AUSTRALIA ECU EDITH COWAN UNIVERSITY

EMCRN

connecting researchers at ECU

SYMPOSIUM 2023

Start Time	End Time	Session Details		
9:00 am	**9:20am**	**Welcome**		
9:00 am	9:05 am	**Welcome by ECU EMCRN Committee Co-Chairs** Dr Masoumeh Zargar, Lecturer, School of Engineering (EMCR Committee Co-Chair) Dr Ross Hollett, Lecturer, Arts and Humanities (EMCR Symposium Subcommittee Co-Chair)		
9:05 am	9:20 am	**Welcome by Vice-Chancellor** Professor Steve Chapman CBE		
9:20 am	**10:20 am**	**Presentations (Session 1)**	**Presenter**	**School**
		Tackling Micro and Nanoplastics Water Contamination with Advanced Materials	Dr Masoumeh Zargar	Engineering
		A Multicultural Nation, Connected Through Country: Applying Indigenous Ways of Knowing to Improve Social Cohesion and Promote Anti-Racism	Dr Mary-Anne Macdonald	Kurongkurl Katitjin
		Rule-based AI Modeling can Enhance Cybersecurity Solutions for Critical Infrastructure	Dr Iqbal Sarker	Science
		Let's Sing Together – Social Prescription to Combat Loneliness and Social Isolation to Support Wellbeing for Older Migrants Living with Dementia	Dr Simone Marino	Arts & Humanities
10:20 am	**10:40 am**	**Morning tea**		
10:45 am	**11:30 pm**	**Keynote Address**		
10:45 am	11:30 am	**'Leveraging your World-Class Research Culture to have Impact'** Andy Lamb, Innovation Studios, startup practitioner and entrepreneur		
11:30 am	**12:30 pm**	**Presentations (Session 2)**	**Presenter**	**School**
		'If These Were My Kids, I Would Teach Them a Lesson!' Punitiveness, Anxiety, and Australia's 'Prison Dilemma'	Dr Piero Moraro	Arts & Humanities
		The Co-Design of Community Safe Spaces	Dr Lesley Andrew	Nursing & Midwifery
		Are Charities and Not-For-Profit Organisations in Australia Adequately Prepared for New Challenges in Reporting?	Dr Tricia Ong	Business & Law
		Optimus Prime-Ing: Can Priming Seagrass Seedlings Provide Enhanced Resilience to Prolonged Heatwaves?	Dr John Whale	Science
12:30 pm	**1:00 pm**	**Lunch**		

Start Time	End Time	Session Details		
1:00 pm	**2:00 pm**	**Workshop**		
1:00 pm	2:00 pm	**'What does research culture mean to you?'** Facilitated by Andy Lamb, Innovation Studios		
2:00 pm	**3:00 pm**	**Presentations (Session 3)**	**Presenter**	**School**
		Invisible Women: Gender Representation in High School Science Courses across Australia	Dr Helen Adam	Education
		Hydrogen geo-storage in Australian Coal Seams: An Experimental Study	Dr Alireza Keshavarz	Engineering
		Can You Be Whatever You Want?	Dr Jennifer Moyle	Education
		Assessing Pain Using an Automated Facial Recognition and Analysis App to Improve Pain Assessment for Hospitalised Older Adults	Dr Rosemary Saunders	Nursing & Midwifery
3:00 pm	**3:15 pm**	**Afternoon Tea**		
3:15 pm	**4:15 pm**	**Presentations (Session 4)**	**Presenter**	**School**
		Osteoporosis Is Associated With Increased Risk For Cardiovascular Disease Mortality In Community Dwelling Older Women: The Perth Longitudinal Study Of Ageing Women	Dr Cassandra Smith	Medical & Health Sciences
		Queer(y)ing the Australian Way of Life	Dr Jeremy Neideck	Western Australian Academy of Performing Arts
		Climate Change Effects on International Tourists' Destination Choice in the Short- and Long-run	Dr Ghialy Yap	Business & Law
		Paraverse - An Advanced Tactical Parachute Simulator for Special Operations Command, Department of Defence	Dr Brennen Mills	Medical & Health Sciences
4:15 pm	**4:30 pm**	**Closing**		
4:15 pm	4:30 pm	**Closing by Deputy Vice-Chancellor (Research)** Professor Caroline Finch AO		
4:30 pm	**5:30 pm**	**Sundowner, Networking and Award Presentations** *Birra Bar, Building 9*		

Tackling Micro and Nanoplastics Water Contamination with Advanced Materials

Dr Masoumeh Zargar, Engineering

Bio:
Dr. Masoumeh Zargar is currently a Lecturer and an Australian Research Council (ARC) DECRA Fellow at the School of Engineering. She holds a Ph.D. in Chemical Engineering from the University of Adelaide. Dr. Zargar joined ECU in 2020 as a Vice-Chancellor Research Fellow after serving as a Postdoctoral Research Associate at the University of Western Australia. She now leads the Advanced Materials and Membranes Research Group, overseeing over 10 Ph.D. students and research assistants. Their work focuses on developing functional materials and membranes for applications such as water treatment, desalination, resource recovery, microplastics/nanoplastics removal from environment, photocatalysis, and PFAS treatment.

