weight = 78.40 ± 11.34kg) participated in this study. In a randomized repeated-measures cross-over design, a 505 agility test was carried out following either BFR or SHAM BFR (no cuff pressure applied) warm-up protocol. Both protocols were carried out using the GAA-15 warm-up. A participant self-rated questionnaire was completed after each session to record the subjective variables. Results revealed that time to complete the 505 agility test was significantly less after BFR condition than after the SHAM. No significant differences were found in either athletes' perception of physical fatigue or their perceived effect on agility performance. The reported muscle soreness was significantly worse after BFR condition, while the reported rate of perceived exertion value was significantly higher in the BFR trial. Findings would suggest that BFR may be used during GAA-15 warm-up to improve subsequent agility performance. However, the significantly greater reported muscle soreness and RPE would suggest that further investigation is warranted into the effects on fatigue over a longer time period.

Parental acceptance of routine varicella vaccination in the UK: A cross-sectional survey

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Abstract

Varicella (chickenpox) a common, usually mild childhood illness can have severe complications. A varicella vaccine has been available since 1980's and by 2018, was administered through universal vaccination programmes in 36 countries. Presently, the UK does not include the varicella vaccine in childhood vaccination schedules. Research on parental attitudes to childhood varicella and varicella vaccine in the UK is limited, therefore, this project aimed to investigate parents' willingness to accept the vaccine for their child and preferences for administration.

In 2021, an online cross-sectional study was conducted. 602 parents (youngest child 0-5yrs) completed demographic questions, child's varicella status, attitudes towards chickenpox, likelihood of getting the vaccination for their child, and preferences for administration. Data for 596 participants was analysed. Most parents (73.9%) were positive about a varicella vaccination being added to routine childhood immunisations schedule, with a combined MMRV vaccination or additional surgery visit preferred for administration. Findings suggest uptake of a varicella vaccine would be high. To our knowledge, this is the largest recent study on this topic in the UK.

The information from this study will be used to inform Joint Committee on Vaccine and Immunisation vaccine policy and practice in the UK, with a view to including the varicella vaccine within the childhood immunisation programme.

This study identified that health professionals are cited as the most trusted and common source of advice on immunisation. A follow up study is currently in progress investigating healthcare professionals' attitudes to introducing varicella vaccine to the childhood immunisation programme.

CREATE WorldCUR 3D

WorldCUR046
Create

Deep Proteome Analysis: Using a Pulsed Electric Field to Enhance Proteoform Resolution

Ishan Herath
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Abstract

Gel electrophoresis is a crucial tool used in biological research to study biomolecules such as proteins or DNA and involves subjecting these samples to migration through a porous gel matrix allowing for separation based on size or molecular weight. This tool helps scientists study molecular pathways, identify novel biomarkers indicative of disease and even identify target candidates for pharmaceutical drug development. Our ability to interpret the information provided by these gels fundamentally hinges on the "resolution" of the gel. Resolution refers to the ability to separate proteins into discrete bands. A higher resolution allows for more accurate studying of the biomolecules and can help identify target proteins important for disease and medical treatment with greater specificity. Typically, when gel electrophoresis is performed a constant electric field is applied to the gel however, this project aimed to investigate whether period interruption of this electric field could improve the resolution of the separation. When proteins migrate through the pores of the gel they can get entangled or diffuse into broader bands due to heat being produced by the electric field. Periodic interruption of the electric field allows the migrating proteins to reorient within the gel matrix before travelling again once the field is turned back on. This allows for proper migration due to disentanglement of the biomolecules from the gel matrix as well as increased joule heat diffusion. After comparing gels separating protein samples with a continuous and periodically interrupted electric field, it was found that periodic interruption markedly increased resolution.

Formulation of a Novel Silver Nanoparticle/Chitosan-based Hydrogel for Topical Antimicrobial Treatment.

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Abstract

Introduction: Since active Ag+ is non-toxic to human cells, AgNPs-based antimicrobials are useful for treating infections including those caused by multidrug-resistant strains, due to non-specificity. Chitosan is a biopolymer that possesses antibacterial effects. It is non-toxic, biodegradable, biocompatible, and cheap. The aim of this study was to formulate a novel antimicrobial gel using AgNPs/chitosan-based hydrogel.

Methods: The AgNPs/chitosan capped were formulated using a strong reducing agent sodium borohydride (NaBH4). Different concentrations of chitosan were tested with varying concentrations of AgNO3 in acetic acid preparations, using different volumes of NaBH4. Formed bases were characterized for zeta potential, particle size, and UV-vis. Chitosan hydrogel was prepared using different concentrations of chitosan in acetic acid and analyzed for thickness. The formed hydrogel is evaluated for antimicrobial effectiveness using a culture media against specific strains of bacteria.

Preliminary Results: The synthesis of nanoparticles with a specific concentration of AgNO3 and chitosan using NaBH4 resulted in the best-formed nanoparticles in terms of specific parameters. The synthesized AgNPs showed a variety of yellow colour intensities indicating the formation of AgNPs.

Conclusion: A preliminary and promising one-step approach was developed to synthesize a novel antimicrobial gel from AgNPs and Chitosan using NaBH4. It is believed that AgNPs/chitosan in this formulation will have an additive antimicrobial activity compared with the available sAgNPs gels in the market. After completion of the research, the formed antimicrobial gel is to be tested in vivo studies and clinical trials, then to be patented and available for use in practice.

The Use of Discourse Markers by Spanish Language Learners

Luana Vanderstraeten
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Abstract

The topic of my research is the use of discourse markers by Spanish language learners. Discourse markers do not have an informational content, but contribute to it by establishing links. They can be used as connective devices with an argumentative, reformulating or organizing function. They can operate as discourse modalizers, can focalize an element in a discourse, can serve to enhance or maintain contact and control in communication. For the compilation of the data, I will use the PRACOMUL(PragmaticCompetencefromaMultilingualPerspective) platform, created in the framework of the PRACOMUL project, which brings together Spanish learners with different mother tongues. More specifically, I will be using students' conversations from the PRACOMUL platform. The students were invited to have a conversation on a general topic with another participant. They were not informed about the research topic, neither were they given any specific explanation on how to use different discourse markers. In a second phase of the PRACOMUL project, the use of discourse markers will be explained in a digital and interactive way. After these virtual teaching modules, the students will participate again and will have a conversation with another student. I will then investigate how the discourse markers were used by the Spanish language learners with different mother tongues, and more precisely analyse which markers appear more frequently and with which discourse function they are used. In brief, I will analyse the use of discourse markers before and after the learning process and therefore I will help assess the quality of the teaching.

WorldCUR 3E

WorldCUR049
The Future

The interaction of ADSCs and BC.

Natasha Cunningham
Technological University of the Shannon, Athlone, Ireland

Abstract

Introduction: Adipose derived stem cells (ADSCs) are deemed as a double-edged sword in the breast cancer microenvironment as they can both enhance and inhibit cancer proliferation and metastasis. MicroRNAs are the underlying mechanism of gene regulation in oncogenic, and tumour suppression as well as cell signalling pathways.

Aim: To investigate the mechanism underpinning the interaction of ADSCs in the BC microenvironment.

Methods: Proliferation assays were carried out to demonstrate the influence of ADSC conditioned media on breast cancer cells (MDA-MB-231, SKBR3, and T47D). The expression of six miRNAs (miR-21, miR-133, miR-222, miR-146, miR-221, and miR-883) and three cytokines (TGF-β, RANTES, TNF- α) was determined via RQ-PCR and ELISA, respectively. Statistical analysis was performed using Minitab 20.1.0.

Results: miR-21 displayed an increase of miRNA expression throughout all co-cultured samples of BC cell lines and ADSCs ($p<0.05$). Both miR-146 and miR-222's expression was significantly increased in SKBR3 BC co-culture with ADSCs ($p<0.05$). MiR-133's expression was significantly downregulated in ADSC-BC co-cultures ($p<0.05$). The indirect co-culture of BC cell lines with ADSC had no significant effect on miR-883 expression ($p>0.05$). Significant down-regulation of cancer favoured cytokine pathways was observed in all BC cell lines co-cultured with ADSCs ($p<0.001$), except RANTES SKBR3 co-culture cell line ($p<0.05$).

Conclusion: The findings in this study demonstrate the molecular individuality of BC and supports the literature that ADSCs have properties as a double-edged sword. This could provide a target for novel treatment therapies to provide patients with a better prognosis through a personalised, molecular approach of treatment.

Emerging Legal and Human Rights issues: The Adaptation and the use of Artificial Intelligence in different industries in Kenya.

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Abstract

Artificial Intelligence is undoubtedly a trending and emerging technology. It is growing very fast day by day, and it is enabling machines to mimic the human brain. Due to its high performance and as it is making human life easier, it is becoming a highly demanded technology among industries.

This study examined performance of artificial intelligence, its demand among industries in Kenya and its challenges. Utilizing Riggs theory of "prismatic society", qualitative methodology, interviews, Focus Group Discussions (FGDs), questionnaires, documentation, stratified proportionate random and purposive sampling techniques; the sample of 302 was selected from target population of 1200 respondents. The results indicate that artificial technology is risky and dangerous if it overtakes humans. The conclusions have legal implications that artificial intelligence is a comfortable technology but should be used with limitations without infringing on human rights principles such as the use of algorithmic transparency, cyber-security vulnerabilities, unfairness, bias and discrimination, lack of contestability, issues on legal personhood and intellectual property, its adverse effects on workers, privacy and data protection issues, liability for damage and lack of accountability.

The article uses the frame of 'vulnerability' to consolidate the understanding of critical areas of concern and guide risk and impact mitigation efforts to protect human well-being. While recognising the good work carried out in the AI law space, and acknowledging this area needs constant evaluation and agility in approach.

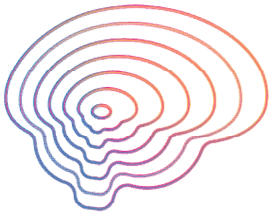
Will Your Work Define You - What Keeps People Working Beyond State Pension Age (SPA)?

David Silver
University of Warwick, Coventry, United Kingdom

Abstract

As birth rates decline and life expectancy increases Governments across the western industrialised world have been urgently reforming pension systems, fearing they may collapse amid an increasing lack of sustainability. This has led to an increase in the age at which people become entitled to receive a state pension (SP). In keeping with neoliberal thinking, responsibility for wellbeing in retirement, both financially and from a health perspective, is now increasingly that of the individual marking a shift from it being historically a collective one.

The reasons that keep people working beyond the SPA, and its effect on wellbeing, were studied by analysing more than 45 papers and articles. The results indicate several common themes around choice and control, or the lack of it for some, and the inseparability of work and identity, particularly for those in professional or white-collar roles. Transitioning to retirement threatens people's sense of distinctiveness; the loss of purpose and self-worth presents a major challenge with far reaching consequences for how people fare in later life. More surprisingly, the flexibility and opportunities approaching retirement are, for some, a matter of chance and fortune, brought about through choices made early in a career. Given that the transition to retirement has yet to be recognised as a significant life phase, recommendations for consideration by politicians and policymakers are made along with the clear need for further research of this area.



SUSTAINABILITY

WorldCUR 3F

WorldCUR052

Sustainability

Predicting characteristics of turbulent flows generated by an active grid

Hauke Ukena

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Abstract

To this day, there is no computer or (artificial) intelligence that is able to completely and accurately describe ore predict turbulences. To get a better understanding for them, they can be created in active grid wind tunnels. Active grid wind tunnels can be used to scale down complex atmospheric wind fields so that scientist may study them in the most realistic way possible. Their aim is to better understand wind fields and their influence on wind turbines as well as finding novel control concepts to better compensate turbulent effects on them. That is key in building and developing wind energy systems which are vital in switching to green energy. In an active grid wind tunnel, flow conditions can be imprinted on the flow via the active grid, wind velocities are measured and then characterised by their power spectra, probability density functions etc. This work is focused on finding a way to predict these characteristics by simulating turbulent flows. Artificial velocity-time-series are calculated and the characteristics deducted. To do this, a MATLAB environment is programmed. The simulated data will then be compared with measured data to determine the validity of the prediction. This could be the next step to better understand turbulence.

Impulsive buying during the Double 11 festival pre and post the pandemic

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Abstract

This study investigates the factors of impulsive buying during the Double 11 promotional festival pre and post the pandemic. Impulsive buying and media is already a hot topic, but few researches discuss it in relation to the pandemic and sustainability. The Double 11 festival, which takes place on the 11th of November on a yearly basis, is one of the most exciting promotional carnivals in the world and the largest in China, being able to stimulate the demand in barely 24 hours. Having lasted for years, it has become a habit or even a tradition for many of the new generation to participate. With the pandemic, increased consumption is seen as positive to a country's economic growth. However, it is not a desired phenomenon if the implication behind the huge turnover number is the stimulation of impulsive buying. The theoretical frameworks to explain the impulsive behavior falls under behavioral economics. Perceptions are often more powerful motivators than reality and reality is often obscured by lack of accurate information. This constitutes the basis of involuntary impulsive buying. Besides this, the social identity theory and the cultural factor of conformity explain further the impulsive buying during the Double 11 when everyone else participates. Understanding the factors behind impulsive buying under major promotional event is relevant to sustainable consumption, in line with SDG 12 Responsible consumption and reduction.

Level of Knowledge, Attitude, and Practice of Emirati Young Adults Regarding Diabetes Mellitus Type-2

Bontu_Melaku
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Abstract

Diabetes Diabetes Mellitus, a global health burden, is particularly prevalent in the United Arab Emirates (UAE), with young adults, including college and university students, representing the majority of the affected population. Consequently, how much the young adults are informed about the disease plays a key role in preventing diabetes and controlling the spread of the problem. This study evaluated the level of knowledge, attitude, and practice of young Emirati adults regarding Diabetic Mellitus type-2 by using cross-sectional design and a sample of 159 Emirati university students in which most of them aged between 18 and 25 years. Data was collected through a self-administered online survey and the final data was analysed using SPSS. The results indicated that 70.4% of participants have good knowledge, 54.9% have positive attitude and 51.5% have good practice towards Diabetes Mellitus type-II. In comparing these findings between both genders, female students are more knowledgeable about DM while male students are better in terms of attitude and practice. This research uncovers the existing gap regarding attitude and practice towards the DM among students, especially among females. Moreover, it highlights the presence of limited knowledge among male students that requires attention. Thus, schools, government, and different community programs are required to implement more impactful interventions to address these gaps. This study also plays an important role in filling a research gap and paving the way for further larger investigations to find the basic reasons why the incidence of diabetes in the UAE is rising so rapidly.

Preventing Migration-Related Corruption: Kazakhstani case

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Abstract

Kazakhstan is an emerging economy in Central Asia that attracts labor migrants from neighboring countries. However, these migrants often face difficulties working in Kazakhstan due to informal management constraints and corruption risks from local authorities. This paper examines the conditions under which corruption and informal management occur in immigration control in Kazakhstan. By analyzing relevant literature, reports, news, and interview responses, the study found that increased pressure from local law enforcement and authorities, migrant diasporas' unity, and the involvement of third parties contributed to migrants' engagement in informal networks. Identifying these corruption conditions can assist in proposing policies to relevant governmental organizations. Future studies could include interviewing more migrants to understand the whole mechanism of corruption. The research supports the hypothesis based on both practical and theoretical investigations. However, the involvement of third parties who do not belong to migrants or local authorities presents difficulties in minimizing corruption risks. The constant engagement of third parties with migrants and local authorities is a crucial detail that can help reveal cases of corruption among migrants who engage in informal networks.

Factors Affecting Social Capital Among Students Aged 14-18 in England

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Abstract

Social capital encompasses the connections and conventions that students develop through school, family and friends. Students from different socio-economic backgrounds who attend different schools have different experiences. The adage 'it's not what you know but who you know' shows the importance of the network that one can form through family relations, extracurricular activities or within their school. The research identifies how various factors affect a young person's access to social capital and examine how this can be improved. Using questionnaires and interviews with young people, the study explores students' understanding of social capital and their access to networks. The interview data informs the statistical analysis of the questionnaire to understand the influential factors in determining access to social capital and the ways disadvantaged young people can compete. The study shows, in line with previous research in this field, that while there are similarities - students from the more advantaged backgrounds, with better access to social and cultural capital, are more likely to take advantage of the networking opportunities presented to them. This research supports the current literature on levelling up and social mobility to inform schools and parents about how students can take advantage of their network and highlight the power of social capital. Young people will approach social capital from different starting points, and this research hopes to suggest ways to maximise access to and the benefits of social capital.

WorldCUR 4A

WorldCUR057
Community

Applying Moral Foundations Theory to Australian Political Parties

Angus Padley
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Abstract

Moral foundations theory (MFT) argues that human moral reasoning is based on six innate ethical intuitions: care, fairness, loyalty, authority, sanctity, and liberty (Haidt, 2012). MFT has major political implications, with Hanel (2017) finding that political parties that appeal to all six foundations in their election campaigns generally receive more votes. However, left-wing political parties often only focus on the care, fairness and liberty foundations whilst largely neglecting the rest (Haidt, 2012). Despite these significant findings, few studies on MFT have been conducted on Australian parties. Therefore, this research investigates how Australia's major political parties use the moral foundations. To do this, this paper coded the 2019 federal election campaign launch speeches of the Australian Labor Party (ALP) (Australia's primary left-wing party) and the Liberal/National Coalition (Coalition) (Australia's primary right-wing party) into the six moral foundations. Next, using this analysis, this paper calculated the percentage each moral foundation comprised of the total number of claims. The results suggest the ALP strongly references the care, fairness and liberty foundations whilst mostly ignoring the rest. The Coalition also made heavy use of these foundations but utilised loyalty, authority and sanctity to a greater extent than the ALP. This suggests that the ALP (and to some extent the Coalition) would benefit from utilising a wider range of moral foundations during elections. Further research may consider conducting similar analyses to older campaign launch speeches to see how the use of the moral foundations has changed over time.

Gender Inequality In Peru's Informal Economy Market

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Abstract

According to the Peruvian National Institute of Statistics (INEI), 75% of the female labour force is in the informal economy market (2018). The informality rate in Latin America is 53% and the Peruvian, 77%, the fourth in the region (Muñoz, 2021). Moreover, Peruvian traditional structural discrimination against women worsened the female situation.

This paper aims to investigate the main factors of gender inequality in the Peruvian informal market by using an event study methodology and panel data 2017-2021 from the National survey of Households (INEI).

Although motherhood contributes to explaining the high informality rate among working women, the education inequality gap is still relevant as we observe heterogeneity of child penalty: High-educated women are 76% less likely to work in the informal sector after 10 years of having their first child while for low-educated women, there is a persistent increase in labour informality of 11%. As a possible explanation, this research highlights that for less educated women, poor job security conditions in the formal sector are similar to informal job conditions.

The research undertaken is relevant because although we have seen significant improvements regarding the gender gap in the economy, this progress has not impacted all population. This project brings awareness and further work towards the development of real-life solutions for this issue such as government policies. Currently, some companies around the world are developing resource female groups, mentorship schemes, and leadership masterclasses. Will this arrive someday in Peru, a country where just 2 of 19 ministers are women?

Community Mediation: Pathway to Sustainable Dispute Resolution Practice- The Indian Experience

Balapragatha Moorthy, Anandini Saha

Jindal Global University (JGU), Sonipat, India

Abstract

For a long time, the Indian Judiciary has been worshiped as a sacred institution with a sacrosanct spell cast around it. However, as per the data in 2022, around 47 million cases are pending in courts in India which has cast a dark light on its functions. This pendency problem is long-standing and has rendered the system unsustainable for all its stakeholders.

As a result, discussion about incorporating alternative dispute resolution to make the legal system sustainable has been at the forefront. The Commercial Courts Act of 2015 and the Mediation Bill of 2021 are significant legislations on this front. Community mediation is another form of dispute resolution that could aid in providing an opportunity for citizens to participate in early intervention of conflicts at a grass-root level. One of the recent forms of community mediation in India is community mediation centres like India's first Youth Conflict Management and Mediation (YCM) centre at O.P. Jindal Global University (JGU), Sonipat, India. The goal of YCM is to empower the youth with skills to be able to REALISE-RESPOND-RESOLVE conflicts and disputes in the community around them.

In this paper, we will trace India's evolution in community mediation. We will be using YCM as a case study to analyze the benefits and challenges of community mediation. Later, we would evaluate the structures in other jurisdictions. The aim of the paper is to develop a community mediation model that could make any jurisdiction's dispute resolution system sustainable.

WorldCUR 4B

WorldCUR060
Health

Holism vs. Individualism in Public Health Methodology: Capitalism and Infant Mortality

Agasthya Vedre-Kyanam
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Abstract

The development of American capitalism facilitated the dominance of a bioessentialist paradigm in public health research. This has resulted in a systematic individualization of health problems that is financially beneficial for the corporate leaders and funders in health research- exacerbating health inequity and degrading research ethics and scientific integrity. The US has the highest rate of infant mortality of the OECD countries. This study investigates the link between capitalism and infant mortality in this context. There has not yet been a systematic analysis of the effect of capitalism on infant mortality research methodology and how both affect infant mortality. Mixed-methods synthesis of 40 studies was conducted to study infant mortality in the US and countries with lower wealth stratification. Thematic analysis of infant mortality calls to action/initiatives from the UN, WHO, and other major centers/organizations was conducted to understand the academic predispositions guiding infant mortality research methodology. Conflict-theoretical and critical-theoretical frameworks were used to guide investigation. Infant mortality is significantly higher in countries with higher levels of wealth stratification. Research attitudes attributing infant mortality to the individual behavior of the mother rather than social factors was also higher in countries with higher wealth stratification. Capitalism is increasingly becoming a determinant of both health and knowledge. This research is important to guide future inquiry into how power affects the nature of public health epistemologies, and subsequently population health. New avenues of research could study how capitalism affects the outcomes and epistemologies of other diseases, such as mental illnesses.

Performing Contraception: A Framework for Reading Contraception as Performance

Emily Nicholson
University of Warwick, Coventry, United Kingdom

Abstract

The contraceptive responsibility in heterosexual relationships disproportionately falls upon women; the ways this responsibility disrupts, controls, and regulates women's bodies and lives are often ignored. Performing Contraception is a data-driven interdisciplinary project which provides a new perspective on the unequal distribution of reproductive responsibility by delineating contraception as an embodied performance and ritual act to reframe contraception's role in women's lives. For the first time, this thesis provides a framework for reading contraception as performance; approaching contraceptive labour as a gendered performance of everyday life. Combining performance and feminist theorists such as Butler and Federici, this interdisciplinary research explores the social-coding, normalisation, ritualisation, and corporal dimension of taking contraception to contribute to wider discourse of unpaid fertility work. Primary survey and interview data are combined with research from feminist theory, medicine, and sociology to explore contraception from the macrolevel of sociocultural, biotechnical, and medical structures which uphold the status quo, down to the microlevel of each dose of contraception as an individual embodied performance. This framework is then built upon, and applied to, the lived experiences of women to explore how gender inequality is (re)produced through individual encounters with contraception. By examining contraception's disruptive and negative impacts, this thesis uses performance studies to provide a new contribution to feminist discourse supporting the improvement and equalisation of reproductive healthcare for all. Continued research on contraception as a disruptive embodied performance of gender can help highlight the inadequacies of contraceptive technologies and challenge social attitudes towards contraception.

Perceived sexual orientation microaggression and depressive symptoms in LGBTQIA+ youth in Asia: The mediating role of resilience and the moderating effect of interpersonal relationship

Wai Yin Wong
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Abstract

With the worldwide acceptance of LGBTQIA+. Aggression against LGBTQIA+ seems to be diminished. Yet, another subtle form of aggression—sexual orientation microaggression (SOMA), unintentional discrimination against LGBTQIA+ members, reflected through individual's verbal, behavioural, and environmental as defined by Sue (2010), still exists within the society. Previous studies suggested the detrimental effect of SOMA on depressive symptoms is significant in the Western. However, Eastern context is rarely studied. The tolerance toward LGBTQIA+ in Asia is much lower, the effect could be more significant. Therefore, relationship between SOMA and depressive symptoms is needed to be proven in Eastern context. Resilience and interpersonal support are considered intertwining mechanisms for battling adversity. Yet, relationship between resilience and SOMA has yet to be proven. Notwithstanding, the relationship between SOMA and interpersonal relational support is needed for clarification. Previous research shows either negatively correlated or null effects when studied against SOMA. This study aims to examine the association between SOMA and depressive symptoms, the mediating role of resilience, and the moderating effect of interpersonal relational support in Asia. This cross-sectional study using an online survey will recruit at least 100 self-identified LGBTQIA+ from different areas of Asia. Measurements include SOMI scale, Connor-Davidson Resilience Scale, and Perceived Social Support Scale. Data collection is ongoing, and we will conduct data analysis soon. This study will provide new knowledge on the mechanisms that contribute to mental health problems of LGBTQIA+ individuals and inform the development of sexuality education and mental health promotion for this understudied and underserved population.

WorldCUR 4C

WorldCUR063
Power

No Human is Illegal: The Peregrination of the Nomadic Homeless in Pittsburgh

Jason Minicozzi
Duquesne University, Pittsburgh, USA

Abstract

Homelessness is a propagating global crisis. In many US cities the unhoused face discrimination through bureaucratic legislation. These ordinances prohibit an individual from soliciting in urban settings. This legal exile of the unhoused revokes their 'right to the city', hence, alienating them from society based on their socio-economic status. These anti-solicitation laws are reinforced through architecture, policing, and public surveillance. Today, scholars identify this phenomenon as hostile or anti-homeless architecture; these designs mutate previously 'public' areas into derelict environments. These obstructions include, but are not limited to: armrests in the middle of benches, lids atop trash cans, and spiked ledges under roofed areas. Hostile and anti-homeless architecture differ in appearance. Hostile or defensive architecture's callousness led to its own demise; however, urban classist antagonisms ensued. Anti-homeless architecture (AHA) emerged as the latest 'solution' for the homeless epidemic. The inconspicuous nature of this architecture allows this practice to continue in modern America.

My research, focusing largely on urban Pittsburgh, identifies inhibitive architecture and its resulting consequences. I utilized non-obstructive observations, geo-demographic analyses, and peer-reviewed secondary sources to depict the baneful effects of this architecture. These empirical methods postulate an increase in violent crimes due to inadequate food, shelter, and safety available in Pittsburgh. My research explores ways to design inclusive architecture coupled with redistribution of basic needs for the unhoused.

German at Leeds - Then and Now

Holly Perril
University of Leeds, Leeds, United Kingdom

Abstract

I am researching the history of the German department at the University of Leeds in order to inform a wider discussion regarding the decolonisation of our curriculum and how universities deal with international crises. I am specifically interested in how German language teaching and learning has been affected by significant world crises of the 20th Century such as WWI and WWII and how this has cultivated an image of the German language within Britain that serves a political function. My research analyses the perceptions of different languages cultivated within the British education system and how this is reflected in my case study, the University of Leeds. I will explore the relationship between Britain and Germany following in Brexit, which has made Germany the powerhouse of the European Union, and how this has further politicised language learning within Britain. Why is it that the British insist that German sounds 'aggressive'? In contrast, why is French considered 'eloquent', 'romantic' and 'graceful'? What is the function of these images and how do they affect the perception of other cultures that we use to inform British students about the wider world? The materials for my research have primarily consisted of historical documents regarding the curriculum, staff, examinations and pedagogy of German teaching within the archive of the University of Leeds. I have used archival materials to develop an understanding of how the representation of Germany and the German language within politics has shaped German language teaching and learning within Britain.

Examining Challenges Facing Women Pursuing Doctorate Degrees in Ghana: A Comparative Study on How Gender Identity Affects the Transition to Scholarly Identity for Men and Women in the Ghanaian Context.

Daphne Chebesi
Ashesi University, Berekuso, Ghana

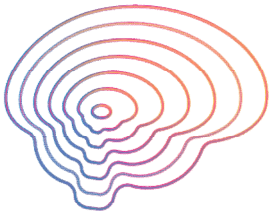
Abstract

While women's participation in education in Ghana has improved significantly over the past years, data suggests that women are still missing at higher levels of education, especially at the doctorate level. The challenges of doctorate studies for women have been linked to societal expectations of a woman. This study examined gender-specific differences in the key identity transition to a scholarly identity for men and women pursuing PhDs in Ghana to help identify challenges specific to women.

Grounded on the social identity theory and using the phenomenological hermeneutic approach to qualitative research with semi-structured interviews as a data collection tool, this study captured the experiences of 6 male and 6 female students at the University of Ghana. Data was analysed thematically. Themes were identified considering pre-existing themes in the literature and new themes that emerged. The results revealed that women in Ghana navigate greater complexity than men while on their PhD journeys and face greater and unavoidable challenges because of their gender identity.

This study contributes to the existing literature by uniquely explaining how gender socialisation negatively impacts women's socialisation in academia at the doctorate level. It also offers a gender comparative perspective that similar studies have failed to do.

This paper tackles issues related to educational inequity at the doctorate level, which has implications for policymaking in higher education and development in Ghana. It also contributes significantly to SDG 4: Quality Education, SDG 10: Reduced Inequalities and SDG 5: Gender Equality.



SUSTAINABILITY

WorldCUR 4D

WorldCUR066
Sustainability

How has the statistical and media representation of Black female athletes in white – and male-dominated sports in the US been impacted by gender norms and power structures?

Oluwatoyosi Somoye
University of Warwick, Coventry, United Kingdom

Abstract

Sport and media are cultural institutions that usually reflect societal norms. In the context of the United States, Black females have faced historical and contemporary discrimination due to their complex intersection. Therefore, the purpose of this paper is to explore the impact of gender norms and power structures on the representation of black female athletes in US Sport media. This paper adds to existing literature by elaborating on theoretical and empirical arguments and applying the intersectional model to this often-overlooked group. A literature review of relevant academic (and non-) publications is used to help us understand how the US media conceptualises and represents black females. Additionally, the theoretical framework of Critical Race Theory and Intersectionality scholarship were combined to filter the literature. By focusing on the three types of intersectionality: structural, political, and representational, the unique experiences of Black females can be highlighted. Whilst examining the literature, key concepts and ideas were grouped together, resulting in two themes: Lack of representation and Misrepresentation. This paper finds that systemic discrimination affects the portrayal (and lack of) of Black females in the media due to bias held by the dominant group. Given the increasing demands for racial equity, it is relevant to highlight the systemic discrimination in sport, as this institution has immense effects on the overall wellbeing of individuals. This research can be extended by incorporating the social categorization of "class" to explore how it may also act as a barrier to the equitable representation of Black females.

The Non-Refillable Cartridge Menace

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Abstract

With the recent technological advancement printing of documents is essential, with paper recycling industries in place, the empty cartridges brings up a problem which needs to be addressed. Most printer cartridges are designed in a way that they are disposed after they are depleted. A visit to three learning institutions initiated the urge to research on the effects of non-refillable cartridges and coming up with possible solution. The study examines the effects caused by the non-refillable printer cartridges and provide a solution in attempts to achieve the sustainable development goal 13-climate action, and in turn achieve other SDGs like 9-Industry, Innovation and Infrastructure. The study had a target population of 83institutions and a stratified random sampled population of 19institutions participating in the research. The study uses collection of samples and observation as the major methods of data collection and measures of central tendency and dispersion and percentages for data analysis. Based on the findings of the study the non-refillable cartridges mostly result to financial constraints, fill up space, and cause environmental degradation and pollution. Following the findings, the researcher initiates a cartridge refilling and drum unit replacement project in one urban center, which cuts on the negative effects. Hence, the research concludes that cartridges should be designed in a way that they can be refilled since when refilled they also continue to function. The research suggests that cartridge-recycling plants need to be set up in major towns globally to save the Mother Nature from further breeding from human interference.

Meta-Analysis of Solar Cell Technology to Improve Performance Considering Market Feasibility

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Abstract

Solar power has demonstrated potential to become a leading renewable energy source in sight of the net-zero goal for 2050, however only currently accounts for 3.6% of global electricity generation. To enhance the competitiveness of solar power relative to other sources of energy generation, it is imperative to invest in new and emerging technologies that can improve the performance and cost-effectiveness of solar power beyond the capabilities of current commercial crystalline silicon devices. This project provides a synthesis of published research papers at the forefront of innovation investigating concentrating PV systems, perovskite solar cells and multi-junction solar cells to determine the suitability of the technologies in various areas of application and discusses their potential as alternatives to crystalline silicon cells. The research found multi-junction solar cells are dominant in space applications but require cost reduction for terrestrial application. However, concentrating technology utilising multi-junction solar cells display promising performance and a competitive LCOE in utility-scale applications. Furthermore, with significant improvements in stability, perovskite solar cells could be a key material for the next generation of solar PV technology. The research contextualises conclusions drawn throughout the project to provide insights into areas that require larger investments to enhance the competitiveness of solar PV technology. With this, the project identifies gaps, inconsistencies and conflicts within existing research, develops an understanding of the boundaries and limitations within the field of research and indicates a need for future research directions.

WorldCUR 4E

WorldCUR069
Create

Native advertising; an emerging digital marketing trend in Egypt.

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Abstract

People globally have little to no awareness about native advertising, especially in Egypt. Native advertising is an online promotion tool that appears in different forms that do not seem commercial in nature. This indirect promotion method raises ethical and transparency concerns to consumers due to its covert nature to foster engagement; hence, consumers get deceived and become skeptical. Qualitative data was collected using two focus groups and telephone interviews with university students, who were asked the same questions with the same structure. The questions focused on their awareness of native advertising and their attitudes and perceptions towards it. The findings revealed that none of the participants was aware of native advertising; some participants believed that it should be a more frequently used marketing tool in Egypt with an advantage in its covertness, while other had the opposite stand, they thought it was unethical and felt “deceived” and “skeptical” (similarly to keywords of the literature). Both perspectives encompassed a comprehension of native advertising in social media in Egypt. Native advertising is a growing advertising tool in the digital era; therefore, more research with a wider and diverse sample is critical, additionally, more awareness to consumers and advertisers shall be taken into consideration to enhance the mutual experience. Future research should focus on a wider and more diverse sample to gain a better understanding into native advertising and its impact, specifically in the MENA region.

Implementation of DevOps tools to minimize time and space complexity: An example with Traffic Sign Classification System

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Abstract

Who wants the work done manually if automation can continuously integrate and deliver the product with better consistency and performance? With the evolution of information-technology (IT), machine learning and artificial intelligence have transformed the real-time system update through which public can keep pace with dynamic society and reduce the time and memory space burden. Among such applications, transportation and urban planning engineers have used traffic sign classification for reducing the complexity and workflow execution delay in a system. This work undertakes the implementation of DevOps (Software Development and IT operations) tools in Convolutional Neural Networks (CNN) based web-app traffic sign classification. Classification is studied by using image processing to ensure that all the traffic signs are detected, integrated and deployed continuously. We train an improved CNN model to identify the traffic signals in an ideal environment, with training cascade classifiers based on Histogram of Oriented Gradients (HOG) features to detect traffic signs. We find that any such system can be consistently and fully automated from development to deployment, saving all the costs, manual data entry and solving the communication gap between the developers and the operations team. This demonstrates how DevOps tools like Jenkins, Jira, AWS, Nagios, Ansible can help in simultaneous automation rather than manual plodding that reduces the probability of error along with giving a performance boost. The recent demonstration of these tools constitutes an effective continuous integration/deployment (CI/CD) pipeline that can be extended to similar real-time automated systems like danger detection and security image recognition.

Narrative Imagination Experiments: Creative Writing as an Empathy Building Strategy

Matilda Lara-Viana
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Abstract

Our research aimed to identify ways in which literature can be used to promote empathy, peace, and wellness. Our hypothesis was that creative writing focused on "narrative imagination" has a positive impact on the way we perceive and treat others. This is relevant because in the current context of post-conflict, our country is in need of practical peace building strategies. Therefore, we aim to show correlations between creative writing and activation of empathy on individuals.

We followed three research stages. First, we did conceptual research. In this stage we looked at the bibliography that was available on this topic. Then, and based on several creative writing theory textbooks, we developed a list of writing exercises focused on empathy. Finally, we executed these exercises with different groups of people, mainly university students, and evaluated how the workshop changed their perception of others and made them more empathic.

This research found that empathy focused creative writing in fact impacts positively in our perception of others. Participants showed a deeper comprehension of otherness and manifested a shift in the way they perceive difference and conflict after the execution of the exercises. This is relevant because it means that creative writing can be used as a strategy for peacebuilding.

After these results we plan on continuing our research by designing empathy focused creative writing workshops. Our goal is to improve and replicate the model that we've created with other groups of people to spread out the impact of our research.

Microencapsulation of Rose Bengal in Microbubbles for use with Sonodynamic Therapy

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Abstract

Rose Bengal (RB) is a chemical of interest currently undergoing clinical trials for some cancers. It is also being investigated as a way to generate reactive oxygen species (ROS) when triggered by ultrasound in the presence of oxygen, a process known as sonodynamic therapy. ROS generation creates oxidative stress, causing cancer cells to die. The purpose of this study is to attach RB to an injectable, oxygen-filled microbubble (MB) to facilitate delivery of RB to the target cancer site. The MB shell is made up of surfactants each with a fat-loving (hydrophilic) head and water-loving (hydrophobic) tail. A hydrophobic drug can be incorporated into the bubble shell, since RB is hydrophilic, when encapsulation was attempted, there was no drug loading. A successful attempt focused on RB's negative charge. By adding the surfactant cetyltrimethyl ammonium bromide (CTAB) to the shell, the MB became positively charged, and contact with RB solution allowed the RB to become statically attached. Using fluorescence measurement, 2.7 μg RB/mL MB were detected compared to no evidence of loading in the absence of CTAB. These results were confirmed using a fluorescent microscope for visualization. Size measurements gave a MB diameter of 2.1 µm, the ideal size to navigate small vessels, with a concentration of 1.35× MB/mL. The results demonstrate the excellent potential of this method to produce RB-MB for use in sonodynamic therapy.

Gravitational Wave Emission From Short Period Binary Stars

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Abstract

The direct detection of gravitational waves in 2015 has heralded a new era in astrophysics. Unlike gravitational detectors on Earth, detectors in space will not be limited to the detection of high frequency waves by the Earth's seismic activity. This project aims to identify binary stars, which are two-star systems, for space-based gravitational wave detection and to measure their orbital periods. A list of known short-period binaries was drawn from existing literature. Plots of the luminosity (a measure of power) per unit area over time, called light curves, were downloaded from a leading database. These were then searched for the orbital periods of the sources. The systems that yielded positive detection were analysed for period stability by fitting periodic signals. The systems that were studied are of high interest due to them being strong sources of gravitational waves. Therefore, they could assist us in understanding gravitational waves, as well as the composition and evolution of stars and stellar binaries. A satellite mission to detect gravitational waves, called LISA, is funded for launch in the 2030s. The systems that will be studied are thought to be the strongest and most numerous of the sources that LISA will see. It is essential to understand how many there are and their properties in the run-up to LISA.

