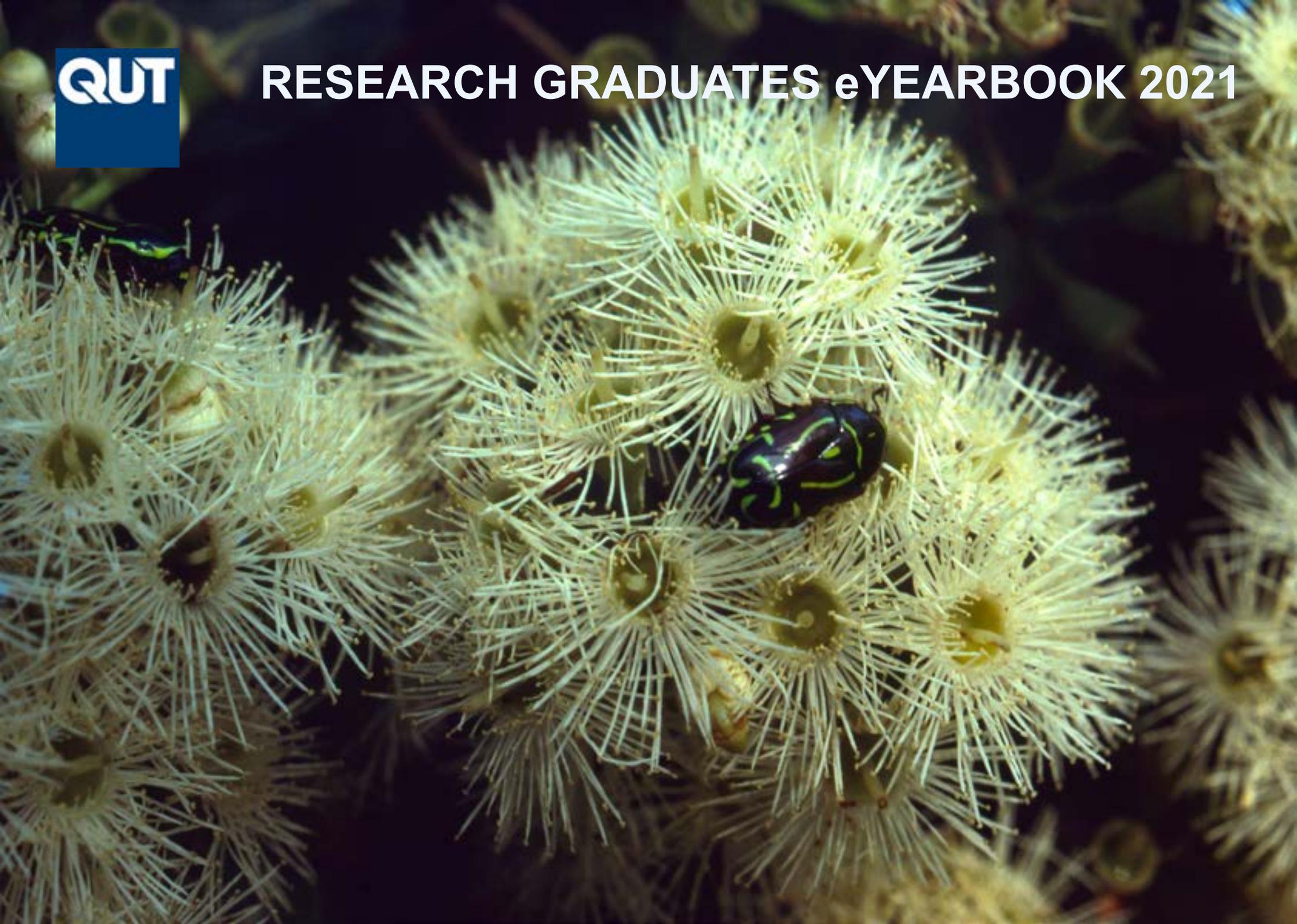


**QUT**

# RESEARCH GRADUATES eYEARBOOK 2021



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# Introduction

## Faculty of Business and Law

**Masters graduates**

**PhD graduates**

## Faculty of Creative Industries, Education and Social Justice

**Masters graduates**

**Professional Doctorate graduates**

**PhD graduates**

## Faculty of Engineering

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**PhD graduates**

## Faculty of Health

**Masters graduates**

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**PhD graduates**

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**Professor Christopher Barner-Kowollik**  
**Deputy Vice-Chancellor and Vice-President (Research)**