Abstract:
The increasing presence of micro and nanoplastics (MPs/NPs) in our water systems is a significant environmental concern, as it can adversely affect aquatic life and potentially even human health. Wastewatertreatment plants (WWTPs) are one of the main pathways by which MPs/NPs enter the aquatic environment, accounting for over 25% of their release into the oceans. Unfortunately, the current conventional treatment technologies in desalination and WWTPs have not been designed to effectively capture/remove MPs/NPs from water. Although membrane filtration processes can offer practical solutions for MPs/NPs removal, limited research has been devoted to applying polymeric membranes for their treatment in the water industry.Further, there is limited research on harnessing the power of advanced functional materials targeting MPs/NPs removal. This presentation aims to provide valuable data on membranes' MPs/NPs separation andantifouling properties using our advanced membranes tailored with functional materials (e.g., metal organic frameworks (MOFs), zwitterionic agents, carbon nanotubes, hybrid nanomaterials) and membrane modification strategies. The developed membranes showed enhanced properties and MPs/NPs separation efficiencies, thereby enabling improved capture and removal of MPs/NPs from water sources. The results can serve as a beneficial foundation for future studies involving other derivatives of these materials and modification approaches. The developed membranes can be later integrated with other treatment techniquessuch as coagulation, flocculation, or hydrocyclones to provide multifaceted MPs/NPs separation from water and industrial wastewater.

A Multicultural Nation, Connected Through Country: Applying Indigenous Ways of Knowing to Improve Social Cohesion and Promote Anti-Racism

Dr Mary-Anne Macdonald, Kurongkurl Katitjin

Bio:
As a scholar of race and education, I am passionate about improving social cohesion and educating the Australian population to better understand and work with Aboriginal and Torres Strait Islander people. My research explores the intersection of Indigenous students' experiences in schools, teacher attitudes, and the potential of Indigenous knowledge paradigms to shape a cohesive national identity for multicultural Australia. Equally comfortable with quantitative methods as I am with qualitative analysis, I strive to develop robust approaches to anti-racism for 21st Century contexts. My research has been featured in The Conversation, Counterpoint, ABC Radio National, and other global media.

Abstract:
In times of national debate on pressing social issues, racism frequently rears its ugly head. Psychologists and trauma experts have highlighted the very real, damaging effect on Indigenous people's mental health caused by sustained exposure to racism in social and mainstream media during the Voice Referendum debate. Peak multicultural groups have highlighted that racism against Aboriginal and Torres Strait Islander Peoples must be addressed clearly and explicitly, as part of a broader journey towards reducing racial discrimination experienced by other Australians and minority ethnic groups. The Australian Human Rights Commission has called for a targeted national approach to anti-racism by increasing institutional and social capacity for active anti-racism. Regardless of the Referendum results, underlying fissures in our society have been revealed that need to be addressed. The answer to this scourge, lies in upskilling the 'well-meaning but silent majority' to become capable advocates for anti-racism.

My research explores a number of powerful vectors that can drive this social change. The first of these is the power of combined national identity, couched in the Indigenous concept of relationality, a concept that considers our innate connectedness to each other, through our connectedness to Place. Through relationality, diverse groups explore their contribution and part of the whole, whilst remaining inextricably unique.

Supplementing this theorisation of identity, my research explores the power we each have to shape our own ethnic groups' relations to others. In-group behavioural modelling of anti-racism is a subtle but intentional approach to re-shaping interracial relations. Peer-to-peer modelling of behaviours, and story-sharing that increase racial competence, awareness, and expectation of a better future. I present two studies exploring the impact of this approach in higher education.

Combining theory and practice, I theorise a new approach to addressing racism, focused on upskilling Australians to reduce racism and become a model of positive race relations to the world.

Rule-based AI Modeling can Enhance Cybersecurity Solutions for Critical Infrastructure

Dr Iqbal Sarker, Science

Bio:
Dr. Iqbal Sarker currently working as a research fellow at ECU Security Research Institute. Before that he completed his PhD in Computer Science from Swinburne University of Technology, Australia. His interests include Cybersecurity, AI & Machine Learning, Data Science, Digital Twin, Smart City Applications & Critical Infrastructure Security. He has published a good number of research papers including Springer book as a lead author. He has also been listed in the world's top 2% of most-cited scientists, published by Elsevier & Stanford University, USA. Dr. Sarker is also involved in Journal editorial, international conference PC, student supervision, and international collaboration.