QCARxE: Qatar-Based Cardiovascular Risk Assessment Using the English/Arabic Version of the EPI·RxISK™ Mobile Application

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Abstract

Cardiovascular disease (CVD) is the leading cause of death worldwide. Early risk assessment and management (RAM) is effective in decreasing CVD-related burden. Mobile technology facilitates access to CVDRAM for healthcare providers and patients, with limited availability and use of it in the Middle East region. This study was done to develop and implement an English/Arabic version of a mobile/web application for CVDRAM in community pharmacies and primary care centers in Qatar.

In phase 1, translation of EPI·RxISK™ CV risk calculator (ERC) into Arabic was conducted and the English/Arabic version was pilot tested by potential end users. Semi-structured interviews were conducted based on the Mobile Application Rating Scale. In Phase 2, a prospective observational study (QCARxE) is underway to explore the feasibility of using the ERC in patients accessing primary health care services for CVDRAM.

In phase 1, 10 pharmacists and 5 patients were interviewed. The data indicates that ERC was positively perceived as having quality engagement, functionality, aesthetics, information, and subjective quality attributes. To date, a total of 36 patients have enrolled, the initial mean CVD risk score was 28.3%, and the most prevalent risk factor was obesity.

The themes derived from the interviews indicate that the ERC was positively perceived. Phase 2 preliminary data indicated a significant proportion of patients accessing primary health care services are at high CVD risk. The use of the ERC will enable patients to become better aware of their CVD risk and improve access to risk factor interventions.

WorldCUR 4G

WorldCUR075
Data

"Most Young Kings Get Their Heads Cut Off": Basquiat's Merchandise

Lily Paternoster
Stetson University, DeLand, USA

Abstract

Jean-Michel Basquiat was an American contemporary artist famed for his abstract and thought-provoking paintings that served as a sharp commentary on racism, drug abuse, and power struggles in America. In the last decade he has gone from being a famous artist to a pop culture icon. The elevation of his status is attributed to a massive boom in merchandise collaborations between his estate and various brands, ranging from Old Navy to Yves Saint Laurent (YSL). My research will analyze these brand collaborations and their respective press releases to determine if the commodification is whitewashing Basquiat's identity. Using art historical sources and memoirs, biographies, documentaries and interviews I will compare the version of Basquiat in the art history canon to an artist printed onto sneakers, handbags, candles, and even 6,1000 USD YSL skim boards. This comparison will allow me to question the relationship between the artist and the merchandise, which is ignored in art institutions. I will be creating a database of all brand collaborations from the first to most recent alongside their press releases. The database will be attached to the appendix of my Stetson senior research paper and available through the Stetson Library database.

Estimating Treatment Effects with Causal Machine Learning Methods

Jiarui Song, *Yizhou Gu*
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Abstract

Using statistical methods to estimate treatment effects, i.e., how some treatments (X) can affect some outcome variables (Y), is crucial for most disciplines. Because of the rapid advancement of machine learning, we can now develop some new approaches to estimating these treatment effects more precisely and with fewer constraints on the dependent variables. Our research proposes a general approach to estimating these treatment effects with high-dimensional data, where the data not only can be numeric or categorical but also can be characters, pictures, or videos.

Our research involves two sections. The first section provides how to utilise machine learning estimators, especially those based on Double Machine Learning (Chernozhukov, 2018) and Causal Forests (Athey, 2016), to study ATE and CATE with simulations under unconfoundedness. In the next section, we use our methods to conduct empirical research on the effects of higher education on wages.

Our approach has advantages for addressing more heterogeneity when the functional form is not linear or cannot be approximated very well with a high-dimensional linear model. Besides, our approach can benefit from all up-to-date machine learning models, including those using inputs such as texts, pictures, or videos.

Although many hypotheses in the social, natural, and medical sciences can be tested with our method, the disadvantage is that machine learning estimators perform like a black box. Thus, there is still need for research in projections of machine learning algorithms.

Reliability of a Unified Tool (MASTER scale) for Bias Assessment of Primary Research

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Abstract

The assessment of the quality of trials is an area of keen interest in methodological research especially for application to evidence synthesis. The need for a highly reliable and valid tool to identify the best quality evidence is a priority. The study aims to assess the inter-rater reliability of the MethodologicAl STandards for Epidemiological Research (MASTER) scale, the first tool for methodological quality assessment (mQA) of multiple analytical study designs in clinical research. Seven raters who have undergone training in clinical epidemiology will independently apply the MASTER tool on eleven studies comparing normal saline with ringers' lactate in acute pancreatitis. Inter-rater reliability for the final count of safeguards assigned to each paper will be calculated via an intra-class correlation coefficient (ICC) derived from a mixed model two-way analysis of variance in which assessment will be the fixed factor and studies will be modelled as random. In addition, each of the seven standards will also be assessed separately for reliability. These 11 studies will include both randomized trials and observational studies since the MASTER tool is a unified assessment tool for analytical studies. Agreement of counts of safeguards within each standard across raters as well as for the whole tool will be reported. Detailed results and conclusions will be updated once the study is completed. If the results confirm the reliability of the MASTER scale, this will be an important finding for researchers wishing to use this unified tool and will help them with decision-making around choice of tool.

WorldCUR 5A

WorldCUR078
Health

EEG Channel and Sampling Rate Reduction for Brain Computer Interfaces

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Abstract

Currently existing brain-interface frameworks built for children with neurological disabilities require extensive set up. The size of the headset are influenced by the many signal points that are required for the headset to work, and we believe that we can reduce these points. By reducing the number of signal points, the tasks of the brain interface would work as before, but now with less discomfort and clean-up.

Electroencephalography (EEG) data from an adult performing a standard 2-selection BCI motor imagery task was collected using a 16-channel system. The BCI processing pipeline was then modified to select only a subset of the 16-channels and evaluate the classification performance on that subset. While limiting the number of channels, the pipeline was iteratively run with all the possible channel combinations with the specified #channels. The goal was to give the best performing channels.

An interesting trend is seen where accuracy increases as the number of channels is reduced toward 10 channels. The consensus between most datasets evaluated was that using between 4-10 channels generally leads to a model that is at least as accurate at interpreting EEG signals as with 16 channels.

The results of this optimization study indicate that the number of channels and sampling rate can be reduced while not only preserving the accuracy with less electrodes but may also result in more accurate classifications. Future work includes conducting a comprehensive analysis on more participants and BCI applications to generalize the findings and further confirm the observed accuracy patterns.

Quantification of Neck Bending Stiffness in Piglets

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Abstract

Quantifying rotational stiffness of the cervical spine in immature animal models is critical to understanding neck injury mechanisms. Research on cervical spine stiffness is limited to adult animal models and animal models whose vertebral morphologies only lightly resemble that of humans. Previous research on neonatal piglets fail to quantify cervical spine stiffness. This study aims to quantify the cervical spine stiffness in flexion-extension (F/E) and lateral bending (LB) motions in a three-week-old piglet. Cervical LB and F/E tests were performed on a three-week-old cadaveric piglet. A force sensor was held under the piglet's head while it was moved through LB and F/E motions, respectively. Head and neck angular displacements were measured by video tracking the movements of key anatomical landmark points on the piglet's head, neck, and shoulder. Applied moment (Nm) and head and neck angular displacements (deg) were plotted, and rotational stiffness values were calculated using custom MATLAB code. The left LB stiffness values during loading and unloading were 0.011 Nm/deg and 0.072 Nm/deg, respectively. The stiffness values in neck flexion and extension during loading and unloading were 0.059 Nm/deg and 0.011 Nm/deg, and 0.010 Nm/deg and 0.076 Nm/deg, respectively. These data reflect the rotational stiffness of the cervical spine of neonatal piglets and can improve the biofidelity of computational models used to study cervical injuries of infants. Future research will analyze the cervical spinal stiffness of younger piglets to further improve these models.

Exploring the Relationship between the Menstrual Cycle and Markers of Physical Performance in Intercounty Ladies Gaelic Football players.

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Abstract

There is a significant lack of research surrounding the impact of the menstrual cycle (MC) on performance in Ladies Gaelic Football (LGF). This study aimed to assess the prevalence of self-reported MC symptoms and perceptions of impact on performance; explore the effect of the MC phase on sprint and power and investigate the relationship between self-reported MC symptoms and objective measures of speed and power.

Methods: 20-senior intercounty LGF players (age 23.2±4.8) were recruited. All players completed an online questionnaire. They reported MC information. Speed (20-metre sprint time (s)) and power (counter movement jump height (cm)) during the early follicular (EF) and mid luteal (ML) MC phases.

Results: Speed was lower in the EF phase (3.6±0.3s) compared to the ML (3.4±0.2s). There was no difference in jump height (EF:29.8±4.2cm, ML:30.8±3.6cm). A significant interaction was discovered between a decline in sprint performance and reported symptom time (F=34.877, p=0.001). All the players reported experiencing MC symptoms, and 50% believed it impacted their performance. Only 15% of players (3/20), had previously informed their coach about MC issues.

Conclusion: The findings of this study highlight that sprint performance is negatively affected in the EF phase. The interaction between symptom time and sprint performance was the first result of its kind. This study highlights the widespread negative effects of the MC on LGF players, indicating a need for more research in the area, and open lines of communication between players and coaching staff regarding symptoms and their impact on performance.

WorldCUR 5B

WorldCUR081
Create

Digital Financial Literacy and Firm Performance

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Abstract

Financial Literacy has long been a topic of interest due to its many proven benefits (Ouachani et al., 2020). Rapid digitalization of firms - including financial service providers - has introduced a new strand in this field known as Digital Financial Literacy (DFL) which assesses the bridge between FL and basic digital skills. The pandemic forced businesses to adopt digital financial services (DFS) which most probably affected their business performance. This study investigates the relationship between DFL and the performance of small businesses in Ghana after the COVID-19 pandemic. Modifying Lyons and Kass-Hanna (2021)'s framework to suit local conditions, this study will use surveys to measure DFL of business owners. Firm performance will be evaluated using growth in sales, revenue, and the number of employees. Regression analysis would determine the nature of the relationship between these two variables. Most likely, there will be a strong positive relationship since efficient use of DFS, among others, cuts down the cost of making and receiving payments. This will indicate the need to integrate DFS into operations. Providers of financial services, informed by the results of this research will then be able to design better-suited DFS for small businesses. Services tailored to the unique operations of small businesses in Ghana would boost performance even more. The one of its kind in Ghana, this study opens up a new strand of literature within the context of Africa. Further research based on this study can explore how DFL affects other firm fundamentals like efficiency and resilience.

An 3D Interactive Media for Learning Robotics

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Abstract

Learning Robotics in a traditional way is challenging and limited because it represents 3D robots in 2D media such as textbooks and presentation slides. Although watching videos can make learners understand the topics easier than traditional media, learners cannot interact with the media directly. The interaction between learners and media can be a very efficient way of learning according to the pyramid of learning. Nowadays, the media are hard to access by terms of installation and operation. The goal of this research is to develop an easily-accessible interactive learning media (ILM) that enables learners to comprehend and visualize 3D robots.

This research aims to address three following problems in robotics learning: limitation visualization tools, inadequacy interactablity of media and lack of accessibility in ILM. The chosen topic for this research is the "DH-parameters in 3D robots" which is the most common struggle topic for robotics learners and ILM can appropriately apply to this topic. ILM can depict a robot's pose and its coordinate frame in 3D. Moreover it has an ability to modify a robot's parameters to change the configurations of the robot. This interaction leads to a traceability of learner to trace information in ILM.

This proposed work can be beneficial in a robotics learning environment including learners and instructors. For example, it provides a higher engagement learning environment, learners will have benefits of interactable 3D spatial comprehension, the platform is affordable and accessible in robotics education.

"We Give Our Sweat Not Our Blood:" The Many Voices of Rural Appalachian Activism in the 20th Century

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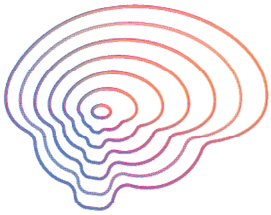
Abstract

The workers of the Central Appalachian coalfields during the early 20th century have long been acknowledged for their contribution during the labor movement; their coal strikes and the eventual United Mine Workers of America (UMWA) paved the way for safer working conditions across the entire United States. Despite being homogeneously depicted in the media as poor, white, and uneducated, some of the key voices of the Appalachian labor movement have roots in diverse ethnic backgrounds. This creative project draws inspiration from newspaper articles, correspondence, and activism artifacts, such as political stickers and buttons to manifest in the form of a short book of poetry detailing the diverse Appalachian existence during the early twentieth century. Historically, storytelling and poetry were vessels for the sprawling popularity of the Appalachian labor movement due to their importance in the culture. Engaging with these resources paints images of an Appalachia that is often shielded from outsider perceptions that fail to acknowledge intersectionality in their interpretations of the region. Generating a discussion surrounding diverse ethnicities in an impoverished region opens possibilities to exploring these identities in rural areas around the world and deconstructing false narratives of homogeneity. By uplifting these often silenced voices, this book of poetry aims to deconstruct assumptions outsiders may hold of the Appalachian culture while highlighting the lessons the past has to offer for the future of the region.



SUSTAINABILITY

WorldCUR 5C

WorldCUR084
Sustainability

Dietary Composition and Overlap of Reintroduced Carnivores in Liwonde National Park, Malawi

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Abstract

Understanding dietary composition and overlap of carnivore species in a protected area is important for supporting management and conservation decisions. In 2017, Liwonde National Park, Malawi reintroduced lions and cheetahs. However there has been no research done on their diet. The aim of this study was to assess the dietary ecology of lions, cheetahs and the resident spotted hyaenas to inform decision making. Two methods were used to investigate prey preference and dietary overlap; carnivore's faecal matter analysis and direct carcass observation. For dietary composition, frequency of occurrence and corrected frequency of occurrence were calculated. Prey preference was calculated using Jacob's (1973) index and dietary overlap was calculated using Pianka's (1974) index. Eleven mammal species, insects and birds constitute large carnivore diet. The results indicate a high degree of dietary overlap (Oab > 0.85 for all), indicative of competition among large carnivores. All carnivores exhibited a dietary preference for kudu (Tragelaphus strepsiceros). The extent of dietary overlap observed is important in the context of carnivore reintroductions into fenced reserves. Competition amongst the large carnivore guild have consequences for population dynamics, habitat use and community structure. Coexistence maybe facilitated by low densities of apex carnivores, but as populations continue to recover, the risk of costly interactions may increase. The recent reintroduction of African wild dogs (Lycaon pictus) could increase competition for resources and further monitoring is required to inform management strategies, both for Liwonde and wider reintroduction schemes hence a need to temporarily halt further reintroductions.

Staying Afloat Amidst the Depths of Environmental Inequalities: How Does Jakarta's Water Governance Affect People Across Layers of Society?

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Abstract

Without intervention, almost all of North Jakarta would be underwater by 2050. This land subsidence phenomenon is attributed mainly to Jakarta's overexploitation of groundwater. In response, this research contributes to the social perspective of this issue by examining "How does Jakarta's water governance affect people across layers of society?". Defining environmental inequalities as the interactions between environment-related topics and inequality, Chancel et al. (2015) outlined four types: access and risk; impact; policy-effect; and policymaking inequalities. Through secondary research and ethically-approved semi-structured interviews with a fishermen's representative, a government official, and a public lawyer, we found evidence for all four types of environmental inequalities, all interlinked. Specifically, we found inequalities in access to water and exposure to land subsidence; groundwater use contributing to land subsidence; effects of adaptation policies; and contributions to policy-making. Among all types, access/exposure inequality is most associated with socioeconomic inequality. This is because poor residences in the North possess limited access to both piped water and groundwater, and its residents are less able to afford adaptation towards water-related risks. While citizen participation in policymaking is generally low across all communities, it may have worse implications on those more reliant on the government. This supports the idea that environmental governance issues exacerbate societal inequalities. Our findings call for a more holistic approach toward water governance, along with higher citizen participation. Direct inclusion of citizens most impacted by policy is vital, and must be supported by those individually capable of affording their own means of risk adaptation.

Admiration of the Violet: Cultivating the Familiar Flowers of Native Woodland and Wayside

Jessamine Michler
University of Kentucky, Lexington, United States Minor Outlying Islands

Abstract

Violets, with their modest little blossoms of yellow, white, and purple hues have been used for perfume and decoration since antiquity. These flowers reached a peak in popularity during the reign of England's Queen Victoria and were cultivated in mass quantities as cut flowers, blooming plants for the home, and bedding plants in the garden. By 1950, the native and traditional violets had fallen out of favor, giving way to the more showy and colorful crosses of pansy and johnny jump ups. Utilizing historical flower and seed catalogs dating from the 1800s to the 1960s as a guide, this research will explore which species of violets were commonplace in the 19th and 20th century garden and how they could be used today. In understanding the violets of the Victorian era, we can begin to shift our modern perspective of these little plants. Their blooms attract a variety of bees and their foliage hosts the larvae of many moth and butterfly species, thus playing an important role in our backyard ecology and the biodiversity of the natural woodland. Easy to propagate and to grow, certain species could be used in no-mulch cottage gardens as underplanting, and the seeds of native violet species could be incorporated in re-wilding projects where human intervention is required to restore a wilderness to its natural state.

WorldCUR 5D

WorldCUR087
Power

The Use of Passive Voice in Discussions of Violence Against Women: Prevalence of Passive Sentence Structure in US and UK Newspaper Reports.

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Abstract

This research project looks at the use of the passive voice in ten news sites across the US and UK in discussions of violence against women. Previous research relating to the use of the passive voice for reporting violence against women finds a clear predominance of this across large time frames and multiple countries. They clearly highlight the use of the passive voice and its influence on the perceptions of agency among perpetrators and victims. The current project aims to add to the existing collection of data and explore whether the political orientations of news sites follow or deviate from the existing trends in the use of the passive voice in news articles; primarily that the passive voice is most commonly associated with negative acts and used in discussions of sexual and non-sexual violence committed by men. Articles relating to reports of sexual violent crimes were used for analysis of sentence structure, utilising similar quantitative methodologies seen in previous research in this area, including frequency counts and exploratory analysis to look at context. This research project aims to bring greater awareness to the issue of how language can be used to achieve specific, and often both social and political, goals. It will also attempt to highlight the importance of making conscious and informed decisions about the media we consume. Additional research may benefit from sociological or psychological perspectives on how the prevalence of the passive voice affects readers' perceptions, looking specifically at the political affiliations and gender of participants.

Examining the Intercultural competence among undergraduate students of Uzbekistan

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Abstract

Intercultural competence (IC) is the ability to function effectively across cultures, to think and act appropriately, and to communicate and work with people from various cultural backgrounds. Uzbekistan has a range of people from different nationalities. These groups, including newcomers from other countries (Russia, Belarus, and Ukraine), are migrating due to geopolitical events. Consequently, professionals in the educational field are expected to know about various ethnic groups, experience relationships with others, and prepare for a multicultural society.

This investigation examines the IC of undergraduate students at Webster University in Tashkent. We hypothesized that the students would views persons of different cultures as "them". Twenty students from various universities in Uzbekistan completed the Intercultural Development Inventory (IDI). Data analysis provided a ‘snapshot’ of their IC at this point.

The findings suggest that Uzbek students have little life experience beyond their home cultures. The Webster University students have a clear sense of their values and practices and a desire to preserve their traditions. They see other persons as “others” without much definition or understanding.

An undergraduate university program, such as those at Webster University in Tashkent, may promote IC skills. University faculty may want to revise and rebuild the curriculum and policies to intentionally incorporate teaching and learning strategies to foster IC among their students. Additional research is needed to understand the IC development of undergraduate students in other settings, such as large public universities (e.g., the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers).

Critical Dynamics in the Emergence of Agency

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Abstract

As adults we understand that our actions can affect the world. Less clear is how we become aware of our causative powers in infancy. This study aims to capture and describe the dynamics of the emergence of agency, action towards an end. The mobile conjugate reinforcement paradigm provides an experimental window into this process. Infants begin the experiment as detached observers, but when one of their feet is tethered to an overhead mobile, infants may discover their ability to move the mobile. A sudden increase in movement rate is proposed to mark a moment of agentive insight (Kelso, 2016; Kelso & Fuchs, 2016). Sloan (2022) collected 3D movement data at 100 Hz from 16 babies (age: M = 100.33 days, SD = 15.57) and calculated cumulative displacement of the tethered foot during infant~mobile interaction. This was differentiated twice across 1-min.-wide intervals with 10ms shifts (using the Matlab function movingslope.m) to produce 1-min. changes in movement rate (acceleration). We will apply linear regression to cumulative displacement in the minute preceding and following the infant's peak acceleration to explore dynamics related to agentive discovery. We predict that the magnitude of fluctuations will be greater before maximum acceleration than after since fluctuation enhancement is a hallmark of complex systems nearing phase transitions (Kelso, et al., 1992). Identifying mechanisms underlying the emergence of agency may help develop an array of novel treatments as aberrations in agency are involved in movement disorders (Kranick, et al., 2013) and mental illness (Szalai, 2016; Jeannerod, 2009).

WorldCUR 5E

WorldCUR090
Community

How the Way Our Communities Develop Affect the Role of Art Within Individuals' Lives-An Analysis of Nietzsche.

Robert Keller
University of Warwick, Coventry, United Kingdom

Abstract

Literature on Nietzsche is plentiful and much has been said on Nietzsche's analysis of how groups such as communities, societies etc. develop as well as on his views about art. However, little work explicitly examines the direct links between the two. Thus, this research aims to answer the question of how Nietzsche's ideas regarding the role of art in groups guide his ideas on the role of art for individuals. To answer this, an examination of existing literature and primary sources was performed. Analysis particularly focused on two primary sources: 'On the Genealogy of Morals' and 'The Birth of Tragedy'. The result is that the strongest influence can be seen through the role of Lamarckism- a theory asserting that characteristics developed throughout a lifetime are inherited by offspring, and sublimation-a theory of how drives or impulses are integrated in an individual. This research's significance lies in illuminating how central ideas about how groups develop are in Nietzsche's philosophy. It shows you can't take Nietzsche's views, in this case on art, in isolation and indicates that art in general may be a concept, potentially with other concepts, that can't be analysed without considering how groups develop. Future research could include incorporating other major concepts of Nietzsche's philosophy. Alternatively, one could generally examine what implications the way our groups develop have on key areas within our lives. With rapid advances in psychology and sociology, present philosophy would benefit from considering them within its analysis.

Social Media Marketing in Developing Market

Dilan Gul Salman
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Abstract

Social media marketing(SMM) experts deal with social media platforms. The main task is to maintain social media accounts in order to boost revenue and meet customer objectives.Aside from the likes of Facebook, Twitter, and Instagram, social media marketing takes many different forms, such as: content marketing/content creating,advertising/sponsorship and influencer marketing.

The tasks of the social media manager include working with a fairly voluminous and highly effective part of the marketing budget, as well as combining several functions at once(copywriter, graphic designer, customer support representative, etc.).This means that the requirement for the experience and communication of SMM specialists who should occupy this key position has increased. A talented specialist can bring significant benefits to the company, an inexperienced or unqualified employee can harm it. According to Glassdoor, the average salary of social media managers in the United States is $50.5 thousand per year. Also according to website investopedia the average salary in the US is $43 thousand per year. So conforming to this information we can say that people can earn more money than average salary via social media. Analyzing the US salary statement ,it was just an example of my research.During researching this topic I got approximately the same results in other countries as in the US salary statement.Also SMM grew during Covid quarantine with a resultant growth in expenditures in Central Asia. In other words, social media marketing has started to be recognized as a money making method worldwide .

Mindfulness in Women Group Setting: A Hong Kong local case-study

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Abstract

The psychological well-being of women has been a focused topic within the social work profession. Due to cultural and other factors, a lot of women in Hong Kong faces stress in their family and might not know how to handle it. In recent years, mindfulness had been used by many practitioners as an intervention method to improve psychological well-being. Therefore, this research aims to explore the effects of mindfulness in a women's group setting in Hong Kong.

A 5-session developmental group, consisting of 9 women of different family backgrounds was conducted. The group focused on mindfulness practices on the five senses (sight, smell, hearing, taste, and touch) and awareness towards own body. Through self-reports, surveys, and discussion, it was found that mindfulness has a positive impact on their emotional control in parenting and other stressful events.

Mindfulness was found to enhance well-being including aspects such as self-compassion. The findings of this research hope to explore if mindfulness can help women to find a way to relieve the stress they faced when acting as different characters in the family and learn self-love. The result of the research might be able to encourage social work agencies in Hong Kong to apply mindfulness in their services provided.

If such mindfulness practices are discovered to be useful in social work settings, it could be one of the cost-effective methods to be focused on in social work intervention for women’s stress management and reduce possible family conflicts in society.

WorldCUR 5F

WorldCUR093
Data

Identifying Genetic Factors Contributing to Chemotherapy Resistance in DLBCL Patients

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Abstract

Diffuse Large B-Cell Lymphoma(DLBCL) is a type of cancer that begins in the B-cells of the immune system. Its primary treatment is chemotherapy, and doxorubicin is the principal drug used. However, only 50-60% of patients are completely cured even after the treatment, as the tumour cells are prone to developing chemotherapy resistance. The purpose of our research is to identify genes that are associated with resistance or no response to doxorubicin in DLBCL patients. After observing gene expression levels in multiple cohorts, we show 118 genes which were uniquely upregulated(highly-expressed) in DLBCL cells. One interesting gene whose high expression linked to poor survival of patients was SPHK1. We show that doxorubicin-resistant cells increased SPHK1 expression by four times in response to doxorubicin exposure, indicating that the gene could be linked to the cells' resistance. The expression of SPHK1 in DLBCL tumour cells was significantly higher than normal B-cells. This implies that reducing SPHK1 expression in cells would affect only DLBCL cells and not healthy B-cells, as healthy B-cells normally show low expression of the gene. SPHK1's function is to catalyze the formation of sphingosine-1-phosphate(S1P), previously recognized to confer resistance to chemotherapeutic agents when injected in human cells, indicating that SPHK1 could be connected to chemotherapy resistance. In the future, SPHK1 could be targeted to prevent progressive disease after R-CHOP treatment in DLBCL patients. Future experiments could infer the potential mechanism of action of SPHK1 pathways to further understanding of how resistance to chemotherapy drugs is achieved.

Mastering the Curriculum: investigating the impact of Learning for Mastery assessments in undergraduate learning

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Abstract

New revision materials and study methods are continually being released year-round; however, the usefulness and practicality of many methods are not often researched. A new resource implemented within the Mathematical Methods module at Nottingham Trent University is the Learning for Mastery (LFM) tests. The LFM tests are online formative assessments consisting of framework questions, which are randomly altered to simulate an infinite question bank. In our specific application, these tests encourage the development of mastery in different core mathematical skills, improving a student's ability to answer more complex questions.

This presentation briefly discusses the concept of modern mastery learning, analyses the effect of the LFM tests on the 2021/2022 cohort performance within the module and explains the ease of creating an LFM test using a computer algebra system, such as Numbas. We find the LFM tests have the strongest relationship with exam performance and are the most significant predicting factor for said performance, even compared to in-person attendance, online engagement, academic history, and other environmental factors. Our research supports the use of LFM tests as part of the re-design of didactic learning in the necessary evolution towards modern, sustainable teaching practices. This also prompts further investigation into the applicability of LFM tests in non-scientific disciplines.

Structural and Molecular Determinants of Human T-cell Leukemia Virus Type 1 Gag Targeting to the Plasma Membrane for Assembly

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Abstract

It is estimated that 10–20 million people worldwide are infected with human T-cell leukemia virus type 1 (HTLV-1), the human ontogenetic retrovirus that is associated with rapidly fatal form of adult T-cell leukemia. During the late stage of retroviral replication, Gag polyproteins localize to the plasma membrane (PM) for assembly, mediated by its matrix (MA) domain. Different from most retroviruses, HTLV-1 Gag-PM interactions are found less dependent on phosphatidylinositol 4,5-bisphosphate(PI(4,5)P2) on the PM, suggesting distinct assembly mechanisms needed to elucidate. We solved the structure of MA and employed mutagenesis, biophysical, biochemical, and cell-based assays to characterize HTLV-1 MA-membrane interactions. The MA structure consists of four a-helices and largely unstructured N- and C-termini. Lysine-rich regions constitutes PI(4,5)P2 binding site, and arginine residues on unstructured N-termini constitutes PI(4,5)P2 and/or phosphatidylserine (PS) binding site. When these residues are mutated, membrane binding and virus-like particle production are severely reduced.This suggests a novel mechanism of HTLV-1 Gag assembly to the PM, mediated by the engagement of the Lysine-rich and Arginine-rich regions. These findings advance the understanding of Gag assembly, an important step in deltaretroviral particle assembly, and important differences in HTLV-1 particle assembly pathway from other retroviruses.These findings support the utilization of comparative analysis in examining the variety of mechanistic differences among retroviruses viral replication and retroviruses-host interactions. The molecular determination of HTLV-1 MA may help in the development of new antiretroviral therapeutic strategies to inhibit Gag assembly to the PM and virus production.

WorldCUR 5G

WorldCUR096
Create

Synthesis and Characterization of Cyclic Peptoids Against Cryptococcus neoformans and Candida albicans

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Abstract

Antimicrobial resistant strains of fungal pathogens such as *Cryptococcus neoformans* and *Candida albicans* have risen to concerning heights, necessitating the discovery of a safe and effective novel antimicrobial agent. Antifungal peptoids, or peptidomimetic N-substituted glycines, have great potential when it comes to acting as antifungal agents due to altered structure, greater availability in the body, and improved stability towards proteases, enzymes that break down peptides, relative to their peptides counterparts. RMG8-8 and RMG9-11 are two peptoids recently discovered in the Bicker Lab with observed antifungal activity against *Cryptococcus neoformans* and *Candida albicans*, respectively, with comparable antifungal activity in lab studies compared to current antifungals on the market. This study attempts to optimize antifungal activity by cyclizing the aforementioned linear peptoids as previous studies have suggested that increased rigidity due to a locked conformation increases the antifungal activity of the peptoids without affecting the observed permeability, or the ability to cross fungal cell membranes. Additionally, peptoids are synthesized via solid-phase synthesis, a relatively inexpensive method that eliminates intermediate purification and consists of a repetition of two simple reactions: bromoacylation followed by amination. To characterize the extent of efficacy, cyclic RMG8-8 (RHS3) and cyclic RMG9-11 (RHS6) are currently being tested for minimum inhibitory concentrations (MIC) against *Cryptococcus neoformans* and *Candida albicans* which will be reported. Future analysis will include mammalian cytotoxicity on HepG2 liver cells and hemolytic activity against human erythrocytes (red blood cells) to determine whether these peptoids are viable options moving towards animal studies and clinical trials.

"Parenting Style vs Thinking Style" --- Compare and Contrast the Influence on Creativity between Parenting Style and Thinking Style

Hoi Yan Yam
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Abstract

Creativity is a critical element for society's development. Hong Kong society lacks creativity, with students having a more fixed mindset. Parenting styles and thinking style play a crucial role in the development of children's creativity. However, the underlying predictors are less known. Also, cultural differences and paternal effects were not considered by major western research. Therefore, the current study compares the strength of parenting styles and thinking style being a predictor on creativity under the local context. 151 Hong Kong young adults aged from 18 to 25 were recruited to complete a one-off online survey composed of the Parental Authority Questionnaire (PAQ), revised Thinking Style Inventory-Revised II (TSI-R2), and Kaufman Domains of Creativity Scale (K-DOCS). Correlation analysis and multiple regression were used to analyze the results. Results showed that maternal parenting styles and paternal permissive parenting style have no association on creativity, type 1 thinking style and paternal authoritarian parenting style has a positive association with creativity, and thinking style is a stronger predictor on creativity. The findings facilitate further suggestions to encourage the creativity of Hong Kong students for future development. Parenting styles are not as important as the previous research shown, one of possible reasons is that school has a larger impact to Hong Kong young adult. Type 1 thinking style, the creativity-generating thinking style, can predict creativity. Therefore, some related measure could be implemented based on this result. For example, the school could put more emphasis on training the thinking style to facilitate creativity.

WorldCUR 6A

WorldCUR098
Power

Uptake of Intrauterine Device (IUD) and Associated Factors Among Women Attending Family Planning Clinic at Arua Regional Referral Hospital.

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Abstract

Low uptake of Intra Uterine Device (IUD) still persists in Uganda despite the governments' initiatives to sensitize, improve accessibility and utilization. Unmet FP needs account for 43% of all unplanned pregnancies in Uganda. It is anticipated that an additional 24 million abortions, 6 million miscarriages, 70,000 maternal deaths, and 500,000 new-born deaths may be averted globally if the FP need is met (Bearak et al., 2018). In 2020, only 4% of 3,329,589 women seeking family planning utilized an IUD(Health ministry, 2020).The aim of this study was to assess the uptake of IUD and associated factors among women attending family planning clinic at Arua Regional Referral Hospital (ARRH).A cross-sectional study was conducted, 380 women aged 15-49 years were enrolled into the study at the family planning clinic at ARRH. Approval was sought at the University, ARRH and informed consent obtained from all the participants. Data was collected using structured interview questions. SPSS data analytical package (v20) was used in the data analysis. 28.9% of the participants had ever used IUD and only 11.7% were currently using IUD. Side effects of other methods, provider influence, partner influence, long acting contraceptive and it being a non-hormonal contraceptive encouraged its use while those who had never used IUD (270(71.1%)) reported myths and misconceptions, limited knowledge about IUD, unsupportive attitude and fear. Age, marital status, education level and occupation were statistically significant. To improve the uptake of IUD among women, all concerned stake holders need to mitigate the challenges and promote facilitating factors.

The Socioemotional Development of BIPOC Youth in White-Dominated Evangelical Spaces

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Abstract

Because many evangelical institutions are dominated by white conservatives, BIPOC (Black, Indigenous, & People of Color) families in these spaces experience limited voice and social mobility as minorities; they're often overlooked by outsiders who've assumed their political alignment doesn't match the conservative group's (Kidd et al. 2007). In many of these privatized evangelical spaces, social equality and mental health is not prioritized (Peteet 2019). My question is: Are minority adolescents at a greater risk of social inequality by virtue of their time spent in these white evangelical circles? To answer this question, I interviewed nine undergraduates from a post-secondary institution in the U.S. southeast Bible Belt. Participants' narratives highlighting low self-esteem and racial insensitivity occurred frequently, mirroring prior research (Kim 2014). My findings suggest that many of these Christian institutions may have failed at implementing modern equity due to its privatized status. Equity leaders are unable to reach these spaces due to political and religious bias. The goal of my research is to build upon the coping strategies existing in response to racial trauma, specifically the trauma taken from narratives of BIPOC youth growing up in evangelical, alt-right spaces and their perceived failure to live up to the white standards of femininity (for women & girls), belonging and culture. Lacking a fundamental sense of belonging is damaging to mental health, and I'm determined to reach those who suffer from this acute rejection.

The Republic and the City: How Can Plato's Theory of Justice Rectify the Injustices in Modern London?

Rebecca Cole
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Abstract

My project examines how Plato's theory of the just city can be applied to London to rectify its key issues, of lack of representation and resourcing, caused by its capitalist model. This is a beneficial contribution to the existing literature because Plato's theory of the ideal state draws out problems of London's capitalist state and suggests effective solutions to these issues, including rethinking London's class structure.

This project takes both a social-legal approach (observing articles on key injustices in London's economy) and a philosophical analysis of Plato's Republic. I anticipate Plato's theory to have significant relevance to London's problems and that this research will provide significant theoretical support for decision makers aiming to identify and resolve injustices in the city.

The anticipated findings of this research project will provide some insight on how London's decision makers can rethink how the city operates as Plato's theory allows us to see the relationship between the issues of resources and representation and how these things should look in a just city. First by turning to Plato's theory of the just city, then by reviewing the suggested alternative methods of mitigation set out in my research.

This project provides some ideas of how London can mitigate the issues of lack of representation and resourcing while maintaining its appearance as a global financial powerhouse seeking economic growth. It will raise many potential new lines of enquiry into detailed analysis of how decision makers in London can mitigate these issues.

WorldCUR 6B

WorldCUR101
Create

Development of a platform (LenLa) for creating and distributing digital interactive learning media.

Warachaya Veeranonchai, Trapoom Ukarapol
King Mongkut's University of Technology Thonburi, Bangkok, Thailand.

Abstract

Digital interactive learning media (DILM) is one of the most effective ways of learning. It allows students to explore the subject's material independently and leverage learning engagement. However, The difficulty of acquiring them is the key reason that it is not widely used. Numerous abilities, including programming and graphics, are needed. Moreover, the DILM is require extra effort for sharing at a large scale. It is not scalable as a result. So we want to simplify the way of creating and distributing DILM.

Our solution is to create a platform (we call LenLa) as a web application with react and three.js that provide users with a set of tools to create DILM easily and also support one-click sharing. Our platform lets users create objects with flexibility from the panel and can set their properties through an inspector.

If DILM could be more accessible, learning in many fields especially the ones that are hard to understand will be elevated. For example, DILM can help learners understand more about topics that relate to 3D space.

The classroom system can be further integrated into LenLa to enhance the learning process and learner experience by letting lecturers create courses that contain a sequence of DILM along with other media such as video to make an effective learning system. Furthermore, the system could include a Lab system that allows learners to test their knowledge and also allows the lecturers to track their learning progress.

For Women, Of Women and By Women: Studying Business as means of livelihood to the driver of social change.

Jasmin Amirbekova
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Abstract

Most of the debates on entrepreneurship until now have been centered around its "market" based nature, the economic rewards accrued, new ventures, technologies, and growth. However, just understanding entrepreneurship as an economic activity will lack its dynamic, contextual, and multilevel nature. Entrepreneurship carried by women can become a site for activism and a driver of change, challenging several gender stereotypes and biases against women. The discussion becomes even more relevant given the post-colonial nature of Kazakhstan, where the "glass ceiling" affects women's participation in all public spaces. This research collects the lived experiences of 20 women entrepreneurs supporting other women through a storytelling method. Narrative inquiry offers a way of investigating individuals' lived experiences and exploring subjectivity. This research identifies "gendered" normative expectations, their motivation to support other women, and their challenges. Analyzing the statistics on governmental sites indicates that the number of women entrepreneurs has doubled in the last decade. In addition to being an "economic panacea," entrepreneurship is a "mode of organizing" and can potentially change various gendered roles and expectations. It provides the freedom of choice, flexibility, and agency that women need. The findings indicate that women's solidarity is essential to fight gender discrimination and envisages a shared responsibility for others' lives. Women unburden themselves of patriarchal values and carry new values of dignity, equality, and respect. Such activism will also drive favorable policies and programs for women and give them a level playing field.