Abstract:
Critical infrastructure (CI) typically refers to the essential physical and virtual systems, assets, and services that are vital for the functioning and well-being of a society, economy, or nation. However, the rapid proliferation and dynamism of today's cyber threats in digital environments may disrupt CI functionalities, which would have an impact on public safety, economic stability, and national security. This has led to much interest in effective cybersecurity mechanisms regarding automation and intelligent decision-making, where AI-based solutions is potentially significant in real-world application areas. In this presentation, we explore ``Rule-based AI" rather than other black-box solutions since human interpretation, i.e., transparency and trustworthiness in decision-making, is an essential factor, particularly in cybersecurity application areas. This presentation covers an in-depth understanding on multi-aspects rule-based AI modeling with a taxonomy of rule generation methods. For this, we take into account not only knowledge-driven approaches based on human expertise but also data-driven approaches, i.e., extracting insights from data, and their hybridization. This understanding can help security analysts and professionals comprehend how systems work, identify potential threats and anomalies, and make better decisions in various real-world application areas. We also cover how these techniques can address cybersecurity concerns in different CI sectors, such as energy, transport, health, water, agriculture, etc. We conclude this presentation with potential future works highlighting research issues with their potential solution directions for how researchers and industry professionals might tackle future generation cybersecurity modeling in this emerging area of study. Overall, we believe this work opens a promising path and can be used as a reference guide for both academia and industry for future research and applications not only in the area of CI cybersecurity but also in other application domains where automation, intelligence and trustworthy decision makings are the key factors.

Let's Sing Together – Social Prescription to Combat Loneliness and Social Isolation to Support Wellbeing for Older Migrants Living with Dementia

Dr Simone Marino, Arts & Humanities

Bio:
Simone is a postdoctoral fellow at ECU Social Ageing (SAGE) Futures Lab, and at NARI (National Ageing Research Institute). He has been a Researcher at the University of Adelaide, a Lecturer in Sociology, Intercultural Communication, and Italian Studies at the University of South Australia (UniSA) for more than 12 years.

His expertise is in migration studies and ethnic identity.

Abstract:
Australia is an immigrant country. While 37% (over 1.4 million) of Australia's population aged over 65 years is culturally and linguistically diverse (CaLD), the number of older migrants with dementia is projected to increase from about 135,000 in 2016 to about 379,000 by 2051.

People with dementia from migrant communities are at increased risk of loneliness and social isolation, and dementia research frequently underrepresents these populations and relevant data on CaLD communities are not routinely gathered or reported.

Australian Institute of Health and Welfare reported that CaLD older people experience social isolation as a consequence of language and cultural barriers, lack of family support, racism and complex immigration and resettlement issues.

Loneliness and social isolation, which are two distinct but interrelated concepts, must-and can-be addressed. Loneliness comprises both social and emotional loneliness: loneliness is a subjective negative feeling associated with a perceived lack of social connections with people who have similar interests (social loneliness) or a perceived lack of a specific desired companionship (emotional loneliness). Social isolation is a multidimensional concept defined as the objective lack or paucity of social contacts and interactions with family members, friends or the wider community. Evidence shows that loneliness and social isolation are important risk factors for all causes of morbidity and mortality, cognitive impairment and severe depression.

In recent years, social prescribing has become a global movement which represents a growing awareness that health care must go beyond pharmaceutical treatments to improve overall health and wellbeing. Social prescribing connects individuals to non-clinical support programs which take a holistic approach to individuals' health and wellbeing by addressing individual needs and interests, facilitating cultural-specific programming, and fostering social connection to reduce isolation. Let's-Sing-Together is a cutting-edge initiative to develop and pilot a social prescribing group-singing intervention to examine the impact on social connection, wellbeing and acceptability for older migrants living with dementia and family caregivers. The project is guided by a team of leading scholars with expertise in aged care, dementia research, migration and CaLD communities, and participatory arts for health and wellbeing. A Music Engagement for CaLD Social Prescription Network (MusE) will be established and launched (as part of ECU SAGE) for further knowledge translation and sustainability of the project. Data collection will involve a mixed-methods approach including pre-and-post intervention outcome measures, observation and semi-structured interviews. Findings will contribute to the development of best practice guidelines and resources to support advances in the social prescription model of healthcare.

‘If These Were My Kids, I Would Teach Them a Lesson!’ Punitiveness, Anxiety, and Australia’s ‘Prison Dilemma’

Dr Piero Moraro, Arts & Humanities

Bio:
I am interested in normative and empirical questions concerning the criminal justice system (policing, corrections, social justice, civil disobedience). I am lucky enough to teach on these same topics (criminology, correctional studies, misconduct and corruption prevention). Originally from Italy, I have a PhD in Philosophy (Stirling, UK).

Abstract:
An enduring question in criminal justice debates concerns the prison’s purpose.

Many believe in retributivism, and think that the prison should be, first and foremost, a place where offenders are made to suffer for what they have done. Others believe in rehabilitation, and think that the purpose of the prison should be to help offenders abandon their criminal habits.

It is no coincidence that retributivism is popular in countries with very high incarceration rates, such as Australia. However, Australia is also the only country in the world where incarceration rates are going up while crime rates are going down: in a 2021 report, the Productivity Commission called this “Australia’s Prison Dilemma”. To understand this anomaly, I discuss the psychological mechanisms that drive public punitiveness. After presenting some empirical studies conducted in the UK and the US, I show that often punitiveness has less to do with the threat of crime and more with the expression of ‘status anxiety’. Behind people’s passionate calls for ‘locking ‘em up and throwing away the key’ lies a sense of insecurity about one’s own status in society (e.g., about being perceived as a ‘good’ person). I then use this framework to analyse current discourses in Australia concerning juvenile offenders and asylum seekers.

I argue that this analysis of public punitiveness can help us understand (and address) Australia’s ‘prison dilemma’.

The Co-Design of Community Safe Spaces

Dr Lesley Andrew, Nursing & Midwifery

Bio:
Lesley Andrew is a senior lecturer at the School of Nursing and Midwifery where she coordinates the Master of Nursing and two integrated PhD units. Her research interests include gender equity, health promotion, the student experience and teaching and learning excellence.

Abstract:
Suicide is a leading preventable cause of death for Australians, responsible for 35% of all deaths in those aged 18–24 years in 2021. For many, the hospital emergency department is the only available service during a mental health crisis. The literature reports this can present an unwelcoming, unsafe and disempowering environment and impede recovery.

The Mental Health Commission report 'Suicide Prevention 2020' highlights an urgent need for an alternative, community-based service with a therapeutic environment tailored towards recovery. These need to be codesigned with individuals with experience of a mental health crisis.

Our qualitative, two stage research project aimed to develop an evidence-base of the service users' community safe space requirements. Participants were Western Australian adults who had a recent experience of a mental health crisis and had presented at an emergency department. In stage one, seven participants discussed how a community safe space should be designed via one of two online focus groups through Zoom. Stage two applied a photovoice method of data collection, in which 11 participants shared visual representations of a safe space by sharing their own photographs. Findings from the thematic analysis of stage one data outline the required sensory, physical and social design of a therapeutic safe space. Underpinning these themes are the principles of inclusivity, agency and peer advocacy, and the rejection of hierarchy and dominance.

Stage one findings, published in the International Journal of Mental Health Nursing have received attention from community partners. This includes 'Roses in the Ocean', a national organisation committed to reducing suicide, and Maroondah City Council representatives in Victoria. We plan to work with these two organisations to inform the development of a community safe space in Maroondah. It is expected the overall research findings will also inform the forthcoming ECU student safe space project.

Are Charities and Not-For-Profit Organisations in Australia Adequately Prepared for New Challenges in Reporting?

Dr Tricia Ong, Business & Law

Bio:
Tricia is an Accounting Lecturer at Edith Cowan University (ECU). She has extensive teaching experience in tertiary education and has practiced as an accountant in managerial roles prior to an academic career. She completed her PhD in 2016, winning the ECU SBL Research Medal for the best thesis in the year. Her current research interests include financial reporting that focuses on changes and impacts from accounting standards, reporting for not-for-profit organisations and sustainability reporting. The alignment of her research interests with her teaching areas has allowed her to integrate research results in teaching, using them as authentic business examples.

Abstract:
Charities and not-for-profit organisations (NFPOs) are under increased scrutiny to provide evidence of accountability through greater transparency in their reporting. In Australia, they are regulated by the Australian Charities and Not-for-profits Commission (ACNC) since 2012 to comply with additional reporting obligations that include preparing and auditing their financial statements. Recent changes in accounting standards have made financial reporting more complex and costly for charities and NFPOs. This project investigates the benefits, costs, and challenges of charities and NFPOs arising from these recent changes in reporting requirements. While tighter supervision and increased disclosure requirements may increase public trust in the sector, excessive reporting obligations and less than necessary scrutiny may incur additional costs and other adverse impacts without resulting benefits. The project evaluates whether these increased obligations and stricter compliance related to reporting regulations are necessary and justifiable, with benefits that can outweigh the costs.

The study was based on a survey questionnaire completed by charity and NFPO report preparers. Results strongly suggested that most of these organisations have been significantly impacted by the new reporting regulations. While most appreciated the benefits of submitting an annual information statement (AIS) to ACNC to promote transparency and accountability to regulatory compliance, many felt that these intended benefits were difficult to achieve. Reasons cited include inadequate knowledge of the new requirements and inconsistency in professional judgements, resulting in confusion, unnecessary costs and stress to their organisations. The statistical results have also indicated that smaller NFPOs were most adversely impacted, primarily due to a lack of financial resources.

A comment letter based on the findings of the study was submitted to the Australian Accounting Standards Board (AASB) and is now available on the AASB's website that are used by regulatory bodies, policymakers, and other stakeholders to improve the reporting framework for the sector.