Jumla Jameela: Building Dyslexia Friendly Communication and Community Through Play

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Abstract

Dyslexia is a Specific Learning Difficulty (SpLD) which causes barriers to learning; including foreign language learning. These challenges can be both cognitively and emotionally taxing and as such foreign language classrooms can be spaces of high anxiety and substantial stress for Dyslexic learners. Multi-sensory structured teaching strategies are advocated for dyslexia inclusive classrooms, moreover that 'fun' is the essential component to maintain motivation to enable dyslexic learners to overcome their barriers (Schneider and Crombie, 2012).

Games were identified as a vehicle to create 'fun' whilst simultaneously providing learners the opportunity to practise skills, often through multisensory gameplay. In addition, games create structured safe spaces and communities to foster learning conducive environments.

Learning Mechanics-Game Mechanics (LM-GM) model (Arnab et al, 2015) was used to develop a serious game to enable Arabic language acquisition. This model advocates that through simple game play, deep learning can be achieved. The developed game reinforces Arabic grammar as it encourages collaboration and positive communications through board game play.

Proof of concept was delivered through the creation of successful prototype of Jumla Jameela. Foreign language learning has been identified as problematic for Dyslexic learners and positive learning resources can remove barriers to learning and create positive learning environments. Moreover, dyslexia friendly teaching resources are inclusive resources which enhance whole class learning experiences and increase learning attainment.

The project can be advanced by introducing Jumla Jamela to new spaces to assist new learners and increasing awareness of dyslexia friendly teaching resources.

WorldCUR 6C

WorldCUR104
The Future

Exosomal CD73 Promotes the Metastasis of Invasive Breast Cancer Cells and can be Used as a Potential Blood-based Biomarker to Predict the Clinical Outcome

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Abstract

Patients diagnosed with invasive breast cancer usually have poor outcomes due to lack of effective therapy. Exosomes, small vesicles secreted by different cells carrying proteins and RNA, have been found to regulate cancer cells. CD73, a protein that is commonly found on tumour surface, was recently found on exosomal surface in cancer patient blood. While CD73 on tumour surface has been proved to promote metastasis of invasive breast cancer, whether the one in exosomes has the same effect and can be used as a biomarker in clinic is unclear. Therefore, we are investigating exosomal CD73's effect on cancer progression and its role in clinical application. We conducted assays to measure the level of CD73 and CD73 activity in cancer-secreted exosomes as well as cell migration assay on invasive breast cancer cells, 4T1.2. We found that exosomal CD73 level and its activity is higher in invasive human breast cancer cells. Additionally, we also identified that exosomal CD73 promotes the migration of breast cancer cells which is an important step in cancer metastasis. Unlike the CD73 found on tumour, exosomal CD73 is commonly found in bloodstream. Therefore, the results of this study could provide a non-invasive and more accessible diagnostic tool for patients to increase the overall survival rate of breast cancer patients. In the future, we aim to conduct assay on observing exosomal CD73's effect on cancer cell invasion through biological membrane and examine exosomal CD73's function in other cancers to elucidate the regulatory network of exosomal CD73.

Green Against the Odds: Overcoming Institutional Barriers to Sustainability in Cities With Pragmatic and Progressive Needs

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The University of Chicago, Chicago, USA

Abstract

If cities are to realize their potential as leaders of sustainability policy and innovation, they require both symbolic resources such as social networks and legitimacy and material resources such as financial and technical support. Although external support mechanisms, including those provided by diverse climate networks, seek to help cities overcome institutional barriers to urban sustainability, previous research on city networks has underestimated the importance of variations among member cities in terms of how serious they are, or can afford to be, about sustainability. We argue that cities taking sustainability more seriously have different material and symbolic resource needs from those that take sustainability less seriously. Drawing on qualitative data from 53 in-depth interviews with city officials across the sustainability-seriousness spectrum, climate network leaders, and other organizations supporting cities, we confirm this variation by identifying that cities tend to face one of two distinct sets of resource needs. Cities with pragmatic needs seek to push the boundaries of political feasibility, and look to peer cities for reassurance; cities with progressive needs aim to push the boundaries of technical possibility and broadcast their achievements to the world. We conclude that different sets of needs require different external support mechanisms, and we note that skewed attention towards cities that already take sustainability seriously limits our understanding of how cities can overcome institutional barriers to climate action, especially when these barriers are particularly high. Our findings offer contributions to literatures on cities and climate change, the institutional drivers of urban sustainability, and network governance.

Demonstrating the potential for repurposing of Metforminin the context of treatment-resistant wounds in zebrafish (Danio rerio)

Melt Hugo
Stellenbosch University, Cape Town, South Africa

Abstract

Patients with diabetes mellitus often develop chronic wounds that are difficult to treat due to impaired endogenous capacity for wound healing. This negatively impacts both the medical system and patient alike, as well as further burdening social and economic sectors. Given the increased incidence of diabetes associated with urbanisation (especially in developing countries) and a western lifestyle, there is an urgent need for alternative and cost-effective therapeutic treatments. Metformin's increasing popularity in drug repurposing is attributed to its already identified multiple therapeutic targets. Here, we investigated Metformin's potential contribution to tissue regeneration using a zebrafish larval model of hyperglycemia. In a multipronged approach, we evaluated effects of glucose, insulin and metformin treatment on larval behaviour in the light/dark transition test, as well as on tail fin regeneration after tailfin transection. Behavioural data indicated that metformin and insulin had similar effects on activity levels in euglycemic larvae, suggesting metformin-associated hypoglycaemia. In glucose-exposed larvae however, significantly decreased activity levels were observed, suggesting a sickness-type behaviour associated with hyperglycaemia. This effect was significantly reversed towards control levels after subsequent treatment with metformin. We also investigated the effect of a therapeutic dose of metformin - in the context of glucose normalisation – on tailfin regeneration in hyperglycaemic vs. euglycemic larvae using fluorescent microscopy. Our results demonstrate the potential of repurposing metformin in the treatment of chronic, treatment-resistant wounds.

WorldCUR 6D

WorldCUR107
Data

Getting Down After Pushing Them Out

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Abstract

The attitudes within society and communities surrounding motherhood and the sexual desires of mothers are primarily negative. A new baby into the family can be a period of hardships and lack of joy, and it too often falls into the hands of the mother and/or the mother figure within a family to avoid expressing those realities for several reasons. Many mothers also share a similar feeling of a loss of freedom and expression after transitioning to motherhood. With the increase in the "mental load" on the mother means that their sexual desires and needs are pushed aside. There is a stigma when discussing the desires of mothers, as it is mainly shamed. This research looks at how this realistic point of view is experienced by mothers, and why it's not talked about in society. In this narrative study, the researcher interviewed women, from ages 20-40, about their own experiences with sexual drive and how motherhood has changed it. Each participant was asked 13 to 15 questions that cover their experiences about sexuality and sex drive following motherhood. Narrative findings were turned into a photo exhibition where the photos generated are an artistic rendering of the researcher regarding the interviews with participants. We hope with the findings of the narratives and the creation of the photos, generate an understanding in viewers of what it feels like to be a mother going through changes in both her body and mind while being pregnant and after giving birth.

Monte Carlo Simulation and Deep Learning: Analysing the Effectiveness of Computational Techniques When Predicting Oil Prices.

Amy Martin
University of Warwick, United Kingdom

Abstract

Predicting commodity prices has been a much-researched topic within finance sectors, where currently the industry standard is a mixture of linear regression and econometrics, or computer models driven by supply and demand considerations. In recent years the industry has been taking a more computational approach, utilising Artificial Neural Networks or Convolutional Neural Networks to generate short price prediction ranges. In this report, I present an analysis of these traditional mathematical methods in comparison to a machine learning approach using public daily data for WTI oil prices from the US Energy Information Administration.

The mathematical method initially chosen is a mean-reverting Monte Carlo Simulation, the model has historical data as input variables and a stochastic differential equation is used to incorporate jumps to simulate real world volatility. The second method analysed is a Long-Short Term Memory Network (LSTM), which is a type of Recurrent Neural Network that utilises a forget gate that allows the network to reset itself at appropriate times. The models are then analysed using both the Root Mean Squared Error and a comparison between actual and predicted prices.

In addition, the Lyapunov Exponent is used to assess how stable the systems are, and a directional change statistic is utilised to analyse the volatility of the predictions.

The results obtained indicate that despite both approaches yielding negative Lyapunov exponents over all values predicted, and hence stability, the Monte Carlo method yields more accurate estimates for short term predictions, whereas the LSTM network gives superior forecasts for long term predictions.

The Ambiguity of Missing at Random:A Study Using Staged Trees and CEGs

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Abstract

Data analysis plays a crucial role in the current world of big data. However, it is rare for any dataset under study to be complete, i.e. without missing values or missingness. These missing values may or may not be informative of the process being analysed. If the missing data are incorrectly assumed to be informative or uninformative it can lead to incorrect conclusions. Therefore, it is important for a researcher to think about the mechanisms that might have caused the missingness. There exist three main missingness mechanisms. The most common one is called Missingness at Random (MAR) and largely assumes uninformative missingness. However, there are multiple – related yet distinct – definitions and interpretations of MAR leading to considerable ambiguity in practice as to when MAR can be defensibly assumed. Our research reviews and highlights the overlaps and differences in two main interpretations of MAR. As an illustration, we analyse a dataset of preterm infants with missing data. We use a type of graphical model – Chain Event Graphs, to explore the missingness. Our research has provided an illustrative example for data analysts to refer to when considering missing mechanisms while analysing the data set and advice on how to treat different definitions. Furthermore, we show that a Chain Event Graph is a useful tool for identifying sparsity in the dataset and allows exploring patterns of missingness. Our research has covered only several definitions. However, there exist some others and it would be beneficial to create illustrative examples discussing other definitions too.

WorldCUR 6E

WorldCUR110
Health

Loss of Glucocorticoid Receptors in Tubular Epithelial Cells Under Diabetic Conditions Limits Renal Fibrosis

Kyla Stembridge
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Abstract

Tubular epithelial cells play a major role in the selective transport of water and solutes in the kidneys. Studies which have examined the effect of the absence of glucocorticoid receptors (GR) in podocytes and endothelial cells in models of fibrosis have shown an increase in proteinuria and renal fibrosis, compared to the GR-replete controls. Tubular epithelial cells account for the majority of cells in the kidney, yet the role of epithelial GR is unknown. Pax8 GR knockout mice were generated by crossing GR fl/fl mice with Pax8 rtTA TetO Cre mice. The resulting Pax8 rtTA TetO Cre+ GR fl/fl mice and Cre- control littermates were provided doxycycline drinking water for 2 weeks to induce deletion of GR in tubular epithelial cells. Mice were then treated with 5 injections of streptozotocin to induce diabetes. After 4 months, mice were euthanized. Serum creatinine, urine protein and kidney histology were examined for diabetic and non-diabetic control and Pax8 GR KO mice. At baseline, control and Pax8 GR KO mice had similar serum creatinine (1.67 +/- 0.92 mg/dL vs. 1.65 +/- 0.41 mg/dL, p ns; n=3-4/group) and did not exhibit proteinuria. After induction of diabetes, both diabetic groups demonstrated heavy proteinuria. Histology of kidney sections from all groups showed diabetic control animals had worsened fibrosis compared to diabetic Pax8 GR KO animals. Loss of GR in tubular epithelial cells may confer some protection under diabetic conditions.

The Impact Of Ecotourism: Does Provisioning Lead to Long-Term Negative Effects on Sharks?

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Abstract

The population of shark has been dramatically declining for decades now, putting them at risk of extinction. Shark ecotourism is a conservation tool that has acquired great support in the last years as an income-generating alternative to shark fisheries. However, there is concern about the potential negative effects of this activity on sharks due to provisioning, a common method used by operators to ensue shark visibility through the use of food, attractant or bait.

The Impact Of Ecotourism: Does Provisioning Lead to Long-Term Negative Effects on Sharks? provides a quantitative and exhaustive review surrounding the potential risks provisioning can entail during shark watching and cage-diving activities. The study focuses on regions in the pacific and Indian ocean using tagging technology to track the sharks.

The findings suggest potential long-term effects such as increased aggression, alterations on their energetic consumption and activity patterns, and an increased risk of inbreeding and diseases. Disruptions of ecosystems through trophic cascades are also indicated. However, empirical research is still limited, and results are conflicted. Although all studies indicate short-term effects on their behaviour, further research is needed to discuss to what extent those short-term effects could be a motive of concern in the future. Given the benefits ecotourism brings, this type of tourism will continue to grow. Consequently, it is imperative to work on how to ensure an effective protection of the targeted species. The study provides guidelines and topics for future research as well as policy suggestions aiming at minimising the impact of provisioning.

Gravity Compensation for Assisted Surgery Robot in Orthopedics

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Abstract

This research presents a gravity compensation system for arthroscope holders, The focus of this article is the design, analysis, and integration of a gravity compensation mechanism (GCM), an electromagnetic brake, and holding positions. Conclusion from discussions with orthopedic surgeons: most surgeons are concerned about how much effort it takes to operate this equipment. The less effort, the more precision the surgeon can achieve. from redesigning a new 7-DOF ATH to increasing the strength of ATH at the expense of the weight of the operation. A gravity compensation mechanism was designed to reduce the operating effort of this equipment. The maximum torque of each joint was evaluated by an adaptive random search algorithm, which transformed each torque into the operation's effort at holding positions of the ATH to ensure the wrench surgeons would take. The GCM was designed to fit the gravitational torque of each joint. criteria for choosing a GCM mechanism was the similarity between gravitational torque equations and GCM torque equations. The 2-DOF GCM could compensate for about 60% of its weight. These results were a key point in improving our design further. Further improving will focus on the vibration that affects the vision of the arthroscope to ensure the fundamental criteria that the surgeon needs, then redesign and optimize the size from 2-DOF-GCM to 7-DOF-GCM, including changing all materials and preparing to test according to the Medical Device Standard.

WorldCUR 6F

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Community

Occurrence and Antibiotic Sensitivity Patterns of Potentially Zoonotic Methicillin-Resistant and Methicillin-Sensitive Staphylococcus aureus in Pigs in Ibadan, Nigeria.

Oluwatobi Fasiku
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Abstract

Staphylococcus aureus, particularly methicillin-resistant *S. aureus* (MRSA), has emerged as a leading antimicrobial-resistant pathogen challenging global health systems and antibiotic therapy. Pigs have been identified as important reservoirs for livestock-associated MRSA. The major concern with MRSA occurrence in pigs is the potential for human transmission. Reports on the prevalence and antibiotic sensitivity pattern of methicillin-susceptible *S. aureus* (MSSA) and MRSA strains in pigs in Nigeria are still limited, hence, the need for this study.

We collected composite faecal samples from 25 pig farms in Ibadan, Nigeria. Isolation of *S. aureus* and antibiotic sensitivity testing was done using standard microbiological procedures. Data were analysed using descriptive statistics. The prevalence of *S. aureus* was 31.2%, with the proportion of MSSA and MRSA isolates being 23.7% and 7.5% respectively. The antibiotic susceptibility profiles revealed a high multidrug resistance prevalence among both MSSA (86.4%) and MRSA (100%).

The high multidrug resistance and the occurrence of MRSA may be evidence of continuous antimicrobial exposure and substandard hygienic practices on these farms. This is undesirable because it constitutes a health hazard for farmers, veterinarians, abattoir workers and pork consumers, who may further disseminate these highly resistant strains to their families and society.

This study supports the existing reports on pigs being an important reservoir of highly resistant *S. aureus* strains. There is a need for further surveillance and a multisectoral approach involving policymakers, farmers, health practitioners and the public in implementing good infection control practices and safe antibiotic usage across all levels.

Application of the RCG Conceptual Algorithm in a Multilayer Perceptron

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Abstract

Artificial neural networks are connectionist systems based on the functioning of biological neural networks for the solution of complex problems. In this field, one of the most used models is the Multilayer Perceptron, due to its capacity as a universal function approximator. In this model there are two problems that are significant both in the convergence and in the execution of the artificial neural network, one related to the design of the architecture and the other to the determination of the initial synaptic weights.

In this article we propose a new approach to determine the architectural design and initialization of the weights in a multilayer perceptron, through the use of conceptual combinatorial logic pattern recognition algorithms, which contribute to time efficiency in the learning process and classification efficiency.

WorldCUR 6G

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Data

How Neoliberalism Shapes Conservation Policy?

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Abstract

The renewed focus on environmental crises at international summits, most recently at COP27, has shown the international importance of environmental protection and the need to change from extractive economic policies. Since the 1980s, neoliberalism, a market-led political ideology has dominated international economic policies. The tensions between environmental protectionism and neoliberalism have been reconciled through sustainability, an opaque policy directive. Therefore, the focus of my historical research is on the tensions in the adaption to neoliberalism vis-à-vis sustainability in environmental non-governmental organisations (ENGOs). This requires a historical analysis of how conservation organizations' strategies have developed alongside neoliberalism. This was explored by looking at the effects of neoliberalism in shaping the strategies adopted by Europe's largest ENGO, the RSPB. Through the Wayback Machine, key developments in neoliberalism and the RSPB historical timeline could be reconstructed through advocacy documents. This was conducted with a literature review on neoliberalism and its role in shaping conservation strategies. The research showed despite existing under neoliberalism's various iterations the RSPB's core value of nature protection through sustainability was not compromised. Moreover, the RSPB was shown to take a conscious effort to shape sustainability towards environmental protection in UK policy. This was because the organisation used the terms sustainability and environmental protection synonymously, shaping scientific and moral arguments for the protection of nature. I propose that rather than being subsumed by neoliberalism, ENGOs are crucial to shaping sustainability globally as a counterweight to neoliberalism and subsequently deserve further study to assess their significance.

Digging Digitization: Examining the Access, Impact and Sustainability of Online Research Platforms Supporting Digital Cultural Heritage in the Middle East

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Abstract

Despite appearing to provide open access sources of information, current platforms for cultural heritage research can unintentionally create an environment where access to information is limited by technological infrastructure. Without the training and tools to efficiently create and interact with emerging technologies, the countries and regions that have historically encountered barriers of access to research will continue to suffer those same inequities in the virtual world. The identification, management and mitigation of these issues is therefore essential to providing effective research, particularly in the field of cultural heritage. With the framework developed by Yang et al. (2020) for "critical digital heritage", this essay examines how certain databases, photo archives and platforms for crowdsourced research adhere to its three main criteria--impact, access and sustainability—in the Middle East and North Africa (MENA). The findings indicate that the first of four data management platforms do not adhere to the given criteria, but the latter two do. Understanding how and why these platforms fail or succeed to fulfill these three main criteria is critical to ensure that research and information in the virtual space is effectively, efficiently and equitably shared with everyone, particularly those in technologically underserved communities.

Who spends the most on medical care? A perspective through data.

Weijun Zhou[1], Lesly Velazquez Ruiz[2], Olenka Besaga[3]
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Abstract

Healthcare systems in the US have faced tremendous challenges, due to exogenous shocks such as the COVID-19 pandemic and an aging population. Moreover, the increase in political polarization during the pandemic has shifted perspectives on how much individuals trust scientific information that shapes expenditure behavior. Big Data can provide valuable information on such behavior and how to improve the health outcomes of society as a whole for healthcare providers and governments. Hence, our research seeks to utilize the potential of Big Data to detect patterns of how household characteristics impact medical care expenditure, especially in areas with strong differences in political affiliation.

Current empirical reports have found that medical expenditure in the US depends on the source of payment, demographic, and geographic factors. Moreover, a generous portion of the total medical expenditure is concentrated among a small group of individuals. To contribute to existing literature, our paper will update the analysis with 2022 data as well as an additional variable of political beliefs.

Specifically, we will utilize ArcGIS, a geographical information system created by Esri, to extract data within Designated Marketing Areas (DMA's). OLS regression analysis will be conducted to draw the relationships between household characteristics (e.g. age, race, education, income and marital status) and the Medical Care Index. We chose Buffalo, NY, Jacksonville, FL, Palm Springs, CA, and Wichita Falls & Lawton, TX as the four DMAs for our research due to the differing political affiliations and population sizes, which allow for the potential of a more diverse sample.

Facts and Fancies: Victorian Fairy-Science for Children and Conservation in the Industrial Age

Loh Jia Wen

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Abstract

As the Victorian world grew more industrial and scientific, fairies curiously swarmed back into life. New inventions like cameras and microscopes did not annihilate fairy land in children's literature; rather, these instruments allowed for a discovery of the minute marvels of nature – a world so wondrous it seemed to be the works of invisible and fantastical fairies. Much of science in Victorian children's literature is thus unsurprisingly also taught through fairies, and Melanie Keene terms this genre of personifying scientific concepts as fairy-science in her seminal work *Science in Wonderland*. Exploring the inseparable connection between science and art in texts by Arabella Buckley and Charlotte Maria Tucker, this research repudiates the scholarly treatment of fairy-science narratives as frivolous works, and asks instead what fairy-science texts communicate that purely scientific or fictional works cannot. Through ecocriticism and stylistic analysis of textual and artistic representations of insects, atoms, and children as fairies, this paper illuminates how Victorian children's education was designed to preserve the mystery of nature in an age of urbanization. Fairy-science, with its magical blending of fantasy with reality, invited children to connect with the living world and protect it from destruction, a lesson that remains just as important in the Victorian Industrial Revolution as it is today with our continual exploitation of the environment. Fairies, like microscopes, gave Victorian children a new lens to see the world, and engaging with fairies in the current digital age can re-cultivate a profound appreciation for nature's unseen magic.

TorchFL: A Performant Library for Boostrapping Federated Learning Experiments

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Abstract

With the increased legislation around data privacy, federated learning (FL) has emerged as a promising technique that allows the clients (end-user) to collaboratively train deep learning (DL) models without transferring and storing the data in a centralized, third-party server. Despite the theoretical success, FL is yet to be adopted in real-world systems due to the hardware, computing, and various infrastructure constraints presented by the edge and mobile devices of the clients. As a result, simulated datasets, models, and experiments are heavily used by the FL research community to validate their theories and findings. However, building these datasets, models, and experiments requires extensive domain knowledge which often slows down the research process. We introduce TorchFL, a performant library for (i) bootstrapping the FL experiments, (ii) executing them using various hardware accelerators, (iii) profiling the performance, and (iv) logging the overall and agent-specific results on the go. Being built on a bottom-up design using PyTorch and Lightning, TorchFL provides ready-to-use abstractions for models, datasets, and FL algorithms, while allowing the developers to customize them as and when required. This research aims to dig deeper into the architecture and design of TorchFL, elaborate on how it allows researchers to bootstrap the federated learning experience, and provide experiments and code snippets for the same. With the ready-to-use implementation of state-of-the-art DL models, datasets, and federated learning support, TorchFL aims to allow researchers with little to no engineering background to set up FL experiments with minimal coding and infrastructure overhead.

Ventilation Concepts for Rooms

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Abstract

During the corona pandemic, schools, universities and kindergartens in particular continue to be places of large gatherings. For the health of people who spend time indoors, it is important to keep the indoor air quality at a high level, especially to protect oneself against airborne infections such as SARS-CoV-2. This is ensured by air exchange, which replaces indoor air with uncontaminated outdoor air, thus reducing aerosol and CO_2 concentrations in indoor air. The air exchange is regulated by ventilation concepts that specify the duration and timing of the air exchange. However, such ventilation concepts are usually not specifically adapted to individual rooms and different room uses and can therefore fail to achieve the targeted indoor air quality. Also, air filtration systems can be used to reduce the risk of infection by removing virtually all aerosol particles from the processed air, but the efficiency depends on their position in the room. Our senior thesis addressed the need to review and optimize ventilation concepts and effective positioning of air filtration systems. For this purpose, an existing system for monitoring the temporal-spatial CO_2 concentration was extended with new hardware and functions, such as an application for simulating ventilation concepts. The result is a system that can be used to create, check and optimise ventilation concepts and evaluate the positioning of air filter systems. Measurements have confirmed the system's usefulness. Furthermore, the system can be set up and used independently by educational institutions, enabling them to contribute to maintaining adequate indoor air quality.

WorldCUR 7B

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Community

Intercultural Competence among Undergraduate Students

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Abstract

Increasing migrations across the world mean leaders need to become more competent in working across cultures. Intercultural competence (ICC) is the capability to accurately understand and adapt behavior to cultural differences and commonalities. While there is growing interest in academia, this study examined archived data from two courses designed to enhance undergraduates' ICC at a midwestern American university. Instructional strategies were based on the theoretical framework called the Intercultural Development Continuum. Researchers expected that students who completed Critical Race Theory (CRT) would show statistically larger gains when compared to non-CRT students. Students completed the Intercultural Development Inventory (IDI) at the beginning and conclusion of Human Relations in a Multicultural Society (HRMS). Researchers used the two-sample t-test to compare the pre-instruction IDI scores of students who completed CRT and students who did not complete CRT before the second course. Analysis showed statistically significant differences in the pre-instruction scores of CRT and non-CRT students, but not in the post-instruction scores. The gap in the pre-instruction scores decreased by the end of HRMS. The results suggest that the CRT course had a meaningful impact on students' ICC even before they began HRMS. During the HRMS course, the non-CRT students had larger gains in ICC than the CRT students. This suggests that each course was impactful early in students' academic studies. This research is relevant to decision makers for program mission, learning outcomes, and course design. Instructional designers may consider differentiating instructional strategies based on students' ICC orientation.

Controlling HIV-1 Mutations

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Abstract

Despite that great efforts have been made in the prevention and therapy of HIV-1 infection, HIV-1/AIDS remains a major threat to global human health. Recently, CRISPR/Cas9 system (Cas9 protein and its guide RNA) has been engineered as an effective gene-editing technology with the potential to treat HIV-1/AIDS. It has been used to target HIV-1 genome to reduce HIV-1 infection. They do this by binding Cas9 to the part of HIV genome which is complementary to its guide RNA thereby inducing its cutting activity, however the HIV virus is prone to mutation in such a way that the Cas9 cannot recognize the DNA of newly formed HIV using its guide RNA (Ebina, 2013). Using literatures and some pre-existing data, this research suggested the use of MutS protein in dealing with mutated HIV virus. This protein recognizes errors in DNA. The cell uses it to recognize mismatch errors that arises during DNA replication and repair it to avoid Mutations in a newly formed DNA (Feng, 2005). In this project, the MutS protein is suggested to be fused to Cas9 protein to enhance its application so that CRISPR/Cas9 system should be able to recognize Mutated Viral DNA by MutS and then cut it using nucleases of Cas9 protein. I am looking for funds to implement this idea. This project will help Scientist to design a drug that can deal with HIV viruses that have mutated in such a way that the MutS independent Cas9 protein failed to recognize them.

Beyond Love: Motives For Marrying Again

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Abstract

Bigamists are often criminalised for their use of deception, but in accepting a homogenous view of bigamists we refuse to recognise the individual circumstances in decision-making. Using the history of emotions as my theoretical framework, my research centres on the individual, allowing for further analysis of their motivations, whilst focusing on what makes us human - our emotions. The extent to which romantic love motivated bigamous marriages in wartime Australia has been assessed through the press reports of Shirley Powell's and Lucy Brock's prosecutions for bigamy (1943). These case studies were analysed using Peter Stearns' emotionology framework and Renata Grossi's research on love and the legal system in Australia. This analysis found these women to lead complex lives, with their bigamous marriages motivated by various reasons, from mental health to maternal influence. By recognising the emotions and relationships motivating bigamy, we can understand more about the influencing factors on the lives of women in wartime Australia. This presentation hopes to recognise the complexities and nuances of individual bigamy cases and the circumstances pushing young women into marriages. Through this research, I hope to evidence the importance of the history of emotions for a social historian and acknowledge that such an approach allows for a reassessment of existing primary and secondary literature.

Trait Mindfulness and Creativity: Social Skills as Moderator and Mediator

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Abstract

The study aims to explore the relationship among trait mindfulness, creativity and social skills. Special education needs (SEN) students commonly show deficits in social skills, especially Attention Deficit and Hyperactivity Disorder (ADHD) and autism spectrum disorder (ASD). The positive relationship was found between social skills and creativity (Alptekin & Sarikaya, 2022), and that between mindfulness and creativity (Henriksen et al., 2020). However, research rarely shows how social skills may moderate or mediate between mindfulness and creativity. The current study adopts a quantitative method by using an online survey to collect data from secondary students who had joined school-based mindfulness programs. The expected findings include social skills will act as moderators and mediators in the relationship between trait mindfulness and creativity. A high social skill level will likely have higher trait mindfulness, leading to higher creativity. Moreover, it is also expected that the relationship between mindfulness and creativity will change under different levels of social skills. With the increased prevalence of SEN students, school-based mindfulness programs can both serve as preventive program and intervention programs to enhance positive student development during adolescence. The expected finding may help improve the mental health of adolescents with and without SEN under the integrated education system of Hong Kong. For further study, the effectiveness in different mindfulness techniques and creativity enhancement can be investigated. Limitations and implications will be discussed.

Keywords: trait mindfulness, creativity, social skill, the school-based mindfulness program

Enteric Neurons Utilize PIEZO1 to Facilitate Homeostatic Recovery from Intestinal Tissue Inflammation in IBD

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Abstract

The gut is practically a brain in itself. Housing its own self-sufficient nervous system, it utilizes an expansive network of millions of neurons to mediate all manner of physiologically processes such as local blood flow, gut motility, and even immunological responses. While it is well known how enteric neurons control effector systems, like peristalsis, the mechanisms and immunological responses underpinning the sensation of the resulting mechanical environment are unclear. Furthermore, despite significant alterations in the mechanical programs involved in digestion exhibited in patients with IBD, the mechanistic relationship between how enteric neurons sense these responses is unknown. We have identified that enteric neurons highly express the mechanoreceptor Piezo1 indicating that neurons can sense and potentially respond to pressure fluctuations in the intestine. By generating Piezo1-conditional knockout mice specifically on enteric neurons, we have identified this receptor's recognition of mechanical force is dispensable for normal intestinal peristalsis and homeostasis. However, in models of IBD, while Piezo1 enteric neuron-deficient mice and WT littermate counterparts show a similar response to acute inflammation, Piezo1 is essential for the resolution of inflammation and coordinated tissue repair programs. One month after colitis induction, while WT mice return to homeostatic intestinal motility patterns and exhibit baseline levels of inflammatory markers, Piezo1-enteric neuron-deficient mice still exhibit prominent dysregulation. Uncovering the mechanism of how enteric neuronal Piezo1 drives tissue reparative process in response to alterations in mechanical force may lead to potential advancement for the specific treatment of many digestive and gastrointestinal disorders.

Communication Practices between Nursing Personnel and Speech-Language Therapists in Feeding and/or swallowing difficulties

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Abstract

Effective communication practices between different healthcare practitioners are critical in an evolving medical world for timely and effective operations to ensure the best, most effective, immediate care to patients. To prevent the breakdown of communication between different healthcare practitioners, and to strengthen the current communication practices, it is important to identify the nature of communication practices between speech-language therapists and nursing personnel in acute feeding and/or swallowing management.
A quantitative, cross-sectional research design was used in the study. The data was collected using an adapted Nurse-Physician Communication Scale, and the population of the research study was identified using convenience sampling. To achieve the research study's objectives, an electronic survey was distributed to nursing personnel throughout South Africa through various channels.
The data collected from the survey revealed that there is a level of mutual understanding within interactions between Speech-language Therapists and nursing personnel, but nursing personnel still felt misunderstood in some interactions, which impacts openness within communication interactions. The reduced mutual understanding and openness in interactions were also influenced by feelings of dissatisfaction in communication interactions, as well as the perception of most communicated information as irrelevant. What was also found was that nursing personnel preferred face-to-face verbal and written communication over electronic modes.
This research study found that there are still areas within communication practices that need to be improved in order to have successful communication interactions that result in better management of patients with feeding and or swallowing difficulties.

“What Does History Mean to Us?’ A Study of Young Berliners’ Perceptions of the Memorialisation of History”

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Abstract

In 2020 the statue of Edward Colston was toppled in Bristol and the debate on whether to keep statues of controversial figures intensified. Are statues glorifying, or do they force us to confront our past? This is particularly pertinent in Berlin, where the historical monuments truly keep history tied to the city. My project looks at monuments in Berlin post-1990 to understand how united Germany has dealt with its complex past through these monuments. I researched responses to specifically chosen monuments at the time of installation using relevant newspapers and compared this to the perception of the monuments now, by interviewing both young and older Berliners. Interviews had consistent questions, determining which monuments they know, how they know them, and their opinions on them. From the research, I saw differences in attitudes and perceptions towards these monuments between the generations, especially regarding opinions of the art itself, and perceptions of the meanings of the monuments and their significance. Consequently, impacting the conversation on how history is remembered, and thus impacting the discussion on how it should be remembered. This project contributes to the debate on the matter of historical monuments and memory culture, helping to uncover the most effective ways for societies to reconcile with their past and thus progress with their future. This further adds to the discussion of how to deal with controversial statues in Britain, and questions how Germany can best progress with its memory culture, a controversial topic since the rise of German far-right political groups.

Vacation migrations: and How to use them to our advantage?

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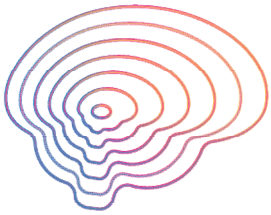
Abstract

Lisbon being one of the most visited tourist destinations in Europe, mobile platforms for hosting services like Airbnb, HomeAway... became more and more accessible and their usage wildly increased. However, the growth of this type of accommodation is problematic because it effects the availability of most residences. The number of places for renting is decreased, and prices for apartments increase. Similar problematic is appearing in cities all over the world, so it would be interesting to get acquainted with how other nations are solving those problems, exchanging information, and learning from others.

Real estate owners are faced with a decision to rent a flat or make a touristic place where they could earn more money easily. Is there an option in-between, that would gain from the other and the other giving back, the ideal situation for both people living there and tourists? The systematic solution of architecture design would be a summary of the economic model and urban studies that would resemble in the building, making a completely different approach to the process. As the whole problematic is too wide for one field, it is drawing from several disciplines to redefine the potential problems outside of normal boundaries.



SUSTAINABILITY WorldCUR 7F

WorldCUR128
Sustainability

Post-Brexit Import Control Infrastructure: Analyzing the National Border Control Post Programme and its Impact on Ports Around Great Britain - Including Key Learning Points for Future National Port Projects.

Dominic Axford
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Abstract

This research investigated the delivery of a significant new infrastructure programme of Border Control Posts at UK ports to undertake checks on food and agricultural imports from the EU (worth almost £36bn in 2019). The first literature written specifically on the subject, it is an important analysis in to how government and industry deliver such projects: providing insight into how legislative decisions and government policy affect such critical parts of the global logistics network. The investigation utilised a cross-sectional study model incorporating a thematic results analysis. Primary data was acquired via interviews with key programme stakeholders. The overall impact of the programme was measured in both operational and financial terms, and preliminary findings indicate many stakeholders succeeded in delivering complex, specialised facilities as specified. However, irregularities in demand forecasting and interpreting legislation appear to have been responsible for significant delays and cost overruns.
Results from this investigation provide an independent, empirical analysis on the delivery of a major infrastructure programme; and codify the nature of the policymaker - port-operator relationship. It advances knowledge of both policy and port management by providing a holistic case-study of the opportunities and challenges such programmes face. With an estimated £450M spent on the programme, understanding how well it achieved its desired aims is important. Moreover, embedding effective import control regimes (such as customs and biosecurity inspections) whilst maintaining efficient port operations is critical to economies and supply chains. Therefore, understanding how these activities influence one another is vital, and would benefit from additional focused research.

Repurposing Agricultural Waste: Use of Sugarcane Bagasse to Alleviate Poverty and Reduce the Carbon Footprint in Ndhiwa, Kenya

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Abstract

Energy poverty is a multidimensional concept that is a challenge in Kenya because of high energy prices, low household incomes and unavailability of certain energy types. Approximately 75% of Kenyan households use wood fuel. The effects of this range from deforestation to user's health. In fact, household air pollution is the fourth-leading risk factor for disease in Kenya, killing more people than malaria and tuberculosis. An underutilized innovation that would solve most of these problems is the use of biomass briquettes made of fiber residue obtained from sugarcane after sugar milling called bagasse as a substitute. Utilizing energy poverty theory, this study employed prototype testing, quantitative and qualitative methods, interviews, questionnaires, Focus Group Discussions (FGDs), pre-existing literature; stratified proportionate random and purposive sampling techniques. A sample of 169 was selected from target population of 2000 respondents. The findings indicate that bagasse briquettes can help alleviate poverty because they fit well into the circular bio economy approach that aims to reduce waste and the carbon footprint – cutting household air pollution by approximately 95%. They also offer an opportunity for establishment of small enterprises, creating employment for poor Kenyans. Lastly, they help households reduce expenditure on energy and allow them to spend more on other needs such as education, nutrition, and healthcare thus improving their quality of life. The industry has vast potential to improve lives of Kenyans if they are sensitized to the benefits of the product and if the government provides fiscal incentives and conducive policies for growth.

Bioaccumulation of Trace Metal Content in Muscle and liver of Cattle Meat Across the United Arab Emirates Markets.

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Abstract

Meat consumption is expanding dramatically worldwide. Food contamination of heavy metals, especially meat, might cause a series of threats to human health. Few studies have investigated the heavy metal concentration in cattle meat, particularly in the United Arab Emirates. This study aims explicitly to quantify the levels of Copper (Cu), Zinc (Zn), Nickel (Ni), Cobalt (Co), Lead (Pb), Cadmium (Cd), Arsenic (As), and Selenium (Se) in the liver and muscle of cattle meat sold in the United Arab Emirates markets. Then, to compare the findings with the World Health Organization (WHO) standards for the permissible levels of heavy metals. Eighteen samples from three distinct regions were used in this investigation (local, Australian, and Pakistani). The samples were digested using microwave acid digestion, and metal analysis was performed using Inductively Coupled Plasma - Optical Emission Spectrometry ICP-OES. The results of all samples indicated concentrations below the detectable level for (Ni), (Co), (Pb), (Cd), and (As). However, (Zn) and (Se) showed a significant increase compared to WHO permissible limit in all the samples. Likewise, there was an increase in the concentration of (Cu) in local liver meat with an average concentration of 4.244 mg.kg, which exceeds the maximum permissible limits along with WHO standards. These results highlight the need for further studies with larger sample sizes to fully understand the extent of heavy metal contamination in cattle meat sold in the UAE markets and to determine the potential risks associated with its consumption.

CREATE WorldCUR 7G

WorldCUR131

Create

Meeting of the Minds: Developing Global Sustainable Social Solutions Through Interdisciplinary Cross-Cultural Collaborations

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Abstract

Globally we are facing challenges related to climate change, food insecurity, poverty, healthcare, education, and more, and as each day passes, these issues become more paramount. To achieve a better and more sustainable future for our world, we must learn to work successfully together. Additionally, with the increase of integration of remote work into most industries during the pandemic, the commonality of global teams has increased, but a framework for the evaluation of the effectiveness of these teams is still needed. Responding to a need for program review, we utilized a mixed-methodology approach comparing the qualitative analysis from interviews of both the team and the individual team member from six global student teams that participated in a United Nations (UN) global innovation summit. We then compared the results of these interviews with an individual rating of team effectiveness and evaluated the results through the lens of Hofstede's Cultural Dimensions. These teams represent a portion of the 200 students from 60 countries, representing 36 different languages that developed sustainable solutions for the sustainable development goals (SDGs) set forth by the UN. Through this analysis, we were able to identify the main benefits and barriers to global team-based success, particularly in developing sustainable solutions for globally challenging issues. These benefits and barriers will assist in the development of a formation framework for global teams and provide insight on how to prepare undergraduate students to be successful intercultural contributors to cross-cultural, interdisciplinary collaborations.

Synthesis, Characterization, and Antimicrobial Activity of a Novel Hybrid Material

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Abstract

Recently, great efforts are devoted to develop new coatings of reasonable cost and high efficiency to prevent the bacterial penetration and microbial growth. The dressing material should fulfill some demands such as maintaining moist environment, preserving the tissue temperature, allow the gas exchange, and doesn't cause any kind of allergy or toxicity. In terms of composition, a wide range of materials have been utilized such as metals, metal oxides, polymers, and 2D materials. In terms of physical shape, many forms are used such as nanosheets, hydrocolloids, sponges, films, and hydrogels, however, nanofibers entail more advantages such as high surface area to volume ratio, excellent mechanical properties, and porous nature. MXene was investigated in a wide range of applications such as chemical sensing and energy storage, however, its application in antimicrobial coating was not investigated enough in literature. This research investigated the synthesis of PVP/MXene/Ag Nanofibers as a novel composite coating by electrospinning of (PVP/MXene) mixture to form PVP/MXene nanofibers followed by deposition of Ag nanoparticles on the nanofibers by UV light. The synthesized materials were analyzed using different characterization techniques. In addition, their performance as antibacterial coatings was studied against common gram-negative bacteria using minimum inhibitory concentration and colony counting tests. Our preliminary examination revealed that the nanocomposite revealed enhanced antibacterial activity compared to PVP/MXene, PVP/Ag, and other commonly antibacterial materials. These results may open the avenue towards synthesis of new MXene-based coatings, with outstanding mechanical properties and enhanced antibacterial activity.

A Study on the modern Swedish equestrians knowledge of the Prehistoric horses.

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Abstract

Horse and man have a long and complicated relationship in Scandinavia starting with wild horse-hunting to modern days riding and competing.

Considering or with an eye to the manifold archaeological evidence for horses and for representations of horses in material culture from prehistoric Scandinavia, from the stone Age to the Viking period.

This study aims to highlight the mutual cultural heritage horse and man share and if and how it affects equestrians and horsemanship in modern times.

In order to do so a qualitative (interviews to museums staff) and a quantitative (questionnaire to horse interested people) investigations was carried out. Respondents were asked whether they had knowledge about horse and man's joint history and asked to assess their own level of awareness on the subject.

The study shows that among people interested in horses there is a great interest towards knowing more about the early history of the human-horse relation.

Museums on the other hand do show material, but do not seem to prioritize the topic. All in all this essay shows that there is potential for further studies and also further development in making the cultural heritage of horse and man available to the public. This can be done by merging platforms to increase the exchange of knowledge between equestrians and the museums and in this way benefit both parties.

Keywords: Archeology, Cultural heritage, Equestrian, Horse, Human-animal relationships, Museum

WorldCUR 8A

WorldCUR134

The Future

Chlorine Dioxide Gas: Development and Optimization of an Antiviral Assay based on the MS-2 Bacteriophage

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Abstract

Since the emergence of the SARS-CoV-2 virus, the need to identify antiviral agents for disinfection has dramatically increased. Previously, chlorine dioxide gas has been identified as an antibacterial agent with strong oxidizing capabilities capable of large-scale bacterial disinfection. Additionally, the MS2 bacteriophage has been recognized as a suitable surrogate for developing and applying virucide decontamination methods. This study aimed to identify and assess the antiviral properties of chlorine dioxide gas based on the MS2 bacteriophage model system using a double-layer agar plaque assay. Results showed that the MS2 bacteriophage could be incorporated and recovered from porous (cloth coupons) and non-porous (steel coupons) and that its recovery can be diminished or eliminated based upon feasible (less than 20ppm) ClO2 gas exposure parameters. Implications of this study support the use of ClO2 gas in the antiviral disinfection process of porous and non-porous surfaces. Current studies are investigating the use of ClO2 gas on wood and plastic surfaces and investigating other environmental factors that may influence virucidal activity.

Effects of Pedagogical Questioning on Singaporean young children's learning of novel categories

Yun Hui Chwee
Nanyang Technological University, Singapore

Abstract

There has been a longstanding debate about the advantages and disadvantages of two polarities of teaching methods, direct instruction and active exploration (free play). Research has shown that questioning might be a viable pedagogy method that combines the advantages of both. When pre-schoolers in the US explored a novel toy with multiple hidden functions, pedagogical questions – questions asked by a knowledgeable teacher who aims to guide children towards learning – has been shown to facilitate more learning and exploration, as compared to direct instruction or questions asked by a naïve confederate. The current study investigated whether these effects can be observed in Singaporean children's learning of novel categories. 30 children (M = 6.51, SD = 0.45) were recruited and randomly assigned to four conditions. In all conditions, children were asked to find out the rule for categorizing two types of novel robots by exploring exemplars. Before children start exploring, a hint was given either by a teacher in the form of a direct instruction, by the teacher in a question, by a confederate in a question, or not given. We then measured how much they explored the exemplars and whether they categorized new cards and identified the rules correctly in a post-test. Results showed no significant difference between all four conditions, which may be due to the small sample size. If a larger sample is able to confirm the research hypotheses, it will have implications on teachers' choice of pedagogical methods in early childhood education.

Predictors of Self-Reported Research Self-Efficacy and Perception of Research Amongst Medical Students in the United Kingdom: A National Cross-Sectional Survey

Deborah Inyang[1], Temidayo Osunronbi[2], William Adeboye[3], Ikenna Ibeanusi[2], Agbolahan Sofela[2]

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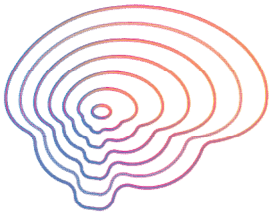
Abstract

There is a decline in clinical academics in the UK, alongside growing ethnic/gender disparities. Higher research self-efficacy (RSE) and a positive perception of research (PoR) amongst students are associated with a higher motivation to engage in academic medicine. This study aimed to determine factors influencing RSE and PoR amongst UK medical students.

We surveyed medical students in 36 UK medical schools in 2021 (n=1573) and analysed associations between students' demographics and RSE/PoR, through multiple linear regression. Research experience before medical school was associated with higher RSE (β=3.02, 95%CI [2.11;3.93]) and more positive PoR (β=0.87, 95%CI [0.24;1.50]). Female (β=-1.75, 95% CI [-2.62;-0.89]) and Asian students (β=-1.23, 95%CI [-2.13;-0.32]) had lesser RSE than male and White students, respectively. These factors were associated with higher RSE: undertaking clinical training (β=1.99, 95%CI [1.09;2.90]), completing a degree before medical school (β=3.66, 95%CI [2.23;5.09]), and attending a secondary school abroad (β=1.96, 95%CI [0.58;3.34]).

We found gender and ethnic disparities in RSE amongst UK medical students. Research experience before medical school was also associated with greater RSE and PoR. To our knowledge, this is the largest study that attempts to investigate factors influencing RSE and PoR amongst UK medical students.

We have made recommendations to address these disparities: UK medical schools should collaborate with the NIHR and allied organizations to create targeted dyadic and augmented group research mentoring and training to underrepresented-in-medicine students; research mentors should explicitly signpost student opportunities for research skill development; research engagement should be encouraged at the pre-university level of education.



SUSTAINABILITY

WorldCUR 8B

WorldCUR137
Sustainability

Automatic Detection and Classification of Wall Cracks

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Abstract

Cracks on walls raise the risk of building damage and collapse. Due to its unpredictable occurrence and pervasiveness in concrete infrastructure, rapid crack detection is of utmost importance in ensuring occupant safety. In Singapore, crack inspections are conducted periodically by Town Councils. Between these scheduled checks, therein lies the possibility of sudden crack formation and crack exacerbation that can go unnoticed. This paper focuses on the development of UnCrack, a user-friendly wall detection kit freely accessible for use by occupants in buildings.

The OpenCV computer vision library and VGG-16 convolutional neural network are deployed in the coding. Canny edge detection is found to trace out crack perimeters during testing, but its tracking robustness and accuracy can be improved. On the other hand, the trained classification model serves to track whether a detected crack is previously analysed and recorded by the kit. Cloud data sharing can be explored as an improvement to provide more meaningful crack classification. This includes approximating the type and severity of cracks.

Results from this feasibility study suggest the benefits of empowering individuals without domain expertise to take part in the crack inspection process. Computer vision and artificial intelligence are realised to reduce human labour and boost detection accuracy. Beyond this paper, a smartphone application instead of the kit can be explored to reach a wider group of users.

May the Force be With you: Developing an Open-Source Materials Tester for Plastic Alternatives.

Amy Lim Kong
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Abstract

Light, versatile and cheap, plastics have become indispensable to modern life. However, they take a long time to degrade, releasing toxins and endangering nature in the process. Consequently, there is an increasing move in society to develop bio-based sustainable plastic alternatives. The large community of people attempting to do so are from maker and creative backgrounds, using approaches that are more cottage industry as opposed to largescale polymer processing plants. Whilst the materials produced are often aesthetically pleasing and locally sourced, the efforts behind improvement and comparison of these materials to the plastics they want to produce is based on trial and error, which is extremely time consuming. Providing these maker communities with the tools to quantify the improvement and development of their materials is a significant challenge. From an engineering perspective, we already have the answer: the standard tensile test is a primary method to measure a range of key material properties like Young's modulus, yield strength and toughness. With a low-cost open source tensile tester, non-STEM specialists will be able to investigate and develop new environmentally friendly materials with their desired mechanical properties faster. 12 different samples of bioplastics were used to build the validation database. Additional testing was carried out using FTIR and DSC to investigate the relationship between the mechanical properties and chemical composition of these materials. Generally, protein-based alternatives were tougher than their carbohydrate-based counterparts. Further experiments could also be carried out to determine what other materials could be used on this machine.

How do German metropolitan regions implement the Sustainable Development Goals (SDGs)?

Gaspar Drode
Humboldt University, Berlin, Germany

Abstract

This talk will present research on the issue of sustainable development of metropolitan regions in Germany. After reunification, metropolitan regions were introduced in Germany as a national spatial planning concept. The idea was to make these regions more visible in the European context. Metropolitan regions are actively managed (with individual projects or strategic spatial development). Our study focuses on the three Metropolitan regions: “Ruhr”, “Rhine-Neckar” and “Hannover, Braunschweig, Göttingen and Wolfsburg (HBGW). “In our study, we use the UN Sustainable Development Goals as a benchmark and examine the extent to which the SDGs are reflected in the policies of metropolitan regions and whether sustainability monitoring is in place. We see that metropolitan regions vary widely in their success in implementing the SDGs and generally have major problems with establishing monitoring. We interpret the findings as caused by the different management structures. Our results should help both to better implement sustainable development and to improve the management of metropolitan regions.

The Creation Myth of Incels: Exploring the Online Incel Subculture

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Abstract

Involuntary celibates, infamously known as “incels”, are young men who feel a sense of victimhood due to their lack of sexual relationships and direct their frustrations at women. Existing research suggests that incels are dangerous and prone to violent acts. Although research on the incel community is growing, more must be done to understand how the minds of young men are molded and indoctrinated into the incel community. This project answered two research questions: RQ1: Do elements of groupthink lead to negative self-fulfilling prophecies within the incel community? and RQ2: How does the use of incel forums contribute to violent behaviors? Combing through incel forums, and determining the frequency of elements found there, revealed high-frequency elements of *misogyny* and *violence* noted in previous research (Kelly & Aunspach, 2020; Hoffman, Ware, & Shapiro, 2020). New ones of *despair*, *self-worth*, *abuse*, and *sex-negativity* were discovered. Understanding how involuntary celibates are created and indoctrinated into the incel community and what contributes to the resulting violence can help create preventative measures against incel violence. The findings speak to more significant issues regarding the way different cultures view sex, masculinity, and mental health and the consequences that arise when these issues are ignored. More research aimed at reshaping the way we approach incels as an issue is necessary to successfully prevent gender violence before it begins. Further research should determine characteristics of communication among incels to aid in identifying them and establishing preventative measures through a better understanding of incel identities.

'Judge as a Member of a Community': Hannah Arendt on the Faculty of Judgement

Marie Massoth
Carl von Ossietzky University of Oldenburg, Oldenburg, Germany

Abstract

The political thinker Hannah Arendt died before she could write the last volume *Judging* of her inquiry on thinking, willing and judging, *The Life of the Mind* (1978). As a result, scholars were left with her fragmented theory of judgement. This paper will analyse Arendt's understanding of the 'faculty of judgement' in her *Lectures on Kant's Political Philosophy* (*LKPP*), a lecture series held at the New School for Social Research in 1970. Additionally, this paper will compare Arendt's reference to concepts of 'taste' and 'reflective judgement', originally from Immanuel Kant's *Critique of Judgement* (1790), with her interpretation and application of the concepts. This approach will refute claims of Richard Bernstein (1982) and others, who deny any conceptual similarity between Kant's and Arendt's theories of judgement. Consequently, this paper will demonstrate how Arendt transforms Kant's talk and explanation concerning the capability of 'reflective judgement' into the conditions of 'political judgement'. Ronald Beiner (1982) and others claim that α) Arendt uses two distinct theories of judgment. Responding to α), I will agree with Waltraud Meints-Stender (2009), Annelies Degryse (2011) and others in their critique of Beiner and treat it as a single theory of judgement. Being an influential voice of the 20th century, Arendt's theory of judgement is regarded as the centrepiece of her political philosophy, and this paper will communicate her perspective on society, spectatorship, agency, and politics.

The UN's Sustainable Development Goal 5.6 in Poland: Abortion, Reproductive Justice, and the Church in the Polish post-Socialist society.

Alicia García Moll
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Abstract

Approved in January 2021, Poland's near-total abortion ban has pushed more than 30,000 women to seek abortion services outside the country. Poland's reproductive services are deeply limited by the government's Catholic viewpoint on the topic. Nonetheless, abortion's radicalization should be regarded in a broad sense, extending far beyond its conventional religious connotation. The new abortion rule represents one of the consequences of the rule of law crisis that the country has been suffering since 2015. It is argued that the limitation of abortion corresponds to the limitation of individual rights and thus, freedom. Several international organizations, such as the United Nations and the European Union, have underlined the importance of abortion rights as a vital part of women's rights. Scholars agree that abortion restrictions do not lower abortion rates, but they do raise mortality rates. This thesis examines the relationship between reproductive rights, democracy, and gender equality. An assessment of Poland's reproductive policies across time, as well as the legal and moral barriers to free abortion, is presented to answer this question. The legal case study (Alicja Tysiac v. Poland) serves to illustrate the European Union's limitations in preserving women's right to abortion and self-determination. The *awfulisation* of abortion as a process of moral judgment carried out by anti-abortion actors contributes to its decriminalization. The findings of the study reveal Poland's unwillingness to comply with international gender equality requirements. This dissertation emphasizes the need to liberalize abortion in accordance with universal human rights standards.

WorldCUR 8D

WorldCUR143
Data

The Relationship between Ethnicity-Based Marginalization and the Collective Identity and Behaviour of Iraqi Ethnic Mix

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Abstract

This study, departed from the assumption that ethnicity-based marginalization and prolonged rights' deprivation fosters ethnocentricity and damages intergroup relations. In addition, this study follows a deductive approach that starts with a certain theory then collects empirical data to test it. We collected data using a survey to capture a snapshot of individuals' ethnic identity and their real life behaviour to explore how data fit the theory. Further, we extracted secondary data from various documents to derive a contextual understanding of the reality of disadvantaged groups and performed data triangulation to increase internal validity of our results. The Cross Ethnic-Racial Identity Scale-Adult (CERIS-A) was used to measure ethnocentricity, intergroup relations, and the impact of ethnic affiliation on individuals' economic, social, and political opportunities. We used a convenience-sampling plan to recruit 120 participants selected based on their ethnic identity. Participants' demographics such as age, levels of education, and socioeconomic status were also collected. The central question revolves around the Ethnicity-Based Marginalization and how it shapes the Iraqi's collective ethnic identity and behaviour. We hypothesized that ethnocentricity, weak intergroup relations, and the feeling of being relatively deprived are experienced by people facing marginalization in Iraq. Results will be discussed from a cross ethnic identity perspective.

Keywords: long-term marginalization, ethnocentricity, intergroup relations.

Stellar Metallicities from Photometry: A Study of Milky Way Ultra-Faint Dwarf Galaxies

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Abstract

This project aims to detect individual stars, for the first time, in the outskirts of several of the Milky Way's ultra-faint dwarf galaxies (UFDs). UFDs are thought to be remnants of some of the earliest galaxies formed in the universe. The distribution of stars in the outskirts of UFDs reveals processes that govern early galaxy evolution since the outskirt is the first region that encounters the environment. Galaxy evolution in the early universe tells us about the physics of the early universe and helps us paint a thorough picture of the evolution of our universe.

We use the u-band imaging filter of the Dark Energy Camera to probe the metal content of stars located in the outskirts of Milky Way UFDs. The u-band brightness of these stars is related to their metal content such that the higher the metallicity, the fainter the star is in the u-band. We then use this photometric information to select galaxy member stars at large distances from the galaxy's centre. We expect to use the spatial distribution of these outskirt stars to determine processes that govern early galaxy evolution.

The methodology used in this project is also readily applicable to other dwarf galaxies outside of the Milky Way. In the future, it would allow us to get the metallicity and spatial distribution of stars in any dwarf systems and provide insights into their evolution history and, thus, insights into the evolution history of our universe.

Residential real estate - an inflation hedge? And to what extent does the causes of inflation have an impact?

Fraser Drennan
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Abstract

With CPI numbers currently at a 40-year-high, inflation and its impact on the cost of living is being felt by all. Which brings us to the question: what asset classes make sense to invest in in an inflationary environment? Real assets are typically seen as a hedge against inflation; meaning that as inflation rises, the value of the asset rises along with it. One of these real assets is residential real estate - housing is the world's largest asset class and on average roughly one half of national wealth in a typical economy. Recent empirical data has found that the value of real estate has risen by slightly more than the rate of inflation over the last four hundred years (Eicholtz et al, 2021). Why has real estate delivered a real return over this period and will it continue to do so? And how do the drivers of inflation; demand-pull, cost-push, and inflation expectations; influence the magnitude of the real return of real estate over these inflationary periods? I will discuss how over the long term, when adjusting for inflation, real estate may not actually be that attractive as an investment as was previously thought, and also by analysing macroeconomic data, come to a conclusion on the inflation-hedging ability of real estate dependent on the different sources behind the rise in prices.

CREATE WorldCUR 8E

WorldCUR146
Create

Instagram, Cannabis, and Mothering: A Feminist Post-Structuralist Discourse Analysis of Instagram's #CannaMom Community

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Abstract

Inside and outside academia, the pejorative 'cannabis user' social construction is positioned in opposition to normative motherhood. Instagram's #CannaMom community exemplifies complex performances of the self in navigating such a contradiction; this paper rejects the deviant female cannabis user trope. Instead, centers narratives of mothers that use cannabis as made visible on Instagram. Paradoxically, the gendered #CannaMom community, a platform for visibility, guards its own visibility out of concern for social and governmental surveillance. Just as mothers cope with day-to-day burdens of motherhood using cannabis, so too do they employ #CannaMom to cope with social stigmas and surveillance. This presentation employs Feminist Post-Structuralist Discourse Analysis (Baxter) to analyze an expansive body of posts and comments in the hashtag's visual and textual content, identifying and categorizing discursive themes.

Discourse themes relating to surveillance and how CannaMoms navigate surveillant gazes illustrate complex interactions with their social environment. In anticipation of surveillance, CannaMoms negotiate their self-presentation by leaning into normative roles. By constructing their identity as representing/embracing intensive motherhood, these CannaMoms do not 'appear' as having 'availability' to be intoxicated. Previous scholarship has successfully adapted Foucault's panopticism, adding great depth about the sources of maternal surveillance in relation to contemporary mothers (Henderson et al. (2007), Fowler (2000)). A discourse combination map (Baxter, 2007) demonstrates that CannaMoms who employ the hashtag explore an identificatory construction that may not be feasible outside Instagram. The functionality of #CannaMom is a resolution to the paradoxes bound in the identity of "cannabis" plus "mom."

Knowledge, Attitude and Barriers of Breast Self-Examination Among Women in Nyio Ward, Arua City

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Abstract

Breast self-examination (BSE) is an effective, inexpensive and simple screening technique for examining breasts monthly to detect breast cancer. 89% of Ugandan women present with III or IV stage which has a poor prognosis. This study was conducted to assess knowledge, attitude and barriers regarding breast self-examination among women in Nyio ward, Arua City, Uganda.

A descriptive cross-sectional study was conducted among 354 women selected by cluster sampling and random walk method. Data obtained was entered in Microsoft excel, coded and analyzed using the SPSS Version 23. From the findings, the knowledge of breast self-examination among the participants was low. Less than half of the respondents (47.5%) had ever heard about BSE as means of early detection of breast cancer and only 11.0% knew how to perform BSE. A majority (83.1%) had a positive attitude towards BSE practice. A majority (83.1%) believed that BSE is crucial in detecting breast cancer early and most (80.2%) believed early detection increases the chance of long-term survival. The most common barrier towards BSE was lack of awareness.

It's necessary to involve all stakeholders in designing educational programs at various levels and within the communities to create awareness about BSE and use Mass media to enhance BSE uptake. Policies for integrating BSE sensitization in other hospital services should be made. Further research should be conducted in urban areas for comparison with the findings and the effect of women's demographics like age, level of education and economic status on BSE practice.

Writing Socialization and Memory Retention – A Mixed-Methods Study

Enese Àgnes Daróczi, Kai Schmalow
University of Vienna, Vienna, Austria

Abstract

Digital devices, primarily computers, are becoming increasingly important for educational purposes. Therefore, it is crucial to investigate whether there are differences between writing by hand or by computer in terms of memory retention. Mueller and Oppenheimer (2015) have shown a distinction between the effect of handwriting and typing on remembrance and demonstrated that in comparison handwriting seemed superior. We want to replicate these findings and additionally inspect various subjective experiences related to handwriting and typing.

Our team devised a mixed methods design allowing us to combine a quantitative psychological test on remembrance with a subsequent qualitative guided interview. The psychological test aimed to replicate the findings of Mueller and Oppenheimer (2015), while the qualitative interview focused on subjective experiences. The test comprised two separate similarly structured measurements involving two texts. First, subjects took notes by hand, afterwards via keyboard. They then had the opportunity to additionally participate in the interview.

We successfully replicated the aforementioned findings: both the quantitative and qualitative data further undermined the superiority of socialization in handwriting. However, early training in the ten-finger-typing system appears to have a positive influence on memory retention and may have potential in rivaling handwritten notes.

Therefore, further research should be constructive. After all, this data may have practical implications for educational institutions, as timely training in the ten-finger typing system appears to be decisive for memorisation. Thus, our findings bear compelling connotations: If socialization in the ten-typing-system is capable of alleviating differences in memorisation, including it in education would be beneficial.

Linguistic Approaches to Regional Varieties: The Case of Canarian Spanish

Maria Yvonne Foncubierta Cabrera
Leeds Trinity University, Leeds, United Kingdom

Abstract

This paper looks at sociolinguistics, or the study of how language relates to society and more broadly to identity. This paper is a comparative analysis of two studies in sociolinguistics which pertain to speakers of Spanish in the Canary Islands. It is therefore looking specifically at the variety hereafter called 'Canarian Spanish'. This variety is of interest as it is my native variety and generally under researched in the literature.

I chose two different types of study as per the scope of the required assignment. One study looked at how a specific verb tense form had been lost in Canarian Spanish to make room for the standard Spanish form (Serrano, 1995). The second study analysed the attitudes of university students in the Canary Islands towards a number of varieties of Spanish, including their own (Hernandez Cabrera and Samper Hernandez, 2018). I was particularly interested in exploring how the attitudes of the speakers of Canarian Spanish affect the loss of specific non-prestigious variables.

The analysis showed that using Canarian Spanish variables is intrinsically linked to the attitudes that speakers hold. When the attached value of a regional variety is negative, it causes stigma, and it affects the representation of those speakers in the media and in the job market. However, more studies need to be conducted to draw clearer conclusions on how the Canarian Spanish variety is at risk of being progressively replaced by standard Spanish, and with that, the identity of speakers erased.

The Heart of a Movement: Conversations Between Activists Olive T. Dargan and Rose Pastor Stokes

Lauren Bollinger
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Abstract

American writers and Socialists Olive Dargan and Rose Pastor Stokes advocated for women's rights and fair labor practices in the early 20th century. Though their approaches to activism differed, they maintained a lifelong friendship based on unrelenting support for one another's aspirations, illustrating how a mutual passion for social change improved the lives of individuals in their vastly different communities. Research utilizing personal correspondence, newspaper articles, and published writing from the Olive T. Dargan Papers, 1900-1966, in the University of Kentucky Special Collection Research Center and the Rose Pastor Stokes Papers, 1900-1993, at Yale University will demonstrate how different approaches to activism impact the success of a movement, using their relationship as the framework. Dargan's approach relies on her connection to the natural world and the rural communities where she spent most of her life, notions that come to life in her fictional works highlighting feminist and socialist issues. Pastor, on the other hand, was at the forefront of New York City socialist movements, leading demonstrations and writing directly on feminist and labor issues. The comparison between the social justice work of these two prominent women is made even more significant by the persistence of political activism in the United States, now and doubtlessly for future generations. This project will focus on the difference between rural and urban activism of the 20th century, providing unique insight into the different ways social justice can be adopted to encompass the needs of different types of communities.

Uncertain Visitations from the Past, Ever-New Creations of Our Brain: The Question of Genre in Etel Adnan's In The Heart of the Heart of Another Country

Tasneem Yousef
Qatar University, Doha, Qatar

Abstract

Despite the recent memoir boom, the genre is self-limiting in scope, bound to the comfortable conventions of prose. Etel Adnan's remarkable *In the Heart of the Heart of Another Country* represents an attempt to expand that scope and invite "poetic intuition" (Bialosky) into the narrative of not only her own life, but of the (Arab) world across the 20th century and into the 21st century. This project explores the hybridity of genre within the text, and how exactly Adnan transmutes the expectations of memoir to achieve her purpose. I analyse the text's construction of time, geography, and narrative perspective through a postmodern lens while also relying on scholarship on autobiographical life writing, examining how the representation of these elements fits within the genre, and their effect. These elements become fluid and multiple rather than linear and discrete, closer to how they are experienced and remembered than to how they are often constructed in language. I conclude that these breaks within genre conventions help to usher in and create a space for less conventional narratives of self, that allow for a more comprehensive expression of identity and memory, outside of the event-based memoir that we are accustomed to. The project provides a novel look at postmodern transgressions within the genre of memoir and at the possibilities for autobiographical writing at large, giving an insight into a masterful example of the phenomenon and into the life and work of a monumental figure in Arab American literature.

WorldCUR 8G

WorldCUR152
Power

The Artistic Influences Between Mediterranean Cultures in the Middle Ages

Juan Manuel Milla Mercado
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Abstract

This project, which has been done with the help of a collaboration grant with the History of Art´s Department of University of Granada 2021-2022, is the result of research on the cultural confluence along the Mediterranean area during the Middle Ages. Past attempts have been made to address the history of Mediterranean culture; in order to find out how, beyond their political and religious differences, there was permanent and significant contact between East and West. Therefore, this work does not focus on a single geographical context, but is characterized by offering a multiple vision of the interconnections between cultures.

Basically, this project has contributed to further banish the idea that the Middle Ages was a dark and poor time on a cultural level; since it has aspired to reflect an infinity of contacts and exchanges that took place in the Mediterranean. In fact, one of the main achievements has been being able to appreciate how there was such a constant flow of aesthetic ideas that would give rise to cultural hybridizations.

Finally, from this project, the defense of cultural history is pursued as a way of encompassing the study of different humanistic disciplines, since it demostrates a broad dimension which transcends the limits of each one. In addition, it is intended to continue addressing research in the Medieval Mediterranean from this transcultural perspective to explain not only the past, but also the complex cultural present.

The Reality of Seventeenth Century Marriage in Upper Class England

Amelia Doherty
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Abstract

Stereotypes around marital relations in pre-modernity have been widespread, and have been to the detriment of the people we discuss. In reality, familial relations, including between spouses, were individualised and complex, and I chose to research this topic to bring these individuals to life, humanising historical processes and removing clinical outlooks. By doing so, I established a situation where people had more free will than originally believed in popular historical culture, and aim to raise awareness of the complexity of the early modern family, as it can bring light to political, economic and religious changes in England. To learn more about this, I used letters, diaries, satires, and even rings and other physical items to establish interactions between husband and wife in the 17th century. This was then supported and challenged by secondary literature, as well as homilies and other religious texts. This allowed me to establish the historiography of marriage and compare to modern expectations of early modern marriage. My findings are that there was more choice and a greater emotional complexity of marital relations than originally anticipated, providing us with insight into how courtship among nobility was as much personal as it was political. This helped establish that women in particular had a greater reach into controlling their own autonomy. This research could be taken further by discovering how, or whether this even is, transferable to the working class population in the same period, and where, when, why and how this changed across time and space.

Urban Agriculture in the UK: A Review

Hannah Corsini
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Abstract

As climate change and food insecurity are two of the most predominant issues facing our planet, it is important to look at the context in which we produce our food and make efforts to revolutionise these production systems. This paper examines urban agriculture in its aims to mitigate the environmental harms of traditional agriculture and as a burgeoning social movement. The objectives of this study were to fill some of the gaps in knowledge about the place of urban agriculture in the wider agricultural production system; to reflect on the strengths and weaknesses of existing schemes; and to make predictions about the future of urban farming in the UK. This study's methodology has two components: firstly, the review of the existing knowledge on urban farming, and secondly, interviews of urban farmers in cities such as London, Bristol and Leeds.

In conducting interviews with urban producers and traditional farmers, along with amalgamating existing secondary research, I find that urban agriculture has applications in improving food security in food deserts, in decentralising food production systems and thereby reducing transportation emissions, and in boosting communities' health and well-being. Concerns raised are the difficulties in funding large-scale urban farming, resulting in trade-offs made between sustainability and efficiency. Many of the issues faced by the UK urban farming movement relate to its existence under a neoliberal environment and comparisons are drawn to the successes of urban farming in socialist Cuba. This line of research holds importance for UK policy construction and food-based grassroots activism.

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A Community-Focused Analysis of Heat Mitigation Techniques in Hunting Park, Philadelphia

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Abstract

Along with rising temperatures, the number of days over 90 degrees is rising in Philadelphia, Pennsylvania. Historically, Philadelphia averaged 21 days at 90 degrees or higher annually; however, July 2020 alone recorded 21 days in the nineties. Projections show Philadelphia will double the number of 90-degree days by 2030. Due to a history of disinvestment and fewer green spaces, the increasing heat unequally impacts low-income communities and communities of color. The Hunting Park neighborhood of mostly Hispanic and Black residents records surface temperatures more than 22 degrees hotter than greener areas in the city. The increased heat leads to an increase in health risks in the neighborhood. Drexel University, the Philadelphia Office of Sustainability, and the non-profit Esperanza collaborated to install cooling structures of umbrellas and planter boxes in Hunting Park to combat heat. This study initiates the analysis to examine the effectiveness of the cooling structures. Comparisons of temperatures between neighborhood blocks in Hunting Park, analyzed the capability of the cooling structures to reduce heat by assessing the temperature difference between neighborhood blocks with and without cooling structures. With help from Civic Scientists collecting temperature data with mobile sensors, the localization of urban heat islands was determined to help assess areas within Hunting Park with an increase in heat disparity. A methodology to determine hyper local urban heat islands to assess heat disparities within neighborhoods with more precision was developed. Implementations of cooling structures will be guided by the findings to prioritize areas with the greatest increased heat exposure.

A Comparative Study of Photon Radiation Shielding Properties of Different Glass Types for use in Medical Facilities

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Abstract

The use of X-ray generating devices, and 60Co and 137Cs gamma-ray sources for medical diagnostic and therapeutic applications have increased globally. However, exposure to radiations from these sources can cause detrimental effects on biological tissues. In order to optimize radiation safety, effective radiation shields are required. This study used the photon shielding and dosimetry (PSD) software to simulate and compare the photon shielding properties of phosphate, bismuthate, tellurite, silicate, and borate glasses for use in medical facilities. The software generated data on shielding parameters in the energy range (15 – 15000 keV) using 60Co source. The parameters investigated included mass attenuation coefficient (MAC), linear attenuation coefficient (LAC), half-value layer (HVL), mean free path (MFP), and effective atomic number (Zeff).

The results showed that bismuthate glass had the highest MAC and LAC values. This is followed (in decreasing order) by tellurite, silicate, phosphate and borate glasses respectively. The results also showed that bismuthate glass had the least HVL and MFP values. This is followed (in increasing order) by tellurite, silicate, phosphate and borate glasses. Since materials with high MAC and LAC, and low HVL and MFP values have higher abilities to attenuate photons, bismuthate glasses are found to be better shielding materials compared to the rest of glasses examined in this study. On the other hand, borate glasses presented the least shielding potential compared to phosphate, silicate and tellurite glasses.

Keywords
Attenuation, Shielding, Radiation.

A Selectively Permeable Membrane for Urea Removal in a Portable Dialysis System

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Abstract

Chronic kidney disease is a leading cause of mortality, affecting >800M of people worldwide. Of these individuals, an estimated 5-10M have kidney failure and require treatment for survival. Current treatments for kidney failure are limited to kidney transplantation and dialysis. Despite being the most widespread treatment, hemodialysis requires that patients visit clinics multiple times a week for 3-5h per session, which is restrictive and expensive. Portable dialysis machines are challenging to develop because of the need for 200L of dialysate per session. Thus, we have designed a novel selectively permeable membrane that can be joined with a photooxidation system to continuously regenerate dialysate. By introducing reducing and dispersing agents, we created size-specific macrovoids in the membrane that separated urea and glucose in solution up to a ratio of 30. The membrane is capable of filtering 14 g of urea in 7-9 h, thus mimicking the continuous nature and high efficiency of natural kidney function. Our designed membrane can be integrated with preexisting urea electro-decomposition systems and form a dialysate-regenerating component for a miniaturized dialysis system. Such a device will grant dialysis patients greater autonomy, decrease costs, and reduce hospital staffing burden. Future research includes optimization for higher surface area and more efficient manufacturing, as well as elucidating the isolated effects of each membrane synthesis parameter.

Design of a Tool for the Identification and Self-Repair of Low-Cost Exomodular Transtibial Prostheses for Amputees in the Colombian Agricultural Sector.

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Abstract

In Colombia, many below-knee amputees, located in rural areas of the country, use low-cost Jaipur foot prostheses due to lack of economic resources. For the same reason and due to geographical impediments, it is difficult for them to travel to the city for maintenance, repair or replacement of their prostheses. Instead, amputees repair their prostheses in any way they can, often causing health problems. To repair the prostheses properly, it is necessary to know the most common failures and how to repair them. Some studies have characterized failures; however, the results are not generalizable to Latin American rural contexts and the knowledge is not easily understood by prosthesis users. This research aims to design a tool that allows the amputee to identify and repair the most common failures. To design the tool, failures were identified through a database search and interviews were conducted with 25 amputees with Jaipur prostheses from the rural sector, 3 prosthetist technicians and 1 physiatrist. The requirements were then listed, and using brainstorming technique 3 concepts were developed and subsequently evaluated with different users through interviews. The main failures found were misalignment with the residual limb, misalignment of the ankle screws and cracks in the foot and soft socket. On the other hand, it was found that this population learns visually and practically. The design process carried out in this research could serve as a basis for designing similar tools that are useful for users of other types of prostheses, located in other geographical contexts.

Escape Responses in Motor Defective Worms as a Model for Studying Sensory-Motor Disorders

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Abstract

The nervous system is composed of functions, including sensory and motor systems necessary for processing environmental stimuli. The interaction between the systems allows us to filter important environmental cues and achieve everyday behaviors, including coordination, movement, nociception, and awareness. Thus, defects in motor outputs are associated with debilitating neurological disorders, including ALS, Myasthenia gravis, Parkinson's disease, and Huntington's disease. These diseases frequently disrupt the transmission of the neurotransmitter acetylcholine resulting in motor output dysfunction (Tata *et al.*, 2014). Though these mechanisms are highly critical, the processes are not fully understood. Therefore, insight into these disrupted motor systems may provide future avenues to manipulate and restore these systems.

We investigate this paradigm by observing behavior in the worm *C. elegans* when receiving cues from an attractive food patch, followed by a repulsive odor, 2-nonanone. Healthy wildtype worms with normal acetylcholine signaling decide to initiate a food-leaving behavior. We found that mutant worms can receive the same sensory input, 2-nonanone, to trigger a leaving response despite lacking significant amounts of acetylcholine (encoded by *cha-1*), which is required for fundamental movement and coordinated locomotion. This suggests that an escape response is sensory input dependent and drives decision-making despite having severely defective motor outputs. This study demonstrates a potential avenue to investigate sensory circuits by manipulating odors or other stimuli to trigger a bypass pathway independent of acetylcholine signals to restore behavior. We will continue this investigation by manipulating the escape response pathway by removing and activating various neurotransmitters that may regulate this behavior.

Individual Granulin Domains Cause Differing Effects on Cathepsin D Activity

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Abstract

Frontotemporal dementia (FTD) is a leading cause of early-onset dementia and is pathologically characterized by degeneration of the frontal and temporal lobes of the brain. While many cases of FTD are sporadic, several genetic causes have been identified. One genetic cause is mutations that affect progranulin, a protein that functions primarily within the lysosome. It is composed of 7.5 unique granulin domains into which it is cleaved in the lysosome. Despite these granulins acting as the functional units of progranulin, their individual roles remain unknown.

This project aims to determine if any individual granulin is sufficient to recapitulate progranulin's effects on lysosomal or cellular function. One effect of increased progranulin levels in rat neurons is reduced cathepsin D activity measured in lysates, making it a useful measure to compare granulins and progranulin. Neurons were transduced with different granulin fragments along with progranulin and a control protein. Assays were then utilized to measure the cathepsin D activity of the neuron lysates. The granulins had differing effects on cathepsin D; some upregulated activity while others decreased activity with the effect's magnitude varying between granulins. Multi-granulin fragments, however, consistently caused a downward trend of cathepsin D activity. These results support that the granulins have differing functions and bring us closer to understanding their roles and how progranulin deficiency causes FTD, knowledge that is necessary to produce treatments. In the future, we hope to determine the role of granulins in other progranulin-mediated cellular processes, including resistance to neuronal death induced by over-excitation.