Optimus Prime-Ing: Can Priming Seagrass Seedlings Provide Enhanced Resilience to Prolonged Heatwaves?

Dr John Whale, Science

Bio:
John Whale is a Postdoctoral Research Associate in the School of Science who works in understanding the potential vulnerabilities of native plant species to climate change using molecular tools (DNA, RNA) with experiments under novel environmental conditions to better understand species' adaptive capacity for conservation and restoration efforts. John has been at ECU since 2022.

Abstract:
Globally, plants are being pressured by changes in environmental conditions, including climate change. In some cases, temperature shifts, both annual means and extremes e.g. heatwaves, are driving species toward their thermal limits. To survive, plant species must either tolerate the stress, migrate to more suitable habitats, adapt to the new conditions, or risk death. Different lifestages (seed, seedlings, juveniles, adults) may have different tolerances and vulnerabilities to such changes. Plants that are subjected to simulated novel environmental conditions can create a stress-memory whereby the effects of future stress can be mitigated, a process known as priming. In this study, we use seedlings of the Australian temperate seagrass Posidonia australis to test whether priming is a viable process to enhance thermal tolerance and build resilience to heatwaves. We collected fresh seedlings from a diverse population in Cockburn Sound, Western Australia and applied a short, simulated heatwave to half (n = 128) while the other half remained at ambient water temperatures. Afterwards, half of the unprimed and primed seedlings (n = 64 each) remained at average ambient summer water temperatures, while the other half were exposed to a prolonged simulated heatwave for 3-months in line with temperatures experienced during the 2011 marine heatwave in Western Australia. We found that priming P. australis seedlings triggers some early growth but provides no benefit under a prolonged heatwave scenario. Overall, seedling survival was high after 3-months for all treatments, while seedlings under the prolonged heatwave scenario experienced greater leaf necrosis, reduced root development, and lower biomass accumulation than ambient seedlings. As a process for building resilience, priming of P. australis seedlings using the conditions tested should not be applied in restoration and conservation efforts in Australia's west coast. Despite this, natural resilience to heatwaves could be enhanced by priming older lifestages or moving individuals adapted to warmer climates into vulnerable populations for restoration.

Invisible Women: Gender Representation in High School Science Courses across Australia

Dr Helen Adam, Education

Bio:
Helen Adam is an Early Career Researcher in the School of Education at Edith Cowan University. Helen's research focuses on promoting equitable education through publication and use of authentically diverse literature to help break down barriers of prejudice and misunderstanding. Her work is published in internationally renowned journals. She is frequently called on for expert media comment and as a presenter to diverse audiences of educators and academics. In 2023, Helen undertook a Churchill Fellowship to the USA and UK meeting with leading international academics investigating ways to enhance expertise in children's books as vehicles for disrupting prejudice and discrimination.

Abstract:
For children to develop a positive sense of identity and belonging, it is important for them to have access to accurate and authentic role models related to their gender and cultural backgrounds. This study was conducted as part of the IncludeHer movement, a movement promoting gender equity in STEM. The visibility of female role models in science is vital for engaging and retaining women in scientific fields. In this study, we analysed four senior secondary science courses delivered across the states and territories in Australia: Biology, Chemistry, Environmental Science, and Physics. We compared male and female representation within the science courses by examining the mentions of male and female scientists along with the context of their inclusions in the syllabuses.

We found a clear gender bias with only one unique mention of a female scientist, British chemist Rosalind Franklin, named in coursework in Queensland, South Australia and the Northern Territory, with all others exclusively referencing male scientists. We also found a clear Eurocentric focus and narrow representation of scientists which could negatively impact students from culturally and linguistically diverse communities and contribute to lower levels of self-confidence, belonging and uptake of STEM studies.

Existing initiatives targeting university students and researchers take place long after perceptions of a male-focused and European-centric STEM community are established. The bias found in this study will contribute to the continuing low engagement of women in scientific fields. We outline possible solutions to address this issue, including the accreditation of scientific discoveries to include female scientists and explicit discussion of structural barriers preventing the participation and progression of women in science, technology, engineering, and mathematics (STEM).

This paper, published in August, 2023, has an Almetric score of 596 and the research team is now engaging with curriculum departments in two Australian States to review gender representation.

Hydrogen geo-storage in Australian Coal Seams: An Experimental Study

Dr Alireza Keshavarz, Engineering

Bio:
Dr Alireza Keshavarz is a senior lecturer at school of engineering. His research is primarily focused on sub-surface energy systems, fluid flow in porous media, CO2 sequestration and hydrogen geo-storage. Prior to joining ECU, Dr. Keshavarz worked as a Research Scientist in CSIRO's Energy Business Unit, where he concentrated on the development of subsurface energy resources and CO2 sequestration. With a strong publication record, Dr. Keshavarz has authored over 200 technical articles in top-tier journals and conference proceedings within the field (Scopus h-index 41; FWCI 3.74). He has led and served as a chief investigator on numerous industry-sponsored projects.

Abstract:
Hydrogen has the potential to revolutionise energy systems and help combat carbon emissions as a clean fuel source. However, effectively storing hydrogen remains a major obstacle in building a robust hydrogen-based economy. To address this challenge, the idea of hydrogen geo-storage has emerged as a promising solution for large-scale storage within such an economy. These underground facilities have significant storage capacity and are economically viable. However, geological hydrogen storage is a relatively new concept, which means there's a lack of data on how it works in real storage conditions. The study focuses on investigating large-scale hydrogen storage across various geological formations, including aquifers, salt caverns, hard rock caverns, coal seams, and depleted oil and gas reservoirs. The primary emphasis is on understanding the interactions between hydrogen and the geological structures and assessing how various rock and fluid properties, such as wettability, adsorption, diffusion and permeability impact the storage capacity within these underground formations.
Among these geological options, coal seams have attracted significant attention due to their unique micro/nano pore structures, which facilitate substantial hydrogen adsorption and controlled gas release, including hydrogen. To further explore this potential, the study conducts measurements to assess hydrogen adsorption capacity and diffusion rates in different Australian coal samples, considering a temperature range of 20-60°C.

The research findings reveal important trends: as temperature increases, the hydrogen diffusion coefficient also rises, and hydrogen adsorption increases with pressure until a certain threshold, beyond which it plateaus. Importantly, this plateau indicates the maximum adsorption capacity at a given temperature, and this capacity decreases at higher temperatures.

These insights enhance our understanding of hydrogen storage behaviour and offer crucial information for the development of efficient hydrogen storage and utilisation systems, which could significantly reshape the energy landscape while addressing environmental concerns.

Can You Be Whatever You Want?

DrJennifer Moyle, Education

Bio:
As a devotee to the art of learning, Jennifer has devoted her life to teaching – the perfect vehicle for ongoing personal and professional growth. Since graduating from ECU in 1994, she has been a primary school teacher, Head of Maths and Science in a high school, and a lecturer across the areas of English, mathematics, science, history, and geography, within the Education faculty of her alma mater. Having just submitted her PhD spanning eleven years she is looking forward to a life in the academic research world. When she grows up Jennifer also wants to be an artist and writer.

Abstract:
"Can You Be Whatever You Want?" – Is an ontological enquiry examined within the pluralistic dynamic framework offered through Creative Analytical Practice (CAP) Ethnography via a convergence of Autoethnographic Faction and Pictorial Narrative Mapping, and Constructivist Grounded Theory, bringing together what might be known empirically, as well as what might be learned through evocative writing.

Set in a context of an 'age of possibilities', and inculcated with the promise of the Australian Dream, we are instilled with the belief that we can be whatever we want in the Lucky Country. However, this dogma is aged, unchecked and under theorised, particularly when our unique ancestral histories, and the circumstances we find ourselves existing in can seem to play a role in who we become. In what ways, for example, are our choices defined by the cloth from which we're cut? Can hessian really go to the ball?

In answering these questions four of my ancestral lines were examined, documenting the people within it and who they had become. Specifically, I investigated their choices within their own socio-cultural realities and time, identified patterns through and across seven generations, and reflected on how their lived experiences have impacted on my life and the parameters of possibility that exist for me.
The individual stories emerging from this process were compacted and coded, resulting in the construction of a 'Can You Be Whatever You Want? Parameters of Possibility Diagram'. This graphic representation demonstrates that our choices are confined by our collective ancestry, the platform of existence from which we are born, and a dizzying array of internal and external forces that can either enable or disable our occupational aspirations.

How has your ancestry, platform of existence, and the forces converged to define your parameters of possibility, and how can you use this knowledge proactively?

Assessing Pain Using an Automated Facial Recognition and Analysis App to Improve Pain Assessment for Hospitalised Older Adults

Dr Rosemary Saunders, Nursing & Midwifery

Bio:
Dr Rosemary Saunders is an Associate Professor, in the School of Nursing & Midwifery, ECU and Research Fellow at Hollywood Private Hospital (Ramsay Healthcare). Rosemary's research over the past ten years has focused on care of older adults in residential and acute care settings and translation of findings into practice.