Probing the Genetic Diversity of Phages Infecting Arthrobacter globiformis

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Abstract

Bacteriophages, also known as phages, are viruses that infect bacteria. There are estimated to be 10^31 phages worldwide. Phages are vectors of horizontal gene transfer, sources of diagnostic and genetic tools, and novel therapeutic agents. To date, 907 phages infecting Arthrobacter, a genus of bacteria commonly found in soil, have been isolated. Of the 254 phages infecting Arthrobacter globiformis, only 83 have been sequenced. The purpose of this study was to sequence and annotate the genomes of novel A. globiformis phages and compare them to other A. globiformis phages. Eight novel phages infecting A. globiformis were discovered and isolated. Two phages, Jinkies and Bumble, were sent for full genome sequencing. Using manual annotation and auto-annotation programs, their genomes were annotated. Jinkies was classified as a singleton and Bumble as a cluster FH virus. Furthermore, it was found that most A. globiformis phages examined share few proteins that perform a similar function, indicating a high degree of genetic diversity among A. globiformis phages. It was also determined that the architecture of A. globiformis phages is not conserved in the right arm (the region for metabolism and regulation). This study expands the library of Arthrobacter phages available for structural and genomic studies and presents new opportunities to study their life cycles and applications. In addition, A. globiformis can cause irritation and allergic reactions in humans; thus, such research may contribute to the development of novel therapeutic agents. Future investigations will send all eight isolated A. globiformis phages for full genome sequencing.

The relationship of of mindfulness-based apps, and emotional competence and anxiety of the primary school students: the moderator of the parental practices of emotion coaching

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Abstract

Children's mental well-being is adversely affected amidst COVID pandemic. Past researches show mindfulness can ease the test anxiety and help with the emotional regulation of female high school students. The components of mindfulness, namely observing, describing, action with awareness, and non-judgmental acceptance are associated with the detection of the body sensation and less distress (Shahidi et al., 2017). However, research on its effectiveness on children is still in its infancy. Meanwhile, parental emotion coaching plays a role in children's mental health that the practice of positive parenting should be promulgated as suggested in the Hong Kong Mental Health Review Report (HKSAR, 2017). In light of this, 50 pairs of participants in the form of one parent and one child dyad are recruited to test the effectiveness of mindfulness on their emotional competence through using a mindfulness-based mobile app called 'Mindful Flourishing', which includes basic mindfulness exercises along with voice guidance and emotion diary for record. It is expected the usage of the mindfulness-based app is positively correlated with the emotional competence and negatively correlated with anxiety. With reference to the Mental Health Review Report, mental health promotion will be provided as Tier 1 services as universal prevention, early detection and intervention. With the advancement of mobile technology, it is anticipated that the practice of mindfulness can become prevalent and conveniently adopted by teachers and parents as suggested by the three-tier stepped care model to prevent children from developing emotional problems.

Keywords: mindfulness, school children, mobile app, mental health

Down Syndrome and Mind-Mindedness

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Abstract

Theory of mind (ToM) is a precursor to empathy development, and it is known that parental use of mind minded (MM) statements (i.e., comments using internal state terms to speculate on what a child is thinking, experiencing, etc.) predicts ToM skills. This is crucial especially for Down syndrome (DS), a developmental disorder (DD) associated with weaknesses in ToM but relative strengths in empathy skills. This study sought to examine differences in parental use of MM statements among 14 children with DS and 14 typically developing (TD) peers with similar mental ability level. As it has been suggested that individuals with DS may be subconsciously treated as developmentally younger by parents and caretakers due to their DS status, it was hypothesized that parents of those with DS may make fewer MM statements than parents of TD youth which would then increase the differences in ToM skill seen in older children with DS compared to children with TD. To test this, videos of parent-child interactions were transcribed and coded for parental use of MM statements using Meins and Ferryhough's Mind-Mindedness Coding Manual. MM statements were then further categorized as being related to desires, cognitions, or emotions. Contrary to expectations, groups did not differ in the use of MM statements about cognitions and desires, but parents of youth with DS made more emotion-related MM statements than parents of TD youth. Future research should seek to replicate these findings with a larger sample and include another DD sample (e.g., autism).

Design of selective non-toxic pyrrolo [1,2-a] quinoxalines as therapeutic agents for the treatment of Alzheimer's Disease

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Abstract

Every four seconds a new patient is diagnosed with Alzheimer's Disease (AD) with 7.7 million new cases reported annually worldwide. AD is a progressive neurodegenerative form of dementia characterised by cognition decline. The leading cause of AD is the build-up of amyloid and tau proteins among brain cells, which prevents intercellular communication and inevitably influences memory loss.

Alarmingly, cases are predicted to increase up to 145 million by 2050 worldwide. As a growing epidemic, AD imposes a financial burden globally with annual costs above £818 billion. Scientists have tried to find a cure since its discovery in 1906. Treatments either target amyloid proteins or temporarily slow AD progression.

AD is manifested by abnormally low levels of acetylcholine (ACh), a neurotransmitter used for intercellular communication. Acetylcholinesterase (AChE) is an enzyme that breaks down ACh; thus, inhibiting its activity can prevent ACh reduction. Our project aimed to synthesise new pyrrolo[1,2-a]quinoxaline analogues as potential AChE inhibitors. This project presents a novel approach using thiols as an alternative to tin, which is toxic and, based on the literature, is the most preferred method. The compounds were assayed, with some showing low toxicity and excellent selectivity towards AChE.

According to recent studies, sulfaquinoxaline, which is toxic, can eliminate amyloid proteins immensely. Therefore, less toxic analogues are alternatively suggested, including the pyrrolo[1,2-a]quinoxalines series we designed, which share a common scaffold with sulfaquinoxaline. Consequently, further steps involve testing our compounds to determine if they can reduce amyloid plaque accumulation.

Does nutrient intake affect susceptibility to Covid-19 and its severity among the adult population in the UAE?

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Abstract

There is conflicting evidence on the roles of Selenium, Zinc, Vitamin D, and Vitamin C intake from food in relation to Covid-19 outcome. Although they are known to play a role in the immune system, their specific impact on COVID-19 susceptibility and severity remains unclear. Therefore, this study aimed to investigate the potential effects of these nutrients on COVID-19 outcomes in the United Arab Emirates. In this cross-sectional study, a total of 205 participants, comprising 146 females and 59 males, completed an online questionnaire that included questions pertaining to sun exposure, dietary intake, medical history, and Covid-19 symptoms and hospitalization. A modified WHO clinical progression scale was used to determine the severity of Covid-19, and the Chi-square test was employed to analyze the correlation between variables at ($p = 0.01$) significance. The study revealed that sun exposure was very significantly associated with a lower risk of contracting Covid-19 ($p < 0.001$), while self-reported Zinc deficiency was very significantly correlated with an increased risk of contracting Covid-19 ($p < 0.001$). However, there was no significant association between the intake of Vitamin D, Vitamin C, Selenium, and Zinc from food and Covid-19 susceptibility and severity. The tendency of taking Vitamin D supplements was associated with the presence of infection of COVID-19. These findings highlight the potential roles of sun exposure and Zinc status in Covid-19 infection. Further research is needed to explore the relationship between essential nutrient intake and Covid-19 susceptibility and severity, with larger sample sizes and more diverse populations.

Investigating brain circuits responsible for attraction and repulsion to smells

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Abstract

By using olfaction, humans can react to an array of odors and, through processing these odors within multiple levels of the brain, regulate behavior. How an odorant can produce distinct behavioral responses depending on the odor concentration and how our brain generates flexibility in our behavior to an odor is still not understood.

We use the model organism, *Caenorhabditis elegans*, an invertebrate worm, to provide a deeper understanding of behavioral responses to the chemical hexyl acetate. Hexyl acetate at high concentrations is repulsive to healthy wild type worms, while low concentrations are attractive. Taking advantage of this behavioral experiment, we have begun to investigate the brain circuits and genes that regulate this odor guided behavior toward or away from low and high concentrations of hexyl acetate.

Using mutant analysis, a method that compares specific genetic mutants against the healthy wild type worm, we have identified genes vital for the function of important neurotransmitter signals within the brain, including neuropeptides and glutamate, as being essential for controlling attraction and repulsion at distinct concentrations of hexyl acetate. Future work will characterize the neural mechanisms and distinct sensory circuits that regulate this olfactory behavior depending on the odorant's concentration. This work will provide key insight into the mechanisms of how sensory systems in the human brain can provide flexibility to distinct intensities of the same sensory cue and understanding how various neurological disorders, including Autism Spectrum Disorder, show significant differences in sensitivity and specificity to different sensory cues.

Cardiomyocyte-specific deletion of GSK-3β promotes ventricular remodeling and cardiac dysfunction.

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Abstract

Heart failure (HF) is a complex and major public health problem, and costs the U.S. $31 billion annually. Therefore, we wanted to investigate novel mechanisms that can lead to the identification of promising therapeutic targets to combat HF. Glycogen synthase kinase-3 (GSK-3) is a family of ubiquitously expressed serine-threonine kinases that consists of GSK-3α and GSK-3β isoforms. GSK-3α/β is critical to regulating many biological processes, including cardiac homeostasis. However, to further examine the role of cardiomyocytes GSK-3β (CM- GSK-3β) in cardiac homeostasis, we employed α-MHC promoter-driven, inducible CM-GSK-3β knockout (KO). At 10 weeks of age, mice were placed on a tamoxifen (TAM) chow diet for 15 days, followed by regular chow for an additional 30 days. After TAM protocol, echocardiographic analysis suggested that CM-GSK-3β KO mice developed severe systolic dysfunction and dilative cardiac remodeling. To further confirm the role of CM-GSK-3β in processes contributing to cardiac remodeling, we harvested the hearts at 45 days post-TAM diet and performed flow cytometric analysis. Consistent with the increased fibrosis, KO hearts demonstrated an increase in frequency of fibroblasts. Furthermore, increased frequency of infiltrated CD45+ leukocytes and myeloid cells such as monocytes, macrophages, neutrophils, and dendritic cells in KOs indicated the potential role of CM-GSK-3β and immune cells cross-talk. Our extensive flow cytometry analysis suggested that CM-GSK-3β regulates pro-inflammatory subsets of immune cells in the heart. Overall, our finding reveals a critical role of CM-GSK-3β in maintaining cardiac homeostasis, and the mechanism behind this needs to be further investigated.

Examining Racial, Ethnic, and Sex Differences as Predictors of Cannabis Use Disorder Treatment Retention.

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Abstract

Treatment trials for cannabis use disorder (CUD) lack racial, ethnic, and sex representation. This limits generalizability and reduces access to effective therapies for underrepresented groups. While these differences have been explored for treatment outcomes, no literature to date has explored if underrepresented groups are being retained in research at the same rates as their non-minority counterparts. The goal of this secondary analysis is to identify racial, ethnic, and sex differences in retention in CUD treatment trials. This analysis used a combined data set of seven pharmacotherapy treatment trials for CUD conducted at MUSC (five completed, two enrolling; N=948). The final dataset is 30% female; 27% African American; 11% Hispanic/Latinx. Mixed effects logistic regression models were utilized to assess for differences in study completion across minority groups. In adjusted models, Non-Hispanic White participants were more likely to complete treatment than all others combined (66% vs. 59%; OR=1.4 (1.0, 1.9); p=0.04). This difference is primarily driven by Non-Hispanic White females (73% v. 58%; OR=2.0 (1.2, 3.4); p=0.01). Non-Hispanic Black/African American participants had similar odds in treatment completion compared to other minority races (p=ns). Although Non-Hispanic White females had greater odds of completion than minority females, there were no overall differences between males and females (62% vs. 66%; OR=0.8 (0.6, 1.1); p=0.17). Results suggest that sex differences do not independently contribute to study retention, but that racial and ethnic minorities have lower retention rates- showing that one of the barriers to diversity in research is retention, not just recruitment.

What is the Most Effective Method of Reducing DOMS After Intense Exercise?

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Abstract

Most people have suffered from Delayed Onset Muscle Soreness (DOMS) which can be painful and debilitating to the sufferer. Symptoms of DOMS vary from slight discomfort and stiffness in skeletal muscle to severe pain, muscular weakness, and fatigue. Though symptoms usually only last 2 - 4 days they still affect an individual's ability to train or compete due to both muscle pain, and a reduced range of motion. This study aims to establish whether massage, cryotherapy, or thermotherapy was the most effective treatment modality for reducing DOMS after intense exercise.

A clinical trial was conducted involving 9, (4 male, 5 female) fit & healthy participants. Each was randomly assigned to one treatment group: massage, cryotherapy, or thermotherapy. After a brief warm-up they completed an intense exercise session which was designed to promote DOMS in their legs, after which they received their assigned treatment. Each participant VAS pain scale results for DOMS in their lower limbs was recorded at 24, 48 and 72 hours after their treatment was completed.

The results indicated that although all the treatments were able to reduce DOMS symptoms, massage therapy appeared to be the most effective method, with thermotherapy proving almost as efficient, cold treatment however, was only efficient as pain relief for the initial 24 hours before losing its effectiveness.

Massage and thermotherapy can both be recommended as valid treatments; however further investigation is required to ascertain whether variations in treatment lengths or timings will have any effect on these findings.

What shortcuts do machines take when learning a new task? And how much insight do these shortcuts provide to gaining a deeper understanding of how a machine reasons?

Ryan Samarakoon
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Abstract

Large language models are neural networks that have learned the structure of a language. Some examples of LLMs are virtual mobile assistants, autocomplete, content writers/generator, chatbots and automated translation services. Despite these models being engineered by researchers, they resemble a black box i.e. it is often not possible to interpret a model's reasoning. My aim is to investigate the generalisability of specific shortcuts these models employ to see if they are similarly exploited outside of purely image recognition tasks. Polysemanticity is the phenomenon in image recognition models whereby unrelated and distinct concepts become represented by a single neuron within the network rather than one neuron matching cleanly to a single entity. Following a guide to building the popular language model GPT-2 from scratch, I aim to isolate a specific portion of the neural network for inspection and show the same phenomenon can also occur within language models. My findings would ideally show that polysemanticity is not isolated to image recognition but rather a broader attribute of neural networks. If so, it would represent a hurdle to the overall interpretability of machine learning models. Future research may consider which steps to take to diminish polysemanticity to improve interpretability and transparency of models, to what extent polysemanticity can be reduced efficiently or whether the phenomenon has trade-offs with interpretability that are worth considering. Practically, the research would aid in the regulation of deployment of these learning systems in sensitive contexts (healthcare, education, defence etc.) where transparency and scrutability are crucial.

Audit of brain imaging in patients with transient ischaemic attack using updated NICE guidance

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Abstract

Transient ischaemic attacks (TIAs), or "mini strokes", are more likely to affect those aged over 55, smokers, overweight individuals, and those with high blood pressure. TIAs are caused by a temporary blockage in blood supply to a portion of the brain, resulting in symptoms such as limb weakness, slurred speech, and headaches. Since TIAs are a major risk factor for stroke, further research is needed to improve patient outcomes. NICE (National Institute for Health and Care Excellence) guidance (NG128) states that same day MRI (magnetic resonance imaging) brain should be offered instead of CT (computerised tomography) scan following TIA clinic assessment. We compared image modality choice and timing for patients with suspected TIA referred from clinic. Data was extracted from the hospital database and statistical analysis was performed. 262 patients from the Royal Stoke University Hospital between June-December 2021 were included. Only 23% of patients received a same day MRI, with the remainder receiving a CT scan only. The results indicate that although imaging is done timely, the choice of imaging for patients with suspected TIAs does not meet current NICE guidance. With TIAs being a major risk factor for stroke, the delay in reporting reduces prompt initiation of treatment and so this research highlights the need for improvement in imaging modality. Suggested future work includes developing a TIA imaging standard operating procedure.

Heavy Metal Exposure Induces Senescence as a Mechanism of Dopaminergic Neurodegeneration in Parkinson's Disease

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Abstract

Parkinson's Disease (PD) is the most common movement disorder, affecting over 10 million people worldwide. PD is marked by the loss of dopaminergic neurons from genetic and environmental triggers, but 90% of diagnoses do not have a known cause. However, heavy metal exposure has been epidemiologically implicated with PD with occupational risk. Metals from industry runoff leach into drinking water, representing an ongoing environmental risk factor for many populations. Despite this well-known connection, the mechanisms behind metal-induced neurodegeneration remain unclear.

Work from our lab suggests that a common feature of toxicant exposure in neurons is the induction of cellular senescence, which accelerates aging, promotes inflammation, and impairs protein degradation. We hypothesized that environmental exposure to heavy metals induces senescence which has negative downstream effects. To test this in a cell model, we treated N27A rat and SH-SY5Y human dopaminergic neurons with 5µM $MnCl_2$ and 2.5µM $PbNO_3$ for 24 hours and utilized immunofluorescence and western blotting to assess protein expressions.

In the metal treated cells, we observed increased p21, which is a senescence protein ($p<0.0001$). We also observed impaired autophagy, which is the pathway of protein degradation and recycling that promotes cell health, with decreased LAMP1, a lysosomal protein ($p<0.0001$). Impaired autophagy causes protein accumulation leading to neurodegeneration and increased PD risk.

In future experiments, we will pharmacologically inhibit senescence via p21 siRNA to potentially reverse adverse effects caused by metals. These results will guide brain tissue experiments to further evaluate the impact of environmental toxicant exposure on PD risk.

Annexin A2 Expression in Prostate Cancer Cells.

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Abstract

Metastasis is a major cause of morbidity in prostate cancer patients; the primary mortality is metastasis of bone tissue. Despite substantial efforts to understand prostate cancer metastasis, the mechanisms involved in preparing the metastatic niche for colonizing the prostate cancer cells are still unknown. Therefore, there is an urgency to identify essential regulators of bone metastasis in prostate cancer for therapeutic targets. Annexin A2 is a calcium-dependent phospholipid-binding protein over expressed in prostate cancer's poorly differentiated high-grade adenocarcinomas. Phosphorylation of AnxA2 at tyrosine-23 creates an important event for the localization of AnxA2 to the cell surface. It provides a binding site for tissue plasminogen activators at the cell surface and converts plasminogen into plasmin, which plays an essential role in the invasion and metastasis of cancer. However, the cell surface expression of AnxA2 in prostate cancer is unknown. Therefore, in the present study, we demonstrated the cell surface expression of AnxA2 in prostate cancer cells to delineate the mechanism of bone metastasis. Prostate cancer cell lines, PC3, and DU145 were grown. Immunoblotting was used to detect the expression of pAnxA2-Y23 and AnxA2 proteins in cells. Our results demonstrated that the expression of pAnxA2-Y23 is very high in prostate cancer cells (PC3 and DU145 cells) compared to normal prostate epithelial cells. However, the expression of total AnxA2 in both prostate normal and cancer cell lines is comparable. Results suggest that the cell surface expression of AnxA2 is high in prostate cancer cells due to increased phosphorylation of AnxA2 at tyrosine 23.

Investigating mechanisms, natural variation and sex differences in response to serotonin

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Abstract

Mood disorders, such as depression, affect over 40 million people in the US. Despite the use of an array of therapeutics for mood disorders, current understanding of the mechanisms underlying these processes and the specific targets of each therapy remains unclear. This results in variable success of the existing treatments, along with very little specificity toward an individual. More recently, there has been a deeper focus on understanding serotonin targets involved in mood and mood disorders. We use the nematode, *Caenorhabditis elegans*, to investigate the behavioral effects of serotonin and the neural mechanisms and intracellular pathways that mediate serotonin's effect on the brain. Our present study specifically investigates, 1) the novel targets of serotonin, and 2) how serotonin-dependent behaviors may vary across different species within the *Caenorhabditis* genus. We have found that known serotonin effects on worm behaviors including paralysis and stimulated egg laying require specific brain signals, and were significantly different across worm species that originate from distinct geographical locations. This implies the possibility of characterizing intracellular pathways and the factors that contribute to the differing behaviors, to better understand the extent of pharmacological drug specificity toward an individual suffering from mood disorders. We intend to continue the discovery of serotonin targets, and how these effects differ across nematodes, to assess the fundamental variation in alternate behavioral responses to both serotonin and serotonin targeting therapeutics, which continues to be highly important in understanding human neuropsychiatric disease, like depression, addiction, and bipolar disorder.

Examine the Effectiveness of Applying Person-Centered Expressive Art in Improving the Mental Well-being of Older Adults in Hong Kong Neighbourhood Elderly Center

Lui Wan In
City University of Hong Kong, Kowloon, Hong Kong

Abstract

The increasing elderly population is a global phenomenon, and Hong Kong is no exception. During the pandemic, the deterioration in psychological well-being is prevalent among the elder in Hong Kong because of disruption to routine follow-up for chronic health conditions, fear of infection, and worries about the community's health. Creative art is a means of encouraging self-expression through a non-verbal form. This study aims to analyze the effectiveness of creative art integrated with the person-centered approach for the elder in a group work setting. In order to examine the effectiveness, six twice-weekly sessions mutual-aid groups related to artmaking activities were held, targeting 70-year-old to 79-year-old elderlies in Yau On Lutheran Centre for the Elderly. Questions from DASS-21, the mood temperature test, and self-rated self-rated health indicate their level of stress and coronavirus anxiety. Compared with the pre-group and post-group data, the main result is that art intervention can provide sources of happiness and reduce anxiety and Stress. The average sources of happiness were significantly increased by 2.661. In addition, the average score for self-rated health was increased by 0.5586. Since the Mask-wearing requirement was to be lifted during the group process, the sources of Stress were increased because of the health concerns. The data might imply that creative art intervention can create a sense of happiness to cope with stressful events. The findings are essential for the future development of elderly services. This kind of non-traditional group activity can be promoted to become a regular service in the elderly center.

PosterExhibition011
Community

Consumers' preferences and willingness to pay to avoid auto-renewal subscriptions

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Abstract

Auto-renewal contracts (ARCs) are widely used today, especially in developed economies, because of their convenience to traders and consumers. Nevertheless, whether or not ARCs are fair to consumers has been scrutinised recently. The scope of ARCs' problems makes policy intervention urgent. However, it is unclear how consumers value the trade-offs in switching from one alternative ARC to another. Thus, we contribute to the literature by analysing consumers' preferences for ARCs. We estimate respondents' WTP to avoid unwanted ARCs using contingent valuation (CV) and quantify the trade-offs of alternative ARCs using a discrete choice experiment (DCE). For example, on average, respondents have lost £33.74 to unwanted auto-renewal subscriptions; thus, they are willing to pay £6.52 on top of the upfront cost to hedge against the risk of losing more money to auto-renewal. We further find that consumers prefer to receive reminders about the renewal date nearer the date. Similarly, people prefer that traders cancel inactive auto-renewal subscriptions within a shorter period of inactivity. Furthermore, consumers favour contracts that allow them to opt-out anytime, including before the end of the minimum contract period, over those without this option. Moreover, they value the choice of entering into a contract without an auto-renewal or a fixed commitment period higher than other attributes. This study would contribute to consumer rights and trading policy reforms.

Evaluating Web News Credibility

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Abstract

The advent of the Internet era provides a convenient way for the public to access data and analyse information. However, the speed with which information is delivered has its drawbacks. Every aspect of people's lives and society is filled with false news and information. The reputation and confidence of the parties, readers, and even the entire society will suffer greatly from inaccurate or fraudulent news, so it is crucial to evaluate the reliability of web news.

The research aims to evaluate the credibility of the news based on the number of logical fallacies, citations, non-objective personal punctuations, and grammatical errors as four indexes of measurement of the accuracy, authoritativeness, objectivity and technicality of news. I will use the news and comments from 'Science Feedback' as training data to build the model and use the random forest classifier in Mathematica to pass the index of the other articles and predict their score.

The model built in the research lies in developing a set of indicators that require no human intervention to measure the credibility of highly complex news stories, thus allowing publishers, social media platforms and the public to efficiently and accurately understand whether a story is credible.

The research provides initial criteria for readers to identify credible web news, and other indicators can be integrated to make the evaluation more accurate. If the research object is extended to other kinds of news besides scientific news, the application scope of the model can be broader.

Investigation of finger-rock interactions and the effect of friction modifiers in rock climbing

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Abstract

Rock climbing is becoming an increasingly popular sport with climbers around the world using chalk with the belief that it improves friction between the hands and contacting rock surface.

Some studies have demonstrated a negative correlation for the effect of chalk on skin friction coefficients while others have found a positive correlation, resulting in an inconclusive relationship between chalk and skin friction. In addition, research has been undertaken on limited types of rock surfaces. This study aims to fill these knowledge gaps and inform design of future climbing friction modifiers.

This investigation was conducted by applying normal and tangential loads to a finger-rock interaction mounted on top of a force measuring plate. Data of the normal and tangential force was collected and processed to obtain the friction coefficient. The experiment was repeated in dry and 'wet' (simulating sweaty) conditions across three loads and four types of rock.

Preliminary findings indicate that powdered chalk increased the friction coefficient for the granite, dry sandstone and limestone. For a wet finger on sandstone and limestone, the effect of chalk was negligible whereas on carboniferous limestone, powdered chalk had a negative effect on the friction coefficient. These results suggest that depending on the rock chemistry and moisture conditions, climbers may not need to apply chalk for optimal climbing performance.

Further research is needed to understand the friction mechanisms at play between fingerpads and rock surfaces. Research could also be done into the behaviour of powdered chalk under load.

Specific Work Organization Factors and their Relationships to Surgical Resident Fatigue

Katherine Redden, Benjamin McManus
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Abstract

Fatigue is a multidimensional construct encompassing physical and mental exhaustion and may have many consequences. Workers in certain fields may be at risk for negative outcomes associated with fatigue. Surgical residents specifically are at risk due to their training requirements. The literature demonstrates that job characteristics influence fatigue, but specific work organization factors remain unexamined in this population. The purpose of this work is to understand how work organization factors beyond time on duty affect daily fatigue. For this project, eleven surgical residents (Mean age = 28.89 years) were recruited from residency programs at a large teaching hospital in the southeastern United States. Residents reported daily work organization factors, routineness (how “textbook”), ambiguity (ethical, scheduling , instructional, “gray” area), and fatigue measured by the Daily Fatigue Impact Scale for approximately a week. Residents also wore activity-tracking devices. A linear mixed regression indicated longer time in surgery, higher ambiguity and being on 24-hour call were significantly associated with higher daily fatigue. Increased years in residency and greater percentage of time lying down were associated with lower daily fatigue. Interventions regarding resident fatigue are commonly discussed primarily in the form of duty hour limit recommendations. These findings suggest considerations such as daily work experiences are also needed to address fatigue. This project’s findings support further research into work organization factors and interrelationships among these factors and fatigue. Further research and into workplace interventions designed to reduce fatigue should integrate work factors such as ambiguity issues, time in surgery, and types of call.

The Effects of Pop Culture in marketing: Exploring How Japanese Cartoon Styles Can Contribute to the Marketing Efforts of Ghanaian Businesses

Yaw Kwakyi
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Abstract

The aim of this research was to understand the impact of popular culture (specifically Japanese animation) on marketing efforts in Ghana. Japanese animation (also known as anime) is a facet of popular culture that has since expanded beyond the cultural borders of Japan. Its immense popularity has seen Japan set up many anime themed facilities like theme parks, restaurants, hotels, and so on, and other parts of the (Western) world are following in their footsteps.

The ever-growing success of these creative facilities serves greatly towards marketing efforts, as tourists and natives alike want to partake in enjoying the resources. The lack of such interests in pursuing an anime themed marketing approach in Ghana spurred this research, to help develop an understanding of how pop culture-oriented marketing in the Ghanaian context could affect consumer behaviour.

The research's aim was accomplished through the use of a qualitative approach to gather data from identified stakeholders in the fields of education, business and marketing through in-depth interviews, as well as questionnaires. Existing literature around the effect of popular culture cartoon characters on consumer choices also contributed to the conclusion that innovative marketing tactics (such as anime themed marketing) are effective in influencing the consumer purchase decision.

This research leaves room for businesses to further understand and develop marketing strategies that demonstrate that they are aware of their consumer and their interests, and serves to contribute to the conversation on marketing psychology.

The Effects of Poor Maternal Care on the Midcingulate Cortex and Social Behavior in Offspring

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Abstract

Evidence from the literature suggests that early life stress (ELS) like social isolation causes prolonged biochemical and behavioral changes in social animals and their offspring. The midcingulate cortex (mCg) is an important brain region heavily implicated in cognitive control and social behavior, but the impacts of ELS on this region remains unknown. Thus, our hypothesis is that poor maternal care will disrupt the development of circuits involving the mCg by inducing an increase in the inhibition of the mCg and leading to behavioral deficits later in life. Using a mouse model, nulliparous female mice were raised in social or isolated settings for three weeks, and bred to produce offspring. The offspring underwent a social conditioned place preference (social CPP) test to measure behavior related to social reward during infancy (postnatal day 23), followed by immunohistochemistry testing for c-Fos and GABA in the mCg. Our data indicated that social isolation in dams failed to produce significant behavioral deficits in social CPP in the offspring. Interestingly, the data showed there are significantly higher numbers of GABAergic neurons present in male stressed offspring, suggesting that poor maternal care may accelerate the maturation of the inhibitory system in the mCg. Since we did not observe changes in social behavior at this age, this effect in the mCg may increase vulnerability to behavioral deficits later in life. This study can provide insights towards understanding the impact of poor maternal care in the development of neural circuits relevant for cognition and social behavior.

The War of Dots: Exploring the Development of English Braille in the United States

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Abstract

Prior to 1917, the United States did not possess a standard language system to enable reading for the blind. Instead, five different fonts, which were made up of tactile embossed dots on the page, competed in popularity across the country. Correspondence in the Benjamin Bussey Huntoon letters to Dr. Francis Joseph Campbell Collection, 1874-1901, at the University of Kentucky Special Collections Research Center provides a unique first-hand account of the struggle for dominance among these five different fonts. The letters were written by B. B. Huntoon, the superintendent of the Kentucky Institute for the Blind and the American Printing House for the Blind, to Dr. Francis Campbell, co-founder of the Royal National College for the Blind in the United Kingdom. Huntoon discussed the evolution of braille, business regarding his printing house, and the blind students he supported. Correspondence with topic experts at the American Printing House and a deep dive into their records will explore the correlation between prevailing attitudes towards the blind and the development of the standardized braille system that is employed today by the same American Printing House for the Blind in Louisville, Kentucky. It will seek to understand how the U.S. government selected our current standardized system out of the five options, and explore outcomes of that choice.

Third Culture Kids Readapting to Home Culture During Military Service: The Effect of Acculturation Strategy and Social Connectedness

Ji In Park
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Abstract

A multicultural upbringing during adolescence shapes Third Culture Kids (TCKs). Previous studies failed to specify the types of relationships associated with the sociocultural adaptation of TCKs re-entering their home country. This study extends the literature by examining the effect of acculturation strategy and social connectedness with different cultural groups on the sociocultural readaptation of Korean male TCKs, particularly during mandatory military service. 150 Korean male TCKs aged 19-36 participated in this study. All participants attended international schools during adolescence and finished mandatory military service. Participants were recruited by convenience through social networks. They completed the online questionnaire assessing their acculturation level to home vs. previous dominant culture, their relationship quality with two cultural groups (i.e., people from home vs. previous dominant culture), and their sociocultural adaptation at the military. The results were analyzed using two-way Analysis of Variance (ANOVA). TCKs who embodied Korean culture more than their previous dominant culture readapted just as successful as those who embodied both cultures. Also, those who felt more connected to Koreans than people from their previous dominant culture had better sociocultural readaptation. The results of this study suggest that feeling more connected with people from their home culture than those from their previous dominant culture could be more helpful in readapting to their home country. This research will add to the body of knowledge regarding TCKs re-entering their home country after solid cultural identity formation. Also, the findings will aid counselors or mental health practitioners in addressing the sociocultural needs of TCKs.

Preventive Effects of Red Ginseng on an Aging Hallmark - Senescence

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Abstract

Rationale/Objective:
By 2030, 1 in 6 people in the world will be aged 60 years or older, increasing the importance of interventional therapies for age-associated diseases. Research investigating cultural dietary differences recognized that the use of herbal medicine supplementation such as processed *Panax ginseng*, referred to as red ginseng (RG), increases lifespan in Asian countries by facilitating healthy aging. However, the mechanism for how RG prevents, delays, or reverses aging-related diseases is unknown. Thus, this study assessed how RG facilitates healthy aging by identifying cellular and molecular mechanisms of hepatic senescence pathways in an aged mouse model.

Methods:
This study compared three animal groups: control young mice, control old mice, and RG-treated old mice. To evaluate how RG delays hepatic cellular senescence, we analyzed the expression levels of the main senescence effectors in the liver: p53/p21 and p27.

Results:
The aged mice treated with RG showed significantly reduced expression levels of cellular senescence markers p53/p21 in primary hepatocytes and p27 and p21 in liver samples compared to the control aged mice.

Conclusion:
RG supplementation attenuates hepatic cellular senescence by downregulating p53/p21 and p27 pathways. Therefore, our results suggest that RG could be a novel interventional agent for delaying cellular senescence.

Relevance of Study:
Our findings provide fundamental information that RG has the potential to be a widely used therapeutic agent to reduce the incidence of age-associated diseases.

Legal instruments for the protection of urban streams. The case of La Volcana urban basin at Medellín as a replicable model.

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Universidad EAFIT, Medellín, Colombia

Abstract

In this research we intend to study from a critical approach, the way in which legal instruments (L-99 of 93; D-2811 of 74) have regulated urban water basins. This project analyses the cultural bases of our relationship with wáter (mainly utilitary), in order to propose legal and pedagogical instruments for the protection of urban streams. Our university campus is crossed by a creek that is currently in a inadequate state as a result of anthropogenic causes. Although progress has been made, such as some court decisions granting rights to rivers, our legislation remains anachronistic and linked to inappropriate cultural practices, for example allowing discharges into the river or channelling it is on these days permitted. Within the context of planetary water crisis, it is necessary to rethink our relationship with water and the way we build policy on it. I´ts imperative to build a regulation in which the human wellbeing is not the only goal of conservation and water is not as simply as a resource. Therefore, we will start from our particular case and then, we will scale the project to our country and our Latin American region. We will make a basin protection manual, based on the legal analisys, the hermeneutic and the field investigation so that the communities know the legal means they have available to protect urban rivers, using the web 3.0 technology. We will also propose a way in which the theory of granting standings to the river is viable.

Suicide Prevention Among Oklahoma's Student Veterans

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Abstract

In 2020, the Governor of Oklahoma issued a statewide challenge to reduce and eliminate suicide among Oklahoma's service members, Veterans, and their families. As a result of this challenge, in 2022 a survey concerning suicidal ideation among Oklahoma's student Veterans was conducted. Multiple agencies were involved in the development of the survey, including the University of Central Oklahoma, and the Oklahoma Department of Veterans Affairs. The survey contained items concerning demographics, social support, military affiliation, and academic status. Additionally, to measure depression severity, the ten items from the PHQ-9 survey (Kroenke, Spitzer, & Williams, 2001) were included. To prepare for distribution, campus Veterans offices were contacted regarding their current outreach practices. The survey was then distributed through Veterans offices at campuses across Oklahoma, including career-tech centers, community colleges, primarily undergraduate institutions, public research universities, and private institutions. In all, 105 student Veterans responded. Chi-square tests and t-tests were performed to identify factors related to suicidal ideation and major depression. Following this, a multiple regression model for predicting the overall PHQ-9 score was developed. These results will be disseminated to Oklahoma higher education institutions to assist with their outreach efforts and to bring awareness to deficiencies in their current practices.

Can Gut Bacteria Drive Running Behavior?

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Abstract

Interest in the microbiome has been rapidly emerging in the microbiology field. Many recent studies have established a correlation between the gut microbiome that not only extends to human health but also towards exercise performance and behavior. In this study, we delve into the bacterial pathways that could mechanistically explain how the microbiome influences exercise performance and behavior. Lactate-utilizing bacteria was investigated to see whether it consumed muscle-derived lactate during exercise to produce short-chain fatty acids (SCFAs) and whether muscles use SCFAs as a direct energy source, which has the potential to increase endurance, running behavior, or both. To do so, mice were inoculated with a cocktail of human gut lactate-utilizing bacteria strains. Endurance and running behavior was compared to that of mice inoculated with Lactobacillus johnsonii, a common yogurt-bacterium. First, the microbiome of mice living a sedentary lifestyle was measured, then the microbiome of mice gavaged with the lactate-utilizing bacteria after undergoing a complete microbiome knockdown was measured. The microbiome of the mice gavaged showed a relative increased abundance of the inoculated bacteria after exercising, suggesting that exercise did in fact cause the increased abundance. Exercise behavior was also measured by monitoring the mice while a wheel was placed in their cage as well their performance by monitoring their endurance when forced to run a treadmill. As a result, we demonstrated that supplementing the microbiome with lactate-utilizing bacteria boosts exercise behavior and endurance and also demonstrated that exercise is the cause of the increase in abundance of this bacteria.

Alternative offender rehabilitation: A study of practitioner's experiences of Equine Assisted Learning as a desistance approach for young offenders.

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Abstract

Equine Assisted Learning (EAL) is an animal assisted intervention where equines are utilised as a goal-directed intervention for behavioural, emotional, and psychological difficulties (Hauge et al., 2014). Preliminary research indicates that equine assisted interventions can be an advantageous adjunctive option to clinical practice for youth with significant mental health challenges (Wilson et al., 2017). The aim of this study was to examine the perspectives of practitioners of EAL to understand the effectiveness as a desistance intervention for young offenders, who may present as clinically complex with low engagement in traditional therapies. The theoretical base for this study was desistance theory, which informs the current framework utilised by the justice system in the United Kingdom for rehabilitation of offenders. A qualitative analysis of semi-structured interviews with three participants was conducted in order to identify themes. Participants were practitioners of equine assisted interventions, and were interviewed about a course they conducted inside a penal institution that engaged with young offenders for a duration of 10 hours or more. Practitioner's lived experiences are significant due to their understanding of youth outcomes, and these perspectives may inform future desistance-focused policy and practice. Results of the study not only complimented existing studies on EAL as a positive intervention (Hemingway et al., 2015), but also showed that EAL meets the principles for supporting desistance as published by Her Majesty's Inspectorate of Probation (HMIP, 2020) which is based on desistance theory (Moffitt, 1993), with themes of social identity, pro-social connections, engagement and empathy emerging.

READY (Research Experience Activity Designed for Youth) to SOAR Program and its Impact on Area High School Students

Brooke Busbee, Leslie Gonzalez Salazar, Jamie Burriss
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Abstract

Very few university-wide programs offer high school students the opportunity to experience undergraduate research prior to enrolling in higher education courses. The READY (Research Experience Activity Designed for Youth) to SOAR program at Middle Tennessee State University (MTSU) was piloted during the 2021-2022 academic year and presented 55 area high school students with an opportunity to visit campus for an immersive research and creative activity experience. The goal of the program is to showcase MTSU's undergraduate research opportunities to potential students through a single-day engagement event and to evaluate the impact of early exposure to undergraduate research. The feedback to the pilot event was generally positive, especially regarding small-group discussions with current undergraduate researchers and visiting the poster presentation event.