Abstract:
Australia's population is increasingly ageing. Pain is one of the most common reasons for hospital admission in older adults and is a significant challenge in the care of hospitalised older adults. Pain assessment ideally involves patients' self-report of pain but for patients with cognitive impairment this is not possible and pain assessment becomes dependent on health professionals observing pain-related behaviours which may not be reliable. Using an innovative evidence-based technology-driven pain assessment app, PainChek® Universal, (that combines artificial intelligence, facial recognition, and smartphone technology), can provide a solution for better assessment of pain in older adults. Our research vision is to reduce the burden of unrecognised and untreated pain for older patients in hospital. To do this, we aim to use an effectiveness-implementation hybrid Type-2 design to implement and evaluate the clinical staff experiences of the feasibility and utility of using a technology driven pain assessment app on one ward in an acute hospital. The first phase has been the training of the clinical staff in the use of the app and an evaluation of the training, guided by the Kirkpatrick framework. The training was undertaken by 44 staff with 19 completing the post-training survey. Most respondents agreed that PainChek® Universal would be a positive addition to the assessment of a patient's pain (84.2%). Satisfaction with subject content, training facilitation, and skills practice was high (greater than 90%). Post training all but one respondent identified they were 'confident' to 'extremely confident' in using the app, but over half (52.6%) reported they would need some support in using the application. Providing training is the first step in facilitating the use of technology for better pain assessment that can improve the safety and quality of care, clinical outcomes, patient well-being as well as lowering the costs of care.

Osteoporosis Is Associated With Increased Risk For Cardiovascular Disease Mortality In Community Dwelling Older Women: The Perth Longitudinal Study Of Ageing Women

Dr Cassandra Smith, Medical & Health Sciences

Bio:
Dr Cassandra Smith is an Accredited Exercise Physiologist (>10 year clinical experience) and Postdoctoral Research Fellow in the School of Medical and Health Sciences within the Nutrition & Health Innovation Research Institute (NHIRI). Her research aims to understand the sex-disparity in cardiovascular disease (CVD) and to improve how we recognise, screen and treat women for CVD. Cassandra has a particular interest in understanding why menopausal loss of estrogen results in rapid bone loss and increases cardiovascular risk.

Abstract:
Background: Osteoporosis has been suggested to be a novel cardiovascular risk factor in older women. We explored whether osteoporosis was associated with increased 15-year risk of all-cause and cardiovascular disease (CVD) related mortality.

Methods: Hip and neck of femur (NOF) bone mineral density (BMD) was assessed in 1998/1999 by dual-energy x-ray absorptiometry. Prevalent osteoporotic fractures were self-reported. Osteoporosis was defined as any T-score ≤-2.5 (hip or NOF) or prevalent fracture or its components. Mortality records were obtained from linked health data. Associations between osteoporosis and mortality outcomes were assessed using multivariable-adjusted Cox regression.

Results: At baseline, 297/1121 (26.5%) women with a mean (SD) age of 75.0 (2.6) years had osteoporosis, 6.6% and 10.8% of these women had a T-score <-2.5 at the hip and NOF, respectively, and 17.0% had prevalent fracture. During follow up, 443 (39.5%) women died, with 14.8% attributed to CVD. There was no relationship between osteoporosis, or its components with all-cause mortality. Compared to women without osteoporosis, having osteoporosis or a hip T-score <-2.5 increased the hazard for CVD mortality by 41% and 96% (HR 1.41 95%CI 1.02-1.97; HR 1.96 95%CI 1.13-3.41). For women without prevalent CVD (n= 862), having a hip and/or NOF T-score <-2.5 was associated with increased hazard for CVD mortality by 146% and 113% (HR 2.46 95% 1.29-4.68, HR 2.13 95%CI 1.26-3.62). When considering three groups (normal, osteopenic and osteoporotic), relative hazards were not higher in the osteopenic group but were substantively higher in the osteoporotic group compared to women with normal BMD.

Conclusion: Osteoporosis, particularly defined by BMD in older women, is associated with higher long-term risk for CVD mortality but not all-cause mortality. Clinical evaluation of patients with osteoporosis should include evaluation of CVD risk. Future studies should investigate the mechanistic and prognostic role of osteoporosis in the development of CVD in older women.

Queer(y)ing the Australian Way of Life

Dr Jeremy Neideck, Western Australian Academy of Performing Arts

Bio:
Jeremy Neideck is a performance maker and academic who has worked between Australia and Korea for almost two decades, investigating the interweaving of cultures in performance; the intersection of queer identities and theories in performance; and the modelling of new and inclusive social realities. Jeremy is Course Coordinator of WAAPA's Bachelor of Performing Arts. He holds a PhD from Queensland University of Technology, where he taught across the disciplines of drama, music, and dance, and led movement training and direction in the BFA (Acting) program for a decade. Jeremy regularly consults on the architecture and facilitation of collaborative projects and programs of institutional and community transformation.

Abstract:
The central assertion of this presentation is that patterns of potential for the future of life in Australia are encoded in the work of queer performing artists and through them, the diverse hopes and dreams of their communities. It builds on a decade of exploring transcultural performance practices in queer space and time with my collaborators, a collective of performance makers that goes by the name Company Bad. We have recently been re-evaluating our landmark work Jiha Underground (2011) in an attempt to understanding why its queer worldbuilding has become a cherished part of the fabric of Brisbane's independent theatre boom, described by Hannah Brown as the 'new new wave', which arose as part of a period of sustained resourcing of new and emerging performance makers in Queensland. This presentation draws on my recently published New Platform Paper of the same name, which expands on the critical spaces opened by our analysis of Jiha Underground and championed by queer and trans writers such as José Esteban Muñoz, Jack Halberstam, Lauren Berlant, and Rachel Hann. The aim of my paper is to reach for alternative modes of associative argumentation and evidencing to understand what can be gleaned from queer voices about the future of life in Australia. My primary aesthetic interlocutors for this paper are drawn from contemporary queer artists whose work is featured on stages across so-called Australia. Their voices evoke the spectre of queer life in Australia: from Indigenous, to settler, to recently arrived. From lesbian, gay, and bisexual, to trans, queer, and non-binary.

Climate Change Effects on International Tourists' Destination Choice in the Short- and Long-run

Dr Ghialy Yap, Business & Law

Bio:
Ghialy is a lecturer and researcher at the School of Business and Law at Edith Cowan University. Her research interests include quantitative analysis in international economics and finance. She is also passionate in risk analysis and tourism economics. Her recent research analyses the effects of climate, economic and geopolitical risks on tourism industry. Currently, her ongoing research projects are investigating the effects of climate change, geopolitical and economic risks on Australia's international trade.

Abstract:
This paper examines climate change effect on international tourists' choices of destination, using Western Australia (WA) as a case study. We adopt WA because climate variability impacts the region's tourism industry. The rising temperatures by 1.5 or 2 degrees in WA can cause a hot and dry climate, which can damage the state's native flora and fauna, increase fire risk and decrease autumn and winter rainfall in the southwest tourist places. The growing uncomfortable weather incidents and climate risks could discourage tourists from engaging in outdoor activities and affect the state's tourism businesses. Therefore, it is imperative to investigate to what extent changing temperatures and weather can influence tourists' decisions to visit WA. Tourists tend to have certain expectations about the ideal weather and temperature at a destination, and expectations play a large part in a tourist's choice of destination. Furthermore, different tourist types react to different levels of risk and display distinct behavioural adaptations to climate change. The quantitative analysis augments a standard tourism demand model by including the destination's climate variables. Furthermore, interaction climate variables, such as maximum temperature and solar exposure or minimum temperature and rainfalls, are included in the model to investigate how extreme weather conditions affect tourists' decisions about their destination choices. The study adopts autoregressive distributed lag (ARDL) technique to allow a dynamic specification of short-and long-run estimations. Using disaggregated tourist arrival data from 18 countries of origin during 2005Q1 and 2020Q1, the study reveals that the effects can be different and varied according to the types of tourists and their climate preferences. From a practical perspective, tourism operators should target their markets based on weather conditions and should not presume that all tourists are predilection for sunshine beach weather.

Paraverse - An Advanced Tactical Parachute Simulator for Special Operations Command, Department of Defence

Dr Brennen Mills, Medical & Health Sciences

Bio:
Dr Brennen Mills is a Senior Lecturer and active researcher in the School of Medical & Health Sciences (SMHS) and Leads the Simulation & Immersive Digital Technology Group (SIDTG). Dr Mills' background is in the development and evaluation of innovative technologies and high-fidelity simulation-based learning environments for education and training, with a focus on resilience building and enhancing preparedness in pressurised settings. This includes development and evaluation of novel pathways for digital, augmented and virtual reality technology.

Abstract:
This project involves a collaboration between the ECU Simulation & Immersive Digital Technology Group (SIDTG) and the Department of Defence (DoD), Special Operations Command (SOCOMD). The project team leverages expertise across the Schools of Medical & Health Sciences, School of Education and School of Science. The project is co-funded by the DoD and the Defence Science Centre.

The project aims were to create an immersive virtual reality (IVR) enhanced parachute mission preparation and training tool for SOCOMD. The primary purpose of the system is to allow users to plan for and practise a descent by parachute into a self-selected area of the world by recreating a portion of the descent under canopy in IVR.
Creation of a high-level 'proof-of-concept' application and initial prototype design allows users to specify a mission configuration and desired landing zone incorporating real-world surrounding topography generated from map data, as well as manipulate altitude and bearing of the parachute at canopy opening. The system creates a first-person view, visualised and displayed through an IVR headset, allowing users to control a virtual parachute from canopy opening to the point immediately prior to landing. Users can review parachute trajectory performance through video playback in first, third, birds-eye and ground point-of-views. Users can also choose to replay scenarios with prior virtual avatars depicting previous jump trajectories, allowing users to follow or consider their new approach in alignment with previous approaches live.

Data collection with n=30 SOCOMD operational personnel evaluating the simulator has commenced to be completed by the end of September 2023. The evaluation compares ParaVerse to another commercially available parachute simulator across perceived value towards education and training, useability and simulation design satisfaction. Upon project completion, the software package will be handed over to Defence partners for embedding into operational and training environments across SOCOMD.

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