The program will be continued in 2023, and surveys will be used to further evaluate students' perspectives of research. To enlighten our understanding of how high school students view undergraduate research, we will be administering a pre/post questionnaire to all participants. Our research questions surrounding this experience include the following: What is their current perspective on the terms "research" or "creative activity"? What is their level of interest in pursuing research as a future undergraduate student? And finally, what is their intended area of study, if known? The results of this study will aid our team in programmatic planning for future READY to SOAR events, help us to better understand how high school students perceive undergraduate research, and their level of interest in becoming involved in undergraduate research.

The Effects of Deleting Interleukin-33 in Mice on Behavior

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Abstract

Anxiety is an ongoing struggle amongst the general population. A previous study conducted by Kano lab indicated that there lies a potential connection between the lack of Interleukin-33 and a decrease in social anxiety. My research consists of behavior tests and investigating the physiological makeup of the brain between mice with and without IL-33. The primary goal of this project is to establish a solid foundation to understanding this connection and identifying where and how these changes originate in the brain. A previous paper that was published, "Behavioral Changes in Mice Lacking Interleukin-33" indicated a potential correlation between the lack of IL-33 and a decrease in social anxiety. My research is still ongoing, however the behavior tests are almost complete. I have so far investigated the social anxiety levels of mice with and without IL-33 through an open-field test and an elevated plus maze test. I intend to further my investigation through comparing the brain makeup between these two experimental groups. Since my research is still ongoing, the results are yet to be analyzed. However, any indication of a decrease in social anxiety levels could be a potential breakthrough in this field of study as a more solid understanding of social anxiety can be reached. This could lead to advances in medication for social anxiety by depicting a source for the problem. I will continue to further my research throughout the years by conducting more experiments that establish a strong backbone for the source and cause for social anxiety.

A Case Study of Ending Trachoma Blindness in Children

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Abstract

What originally developed as a side effect of chlamydia, trachoma was, and still is, a highly contagious infection that can lead to incurable blindness if left untreated. According to recent data, 125 million people worldwide currently live in trachoma endemic areas and trachoma is the leading infectious cause of blindness worldwide. In the early 20th century, many people of rural Kentucky (USA) were afflicted by trachoma. The disease spread through families due to a lack of knowledge of sanitation and hygiene that could have prevented it. State health resources were employed to improve sanitation, educate families about hygiene, and reduce the rate of trachoma blindness. A significant advocate involved in this outreach was Linda Neville. Born and raised in Kentucky, she spent her life devoted to the welfare of Kentucky citizens and worked to eradicate trachoma blindness among children. Research using the Linda Neville Papers, 1900-1950, from the University of Kentucky Libraries Special Collections Research Center will explore the social and medical framework needed to decrease incident rates of trachoma in rural areas of Kentucky in the 20th century to assist areas that still suffer from high rates of trachoma infections. Research will also explore modern examples of countries that have eliminated trachoma as a public health concern. The World Health Organization has set 2030 as the target date to end trachoma worldwide. The goal of this research is to translate successful measures taken to provide hope and a framework for those still battling trachoma infections in the 21st century.

Prevalence of clinical and subclinical Bovine mastitis in Bomet central sub county in Kenya.

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Abstract

Mastitis continues to be one of the economically most important diseases in dairy farming. A survey of mastitis in bovines was done in April 2022 in Bomet central sub county in Kenya, using California mastitis test kit. A total of 75 bovines from 50 farms were sampled and the overall prevalence of bovine mastitis was 16%(n=75). The occurrence of clinical mastitis and subclinical mastitis were 25 % (n=12) and 75% (n=12) respectively. In the intensive system the prevalence of bovine mastitis was 71% (n=14)while in the semi intensive system 3% (n=14).A semi structured questionnaire was also administered to 50 smallholder dairy farmers to collect data on management practices, animal factors, and disease history. Breed, udder hygiene, stage of lactation, parity and floor type had a significant influence on the prevalence of subclinical mastitis. Among the breeds , Friesian. had a high prevalence than Ayshire/ From the findings, control measures such as, milking mastitic cows last, using a clean towel for udder drying for each cow, and culling mastitic cows are important and should be considered and included in the Kenyan mastitis control programs in order to reduce the prevalence of mastitis below 16% as found in this study.The observed prevalence could have been attributed to poor milking practices and inadequate methods applied by farmers in controlling mastitis on their farms. It was therefore concluded that daily management and milking practices were poor and were due to lack of knowledge as noticed from the discussions with the farmers.

Between Sand and Sea: The Self-Making of the Young Male Bedouins of Awlad ‘Ali

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Abstract

This paper is concerned with exploring different forms of modality, three in particular, among the youth of Awlad ‘Ali on the northwestern coast of Egypt, particularly in Al-Omaid. It is a result of 26 days of fieldwork in which I followed three distinct threads of existence by accompanying three different young men from Awlad ‘Ali: Said, Rahouma, and Hatem. This paper attempts to understand the options present and the decisions made as they emerge from being dependent on their families to formulating their own sense of self as adults socially, spacially, and financially. By tackling questions of power, authority, organization, masculinity, performance, and leisure, a brief understanding of what it is like to be young, male, and Bedouin on the northwestern coast of Egypt amidst a spur of globalization is drawn. References to previous scholarship on the modality of life in this region will be drawn comparatively in an attempt to emphasize the transformation that is currently taking place. Some names were changed to maintain anonymity given the sensitive information provided.

PosterExhibition006
Power

An Increasingly Polarised Political Environment: How does constituencies voting patterns affect US Senators voting position?

Ryan Yap
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Abstract

The increasingly polarising political environment in the US has put the Median Voter Theorem, a fundamental model in political economics, into question. With most literature mainly being focused on the demise of the theorem for candidates, there have been limited questions into why elected politicians often ignore the median voter preference in their constituents. This study asks how constituent voting preference patterns affect politicians voting decision-making, as constituents often differ in terms of voting preferences heterogeneity. The research will consist of looking at both individuals' political survey data, and each state's ballot and election results to create a measurement for voting preference at a state level. This will be compared to senators voting roll call data for each Congress, employing OLS regressions to find a relationship. The hypothesis is that the results will be similar to Lewis and Gerber 2004, but on a national level, where politicians are less constrained in median voting preference in heterogeneous constituents. The result should indicate that in areas where there is increasing polarisation among voters, elected politicians will have more freedom to break away from the median voter position and follow their party-line voting instead. This finding will also partially explains why there appears to be a shift away from politicians holding centrist political positions, as there are fewer incentives to do so. There will be immediate ramifications for how political parties could best position themselves to maximise their political voting power, possibly allowing for achieving more of their political agenda.

Differential outcomes in countering Covid-19: Bad Politics or weak state capacity?

Jazir Mohammed
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Abstract

The Covid-19 pandemic has led to a wide range of government successes and failures countering the spread of the virus. Using in-depth case study comparison between South Korea and India, this project will assess whether these outcomes are a product of the individual politics of states in recognising urgency and the need to act, or individual state capacity where it depends on the ability of institutions to fulfil desired policy goals. South Korea was able to flatten the curve and minimise damage meanwhile India suffered a tremendous second wave which led to 200,000 deaths, severe disruption to healthcare, and a shortage of oxygen. I will assess each individual government response by tracing policies in response to each crucial development, as well as data on emergency spending and deployment of workers and resources. India's government incompetency led to a refusal to lockdown in time, allowed large public events to take place, as well as no emergency stimulus funding. However, given the lack of technological infrastructure and centralised healthcare system (utilised highly in South Korea), the differing institutional frameworks could be more significant than individual politics. South Korea experienced far more conformity from its citizens to isolate and wear masks. These findings will provide more insight into the role of government in tackling public health crises. It will suggest what specific institutional arrangements are needed to successfully tackle the spread of a disease, as well as providing better policy solutions that can optimise performance and minimise failure under weak institutional settings.

Festival and polis in transition. The participants of the Panathenaia

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Abstract

Women, slaves and non-Athenian Greeks existed and worked in Athens. Nevertheless, they are mentioned in the ancient sources mainly as marginal figures. The same applies to the sources regarding the main festival of the Athenians, the Panathenaia. By analyzing the festival participants and subdividing them into groups such as age, gender or office, it becomes apparent that the festival became more inclusive. At the same time, the Athenian political system was changing from a tyranny to Attic democracy. So how did the political restructuring of Athens from the founding of the Great Panathenaia in the 6th century to its final expansion in the Periclean period influence the presence and representation of participants in the festival? The basis of this work is a source-critical evaluation of the source corpus in chronological order, taking into account the participants. The Panathenaia were already a political festival at their foundation. It proves the political restructuring and changing foreign representation through the participants. Finally, all Athenians and those associated with them were represented at the festival, so a more diverse picture of Athenian society can be reconstructed. This research is relevant in breaking the transmission of the eurocentric, patriarchal narrative of the ancient sources. Also in the context of modern democracy research, it is worthwhile to look at the society that was confronted with a democratic system for the first time. Furthermore it shows what influence political participation had on the representation of marginalized groups in the public sphere.

Infodemic: The dissemination of misinformation online

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Abstract

An MIT investigation in 2018 found that misinformation spreads up to 20 times faster than evidence-based facts.

This research asks how individuals, enabled by social media platforms, amplify misinformation at this rate.

Method
This project analysed the social media amplification of nine different stories across a range of topics, by users, enabled by Twitter, Instagram, Facebook and smaller unregulated platforms. Unlike much of the existing literature, including the MIT investigation, which took a quantitative approach to this research, it utilised process tracing, a qualitative approach, because this method instead focuses on processes that explain events within cases. This involved starting from where stories first publicly appear on the internet, then looking for patterns when following the amplification of popular stories that gained traction, comparing them with ones that did not. This was combined with existing literature research.

Headline findings
Misinformation spreads effectively with a link to an article with an impactful headline or a concise image or video. Furthermore, misinformation communicated through an angry tone is more likely to go viral.

Implications
Dealing with misinformation is important because, for example, COVID-19 misinformation, which is ubiquitous online, is driving vaccine refusal, demonstrating the lethal consequences of this issue. Furthermore, this research matters to policymakers, because they can use it to conceive targeted measures that prevent the spread of publicly shared misinformation on social media. For example, they could force mainstream sites to invest more resources into muting or labelling new misinformation that is most likely to go viral.

Sisterhood and Sanctity: A Reexamination of Colonial Mexican Femininity

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Abstract

Today we view female liberation as a primarily 20th century development; however, a recent discovery of a 1737 Mexican manuscript printed by a woman and written about women allows us the opportunity to re-examine historical ideas of femininity in Colonial Mexico. During the 42 years (1714 - 1756) that Manuela Cerezo spent as the primary printmaker in Puebla, Mexico, she came to be known as the most important female printer in Colonial Mexican history and printed numerous works in Spanish and indigenous languages. This research will analyze a book she printed about the first 100 years of the Convent of San José and Santa Teresa which belongs in the Lou Emma Wilson Mexicana Collection at the University of Kentucky Libraries Special Collections Research Center. Critical linguistic and historical analysis — techniques used to understand ideologies within a discourse — will be employed to gain a better understanding of how these women fit in with modern preconceived ideas of historical femininity like the separate spheres model. Given the working relationship between Manuela Cerezo and the women of the convent, this investigation will likely challenge the traditional historical consensus by revealing a previously unexplored model of femininity. It is the goal of this research to promote a more balanced and inclusive history by bringing to light the strengths and resilience of Manuela Cerezo and the women of the convent. This investigation will use archival materials as a tool to bring about social justice and inform us how to combat modern misogyny and patriarchy.

Southern California's Emerging School to Warehouse Pipeline

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Abstract

Southern California is known as the warehouse capital of the world and consequently faces precarious conditions. However, there is a gap in understanding how the logistics industry is specifically shaping educational opportunities for marginalized communities. As the United States continues to experience a warehouse and logistics boom, this project will explore how rapidly expanding logistics companies and their warehouses are reshaping the educational opportunities and trajectories of working class communities of color in Southern California.

This project investigates this emerging school to warehouse pipeline in three areas: how the logistics industry is shaping public education curriculum, the paradigms echoed in these warehouse communities, and how geography is affecting socioeconomic mobility.

The need for adequate and just education for these affected students is especially acute due to the scale of influence developed by the logistics industry and the lack of opportunity available once they enter the workforce. The school to warehouse pipeline in this project will be analyzed through the lenses of critical race theory and critical geographies of education.

This project will utilize conduct semi-structured interviews with young warehouse workers, and focus groups with stakeholders in public education involved with logistics programs. The results of this study will produce GIS story maps that can be leveraged by community advocates to emphasize the expanding impact of this school to warehouse pipeline. The principal aim is to define and bring awareness to Southern California’s emerging school to warehouse pipeline, a phenomenon experienced by an entire region that has yet been defined.

Dynastic Failure: Al-Mansur's Responsibility for the Subsequent Collapse of the Caliphate of Cordoba

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Abstract

Muhammad b. Abi' Amir, better known as al-Mansur (The Victorious), was the founder of the Amirid regency and is viewed among academics as a successful ruler. As his name suggests, al-Mansur was a victorious military leader who finessed his way to being the hajib and de facto ruler of the caliphate, breaking the line of Umayyad rulers. Yet, shortly after his death, the caliphate of Cordoba collapsed in a spectacularly swift fashion. So, his administrative changes must have destabilised the caliphate to some extent, and this research aims to find his level of responsibility. The research conducted looked at a small variety of primary and diverse selections of scholarly works. Historians, such as Kennedy and Provençal, place the beginning of instability at the start of al-Mansur's reign, and there is a clear line between al-Mansur's administration and the collapse of the caliphate. The findings declare al-Mansur responsible for creating the environment for caliphal collapse and questions the success and stability of the Amirid dynasty. Thus proposing a new way to examine the collapse of the caliphate of Cordoba because the environment for collapse was built under al-Mansur. The research's relevance in Medieval Islamic history is quite significant. This is among the only pieces of research around the causes for the caliphate's collapse and, to my knowledge, the only one that focuses on al-Mansur. Additionally, the research mostly examines the time period leading up to the seminal work on this subject, Scales: "The Fall of the Caliphate of Cordoba."

The Working Woman: A Case Study of American Feminism during the Vietnam War

Ash Pechon
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Abstract

Women activists protesting against the Vietnam War were a crucial force in the American anti-war movement; however, they often operated within a patriarchal structure that sought to reinforce traditional roles that left them seeking greater equality. They were expected to support the radical movement while remaining in their place as wives, mothers, and nurturers, allowing men to maintain control. Unsurprisingly, the second wave of feminism evolved from the disconnected reality politically active women faced in the United States during this time. This research conducts a qualitative analysis of voluminous correspondence in the Don Pratt Papers at the University of Kentucky Special Collections Research Center between Kathleen Pratt, a member of the anti-war movement in Kentucky, USA, and her husband, a conscientious objector for whom she served as a proxy during his prison sentence. During her experience, Pratt began questioning patriarchal culture and became engaged in the feminist movement. This research sheds light on the often-unappreciated female supporters of the movement and how activism led them to take action against the oppression of the patriarchy, creating a case study of one woman's evolution from anti-war protester to feminist activist. The impact of a normalized culture of sexism on the work of intersectional activists is still felt by women taking part in social and political action today. By examining individual lives through the study of archival documents, researchers can gain insight into how the realities of female activists of the past shaped the Western feminist movement as it is known today.

The Impact of Economic Sanctions on Russia's Economy and Warfare

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Abstract

This research aims to examine the impact of economic sanctions imposed on Russia as a response to its invasion on Ukraine on Russia's economy and its ability to continue warfare. It aims to assess their effectiveness which may help to tackle similar problems in the future and prevent wars.

Findings are based on Robert A. Pape's (1997) thesis that economic sanctions rarely work in achieving their political objectives. This applies in Russia's case as the sanctions have failed to thwart warfare, despite significantly influencing Russia's economy.

I rely on International Monetary Fund's analyses and predictions, inflation data, as well as Richard N. Haas's report stating that economic sanctions are short-term causing a global economic shock that takes its toll on the poorest and seems counterproductive. The expected effects will be noticeable only in the long-term scenario.

Research examines financial sanctions, such as the freezing of Russia's gold and foreign exchange reserves stored in the West ($630 billion), which have resulted in high inflation rate and the fall of rouble in value. The removal of Russia from the SWIFT system has delayed payments to Russia for energy exports. Nevertheless, Russia's position as prime energy exporter renders it less susceptible to the impact of the sanctions.

Findings show that long-term impact of sanctions on Russia's economy can be severe but will not hinder warfare in coming months. Moreover, sanctions seem to have produced some unintended and undesired global consequences instead of thwarting warfare.

Pandemic of Hate: Hate Crimes Against Asian and Asian American Women During the COVID-19 Pandemic

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Abstract

COVID-19 unleashed two pandemics for Asian and Asian American women in the United States. The first was a virus, but the second pandemic was a statistically significant rise in documented hate crimes committed against Asians and Asian Americans, particularly women. Why were Asian women common targets of anti-Asian hate crimes during the pandemic? Research will explore instances of hate crimes against Asian women that occurred in America during the height of the COVID-19 pandemic in 2020-2021, why women were particularly vulnerable to these crimes, and the history of stereotypes about Asian women in America. Sources such as Stop AAPI Hate as well as existing literature will be used to explain the origins of Asian stereotyping and how they are still reflected in today's society. This research aims to deconstruct the intersectionality of racism and sexism toward Asian women and confront modern hate crimes and stereotypes regarding Asian women in America. Further research would seek to explore rates of hate crimes against Asian women to determine if rates of violence increased or decreased once the COVID-19 virus receded in 2022 to determine if this recent period of violence is indicative of an ongoing trend.

Ending Wars Over Water - To What Extent Can AI Be Used To Predict And Prevent Global Water Conflicts?

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Abstract

Worldwide, more than 250 bodies of water are transboundary, meaning they cross the political boundaries of multiple countries. This creates a system of hydrological, economic, and social interdependence between communities reliant on these water sources. Transboundary Water Conflicts can occur as a result of this intense interdependence. Many factors contribute to the sparking of transboundary water conflicts, ranging from natural hydrological factors to hydro-political interactions.

Previous attempts to predict these conflicts by analysing the contributing factors have typically failed because data patterns are hard to identify. However, there is potential for Artificial Intelligence to fill this gap and identify future 'hotspots' up to a year in advance by identifying patterns in data where humans can't. This research determines the extent to which AI can be used to predict and prevent water conflicts. This is done via a critical literature review of previous studies and datasets where AI was deployed to predict water conflict.

Not only does this study advance our understanding of the factors that lead to water conflicts, but by detecting conflict early, governance bodies can engage in processes to de-escalate conflict by providing pre-emptive solutions. Looking forward, this gives rise to significant policy implications and water-sharing agreements.

With demand for water expected to grow by 55% between 2000 and 2050, competition between countries over shared water will increasingly lead to water conflict. There has never been a more significant time for us to be able to accurately predict and take precautions to prevent global water conflicts.

Grade inflation in secondary schools. Evidence from Portugal.

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Abstract

In most OECD countries, higher education entry depends on either Teacher Attributed Grades (TAG) in secondary schools, National Standardized Exams Grades (NSEG), or both. Further, there are mostly no external referees or standardization algorithms, which leaves room for grade inflation and teacher bias. This paper uses evidence from Portugal to measure grade inflation in secondary schools. Grade inflation is measured as the difference between each student's TAG and the NSEG. I use repeated observations, with data for every school and every student in the country over 13 years, allowing me to measure this metric over time and across schools. In 2016, the government suddenly stopped financing several private schools. I use this policy shock to understand how students moved among schools and how the change in schools' financial needs changed grade inflation in these schools. There is evidence that the shock led to a dramatic reallocation of students, migrating from these schools to either public or other private schools. If certain schools have a stronger bias towards grade inflation, this has relevant effects regarding fairness in higher education access and a consequential impact on income distribution. Students from private and public schools might be fundamentally different; hence, the paper focus on this empirical challenge of selection, trying to control for differences in the economic background of students. This paper attempts to solve the two main problems published articles in the field tend to have: lack of systematic data or instruments to infer causality.

An Ethical Dilemma: Developing a New Model for Teaching Culturally-Aware Ethics in American Medical Schools

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Abstract

At the beginning of the COVID-19 vaccine rollout, the Centers for Disease Control and Prevention (CDC) reported Black Americans were less likely to seek out vaccination against SARS-CoV-2 than white Americans. The hesitancy to receive medical attention during the pandemic can be partially attributed to a general distrust of the American medical system by minority populations, and with ample reason. From the Tuskegee syphilis experiments to Henrietta Lacks, unethical medical ideologies and practices have targeted Black Americans since the time of slavery, and the echoes of maltreatment persist today. Despite this well-documented medical distrust, there is little focus on the subject in American medical school curricula, and many ethics courses appear as electives or in small sections of foundational courses. Research will analyze current models of medical ethics education on medical mistrust by the BIPOC community in the top 10 American medical schools to highlight gaps in medical ethics education. Further research will build on these gaps to create a new model for teaching and understanding medical mistrust and physician racial bias. As America works to dismantle systemic racism, it is vital to this effort to minimize racism in aspiring doctors to eliminate disparity and improve health outcomes for Black Americans.

Hair-related Barriers to Physical Activity for Black Women: A Photovoice Project

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Abstract

Hair is a particular aspect of diversity for African American women that often requires specific maintenance practices unique from other ethnicities. These hair care practices however, can create barriers for African American women to exercise because of concerns of exertion to the point of sweating, which can cause their hair to not look presentable afterwards. This pressure to maintain a standard of decency can be increased in areas where African American women are the minority population in a gym. However, despite this concern, it often comes at a disadvantage which is the decreased likelihood of African American women to participate in aerobic exercises. Subsequently, statistics observed from the CDC reveal that there was a significantly lower number of active non-Hispanic black adults in Oklahoma.

The purpose of this research is to investigate hair-related barriers to exercise among African American women in at the University of Central Oklahoma. The primary methodology used in this research is Photovoice, a creative and powerful way to elicit the unique perspectives of Black women and their experiences with hair care that interferes with aspects of exercise.

The results from this research will better equip health educators and physicians with understanding the intersectionality in women's health, and with the methods used in this research, determine how best to communicate this to them and to African American women in the community. Additionally, the findings from this research will be used to facilitate discussions among participants on how best to advocate for cultural inclusivity in healthcare.

Avocado Capitalism: A Critical Commodity Chain Analysis

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Abstract

Food is 'the most intimate of commodities (Akram-Lodhi, 2007) that sustains and connects our lives to others in distant places through often invisible linkages'. By tracing the avocado commodity chain from the Huertas (avocado orchards) of Mexico to a London supermarket we seek to uncover a 'vivid and fleshy understanding of our multicultural pasts, presents and their power-soaked entanglements' (Cook, 2004). The avocado is used as a vehicle to trace disparate livelihoods that commodities traverse, and how a political project of 'commodity fetishisation' seeks to erase the social relations they imbue.

This paper employs a critical commodity chain analysis as a means of uncovering the lived and breathed experiences, relations and power hierarchies that are imbued in the global agri-industrial complex. The paper examines the avocado as a commodity underpinned by an agri-export commodity chain constructed through a neoliberal project of accumulation by dispossession to engender the production of uneven social relations. This paper takes the form of a research report that critically applies scholarly literature to research on the historical, socio-political, and embodies elements of the avocado commodity chain.

Via a Marxist political economy lens we locate uneven nodes of profit creation and dispersion to critique a neoliberal project of export-orientated development in the global south. Drawing on a 'food-regimes' perspective we uncover intersecting dimensions of food insecurity and dispossession at a variety of scales. This paper concludes that precarity is constructed throughout the avocado commodity chain via violence, dispossession, and a rejection of livelihoods outside neoliberal trajectories.

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Analysis and Optimization of Polycaprolactone Flow Diverting Stents for Treatment of Brain Aneurysms

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Abstract

Treatment for brain aneurysms involves injection of porous, cylindrical tubes (called flow diverters, FD) that can cure aneurysms. Current metal FD needs to be replaced to combat negative side effects such as scur on the blood vessels, blood clotting and stroke. Recently, we developed a FD made from polycaprolactone (PCL) with a patented in-house fabrication unit. PCL is an FDA approved, nontoxic biodegradable polymer for use in biological research. Because PCL is a polymer and not metal, it deforms a lot easier. The goal is to strengthen the PCL FDs using heat treatment. It involves prolonged heating of the material near its melting point for a long period of time. This allows the PCL strands to melt together, but not lose their shape, and strengthen the structure by having a stronger connection between strands. An oven was built in-house from a vacuum-sealed cup to maintain an accurate temperature for heat treatment due to the low melting point of our PCL, being only 60°C. The increase in structural strength was determined using a machine that measures the force it takes to destroy the FD's structure. After heat treatment, the FD appeared to have less deformation due to this strength increase, making it a viable alternative to metal FDs that can lead to a lower frequency of complications. With these findings, PCL can be safely used to make FDs and further research will be done to make stents of different shapes and characteristics to test which design works best.

The Effect of Colour Theory and Design on the Perception of Application Security

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Abstract

After a surge in data protection laws and media coverage of cyber attacks, public trust in business security is decreasing. Many studies have focused on the factors that drive whether a user believes an application is secure. However, the factors often examined in such literature highlight technical and social reasons for this, with no existing studies focusing on the effect of UI design and colour schemes on intention to use an application. Using qualitative research methods, such as surveys and interviews, this study focuses on whether colour schemes, design components and other visual aspects affect a user's perception of an application's security. Several combinations of different elements were created based on initial research, then presented to various users, to identify whether a universally pleasing design language existed. A huge factor in this was shown to be colour associations that differed from person to person. It was made clear that cool colours, such as blue, increased user satisfaction due to their security-based connotations. These findings, in conjunction with existing literature, will help place a new emphasis on designing work that looks as secure as it is. Users can rest assured that the technology they are using is protected, since this research is based on what they need from an application. Hence when shared with industry, this could help form a new set of secure design rules, in line with existing accessibility and usability guidelines. New applications and websites can better represent their creator's stance on security, and increase user trust.

Banking While Female: Women's Alternative Banking Systems Around the World

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Abstract

Women of many cultures create financial systems that exist outside of the established male-dominated banking institutions. For some women, it is a cultural tradition they inherited from their mothers. For others, it is necessary due to discriminatory bank practices that deny women financial equality. The intersectionality of historical sexism and racism leave women of color acutely vulnerable to systemic constraints, leading many to turn to their own female communities for financial trust and respect. Even in areas where sexist and racist banking practices have decreased, women often continue operating financial systems outside of traditional banking and have even created additional practices, such as female-led micro loans, that impact women across the world. This research will explore the concepts behind women-led groups that pursue financial security through interest-free, internal banking systems for themselves and other women. Comparisons will be made from examining similar groups from five continents to see how women across the globe approach financial stability utilizing tools outside of mainstream banking. Qualitative analysis of women-led alternative banking practices through the use of primary source documents, micro-loan websites, and literature review will explore the environments that create banking inequities and explore how women of different cultures overcome financial disparities through their social finance groups. This will contribute to a greater understanding of self-made female financial literacy and inform studies on immigrant behavior and finances in immigrant households. After IRB approval, further research will interview women who currently practice alternative banking for insight into generational practices and how they are sustained.

Epistemology of Happiness and Reframing the Measurement of Happiness

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Abstract

Happiness has always been central to virtue ethics and an emphasis in classical philosophy. What is happiness? What makes it hard to answer if you are happy? How can happiness be measured and perceived? The debate on what happiness is and how it can be measured has not yet ended in modern times. This might be because happiness is often arbitrarily defined and measured by individuals, which makes it challenging to observe happiness objectively. However, the fact that Happiness Index is carried out, despite apparent obstacles, suggests happiness is likely to be measured in certain methodologies; in this research, happiness is observed and measured through biological, behavioral, and self-report measures on the basis of duration, intensity, certainty, and proximity. The result of this research will articulate the methodology to measure happiness and demonstrate how individuals and society interact with each other in the pursuit of happiness. Furthermore, I will argue about how happiness can be perceived by individuals and about the possible answers philosophy can offer to the question of what happiness is.

Generating African Wax Textile Patterns With DCGAN

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Abstract

Recently, Artificial Intelligence has emerged as a tool for art creation. With the use of a class of neural networks known as Generative Adversarial Networks, paintings and photo-realistic images can be created from an input of numerous images. It can similarly be applied to textiles and generating textile patterns. The field of AI is, unfortunately, biased. In the realm of image generation, traditional art and textiles patterns tied to certain demographics have yet to be explored. To remedy this, my project strives at the generation of African wax print patterns--culturally significant clothing patterns originating in West and Central Africa.
To familiarize myself with the topic, I looked into several human-AI collaborated projects including the Little Black Dress project, Imagen, and the Fashion-MNIST dataset. The project results showed how AI aided in innovation for art and fashion. I additionally studied the results and methodology of existing pattern generation projects for various cultural patterns including Henna designs, Chinese seals, and Cantonese porcelain. Afterward, I collected and preprocessed 1000 images for my dataset and built a DCGAN model to generate new patterns based off of the dataset. I experimented with model architecture and hyperparameter values in attempt to improve results.

My project explores how a DCGAN can be utilized to synthesize images which would retain the unique characteristics of African wax textile patterns. The next steps will be to research different ways to implement DCGANs to make one that can learn from images which are all individually unique.

Goodnight, Sweetheart: A Wartime Love Story

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Abstract

Against the backdrop of the horrors of World War II, American doctor and pilot Tom Field and Australian teacher Nancie Davis met during his service in Australia and fell in love for a lifetime. They wrote to each other frequently during the war and afterward, while she waited for immigration papers to come to America. Their letters tell a story of aspiration during devastation, change amid chaos, and the stabilizing force of love during a global war. Utilizing their cache of recently discovered wartime love letters that were donated to the University of Kentucky Libraries Special Collections Research Center, research will visualize their service and love story through the creation of a graphic novel. This graphic novel aims to tell the lessons of love, loss, and relocation from Tom and Nancie's story, lessons that are still relevant in the 21st century. The archives, which includes pictures, newspapers, and almost 500 letters from 1941 to 1945, will be used as a launching point for further research regarding daily life during World War II. It is hoped the reformatting of their story from letters in an archives to a vibrant and easily accessible graphic novel will allow their epic romance amid the instability of war to be told to a wider audience in the modern era. Further goals of this research include publishing the graphic novel so that it may inspire audiences to think creatively about stories of real people waiting to be explored in the archives.

The Application and Influence of Musical Involvement on Medical Practice

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Abstract

Useful interdisciplinary connections often appear where least expected, and the parallels between music and medicine provide a unique area for exploration. Listening skills, a detail-oriented mind, and having an ability to work as part of a team are just a few of the many qualities shared by musicians and physicians. Connections between music and medicine are well researched in the context of music therapy, where music has been used to decrease stress, raise spirits, and even lead to better patient outcomes. There is little research, however, about how the skills learned through musical experiences affect a physician's practice. This study explores what specific skills are gained through musical involvement, how they come into play in medical practice, and to what degree these commonalities are consistent. In this study I interviewed multiple physician-musicians about their backgrounds, and how those experiences currently impact their medical practice. Data from these interviews was then transcribed and coded to identify repeated themes, and descriptive statistics were used to analyze trends. Finding how musical involvement manifests itself in medical practice reveals often unrecognized elements, and provides insight into how medical education could be altered to better address these areas.

The effect of physical distance on remote surgical robot operators' moral judgement.

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Abstract

Surgical robots represent a rapidly growing advance in biomedical engineering, enabling remote operation by surgeons at consoles translating their hand movements into real-time control of surgical instruments at distant hospitals. However, these remote procedures may present ethical challenges, as prompt moral judgement is often required during surgery. This study aims to explore the effects of distance on the moral judgement and actions of remote surgical robot operators.

A comprehensive literature review was conducted, analysing relevant sources in a variety of fields, found by using keywords such as "surgical robots," "medical ethics," and "moral sentimentalism" in bibliographic databases. I first investigated the role of empathy in moral judgement, contrasting arguments supporting and critiquing moral sentimentalism. The conclusion drawn is that empathy can indeed influence moral judgement (Gill, Michael B. 2007). A psychological experiment (Schiano Lomoriello. 2018) was used to further demonstrate that participants' empathic reactions were influenced by perceived physical distance from individuals in distress. By drawing parallels between remote surgical robot operators and military drone operators (Hussain, Murtaza. 2021), the study highlights concerns about potential empathy loss due to distance.

Additionally, moral behaviour has been found to be impacted by distance, as evidenced by the disparity between overseas and local donations from the UK (NPT UK, 2022). This raises concerns about the potentially diminished sense of empathy and morality in remote surgeons. To address these concerns, the study proposes several measures, such as targeted education for medical professionals regarding the potential moral implications of remote surgery.

The Significance of Hair as Motif and Medium in Pre-Raphaelite and Chinese Dynastic Art

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Abstract

Critical essayists surveying the history of Chinese dynastic art share a tendency to reduce East-West relations to simplistic models of mutual influence, owing to cultural exchange and import. Crucially, an over-reliance on phrases such as “Occidentalism” and “Orientalism” in existing literature have caused scholars to overlook independent and organic cultural development in art. In response to this, I propose that certain trends in both Chinese and British art prevailed independently of ideological and artistic import, focusing on the use of hair as motif and medium due to its unique cultural significance. Drawing upon existing literature written in both English and Mandarin, this paper begins by examining the cultural roots behind the treatment of hair as motifs, emblematic of female sensuality and sexuality. It contends with nuances in depictions by male and female Pre-Raphaelite artists and the predominantly male Chinese artists to assert the prevalence of the male gaze. Following which, the use of hair as medium is articulated as means of feminine resistance, through practices of creating memorabilia and portraiture out of hair in Britain, and hair-weaving as part of Buddhist devotional practices in China. Thus, the inherent sensuality of hair, both embodied (motif) and disembodied (medium) is reasserted, contextualised as part of wider cultural histories developed independently of trade and ideological import. By introducing an alternative paradigm in the comparison of Western and Eastern art and focalising on the unorthodox hair, this paper provides a framework for further studies on bodily motifs in cross-cultural comparative studies of art history.

Simulation and Synthesis of Geometrical Coating Complexities in 3 Dimensional Glass Substrates using Physical Vapor Deposition Techniques

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Abstract

Organic Light Emitting Diodes (or OLEDs) that emit a high frequency wavelength such as blue, leak a lot of energy in a given unit of time, rendering their working lifetime as a Solid State Lighting (SSL) device much lower than expected. Studies in nano-scale energy physics suggest that the coating of conductive organic solvents used on the glass base of such LEDs disintegrate over time with more energy emissions, leading to loss of that solvent medium to convert chemical energy into light. To abate this effect, focus is brought upon the PVD (Physical Vapor Deposition) method of depositing these organic solvents directly from solid to gaseous vapor onto the glass base (or substrate). Effectively synthesizing a highly accurate model for accurate predictions in context of the unpredictable nature of the movement for minimizing solvent loss, and optimizing a particular substrate pattern while having a successful coating is key (where success is determined by its efficacy, adhesiveness, and uniformity). According to typical PVD behavior, having the substrate follow particular defined motions within the constraints of the PVD chamber is key to analyzing and visualizing this optimization for successful coating, such that model calculations will suggest a fully an increase in its lifetime two-fold, based on a metric of comparisons (an important one being the voltage and power consumption for a current supply value, and that of stress based durability) between current SSL devices and the new model of OLEDs that will be synthesized via this novel PVD model.

Dolichos (Lablab purpureus) Microbiota and Its Potential in Plant Growth Promotion

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Abstract

Dolichos (Lablab purpureus) is an underutilized indigenous leguminous crop from Kenya and has significant potential for improving food security. The crop is highly nutritious to humans, can be planted as a cover crop, and has excellent nitrogen-fixing properties. As climate change threatens to prolong droughts and worsens agriculture-related diseases and pests in Kenya, dolichos has great potential to serve as a climate change resilient crop that can address food insecurity. Dolichos is faced with numerous stresses due to climate change which can be addressed by identifying the beneficial endophytes (non-pathogenic bacterial and fungal microbes that reside in plant tissues) related to plant growth promotion (PGP). Dolichos samples were collected from agricultural fields in Lanet, Nakuru County, Kenya. After bacterial and fungal endophytes were isolated on nutrient agar and potato dextrose agar, respectively, the endophytes were identified based on ability to solubilize phosphate and fix nitrogen, two aspects critical to PGP. A total number of 29 bacterial and 19 fungal endophytes were isolated from the roots, stem, and leaves. The dominant fungus present in dolichos was Aspergillus spp, which had the highest phosphate solubilization efficiency at 17 percent, and 79 percent of the isolated bacterial endophytes had the ability to fix nitrogen. These findings demonstrate the highly effective and abundant PGP bacteria present in dolichos. The isolated endophytes will be used for further research to determine possibilities for amplification in dolichos to improve resiliency and transmission to other crops threatened by climate change and in need for more PGP bacteria.

Read This like a Performance - Expanding on Theatrical Audience Engagement and Communication

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Abstract

Audience engagement is an important factor in performing, presenting, or sharing work and ideas. By focusing solely on the material, and not the methods we use to communicate, the burden of understanding it is placed onto the audience. In order to engage, audiences have to reach arbitrary boundaries to access these ideas rather than the work reaching out to them. However, by taking the approaches to audience engagement used in theatre and performance, and applying them to a multidisciplinary context, we could begin to find more effective ways of communicating with a wider audience.

Much of current literature focuses on how audiences behave, whether as a product of cultural phenomenon, in reaction to performance, or as a factor of performance like a cast or prop would be. As such, audience studies can be difficult to translate into a non-theatrical context. This research aims to analyse existing theatrical theories and techniques surrounding audience engagement and break them down into adaptable concepts.

Firstly, creating a narrative to curate long-term commitment, a technique already borrowed by disciplines such as marketing or television studies. Secondly, Zeami Motokiyo's philosophies in Noh theatre that outline how actors can adapt to their audience. Finally, Bertolt Brecht's distancing effect (Verfremdungseffekt) in Epic theatre, which discourages audience immersion in order to promote real-world thought.

By understanding why these concepts work, future researchers can utilise them as universal strategies for communication, apply them to new work, and begin to reimagine wider academic and interdisciplinary forums.

Characterizing the role of glutamate in decision-making behavior

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Abstract

Glutamate signaling is a key neurotransmitter involved in complex behaviors across the human brain. Glutamate signaling has been implicated in pain sensing, olfaction, learning, memory and decision-making. Despite understanding the appreciation of glutamatergic transmission in complex behavioral strategies, human's understanding of the molecular mechanisms and brain circuits that are shaped by glutamate signaling is still not fully understood. This project uses the invertebrate worm, C. elegans, to characterize how glutamate controls decision-making behaviors associated with the sensation of odors and the processing of food related cues. This project used a behavioral paradigm that examines escape responses from food when paired with a repulsive volatile odorant, 2-nonanone. This behavioral paradigm includes mutant nematodes on a food patch and 2-nonanone placed adjacent to the food patch. The leaving rate of the mutants is recorded and compared to the wildtype N2 worm. The findings of this experiment include glutamate signaling mediates, 1) food recognition, while worms reside on a food patch, and 2) the dynamics of food leaving during exposure to repellents. Findings also include key roles for glutamate based on using mutant analysis, to examine worms that lack glutamate transmission of downstream glutamate receptors in the worm's 'brain'. This project has identified a role for glutamate signaling in spontaneous food related behavior on a food patch, and identified a role for glutamate and multiple glutamate receptors that mediate 2-nonanone-dependent food leaving. These findings provide a platform to continue investigations of how key human relevant neurotransmitters control complex decision-making behaviors.

"In Kinship to Our Crafts": Larkspur Press and Kentucky's Literary Community

Avery Schanbacher
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Abstract

Small literary presses fall at the intersection of craft and literature, and provide a platform for communities of regional authors to publish their work and distribute it to a local audience, amplifying voices that may not be prioritized if they were publishing on a larger scale. Larkspur Press, one such press in rural Kentucky (USA), has built on connections between local writers to popularize and preserve the works of local and first-time authors since its founding in the 1970s. Using the Larkspur Press Records, 1974-2000, at the University of Kentucky Special Collections Research Center, this research will explore opportunities and challenges of operating a small literary press in a rural area, as well as the role of the press in local literary and printing culture. Research will examine instances of collaboration between authors, press, and booksellers, as seen through correspondence, to further understanding of how small presses encourage and distribute literature. While small presses empower local writers and preserve culturally relevant works by helping authors transition from printing in magazines, journals, and other ephemeral formats, their stability may be impacted today by the dominance of large publishing houses and online booksellers. The literary movements fostered by the press continue to thrive through diverse readership of both the printed word and newer platforms like social media. This qualitative analysis of independent press will explore opportunities to educate communities about similar frameworks that increase publishing opportunities for underrepresented voices using the dual appeal of craft and literature combined with collaborative, sustainable operations.

Testing Effects of the Anti-diabetic Agent Acarbose in Mice with Renal Carcinoma: A Diet-Based Approach to Cancer Treatment

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Abstract

Immunotherapies are the standard of care for renal cancer patients, but only ~50% of patients respond to treatment. Because renal cancer cells use glucose as an energy source to sustain their proliferation, our lab studied the connection between diet and renal cancer using acarbose, an FDA-approved glucoregulatory agent that prevents the breakdown of complex carbohydrates into glucose. In lean mice with Renca renal tumors, acarbose blunted blood glucose elevation after meals and reduced renal tumors in a CD8 T cell-dependent manner. When acarbose was combined with anti-PD-1 immunotherapy, spontaneous lung metastases were significantly reduced. However, both obesity and type-2 diabetes – characterized by high blood glucose – are common comorbidities in renal cancer patients. Thus, to emulate clinical patients, we worked to develop a BALB/c mice model that would reflect both obesity and high blood glucose by using a standard high-fat diet plus streptozotocin, a toxic chemical that kills insulin-producing pancreatic beta cells. We found that using this approach, it was possible to generate mice with either obesity or high blood glucose, but not both. Low-dose streptozotocin produced unregulated Type-1 diabetes, reducing body weight and survivability. Acarbose was ineffective at reducing renal tumors and spontaneous lung metastasis in obese mice on a standard high-fat diet that contained low levels of complex carbohydrates. Surprisingly, acarbose was also ineffective at slowing renal tumor growth in mice fed a high-fat diet containing starch. Future studies will examine how ACA interacts with other cancer cell lines and how obese mice respond to immunotherapy with acarbose.

Religious Facility Design: Focused on an Inclusive Design for the Community

Emme Douglas
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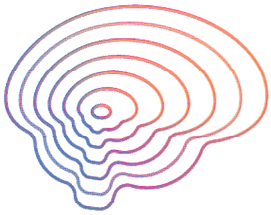
Abstract

A variety of generations coming through the church can cause a disconnect between the church and the community it is serving. This disconnect is causing less church members, an unwelcoming environment, a difference of preferences of churches based on aesthetics, traditional church designs not meeting accessible design standards, and a disconnect of what resources the community is expecting from the church. Designing a church to be a welcoming environment and focusing on how to serve multi-generational people can promote more church attendings and a well taken care of community. The purpose of this study focuses on how the inclusive design of a church can support the needs of the guests, members, and the local community. Through literature reviews, case studies, site visits, and surveys, many accommodations and considerations can be made, such as wayfinding, daylighting, paths of travel, flexibility, interactions, and community outreach programs and resources to achieve a successful church design. The design solutions for this project are: bold signage and floor patterns for wayfinding, mixture of traditional and modern church aesthetics, accessible and inclusive design practices, a mission center to promote and teach community ministry, a community pantry, and temporary housing for new community resources that can support the needs of the people. Overall, this project will be a jumping off point for churches to best support the community and provide a place for all generations to find a home church.



SUSTAINABILITY

PosterExhibition017
Sustainability

Digitalisation and decarbonisation of urban farms - opportunities and challenges for sustainable development

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Abstract

Urban agriculture continues to emerge as a sustainable alternative to enhance food security while improving life quality in urban environment. Renewed interest in growing food in urban areas has provided means for increasing access to locally produced fresh food, this ranges from building integrated (i.e., rooftops, vertical farming, hydroponic facilities) to warehouse farms as well as schools and community gardens.

For such promising development to be sustainable it is important that it is not a carbon shifting activity but rather a decarbonised solution. This paper therefore presents a critical review of existing research and commercialised practices in aims to identify opportunities and challenges for digitalisation and decarbonisation of urban farming through electrification. While the focus on digitalisation is centred around the introduction of machine-learning based technologies to monitor the health of crops, the latter is concerned with the integration of energy efficient resources and processes to utilise renewable energy accessible at urban environment.

Several IoT infrastructure applicable in this context at a small and large scale already exist. Application of hydrothermal carbonisation to convert waste into biofuels or organic solar cells has shown to provide opportunities for decarbonisation. Uptake of such alternatives however remains slow and is challenged by cost, scaling, and governance. Barriers for market and consumer acceptance need to be addressed and increased efforts in commercialisation is needed by companies and government entities whilst further improving technology and innovations. These findings are hoped to identify existing gaps for research and innovation as well as policy in urban agriculture.

Environmental drivers behind genetic divergence and analysing the population genetics within and between 14 mountain chickadee (Poecile gambeli) populations

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Abstract

Given its rapid rate, it is essential to study the effects of anthropogenic climate change on wildlife populations. In this study, we utilised ddRAD sequence data to investigate genetic divergence and identify the environmental drivers of genetic differentiation between 14 populations of mountain chickadees, from the family Paridae, sampled across North America. To delineate populations and identify potential zones of hybridisation, we conducted a discriminant analysis of principal components (DAPC), admixture analysis, and calculated pairwise Fst. The DAPC revealed four clusters, with the southern California population isolated from the rest, which is consistent with previous studies. We then used BayeScEnv to highlight significant outlier SNPs associated with the five environmental variables between clusters. Genes within 100kb of outlier loci were identified to test for gene-environment interactions. We then conducted a gene enrichment analysis to identify the affected pathways. We identified over 50 genes associated with more than 20 pathways, including stress response and circadian rhythm, linked to outlier SNPs. We then performed Mantel and partial Mantel tests using GenAlEx to investigate predictors of genetic diversity. There was a strong correlation between genetic and geographic distance, indicating isolation by distance. Local temperature was also highly correlated with genetic distance. Maxent was used to simulate range shifts under different climate scenarios for the next 50 years. Species distribution models showed a northward range shift and a decrease in habitable zones, highlighting the need for immediate conservation action.

Malls: Adaptive Reuse and Community Revitalization

Micah Ballweber
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Abstract

The United States is home to approximately 116,000 shopping malls nation wide, a shocking increase of 86,000 malls since 1970. These malls span an estimated 900.4 million square feet. In the wake of the Covid-19 pandemic and trending e-commerce, 25% of these malls are predicted to close by 2026. If these perditions are true, there will be roughly 29,000 buildings and 225,100,000 square feet left empty and desolate. The purpose of this research is to explore how abandoned malls can be adapted into mixed-use developments that will positively impact the economic, social, and cultural standing of the surrounding areas and help improve sustainable reuse practices to create flourishing communities.

Research was conducted through precedent studies, literature reviews, and user surveys. The findings indicated that in order for mixed-use developments to be successful they must provide a positive impact on community by conserving lifestyles of residents, integrating cultural heritage, deepening neighbor-to-neighbor relationships, and revitalizing buildings. When struggling communities are equipped with these things they have a greater potential of becoming self sustaining, social, economic, and sustainable urban spaces.

One must see these communities and the potential they hold, while looking beyond a “start from scratch” mentality towards sustainable solutions and “out of the box” thinking. This project explores the adaptive reuse of abandoned malls and buildings in these areas and their conversion into impactful, cultural, sustainable, and community spaces that will revitalize existing infrastructure and breathe new life into dying communities.

Managing Crisis in Small Hotels to Improve Business Continuity

Roselyn Sackitey-Matey
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Abstract

While studies prove that small hotels are important contributors to the economy, the recent Covid-19 pandemic showed a downfall, as many hotels collapsed. This has been linked to many hotels not owning crisis management plans to help minimize the harsh effects of a crisis. This study therefore examined how hotels manage crisis to improve business continuity and to what extent crisis management strategies are used in small hotels in Accra, Ghana.

Extensive research was done on the hospitality industry, Crisis and Crisis Management, Business Continuity and the Business and Crisis Lifecycle. This research made use of the phenomenological approach to qualitative research with semi-structured interviews as a data collection tool. This study collected data from six hotel managers in Tema on their perspectives and lived experiences during the Covid-19 pandemic. The findings showed that the majority of hotels, being small ones, had no crisis management plans and little crisis management expertise to use in their establishments. Due to a lack of knowledge, the hotels that had crisis management plans hardly ever used them.

Small hotels in Ghana are at risk of collapsing when encountered with a crisis due to little to no knowledge of crisis management strategies or plans, this affects the profitability and stability of the Ghanaian economy.

It is imperative that hotel managers create crisis management strategies and plans and appoint visionary board of directors with risk management expertise to limit crisis. This will sustain economies as hotels contribute a huge amount of GDP to the country.

Studying The Biogenesis Of Protein Storage Vacuoles

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Abstract

The protein storage vacuole (PSV) is a compartment that feeds the world as it stores the major source of proteins that humans and animals use when eating plant seeds. However, how PSV come about during seed maturation is still very debated as vacuoles usually degrade wastes instead of storing material, therefore research in this field is essential to further understand how proteins that provide the majority of the proteins to humans come about for further development.

The project relied majorly on molecular biology to generate constructs for the expression of particular storage protein regions fused to fluorescent proteins. These constructs were supposed to be expressed in two model plants, but time constraints only allowed results shown of the success of constructs generated without expressing it into plants. My construct showed positive results, fluorescing targeted proteins in modelled compartments which will enable me to target specific proteins on the PSV.

Research findings suggest that the constructs I generated can facilitate studying the biogenesis of these protein storage vacuoles. By understanding them, it is possible to manipulate how we produce and use these proteins in the future. This can be a way to produce a highly efficient protein source that could help fight food scarcity in the future.

Studying the biogenesis of PSV will allow new approaches in handling future food sources to maximise their efficiency. This could affect farmers and how they grow their crops and biologists in battling food scarcity once diseases are cured leading to higher life expectancy.

The bison dental metabolome of ancient samples.

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Abstract

Dental calculus is a mineralized microbial dental plaque biofilm which forms constantly throughout an organism's life. The mineralized plaque results in a quality record of host microbe interactions which is well preserved throughout history. Through metabolomics analysis, the dental calculus of ancient bison samples can give insight into the potential human influence on the bison's molecular biology. The objective of this study is to create a comprehensive characterization of the metabolites present in ancient bison dental calculus. This was achieved through liquid chromatography mass spectrometry (LC-MS). The data was then analyzed through Global Natural Products Social Molecular Networking (GNPS), a molecular networking and data-sharing web-based platform. The results showed a range of molecules such as lipids as well as foreign molecules such as DEET. These results will enable us to gain insight into bison molecular biology and the potential correlation to human influence.

The Effect of Light Quality on Circumnutation (swaying motion) on the Flowering Stems of Arabidopsis thaliana.

Noah Pfeifle
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Abstract

Circumnutation is a swaying back and forth organ movement that takes place in plants that was named by Darwin. A variety of factors affect it, however the reasoning behind the movement has never been discovered for aerial plant components such as inflorescences. Prior research shows that the movements of inflorescences respond to natural sun gradients, however the specific movement of circumnutation was never looked at. By exposing Arabidopsis thaliana to different light qualities, it can be determined whether or not the circumnutation movements are affected by light wavelength. The use of time-lapse photography allows the responses of these plants to be recorded over a significant amount of time, as well as allows analysis to be done using an external program. By recording the circumnutation of Arabidopsis thaliana in different light qualities, it will be determined if light qualities do affect the circumnutation of Arabidopsis thaliana.

The Impacts of Access to Food and Healthcare as Barriers to Licensure in Adolescents

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Abstract

Adolescents are increasingly opting to delay or forgo driving licensure, potentially limiting their mobility that is essential for receiving healthcare and obtaining food. Research has shown people with greater mobility have better health and well-being outcomes. Lack of food access may adversely impact growth and development. Lack of healthcare access may lead to unfulfilled health needs and difficulty accessing medical attention. This project examined if local food and healthcare availability were contributing factors in adolescents' decision to obtain a driver's license. Drawn from a larger, longitudinal study that recruited adolescents in the southeastern United States via publicly posted flyers and announcements, 16- to 18-year-old adolescents with and without a driver's license (Mage=17.11 years) provided sociodemographic information, home addresses, and family affluency. Geospatial software mapped participants' addresses and assessed the distance to and density of food and healthcare services within a 1-mile radius. Logistic regressions indicated increased food vendor density and black race were associated with decreased odds of licensure. Higher family affluency was associated with increased licensure odds. Access to healthcare had no influence on licensure status. Nearby food access influences driving licensure in adolescents. Local municipalities may consider targeting areas with low access to food for expansion of food options or alternative transportation options. Those with lower accessibility to food may be at a greater risk for poor health outcomes due to both the need to drive (i.e., injury risk) and lack of nutrition options. Future research should identify other geospatial factors affecting mobility and subsequent health outcomes.

The Study of Difficulties in Handling Plastic Waste for Achieving Sustainable Plastic Waste Management

Napat Uraisomsurat, Thanaphan Rueangsuk, Khatatip Osirikan, Thayida Thiamthad

Institute of Field Robotics (FIBO), King Mongkut's University of Technology Thonburi, Bangkok, Thailand

Abstract

Every year, Only one-fourth of 2 million tons of yearly plastic waste in Thailand were recycled, although the awareness of Thais towards this problem has been rising in the past few years. For used plastic in the food supply chain to be recycled in Thailand, four steps, including removing biodegradable waste from plastic containers, cleaning, drying, and sorting are required. However, these steps are difficult to follow as they require too much effort and support equipment. Therefore, suggesting these steps to people without understanding the real burden of the plastic waste management journey might lead to misleading solutions.

This participatory research aims to comprehend the problems occurring when people are required to change their waste management behaviors. The study was conducted with 100 students at the Institute of field robotics:FIBO. Several variables are observed including the quantity of plastic waste that goes into the recycling process, and the difficulties in Handling Plastic Waste. The results of the study show that the increasing time spent for cleaning plastic waste, difficulties in cleaning plastic bags, and the bad smell from the food scraps.

This study will be beneficial insights for people who want to develop innovations in waste management, especially in an office environment. As engineering students, we will utilize our research findings for developing a waste management system to be used in our institute. The system will support people by reducing their effort and difficulties they might face in handling plastic waste and pave the way to sustainable societies.

The Environmental Lives of Rural Workers: Representations Through the Medium of Painting and Prose, C.18-19th.

Jack Taylor
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Abstract

Given the intellectual primacy of the idea of the Anthropocene, understanding how we live with our immediate environments assumes a critical potency. Whilst we know a great deal about how those in the Global South living on and with the land interact with, and make sense of, their environments, we know remarkably little about rural workers in the time and place of the first industrial revolution, that moment in time when the Anthropocene arguably became meaningful. This paper utilises the existing methods of visual, textual and landscape analysis in cultural and historical geography, to explore how meaning can be taken from paintings crafted by the rural working class, and poetry written by so-called 'peasant poets'. The findings from the analysis of four pieces of rural folk art and two selected poems are presented thematically with a focus on ideas of 'space' and 'place' and how human and non-human animals interacted with their lived environment. Connections are made to the sub-discipline of animal geographies, to better understand the environmental lives of not only rural workers, but the animals in which they commanded. This research addresses a gap in our knowledge in relation to the lives and practices of the rural working class and their complex environmental understandings, focusing on the presentations produced by everyday workers rather than the rich and gentry. The paper thus speaks to the efforts in historical geography to better understand the under-represented, and to better tell the more-than-human histories of people living in rural England.

Investigation and Characterization of Bombella Apis and Genome Isolate DLM19

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Abstract

Honey bees are known to be one of the most industrious species across the globe with a very highly developed social system. Similar to any developed society, honey bees have different roles within their colonies. Recent research has led to the discovery of a bacterium known as Bombella apis which is found in several niches of the hive including the larval guts, worker jelly and in the honey bee queen digestive tract . This gram-negative bacterium from the Bombella genus has been found to help protect the brood from fungal pathogens and infection . With the current decline in the bee population, it is becoming increasingly important for us to understand what may be causing this disturbance. Honey bees are one the major pollinators on Earth, which make them important for the production of food). In this research, we delved into the characteristics of Bombella apis and investigated the genome of isolate DLM19, isolated from the gut of a honey bee to explore the diversity in functionality and genome content of the Bombella bacterium. This was determined through the analysis of certain factors including the size of the assembly, the Guanine-Cytosine(GC)%, and the genus to which it was most closely related. By researching Bombella apis we are not only able to learn more about honey bees and the microbiomes that exist within them but also discover microbes that could be used in today's medicine.

Biophysical Characteristics of Fungus-Fermented Napier Grass Pennisetum purpureum S.

Vanessa Chery[1], Evans Obura[2], James Kamau[2], Anne Osano[3], Joshua Ogendo[2]
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[3]*Bowie State University, Bowie, Maryland, USA*

Abstract

Throughout Africa, Tilapia aquaculture is a sustainable livelihood for small-scale farmers and contributes to food security. However, highly priced Tilapia feed threatens profitability for farmers. *Pennisetum purpureum*, commonly known as Napier Grass (NG), is an abundant and nutrient-dense livestock feed but is not available to Tilapia due to cellulose. The fungus *Pleurotus ostreatus* can transform the cellulose in NG into nutrients for Tilapia. However, this approach has not yet been explored. Understanding the biophysical characteristics of fungus-fermented NG is needed to inform scientists and farmers on livestock productivity improvement. In achieving this, the study aimed to determine whether NG supports the growth of *P. ostreatus*. Existing literature was reviewed. NG was prepared as a substrate and inoculated with *P. ostreatus* spawns. Humidity and temperatures were monitored. *P. ostreatus* colonization was successful, confirming that NG supports its growth and is therefore a potential Tilapia feed. Low temperatures delayed the growth rate while three competitor fungi also colonized the substrate. Physical characterization of fungal colonies and microscopy were used for identification of these fungi. Two of the three competing fungi belong to genera known to produce mycotoxins. Successful *P. ostreatus* colonization establishes NG as a potential Tilapia feed that could be farmer-made, increasing profitability. Further questions remain to be answered concerning increasing feasibility for farmers. The use of growth chambers could facilitate rate of growth and reduce contamination risk. Further research will aim to understand the three competitor fungi's toxicological effects and develop a procedure to reduce their presence.

Thermodynamic Study of Carbon Mineralization with Recycled Concrete Fines for Carbon Capture and Utilization Applications

Akhila Mattapalli
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Abstract

The cement industry is responsible for almost 10% of global CO_2 emissions due to the thirty billion tonnes of concrete produced worldwide each year. In addition to the CO_2 emissions released during production, millions of tonnes of demolished concrete are generated yearly. Although recycled concrete is recognized as a possible solution, mostly coarse particles (aggregates) are utilized. Using recycled concrete fines (RCF) will further reduce the net emissions produced by concrete, decrease energy consumption, and fully reuse demolished concrete, thereby extending the cyclic nature of the production process. By exposing the concrete to carbon dioxide in the atmosphere or synthetically, also known as carbon mineralization, we can use concrete as a form of carbon capture utilization and storage (CCUS). This process reduces the carbon emissions produced by cement and concrete production processes. Similarly, supplementary cementitious materials (SCM) and CO_2 as a part of the cement mixture provide a pathway to use industrial waste in concrete production. Adding an alkali activator (portlandite) and slightly increasing temperatures can significantly improve the process efficacy and productivity.

We simulate the mineralization process using CemGEMS, a thermodynamic cement modeling application. The project focuses on the effect of using RCF, CO_2, SCM, and portlandite on the products formed. Preliminary results of the simulated reaction indicate the feasibility of adding CO_2 and RCF as reactants. Our next steps include finalizing the relative amounts of the constituents that generate the most viable products.

Materials Parameter Estimation From Microstructures With Machine Learning: Thermodynamic Parameters Database Generation

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Abstract

In this work, we developed an experimental transmission electron microstructure image database of Iron Chromium Cobalt Alloy (FeCrCo). In the future, this database will be used to create a machine-learning algorithm that can predict thermodynamic parameters based on experimental transmission electron microscopy images. Throughout this work, we have primarily focused on the interaction parameters of excess free energy. We have utilized the previously developed phase-field method for spinodal decomposition through the Cahn-Hilliard equation. The phase field model equations have been used to generate the FeCrCo microstructure images via the MOOSE (Multiphysics Object-Oriented Simulation Environment) framework. This study is specifically focused on the heat treatment condition of Fe-31Cr-23Co alloys at 873K for 100 hours. Through our research, we explored a wide range of thermodynamic parameters in order to determine their effects on the microstructure morphology. We've found that altering the interaction parameters between metal atoms doesn't change how things look on the atomic scale. We will continue generating databases using a wider variety of parameter combinations such as kinetic parameters. Eventually, these microstructure images will be used to train a neural network that can predict thermodynamic parameters based on alloy morphologies.

Creating a Net Zero University - Implementing Circular Economy Concepts in the University Environment

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Abstract

Nottingham Trent University's Maudslay building is home to a varied range of workshops, laboratories and studio spaces. They provide support for thousands of students across the school of Architecture, Design & Built Environment. However, the energy consumption and waste production of the Maudslay building is becoming an increasingly bigger problem. Alongside the building's need for lighting, heating and power, a large proportion of courses here require students to produce models to aid their studies – which in turn generates a proportional amount of material waste.

Waste removal costs vary greatly throughout the year, however energy usage across the many buildings at city campus directly reflects the time and temperature during the year. Our findings highlighted that in today's society there is an abundance of support for making sustainable changes to our buildings, but that is usually where it ends. Sustainable alterations often carry large upfront costs, which become difficult to implement as the funding and support isn't always available. External input from companies such as ENVA was used to determine how, and if, the goal could be reached.

From the input of the staff and students, a road-map utilising circular economy concepts was devised, that will put NTU's ADBE School on track to becoming the world's first zero waste / zero carbon campus building. It involves a series of milestones, categorised into short-, medium- and long-term goals. From mindset changes through to a ban on the always troublesome single-use plastics, the journey will be challenging, but it is certainly not impossible.

Social-Ecological Systems (SES) Analysis of REDD+ vs Palm Oil in Indonesia: Which Yields the Most Benefits for Social Sustainability?

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Abstract

Recently, Indonesia has updated its carbon pricing laws signifying its readiness to harvest the economic and environmental gains from selling carbon credits—it potentially supplies 75-80% of the global carbon market by sequestration. Similar initiatives such as Reducing Emissions from Deforestation and Forest Degradation (REDD+) projects have been initiated in the country since 2010. Existing literature often concludes the environmental benefits of preserving the forests are clear or suggest that REDD+ would not be able to outcompete oil palm financially. However, there is still no clear outlook on REDD+ social benefits against the palm oil industry that supports the lives of 7.8 million Indonesian workers, yet primarily relies on forest conversion. The study explores the overall social impact of REDD+ projects compared to palm oil plantations in Kalimantan, Indonesia. Mainly utilising the social-ecological systems framework to identify the relevant social and ecological variables to be analysed. Data collected are a variety of secondary quantitative and qualitative from the REDD+ projects' and palm oil corporations' annual monitoring reports. This study's findings showcase no significant differences in the type of social benefits that REDD+ and oil palm offered. While the magnitude of the impacts given by palm oil corporations is more significant than REDD+, many are exclusive to their employees. Substantially, REDD+ projects focus on developing independent sustainable livelihood opportunities for the community without jeopardising the environment. Thus, this investigation informs a nuanced understanding for the government of Indonesia to strengthen its carbon payment schemes to reap the best possible societal outcomes.

SoyFACE Data Compilation and Analysis

Jelena Herriott
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Abstract

Soybean is sensitive to atmospheric changes including rising carbon dioxide and ozone concentrations resulting from climate change. Data generated from wind rose plots show that depending on the direction and speed the wind prevails during a particular period of the growing season, the crops in the treatment would be exposed to either gas in that same direction the wind prevails. Identifying trends in generated wind rose charts tested the accuracy of the fumigation treatments when the system was turned on. This was done by comparing the top 5 prevailing wind direction to the wind speed and direction collected in the raw data the SoyFACE treatments.

For the past 20 years, field experiments at the University of Illinois Urbana-Champaign (UIUC) have examined the response of soybean crops to rising carbon dioxide and ozone levels using Free-Air Concentration Enrichment (FACE). FACE is a technology that releases carbon dioxide or ozone gases across crops to test how atmospheric changes will impact crop development, growth, physiology, productivity, and quality in the future. FACE treatments are delivered by wind, and the SoyFACE team at UIUC has over 20 years of data describing wind speed, wind direction, fumigation efficiency, and additional weather metrics. This is an analysis of the SoyFACE treatment data to identify trends and determine the effects of wind speed and direction on the accuracy of the elevated carbon dioxide and ozone gas levels.

Temperature, Oxygen, and Vegetation as Drivers of Microbial Dynamics in Warming Peatlands

Teagan Kuzniar
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Abstract

Peatlands, a type of wetland, have slow rates of organic matter decomposition due to the water-saturated and oxygen-limited environment. This causes the accumulation of organic carbon and sequesters atmospheric carbon dioxide. Climate warming is predicted to cause increased greenhouse gas emissions from peatlands due to increased rates of microbial metabolism and organic matter decomposition. This is expected to cause a shift in dominant vegetation with a decline in Sphagnum mosses and an increase in Polytrichum mosses. However, little is known as to how vegetation and temperature affect microbial functioning in wetland environments in the presence and absence of oxygen. To investigate these questions, we conducted a warming experiment in both the presence and the absence of oxygen using soil associated with Sphagnum and Polytrichum mosses from Cranberry Glades, West Virginia, USA. Based on soil properties, biomass, and respiration measurements, we found that microbial responses to temperature are dependent upon oxygen availability, and respiration is dependent on plant species and temperature. This indicates that precipitation changes associated with climate warming, which alters oxygen availability, may determine soil carbon responses to temperature. Additionally, the decrease in microbial biomass along with the increase in microbial respiration could lead to a loss of carbon from wetlands into the atmosphere. This reinforces the idea that carbon is being lost from these ecosystems in warming conditions. The interaction between microbial functioning, temperature, oxygen availability, and vegetation provides valuable insights as to how these ecosystems will respond to climate change on a larger scale.

PosterExhibition008
Data

Biophilic Design to Improve the Quality of Life for Dialysis Treatment Facility Patients

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Abstract

Today one in three American adults is at risk for kidney disease. To manage this ailment, dialysis treatment centers provide treatment for end-stage renal disease patients. Treatment is impossible to neglect because if not maintained it will turn fatal. For this project, research was gathered by reviewing case studies, observing existing centers, and conducting interviews with patients and staff. Results concluded that centers focus mainly on physical health and do not approach mental health by way of the designed environment. This dialysis treatment center offers hemodialysis treatment for kidney failure patients seeking essential care with a healthy dose of nature to improve the overall experience. The lakeside location is a vacation destination for patients looking for a getaway the whole family can enjoy, while still receiving essential dialysis treatment. A unique approach to the traditional dialysis center layout enables each patient to have a view of the great outdoors while remaining connected to the water source that is ancillary to the treatment process. Natural plants, handcrafted tree models, and nature-inspired material finishes offer an environment different from the dismal, sterile atmosphere typically found within treatment centers. In conclusion, this project brings the healing elements of connecting to nature into the treatment center for improved quality of life while receiving life-saving care.

Characterization of Immune Cell Signaling in African spiny mouse in Response to Skin Wounding

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Abstract

Prior studies have detailed the unique mammalian regenerative capability of the African spiny mouse *Acomys Cahirinus* (*Acomys*) that lacks distinct fibrotic scarring observed among other mammals across tissues including skin, muscle, spinal cord, heart, and kidney. As such, delineating mechanisms which confer this unique capability offer an opportunity to understand and extrapolate the regeneration process to non-regenerating mammals such as humans. Through comparative analysis of skin wounds between regenerative *Acomys* and non-regenerative relative *Mus Musculus* (*Mus*), assays characterized variations in cytokine immune signaling. Numerous pro-fibrotic cytokines were detected in *Mus* wounds whilst *Acomys* only exhibited one-third, demonstrating minimal inflammatory activation. A similar pattern was observed for vasculature reformation as *Mus* wounds contained relatively greater quantities of signaling factors; nevertheless, upregulation of two uniquely present pro-vascular factors were identified in *Acomys*. Further analyses were performed using skin cells that indicated another factor uniquely expressed by *Acomys* epidermis skin cells. Assays were performed to investigate whether respective wound environments are inhibitory to dermis skin cell migration. *Mus* wound environments impeded cellular migration relative to equivalent protein concentrations of *Acomys* wound environment. This suggests that a lesser activation of immune response contributes to cellular migration in regeneration. These results demonstrate that the regenerative phenotype involves coordination between the reduction of both pro-inflammatory and migration-inhibiting cytokines alongside upregulation of vascular factors. These physiological responses promote the *Acomys* regenerative wound response. Future work will determine the specific molecular pathways affected by observed variations in cytokine signaling that guide regeneration.

Ethical AI & ML, enabled through systems thinking; an interdisciplinary overview of techniques and tools that prevent bias in AI and ML systems

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Abstract

In recent years, the use of artificial intelligence (AI) has exploded in a variety of industries. As AI technologies become more sophisticated, there is an increasing need for organisations to ensure that their AI systems are ethical and free from bias. However, little agreed-upon best practices for ensuring ethical AI and a lack of interdisciplinary engagement between business and technology. Segmenting approaches to explainable AI/ML techniques was lacking until Longo et al. 2022, however this prompts restriction to the flexibility of interdisciplinary studies attempting to address ethical issues alongside their technical counterparts, this paper seeks to justify an interdisciplinary approach.

Systems thinking (ST) as a tool, is increasingly appliable in interdisciplinary studies, originally modelled in the biological field. Systems thinking provides a holistic approach that retains results exhibiting greater accuracy in describing and analysing complex problems (Liew, Foo, Lee & Goh, 2006). Crucially systems thinking enables assess and challenge of complex problems that are closely interlinked, this is fundamental when tackling the challenges of AI ethics/bias and the socio-technical complexities. In the setting ethical AI, a ST framework creative, holistic, and adaptive approach, linking business policies/strategies and technical infrastructure for novel techniques like counterfactuals environmental-chaos sensitivity analysis.

This novel study exposes the advantages of using techniques like paradox theory and counterfactual analysis alongside business interventions presenting research that is immediately applicable and crucial to the sphere of ethical AI/ML. The study critiques both business and technical traditional strategies regarding AI/ML development and prompts divergent alternatives.

Examining the Influence of Internet Use on Students' Reading Habit and Academic Achievement in UAE

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Abstract

Internet usage in the world has grown rapidly, providing many opportunities for people around the globe. The extensive usage of the internet among university students raises concerns over its influence on their academic performance. Several countries have addressed this topic extensively, but research about the United Arab Emirates students remains scarce. Therefore, the purpose of this study is to investigate how internet use affects university students' reading preferences and academic performance in the UAE. 68 female and 32 male Zayed university undergraduate students who were chosen using the convenience sample approach participated in the study. Responses were collected through online surveys and analyzed using SPSS software. The findings showed a moderate correlation between the amount of time spent online for academic reasons and CGPA (r=0.293, p=0.003). Most respondents use the internet for socializing (M=3.27) and recreational (M=3.15) than developing reading habits (M=1.85) or using it for coursework (M=2.51). The findings show that while the internet can be a valuable tool for learning, students may need to be more intentional about their online activities to maximize its benefits for academic success. A study such as this is useful because it evaluates whether the internet is fulfilling its role as a facilitator of academic success among university students. Future research may concentrate on examining methods to increase students' internet usage for academic objectives. Furthermore, this study provides valuable insights for educators and university management in the UAE who aim to promote academic success among students.

The Best Tests: Optimizing Detection of Cognitive Decline in People Living with HIV

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Abstract

Approximately half of people living with HIV (PWH) experience HIV-associated neurocognitive disorders (HAND). There is an ongoing need to find efficient, cost-effective ways to screen for HAND and monitor its progression. Prior studies demonstrated that certain neurocognitive test pairs are sensitive to HAND cross-sectionally and outperform other screening tools such as the HIV Dementia Scale (HDS). However, few studies have examined optimal tests for longitudinal screening. This study aims to identify the best neurocognitive test pairs for detecting cognitive decline longitudinally.

132 participants from the Comprehensive NeuroHIV Center cohort completed neurocognitive assessments longitudinally (328 total visits, average follow-up time=4.9 years). Receiver operating characteristic analyses examined the significant global cognitive decline. Results were compared with the predictive ability of the Modified HIV Dementia Scale (MHDS).

The combination of Trail Making Test A and Grooved Pegboard Non-Dominant demonstrated the best balance between sensitivity and specificity in detecting cognitive decline (sensitivity=.85, specificity=.74, AUC=.79, p<.001). The 6 best pairs all included Grooved Pegboard, a test of fine motor speed. MHDS predicted cognitive decline no better than chance (sensitivity=.87, specificity=.24, AUC=.53, p=.66).

Several neurocognitive test pairs, particularly those that include Grooved Pegboard, are sensitive to HIV-associated cognitive change, and far more sensitive and specific than the MHDS. Neurocognitive test pairs can serve as valid, rapid, cost-effective screening tools for detecting cognitive change in PWH. Future research should validate the present findings in other cohorts and examine the implementation of test pair screenings in HIV care settings.

The Ethical Knob from different perspectives - a utilitarian, deontological and linguistic view

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Abstract

The Trolley Problem is a moral philosophy thought experiment that has been widely treated, especially by Philippa Foot. It describes dilemmatic accident situations in which harm to persons will inevitably occur and plays with the various possible decision scenarios and the respective ethical justifications and reasons for them.

Current applications of the trolley problem can be found above all in the field of autonomous driving. This is also the case with the tool presented by Contissa et al. in 2017, which offers a possibility for personalised decision-making in dilemmatic accident situations.

The Ethical Button can be used as a control mechanism - similar to a volume control in a car - where the user can choose between the options "selfish", "altruistic" and "impartial". The consequences of the decision for the respective option are already pre-implemented and only have to be implemented by the vehicle in the event of an accident.

The instrument may have advantages, but it also brings with it a whole range of ethical and legal problems. In my work, I therefore deal with texts from philosophy, linguistics and psychology in order to develop a well-founded ethical concept in relation to the ethical button and to understand and be able to ethically evaluate the respective implications of the individual setting options.

The aim is to help the decision-makers, i.e. the programmer, the company, but also the state, to assess the legal problem arising from the question of who can be held liable in an accident situation.

The Identification of Gammarid Amphipod Species by Scanning Electron Microscopy and Dna Barcoding

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Abstract

Amphipods – also known as scuds or freshwater shrimp – are aquatic, bottom-dwelling members of the subphylum Crustacea that inhabit various freshwater, brackish, and saline communities globally. Gammarid amphipods exhibit collector-gather feeding behaviors and are moderately-tolerant to aquatic pollution. The identification of amphipod species is difficult due to small specimen size, little morphological variance, varying environmental phenotypes (ecophenotypes), and lack of study at the species level. We were interested in examining the morphological diversity of Gammarid amphipod specimens from the Mingo Creek watershed of Washington County, Pennsylvania, United States of America. Specimens were collected in compliance with the "Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers" established by the Environmental Protection Agency of the United States of America (US EPA). Specimens from the Gammaridae family – Gammarus and Crangonyx genera, specifically – were previously analyzed using scanning electron microscopy (SEM) and low-power light microscopy. Specimen identification determined with microscopy was verified by DNA barcoding. Primers for DNA barcoding were designed from published universal sequences of the cytochrome oxidase subunit 1 (COX1 or CO1). DNA was extracted from amphipods culled from field samples and was used for the amplification of specimen COX1 fragments by polymerase-chain reaction (PCR). Positive results were obtained for the primer sets and the DNA sequences were confirmed by Sanger sequencing. The results may potentially confirm that DNA barcoding is an effective approach for identifying amphipods in natural environments.

ParaView-ing Data at NERSC Remotely using Jupyter Notebooks

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Abstract

ParaView is an open source data analysis and visualization program that is used by researchers around the world to analyze complex scientific datasets, containing things like a mixture of particles and fluids. Due to their size and complexity, these datasets cannot be easily analyzed with general-purpose tools like Microsoft Excel. Prior to this project, ParaView data at Lawrence Berkeley National Laboratory was exclusively analyzed using the ParaView graphic user interface (GUI) client. However, Jupyter is an increasingly popular web-based application that allows users to create and share documents containing code. This project is exploring ways to extend ParaView support in Jupyter. Kitware (the creators of ParaView) have developed a kernel for Jupyter that allows a python representation of the ParaView scene in Jupyter to be rendered by ParaView and displayed in the same notebook. In previous work we have shown that Jupyter notebooks running the ParaView Kernel can be set up on a personal computer and connected to a ParaView server that is running on a supercomputer. This project aims to fully implement this kernel on the supercomputers at the National Energy Research Scientific Computing Center (NERSC) through a Kubernetes cluster on the NERSC network.

Evaluating the Effectiveness of an Advice and Guidance System in Facilitating Communication and Collaboration Between Primary and Secondary Care Within the East Lancashire Hospitals NHS Trust

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Abstract

Past literature suggests that the nature of relationship between GPs and specialists has been constrained. Hence, efficient communication and functional relationships amongst both services are crucial for ideal patient care and minimised safety risk to patient and provider. Advice and Guidance is a locally-developed (Morecambe-Bay Trust) and easy-to-use web-based messaging system that enables communication between clinicians. It allows primary care with continued access to specialist clinical advice on treatment plans, test results, accuracy of referrals and identifying fitting services for continuity of care. This project was conducted to examine the effectiveness of A&G. Data was collected through a Qualtrics survey which was distributed to primary and secondary care providers in Pennine, Lancashire. Demographic information such as NHS Trust/ Primary Care Network, Age and Role were also recorded. Responses collected in this survey will be further utilised for a future Quality Improvement Project. Results revealed that A&G was most effective in terms of clinical education and reassurance opportunities, timeliness of response and referral-based information. Moreover, clinical management, uncertain diagnosis and investigations were the most sought and replied queries of advice yielded. Contrariwise, A&G presented certain drawbacks of process duplication, increased workload, system functionality and referrer-role specificity which reduced its usage across both clinicians. Thus, it can be concluded that A&G is significant in terms of time efficiency and optimal patient care, however several initiatives must be carried out to rectify the persisting drawbacks and encourage more adaptation of the A&G scheme as part of routine practice.

Analyzing the impact of cultural competency training of Learning Assistants in a large enrollment STEM gateway course

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Abstract

A Science, Technology, Engineering and Mathematics (STEM) bachelor's degree gateway courses propagate many inequities that significantly affect students with marginalized identities. These courses are often supplemented with undergraduate Learning Assistant (LAs), whose role requires that they have far more direct interactions with the students. We, therefore, developed diversity, equity and inclusion training focused on evidence-based instructional pedagogies to improve the cultural competence of our learning assistants. In designing the cultural competence training, we sought to 1) generate leaders with the skills to promote inclusion during their time at the university and in their future roles, and 2) to support LAs with marginalized identities. The training occurs via a mandatory, semester-long online course, which covers, among other topics, accessibility in education, and the effect of microaggressions, and the impact of personal identities including LGBT+, first generation college students, transfer and international student on the college experience. Besides completing a weekly reflection prompt, LA's completed pre- and post-semester open-ended responses addressing their knowledge and opinions of cultural competency. At the end of the semester, LAs completed one on one interviews. Between 70.3% and 100% of students agreed with statements reflecting students' positive impressions of the match module. Furthermore, 64%-79% of students indicated that they continue to reflect on the module even after the semester ended, with the module covering the history of inequities and injustices in STEM. Based upon our findings, we suggest active implementation of cultural competency training for LAs to reduce the existing inequities affecting marginalized student populations.

Changes in Gene Expression of Group B Streptococcus in Response to Glutathione Availability and Hydrogen Peroxide

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Abstract

Group B *Streptococcus* (GBS) is a Gram-positive bacterium that causes severe meningitis and sepsis in infants. GBS synthesizes the antioxidant glutathione at very high levels, which can be used to protect cells from reactive oxygen species (ROS) such as *H2O2*. GBS uses a single gene, *gshAB* encoded by a bifunctional enzyme, γ-glutamyl-cysteine synthetase glutathione synthetase, (γ-GCS-GS) to produce glutathione. Previous work in our lab has shown that when glutathione synthesis is unavailable, there is a correlated decrease of virulence within GBS. Glutathione has also been shown to be instrumental in promoting the virulence of other opportunistic pathogens such as *Listeria monocytogenes*. Our specific goal in this study is to determine how exposure to *H2O2* affects how glutathione impacts the gene expression of target genes involved in virulence and immune suppression. A qPCR and RNA sequencing are used to measure the gene expression of our target genes. Our hypothesis is if GBS is exposed to hydrogen peroxide and glutathione is available within GBS, the target genes involved in virulence and immune suppression will be upregulated. If the gene increases its response to hydrogen peroxide it may be to perform a function. So far, the single gene, *gshAB*, and our putative glutathione transport channel proteins have been upregulated depending on the strains of GBS and our four glutathione conditions. The study is still in the process of discovering whether our other target genes will have a different approach. Our results are important first steps in understanding how glutathione affects virulence during infection.

Creating meaningful global North-South engagements; decolonization of global North-South exchanges, through analysis of the gap between formal mechanisms and informal outcomes in the context of higher education exchanges, through the lens of systems thinking

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Abstract

Global-north higher education institutes have in the last decade experienced a resurgence voicing their vow to their commitments of decolonisation surrounding global exchange engagements. However, power relations between global-north and south bodies for exchange programs remain entrenched in aid-mindset, superiority logic, asymmetrical value relations, which strengthen adverse feedback loops in the long term. Meaningful engagements origin from accountability, understanding and compassion. The rise of institutional exchanges between Global North-South institutions calls into question the balance and the benefits to both parties. The ultimate findings question accountability and the awareness of these aims in the practice of the exchanges.

This paper is an exploratory study understanding the gap between formal aims and provisions and outcomes, the focus is on gaining insight from triangulated findings. The body of knowledge combines the aims and goals of the institution alongside the thematic analysis of sentiment towards improvements to justify if engagements are meaningful and attempt to debias students/staff before exchanged North-South interactions. The “main systems”, understood by an applied systems thinking methodology is found through a reflexive thematic analysis. With an additional, ethnography (using photographic narrative) to understand contextual informal culture across Global-North institutions, however, supporting evidence towards the wider findings. A system thinking framework is promoted as a theoretical tool of practice to conceptualise impact of decolonisation and improve awareness and implementation of better practice to encourage meaningful engagement. This includes provisions that seek to highlight the opinions and voice of Global-South partners- increasing their ability to enable meaningful engagements.

Defining the function of Jagunal Homolog 1 in mammalian cells and zebrafish development

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Abstract

Jagunal homolog 1 is a highly evolutionarily conserved protein, indicating that it plays a role in an essential cellular process. It is a transmembrane Endoplasmic Reticulum (ER) protein that cycles between the ER and the Golgi.

To study the organismal functions of Jagn1, we have a developed a zebrafish model system. Zebrafish have two JAGN genes: Jagn1a (expressed almost exclusively in the brain) and Jagn1b (expressed ubiquitously). We utilized the CRISPR/Cas9 system to generate fish deleted of either JAGN. We uncovered that the Jagn1a knockout zebrafish larvae display no obvious phenotypes and grow to adulthood, but exhibit a neuronal defect reflected in altered circadian rhythm. While, Jagn1b knockout larvae die early in development, with none reaching adulthood. We are currently probing the physiological basis of larval death.

To understand the role Jagn1 performs in cells, we aim to identify proteins interacting with Jagn1. We have generated Jagn1 constructs tagged with the BirA* biotin ligase at either the N or C-terminus, when expressed in cells supplemented with biotin, proteins neighboring Jagn1 are biotinylated. Biotinylated proteins are then purified on streptavidin beads and identified via mass spectrometry. A number of putative interactors have been identified and will be tested for direct binding. Jagn1 has also been implicated in a cellular response to ER stress, and we are also investigating if and/or how the gamut of proteins interacting with Jagn1 changes during cellular stress. Together, our studies provide a fundamental new insight into the role of Jagn1 in cellular and organismal homeostasis.

Developing a strategy to optimise smart farming using an embedded feedback control system and artificial intelligence techniques

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Abstract

With the anticipated rise in population, the smart farming industry needs to exponentially grow in alignment with the rise in demands and expectations. To address this global societal issue, it is vital to utilise emerging technologies and leverage data driven models to achieve greater production capabilities – simultaneously improving both yield increase and cost reduction aspects.

Using a systems engineering approach, this project devised technological strategies and business potentials that address these global agricultural problems. Initially evaluating successfully deployed smart farming solutions helped to identify current constraints and growth opportunities. A combination of sensor inputs was then used to develop an embedded feedback control system (using Arduino) that could be replicated in a smart greenhouse environment. The effectiveness of the engineering model was tested by conducting a plant growth experiment and developing an IoT (Internet of Things) app which transformed the data into valuable insights to monitor the overall crop health. Through storing this data in the cloud, global data streams can be incorporated and predictive Artificial Intelligence (AI) techniques can be applied to provide optimised farming recommendations.

The purpose of this project is to devise a 'smart' methodology for farmers that is accessible, adaptable, and sustainable. A key theme to pose is that the AI techniques recommended are not there to replace farmers but in fact aid them with efficient labour, income projections and help to sustain their long-term agricultural needs. The strategies recommended will aim to positively impact significant societal issues regarding climate change, rising demands and protecting biodiversity.

Perceptions and Experiences of Undergraduate Pharmacy Students and Alumni Towards Research After Exposure to Undergraduate Research CoursesPublished in: Frontiers Medicine, Health Profession and Education section on Sep 8th, 2022

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Abstract

Introduction: Academic institutions have a duty to equip health professional students with the requisite research skills to ensure the implementation of evidence-based practice. This study aims to determine the perceptions of pharmacy students and alumni towards research after completing Undergraduate Research in Pharmacy Courses (URPCs) at the College of Pharmacy–Qatar University (CPH–QU). Methods: A cross-sectional survey was conducted. All CPH-QU alumni (n=238), and all third- and fourth year professional students who had completed at least one URPC (n=42) were approached. The questionnaire contained items relating to research experience and perceptions of significance, confidence in conducting research, actual and anticipated outcomes, and motivation for future research. A Theoretical Domains Framework informed the development of selected items. Results: The response rate was 72.1% (202/280). The participants gave positive responses relating to their perceptions of research significance (Median=5.0 [Interquartile range (IQR)=1.0], Minimum–Maximum=1–5), confidence in conducting research (Median=4.0 [IQR=1.0]), actual and anticipated outcomes (Median=4.0 [IQR=1.0]), and motivation for future research plans (Median=4.0 [IQR=1.0]). The majority of participants perceived nonconfidence in using data analysis software (72 [39.4%]) and a high proportion of participants were non-confident in conducting data analysis (45 [24.6%]). More than half reported publishing at least one peer-reviewed article (99 [54.4%]) from their courses and were highly motivated to consider post-graduate degrees in pharmacy (132 [73.3%]). Conclusions: Incorporating URPCs into CPH–QU curriculum has potentially improved students and alumni's perceptions of research. Action is needed to improve confidence in different aspects of research.

Stress, Mental Health, and Coping Mechanisms of Black or African American Male Collegiate Athletes: A Qualitative Study

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Abstract

There are many pipelines that Black or African American males are sucked into. The sports pipeline is one. It is not inherently wrong for Black or African American men to be pushed to pursue sports; however, this pipeline can be a breeding ground for stress and poor mental health. Therefore, male collegiate athletes identifying as Black or African American should be considered a high-risk population for mental health issues due to the risk factors that can intersect and create the potential for poor mental health as well as an increased propensity for mental health conditions if ignored.

This study consisted of 9 participants. They were asked a mixture of demographic and open-ended/closed-ended questions. Answers to these questions identified areas of stress and their perception of mental health. Additionally, the relationship between mental health, stress, and social identities was discovered. These relationships affect help-seeking behavior and coping mechanisms. Background research identified a gap in knowledge and minimal interventional frameworks that offers addresses whole-person support for this historically marginalized population.

The data gathered through this qualitative study will assist in further exploratory research, then ultimately be used to help develop a framework facilitating early recognition and interventions. The framework will address the psychological needs of marginalized populations, like those of the Black or African American population. The hope for the future is to use this framework in other institutions as well to promote increased help-seeking behaviors, and prevent poor mental health from spiraling into clinical mental illness through this framework.

Supernova or Super No? The Characterisation of the Binary System SBSS 1709+535.

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Abstract

Type Ia supernovae are the result of a thermonuclear detonation of a white dwarf, however our current understanding of their detonation does not account for the rate at which they are observed (Rebassa-Mansergas et al. 2019). The Physics Nobel Prize in 2011 showed that these supernovae are key to measuring cosmic distances, and thus understanding the expansion of the universe. A system consisting of a white dwarf and hot subdwarf was recently found to be most likely to have sufficient mass to go supernova (Pelisoli et al. 2021), suggesting this class of binary could significantly contribute to the rate of these supernovae. My aim was to characterise another similar binary system SBSS 1709+535 to find whether it could also be a progenitor. With data taken by the Transiting Exoplanet Survey Satellite (TESS) I produced a light curve of the data and found the period of the system. I found this to be less than 24 hours, which is like other similar binary systems. With this period and other parameters found from literature, I used a Python script to produce a model of the system. I used the results to find the mass of the hot subdwarf to be $0.348^{+0.085}_{-0.083}$ $M_{\odot}$, the mass of the white dwarf to be $0.379^{+0.083}_{-0.082}$ $M_{\odot}$, with the system having a combined mass of $0.728^{+0.153}_{-0.149}$ $M_{\odot}$. The system is most likely not to go supernova, as it has insufficient mass. Despite this, I have looked at further TESS light curves and identified another possible candidate system.

The Role of the lin-41/let-7 Regulatory Pathway in the Neuronal Maturation of C. elegans.

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Abstract

Neurodevelopmental disorders are largely associated with mutations in molecular pathways involving brain or nervous system maturation. The genetic timer mechanisms controlling the maturation of the post-mitotic nervous system are poorly understood. The model organism, *C. elegans*, is ideal to study such questions due to their fast and stereotyped post-embryonic development, invariant cell lineage, transparency, and well-characterized compact nervous system. The regulatory pathway involving the evolutionarily-conserved *let-7* microRNA and its downstream target, RNA-binding protein *lin-41*, are of particular interest because they are implicated in the temporal progression of mitotic cell types from adolescence to adulthood in *C. elegans*. We aim to understand the role of *lin-41* and *let-7* in post-embryonic, post-mitotic neuronal maturation. Using transgenic fluorescent reporters, expression patterns of *lin-41* and *let-7* across post-embryonic development were characterized in the entire nervous system as well as in the AIB interneuron, which plays a crucial role in forward/backward locomotion. To examine the functional role of *lin-41*, we examined the locomotory and food preference behavior of transgenic worms, in which the activity of *lin-41* was manipulated in the AIB interneuron, using the worm tracker. We found that the downregulation of *lin-41* was important in the maturation of the AIB interneuron resulting in functional behavioral changes. Next, we will identify the molecular targets by which *let-7/lin-41* control AIB maturation as well as their role in the maturation of other neurons. Understanding these mechanisms will allow us to better understand neurodevelopmental processes and identify novel therapeutics for neural disorders.

Variability in Measurements of Hemodynamic Force: Does It Matter?

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Abstract

Hemodynamic forces (HDFs) analysis represents a novel approach to quantify intraventricular pressure gradients, responsible for blood flow. Recently, a new noninvasive method based on feature tracking (that analyzes the motion of the naturally occurring pattern in the myocardium) has been proposed. However, data on the reproducibility of this method is still scanty. Thus, the aim of this study is to assess the reproducibility of HDFs parameters derived from feature-tracking cardiac magnetic resonance (CMR).

As part of an ongoing study evaluating the effect of exercise training on cardiac mechanics in athletes, 20 subjects will be evaluated using CMR. Left ventricular HDFs will be derived from three-long-axis cine images, from which the mitral valve and the left ventricular outflow tract areas can be estimated, using a mathematical model integrated into a dedicated prototype software (Q-Strain version 4.0.38.4; Medis Imaging, Leiden, NL). Images will be analyzed by two independent observers expert in cardiac imaging. Furthermore, one of the observers will repeat the analysis in 15 subjects two weeks apart. Intraclass Correlation Coefficient and Bland-Altman plot will be used to assess association and agreement, respectively.

The reproducibility of any new technique must be assessed before its clinical application, in particular for evaluating the significance of differences between pre- and post-intervention studies.This research will provide the fundamental basis for the use of HDFs parameters derived from feature-tracking CMR, both in research and clinical practice, which could eventually lead to the detection of cardiac impairment and allow medical intervention at early stages.

Determining the role of enhanced perineuronal net deposition in seizure susceptibility in Angelman syndrome model mice

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Abstract

Neurological disorders can be caused by genetic alterations in many genes; UBE3A is one such gene, as a mutation or deletion in the maternal copy of this gene has been shown to cause Angelman Syndrome (AS). AS is a developmental disorder that affects 1 in 15,000 live births, and is characterized by many symptoms, with seizures being highly penetrant and debilitating. Previous research on the pathological characterization of AS model mice showed an increased seizure susceptibility as well as abnormally high levels of perineuronal net (PNN) fluorescence. Our project aims to determine whether the increased PNNs in the dentate gyrus of the hippocampus may be responsible for this enhanced seizure susceptibility. Mice were exposed to flurothyl in order to determine differences in seizure susceptibility and better understand the emergence of the enhanced PNN deposition seen in AS model mice. We found that AS mice become more susceptible to seizures throughout the incubation period, with a simultaneous increase in PNN fluorescence. Also, degrading PNNs appear to have a slight protective effect in AS model mice. These results may indicate a possible therapeutic target for AS individuals suffering from otherwise intractable seizures.

Sexual Offence Governance in Immersive Virtual Reality

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Abstract

Emerging technology and incidents of harmful misconduct online continue to challenge existing legal frameworks. With increased engagement amongst users in immersive Virtual Reality (VR) platforms for social and professional interaction, reports of sexual abuse transpire. Policy-makers and developers seek solutions to ensure user safety, given the ethical and moral concerns about virtual street crimes. While platform providers empower users with privacy settings (personal boundaries, exit and report buttons), no legal recourse is available. Therefore, this paper asks whether the existing English law of sexual assault is appropriate for addressing the emergence of sexual offences in VR. Discourse analysis of language employed by victims, providers and academics dissects the concerns arising from the recent cases of alleged virtual assault. Through doctrinal research, I critically evaluate the substantive law of sexual assault to demonstrate how the core principles of (a) consent, (b) the rational and reasonable subject and (c) conclusive and evidential presumptions are undermined by the conditions in VR. The research finds that due to the spatial and temporal characteristics of the actual world and the physical notion of the body, harm and consent, the existing law is an inapplicable solution. The paper proposes a new framework to acknowledge the distinct vulnerability of our virtual self. Notably, it suggests recognising the gravity of sexual-nature virtual abuse, adopting alternative vocabulary, blaming perpetrators rather than victims and enforcing a fundamental code of conduct. The paper is timely in developing effective strategies to criminalise virtual-only sexual crimes and eliminate legal shelters found in metaverses.

Understanding the Role of Traditional Healers as Key Players Along the Cancer Care Continuum in Sub-Saharan Africa

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The Future

Abstract

Traditional healers play a significant role in Sub-Saharan Africa's healthcare system, serving as trustworthy sources of information and care in their communities. Cancer incidence rates are high in this region and mortality rates due to cancer are rising. However, there is limited information surrounding the role of traditional healers in cancer care. Given the prevalence of patients consulting them, it is necessary to precisely understand how they impact cancer care delivery in Sub-Saharan Africa. To understand this, we are conducting a systematic review with specific inclusion and exclusion criteria. 1187 titles and abstracts were screened, with 170 moving forward to full-text review. During full-text review, 139 were excluded and 31 studies were included for final data extraction. Along the continuum, results showed that healers play prominent roles in diagnosis through observation and a traditional technique of bone throwing as well as treatment with medicinal plant preparations (decoctions, infusions, and powders) while providing valuable emotional and spiritual support. Most also refer patients to biomedical facilities as needed. With cultural beliefs, cost and accessibility, and feelings of fatality as factors that drive patients with cancer to specifically seek out traditional healers, these results highlight their unique contributions alongside the modern healthcare system, including perspectives of healers. Further research on the dynamics between traditional and modern medicine can allow development of strategies to foster mutual trust. Greater understanding and partnership between traditional healers and modern healthcare providers is vital to improve the referral system, reduce treatment delays, and improve cancer outcomes for all.

Open-Source Expandable Printed Circuit Board and Failure Handling Design for CubeSat—Even You Can Do It!

Kittitouch Lelapiyamit, Thansak Pongpaket

King Mongkut's University of Technology Thonburi, Bangkok, Thailand

Abstract

CubeSat has become a popular educational platform for deploying payloads into orbit due to being affordable and having numerous case studies. Even so, many university-level missions fail at a rate of around 50%. The reasons behind this number are that the difficulty of adapting an existing design is the primary reason why people choose to make their own, which results in poorly designed hardware for the harsh environment of space and a lack of failure handling software. We develop an expandable, low-cost printed circuit board (PCB) that can be stacked and has a power supply unit, a microcontroller, several sensors, a watchdog, communication bus isolation, and external memory. For the component selection methodology, we study and analyze existing research and adapt it to our design. We use a software Hamming error-correction code to protect the data. Since our PCBs are modular, the reader can design their own system. We offer failure handler software and hardware that can be easily integrated into their design. Our ultimate goal is to make space studies more accessible to everyone, increase the success rate, and allow people to focus on their missions rather than the hectic development. Lastly, we intended to make our project open source so that it would continue growing, and because there are still flaws and potential for improvement, anyone can participate by sharing their changes and knowledge for various missions. We hope that this project will develop into a community where people can discuss their designs.

Exploration of body image flexibility and empathy of physiotherapists towards patients

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Abstract

Social statistics state that healthcare professionals, especially physiotherapists, come frequently in physical contact with patients of various ages, and as a result, are thought to have an optimum empathetic value to build a strong professional interaction with patients and their relatives for a faster and more efficient recovery. This study highlights the importance of body image of physiotherapists (male and female) and empathy with different numbers of years of experience (YOE) in practice. A total of 18 subjects from Aspetar hospital, Doha, Qatar participated in the study by filling out the Body Image-Acceptance and Action Questionnaire (BI-AAQ) (Sandoz et al., 2013), and the Toronto Empathy Questionnaires (Yeo et. al, 2021). More participant are being currently recruited and results as well as their implications will be discussed when they become available. Recommendations for future studies will be also discussed.

Understanding the structural basis of small molecule inhibitors of Mycobacterium tuberculosis DosS

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Abstract

Tuberculosis (TB) is an airborne infectious disease caused by Mycobacterium tuberculosis (Mtb) that mainly affects the lungs. Mtb growth is inhibited when macrophages engulf bacteria into granulomas, causing Mtb to become dormant in the host cell. The DosS/DosR regulatory system helps Mtb sense hypoxia, CO, NO, etc. In the presence of hypoxic conditions, the DosS/DosR regulatory system is responsible for the upregulation of the dormancy genes. When sensing the change in oxygen level, DosS undergoes autophosphorylation transferring the phosphate group to the DosR regulator, which binds to the DNA regulon and upregulates ~50 genes dormancy genes essential for dormancy survival. Therapeutics have proven to be ineffective when treating dormant TB. The DosS/DosR regulatory system can be inhibited by introducing small molecule inhibitors that bind to the GAF-A domain on the DosS sensor. My project involves understanding the structural basis of small molecule inhibitors that bind to the GAF-A domain. In this work, incubation experiments were run by varying the incubation time, concentrations of Inhibitor, and GAF-A to obtain inhibitor-bound GAF-A protein, which was crystallized using the hanging drop crystallization method to elucidate the overall structural changes of the inhibitor-bound protein. The crystal tray was set by varying pH, concentration of Calcium Acetate, and Polyethylene Glycol (PEG). Diffractable crystals were obtained for inhibitor-bound GAF-A at conditions pH 7.2, 18% PEG and no clear effect from [Calcium Acetate]. This knowledge would then be used for further drug modification and discovery by diffracting the crystals to determine the crystal structure.

Optimizing ATDC5 Seeding of Graphene Foam for Cartilage Tissue Engineering

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Abstract

Knee osteoarthritis (OA) is a degenerative joint disease which weakens hyaline cartilage, the protective tissue at the ends of diarthrodial joints. Since cartilage has a limited healing capacity, development of 3D tissue engineering is a prospective treatment which utilizes bioscaffolds to match the mechanical properties of the target tissue. However, challenges exist in characterizing 3D bioscaffolds using current techniques as they are limited by scaffold opacity and dimensionality. It is important to understand cell migration and distribution within these three-dimensional environments. This project utilizes X-ray microtomography (microCT) to characterize structural features of chemical vapor deposition (CVD) graphene foam (GF) such as surface roughness, porosity, pore interconnectivity, and surface to volume ratio. Furthermore, 3D microCT imaging of mouse-derived chondrocyte progenitor cells grown on GF bioscaffolds was optimized by developing a new cell staining protocol using colloidal gold. Unlike 2D cell cultures, analyzing a single cell plane is not sufficient when working with three-dimensional cell cultures, therefore it is important to characterize proliferation, migration, and distribution of cells within the bioscaffold. Cellular distribution and proliferation are important to functional cartilage tissue and the methods that we have developed allow us to quantify those parameters as it relates to bioscaffold architecture.

Twin Pregnancies With Complications: The Impact on Neurodevelopment: A Study via Registry Follow up (TWINS-RF)

Summayah Beg
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Abstract

The incidence of twin pregnancies has noted an exponential rise of 1.6 million births per year. However, despite the success of novel reproductive technologies and the advancements in the understanding of general twin physiology, there remains a lack of research investigating neurodevelopmental outcomes post birth. The objective of this study was to compare the incidence of adverse neurodevelopment outcomes in uncomplicated monochorionic and dichorionic twin pregnancies and pregnancies affected by twin-to-twin transfusion syndrome (TTTS), twin anaemia polycythaemia sequence (TAPS), sFGR and sIUD.

The study population was divided into controls (uncomplicated twin pregnancies) and cases (twin pregnancies complicated by TTTS, sFGR, TAPS or sIUD). Mothers of children aged between 12 to 60 months at time of assessment were asked to complete the relevant ages and stages questionnaires (ASQ) to assess the child's neurodevelopment. The primary outcome measure was an abnormal ASQ defined by a score 2 SD lower than the mean. The overall prevalence of an abnormal ASQ-3 score in children with complicated twin pregnancies was significantly higher and double than that in uncomplicated twin pregnancies (14.53%;17/117versus7.62%;16/210, p = 0.047). Children born of complicated twin pregnancy also showed significantly higher rates of impairment of the gross motor domain compared to the control group (8.55%; 10/117versus2.86%; 6/210, p = 0.022).

Having ascertained the significance of developing adverse neurodevelopment outcomes in twin pregnancies, we can analyse maternal and fetal outcomes present, this allows us to place measures within the clinical environment to reduce the prevalence of adverse outcomes in future twin populations.

Cystic Fibrosis: A journey to mucus clearance.

Maryam Adam
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Abstract

Cystic fibrosis (CF) is a hereditary, life-limiting disease that affects the lungs in around 75,000 people worldwide. CF is caused by a mutated Cystic Fibrosis Transmembrane Conductance Regulator (CFTR) gene. The CFTR protein is found in many different epithelial tissues. The CFTR protein's main function is to act as an ion channel that regulates liquid volume on epithelial surfaces by secreting chloride and inhibiting sodium absorption. Mucus clearance, the lungs' natural defence system, fails when the volume of airway surface fluids is diminished. Due to mucus clearance failure, a CF patient is unable to efficiently remove inhaled germs. The lungs cannot expel the mucus which contains pathogens leading to symptoms depending on age and severity. A few of the severe symptoms consist of malabsorption, pancreatitis, infertility and pneumonia. CF requires drug therapy, physiotherapy and nutritional support. Improvement comes in the form of treatment by corrector drugs like Ivacaftor which is effective in patients with the G551D mutation that only occurs in a small population of CF, Lumacaftor for the more occurring F508del mutation and Orkambi which is a mixture of both drugs. Another promising approach is gene therapy. There are several concerns surrounding therapy for CF. A major challenge for the CF research community is the capacity to treat it utilising tailored medication based on each patient's genetic profile. Clinical development of gene or cell-based therapies holds the potential of a mutation-agnostic solution for CF in the future.

Cardiac Fibroblast GSK-3α Aggravates Ischemic Cardiac Injury by Promoting Inflammation

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Abstract

Myocardial Infarction (MI) is a leading cause of death worldwide. Glycogen Synthase Kinase-3 (GSK-3) has been identified as a promising therapeutic target for cardiovascular diseases. The GSK-3 family has 2 isoforms, α, and β. Previously, our lab identified Fibroblast-GSK-3β reduces fibrosis in the ischemic heart. However, the role of Fibroblast-GSK-3α in the ischemic heart is not well defined. To determine the role of Fibroblast-GSK-3α in MI-induced cardiac damage, GSK-3α was deleted in activated Fibroblasts using the tamoxifen (TAM)-inducible Periostin promoter-driven Cre recombinase. 12 week old mice were fed with TAM diet. After 1 week of the TAM diet, control and KO mice underwent MI surgery. Serial echocardiographic analysis revealed that KO mice had reduced MI-induced systolic dysfunction and dilative remodeling. To investigate the role of Fibroblast-GSK-3α in MI-induced chronic inflammation, hearts were harvested at 4 weeks post-MI and the expression of inflammatory genes was examined. Surprisingly, inflammatory gene expression was remarkably low in the KO group. To delineate the underlying mechanisms, the effect of GSK-3α deletion on the pro-inflammatory NF-κB signaling pathway was examined. WT and KO Fibroblasts were treated with TNFα (inflammatory gene). Western blot analysis showed a significant reduction in NF-κB activation in TNFα treated KO FBs. Additionally, experiments demonstrated that inflammatory gene expression was downregulated when immune cells were co-cultured with KO Fibroblasts. Our findings show that Fibroblast-GSK-3α plays a critical role in pathological cardiac remodeling. Thus, it could be therapeutically targeted for future clinical applications to reduce post-MI complications.

WorldCUR 2023
THE UNIVERSITY OF WARWICK

International Student Research Project

International Student Research Project (ISRP)

WorldCUR 2023 wanted to provide opportunities for students to network and research together before the Congress and to share their findings at WorldCUR.

To achieve this, the team at Warwick created the International Student Research Project (ISRP) to bring together students from across the world to devise, undertake and present a research project of their choice at WorldCUR. The team at Warwick, led by Professor Jane Bryan, were also particularly keen to design the ISRP project to provide postgraduate students the opportunity to acquire supervision experience.

Student researchers from different institutions and countries were formed into seven interdisciplinary, international teams, each team supported by two co-supervisors (one an established academic and one a postgraduate doctoral student).

Whilst many of our ISRP students were able to attend WorldCUR-BCUR in person, the model for the project did not require this. The project was designed to enable students unable attend in person to use the connectivity created by video conferencing to have an 'internationalisation at home' research experience.

The innovative ISRP model is a low-cost, easily replicable 'internationalisation at home' format, which enables students to undertake international research projects and build international connections and intercultural awareness despite restrictions on their mobility. The projects have also developed the skills and employability of student researchers and novice postgraduate supervisors.

The ISRP would not have happened without the support of Dr Maher Khelifa (Qatar), Professor Julio Rivero (Carroll), Professor Maria Iacullo-Bird (PACE) and the amazing ISRP students and supervisors.

Ocean's Urgency for Recovery

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Abstract

Water is the greatest "universal solvent" due to its ability to dissolve most substances on Earth; however, it is being used as a dumpsite for humanity's trash. Matters are progressively getting worse for the health of all ecosystems, animals, and Earth itself. The goal of this research is to review the information that is currently available about ocean pollution to then determine what the next best steps are to aid in its recovery. Our work coincides with the fourteenth goal of the United Nations' sustainable development goals (SDGs): life below water. We would like to bring awareness to the current standings of our bodies of water, the causes of how it came to be, the effects it has brought forth, and what the future can look like for our oceans on a global scale. We will use prior research, literature, and statistics on ocean pollution to educate ourselves and inform our audience on the journey of the ocean's health. By doing this, we believe that we will be able to determine the severity of marine pollution as well as what is being done about the issue. There will be conversations on point and nonpoint sources, debris, algal blooms, oil spills, and discharges, and the harm they have caused, such as coral bleaching and the death of marine life. With our research, we hope that the harsh realities shown will bring enlightenment for change by taking action through the support of advocacy groups and mindfulness in our daily lives.

Supervisors

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Application of Stochastic Game-theory in Sustainability

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Abstract

Policies play an essential role in future solutions to sustainability issues internationally. Undergraduate students are going to be critically impacted by the over-exploited energy resources and the subsequent government policies. Ever since our childhood, we have faced the ground-level impact of the government's actions on environmental challenges. Thus, we are passionate about using our acquired knowledge to analyze policies outlined by the government. Our approach will be to link the two fields: game theory and stochastic processes. With the increased application of game theory, we will be using a combination of Mixed Nash Equilibrium (the optimal solution of a game) and random distributions from the field of statistics to comprehend the impact sustainable policies have on economic entities. It will be relevant to a growing body of literature that is aiming to use stochastic game theory to analyze and improve environmental management. Our presentation hopes to link statistics and game theory in an innovative manner which is less frequently used in research works. This research hopes to creatively analyze a government's thought process and considerations while making its sustainability decisions. This approach could help us predict a government's policies and decision-making, encouraging and validating multidisciplinary and mindful research.

Supervisors
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POWER

To What Extent do Student Perceptions Align with the Push Toward STEAM?

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Abstract

Universities in the United Kingdom and the United States have begun to seek collaboration between the Arts and STEM fields. Historically, degrees from STEM fields have been placed in higher regard than the Arts; the dominant effects of this trend have been seen in disparities in social support through funding and dedicated institutions. This project intends to research the effectiveness of STEAM, specifically in identifying if the new definition amplifies collaboration across disciplines, or instead places the fields as adjacent and of equal value.

To incorporate the strengths of both Haoquan and Madison's backgrounds, this project will be conducted through both quantitative and qualitative research methods.

Quantitative: This entails collecting numerical data on the enrollment of Arts and Humanities disciplines at each school between 2015 and 2022 and will be compared to STEM subjects to demonstrate the emerging trend and identify the drivers of the trend in light of previous research. This data will also consider if the two universities are running and recruiting students for interdisciplinary programs, or if the Arts and STEM fields still remain separate.

Qualitative: Through an anonymous questionnaire, sent to students in both universities, the goal will be to track student motivations for entering their field and their perceptions of the value of their discipline. This will allow us to identify the personal aspect of choosing a major and consider how this overlaps with previous literature.

Supervisors
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Student perceptions of abortion stigma and its potential effects on help-seeking behaviors

Diana Bello[1], Jordan Teetz[2]
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Abstract

The US constitutional right to abortion, a controversial and politically leading topic in the United States, has been eliminated after Roe v Wade was overturned in 2022. The Abortion Act of 1967 in England, Scotland, and Wales, legalized abortion subject to a number of conditions, including harm to the woman's bodily or mental health. The threshold of harm to mental health based on the perspective of a registered medical professional, not the pregnant woman. A new legal structure, in Northern Ireland, became effective in 2020, allowing for legalization up to 12 weeks. Sexual education, within the US, is a highly politicized topic, in which approximately 50% of high school students learned about birth control methods. Continually, debates are created surrounding if school's have the right to teach sexual education, or should remain an abstinence-only institution. We are seeking insight on how sexual education and mental health knowledge plays a role in one's perception of resources such as abortions. Through a survey, we will compare student's perspectives on abortion to knowledge on female reproduction and mental health. With the results of this study, we hope to show how this lack of education prior to university causes ongoing harm to those trying to obtain help-seeking behaviors.

Supervisors
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HEALTH

What challenges does Generation Z face from the usage of social media?

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Abstract

This study explores the challenges of social media usage that will contribute to the social disconnect in Generation Z.
There has been growing concerns about the effects of social media. Lang and Ngien have found that "Instagram use affects social anxiety, through social comparison" in addition it has also been found that "…teens with poor social skills have worse perceptions of their own social skills" (Cillessen and Bellmore 2011). The following factors will be examined to determine if there is a correlation between social media usage and the decline in in-person social ability These factors include time spent socializing through a platform, time spent socializing in person, and average screen time. This study aims to provide findings that explain social media's effects on in-person social ability.
To explore this, groups of international college students from three college campuses will be surveyed regarding their social interactions on social media and in person. The campuses surveyed will be Carroll University, Pace University, and the University of Warwick. Each group will consist of 50 students and will be recruited through campus email. Our findings will allow other generations to gain a deeper understanding of the challenges they might face when communicating with Generation Z. For example, its possible professors could modify their current teaching practices. Furthermore, this information can be utilized to better connect and improve their social ability. From this study, young social media users will better understand the importance of in-person social interactions and place more emphasis on balancing their interactions.

Supervisors
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COMMUNITY

Who spends the most on medical care? A perspective through data.

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Abstract

Healthcare systems in the US have faced tremendous challenges, due to exogenous shocks such as the COVID-19 pandemic and an aging population. Moreover, the increase in political polarization during the pandemic has shifted perspectives on how much individuals trust scientific information that shapes expenditure behavior. Big Data can provide valuable information on such behavior and how to improve the health outcomes of society as a whole for healthcare providers and governments. Hence, our research seeks to utilize the potential of Big Data to detect patterns of how household characteristics impact medical care expenditure, especially in areas with strong differences in political affiliation.

Current empirical reports have found that medical expenditure in the US depends on the source of payment, demographic, and geographic factors. Moreover, a generous portion of the total medical expenditure is concentrated among a small group of individuals. To contribute to existing literature, our paper will update the analysis with 2022 data as well as an additional variable of political beliefs.

Specifically, we will utilize ArcGIS, a geographical information system created by Esri, to extract data within Designated Marketing Areas (DMA's). OLS regression analysis will be conducted to draw the relationships between household characteristics (e.g. age, race, education, income and marital status) and the Medical Care Index. We chose Buffalo, NY, Jacksonville, FL, Palm Springs, CA, and Wichita Falls & Lawton, TX as the four DMAs for our research due to the differing political affiliations and population sizes, which allow for the potential of a more diverse sample.

Supervisors
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The US and UK constitutions, lessons to learn with flexibility

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Abstract

The UK legal system does not have a codified constitution; therefore, the UK lacks clear guidance of rules and procedures. Whereas the US has an extensive codified constitution; however, this can inhibit the flexibility of ability to amend the US constitution, slowing the development of US law. This project will compare the UK and the US constitutions and the benefits and disadvantages of both systems. Previous research on the UK constitution suggests the state should consider codifying its constitution because the UK requires clearer procedures and rules. Previous research on the US justice system has suggested utilising the tools in its constitution, such as amendments, to create greater flexibility in its foundation. By drawing on this research, we will first analyse the advantages of both constitutions before examining how flexible should the process of amending a constitution be. This will then provide a basis for interrogating how to improve both constitutions.

This project reviews current primary and secondary literature on the US and UK constitutions and compares the arguments from both countries to assess the benefits and disadvantages of a state operating with a codified constitution.

This project provides some ideas of how both the US and UK can review their constitutions. The comparison of the existing concerns over the US codified constitution and the UK uncodified constitution and conventions will suggest interesting questions about how the US could develop a more flexible way of amending its constitution and how the UK could move towards a codified set of rules.

Supervisors
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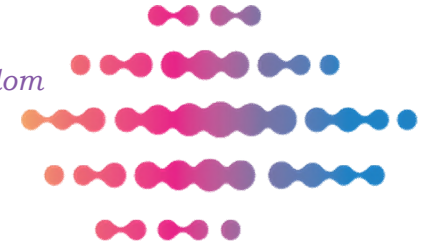

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