HDR research activity remains at the heart of QUT's real world research ambitions and our HDR cohort is one of the key the engine rooms of our innovation pipeline. In 2021, our HDR cohort showed great resilience in a world that continues to be challenged by a pandemic, complex international relations and an increasingly fractured world. Our HDR students find answers to questions that touch the very fundamentals of the human existence and its embedding into our societies, explore ways towards innovative health solutions, understand the complexities of nature from the very small to planetary and extra-terrestrial dimensions on a fundamental level and engineer the innovations that support a sustainable environment.

QUT will continue to place great importance on the HDR journey including both the research and career development components. Our graduates continue to take up leadership position ranging from industry to government agencies to academia in Australia and abroad, enabling positive change. We are continuously striving to enhance our HDR experience and research leaders across our schools, centers, faculties and divisions continue to work in partnership with our HDR cohort to maximize their impact.

The year ahead will continue to challenge us as a society and a global community on several fronts, thus resilience building remains a key learning outcome for our HDR students, enabling them to thrive in pushing the boundaries of knowledge forward.

I hope you enjoy the read.



**Associate Professor Amanda Gudmundsson**  
**Executive Dean, Faculty of Business and Law**

**Introduction**

**Faculty of Business and Law**

As Executive Dean of the Faculty of Business and Law I am proud and excited to present the achievements of our graduating higher degree research students.

**Faculty of Creative Industries, Education and Social Justice**

Researchers in the Faculty of Business and Law have focused on investigating and developing actionable solutions to real world problems faced by individuals, enterprises, and governments amongst others. Working extensively with, and through, domestic and international collaborators the research outcomes of our graduates have had local, national and global impact on policy and practice as well as advancements in our academic disciplines.

**Faculty of Engineering**

Throughout the year, the COVID-19 pandemic significantly challenged our researchers, severely interrupting their research process, especially when collaborating with external partners internationally. Our researchers have demonstrated significant resilience and flexibility, completing their research commitments and graduating from the Faculty of Business and Law. The work represented in this yearbook offers new knowledge for individuals, businesses, governments, and policy makers who are facing an increasingly dynamic environment in which 'keeping ahead of the game' is a real challenge. QUT's eYearbook showcases in more detail the cutting-edge research and achievements of our graduates and I hope you enjoy reviewing their work.

**Faculty of Health**

I would like to congratulate all of our higher degree research graduates. I wish you well for your future endeavours and invite you to keep in touch with QUT through QMomentum, a program and platform that supports research graduates to transition from study to work.

**Faculty of Science**



**Professor Lori Lockyer**  
Executive Dean, Faculty of Creative Industries, Education and Social Justice

**Introduction**

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QUT's Faculty of Creative Industries, Education and Social Justice seeks to create inclusive, ethical and sustainable change for a just world. We do this through collaborations within thriving interdisciplinary and diverse communities that connect our teaching, learning and research to deliver real world change.

We are invested in areas of research identified as priorities for the world, the nation and the state, and focused on the technology and innovation that will enable our society and our economy to progress. Our researchers collaborate on projects in specialised research groups and facilities across disciplines and institutions.

Our research graduates come to us from a wide range of backgrounds, often with significant professional experience, and are ideally placed to be the innovators and activators in the coming decades. We are stronger through our personal and professional diversity, and in recognising this strength I also acknowledge our graduates whose research is undertaken in collaboration with other QUT faculties.

As our research graduates go out into the world, we know they will make a difference, and as many graduates do, return to QUT to share their knowledge and insights with the next generation of change-makers. I am delighted to congratulate our 2021 graduates.

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**Professor Ana Deletic**  
**Executive Dean, Faculty of Engineering**

On behalf of the Faculty of Engineering, I wish to congratulate you on completing your research degree. The creation of new knowledge requires nothing less than passion and determination. This milestone marks a tremendous personal accomplishment and I thank you for choosing to share this journey with us at QUT.

It is so inspiring to see the breadth of innovation generated by our researchers in training. Your novel contributions to our understandings of engineering and the built environment are essential to the continued advancement of these fields, as well as the communities and industries they support.

The capabilities you have developed during your degree place you at the forefront of your chosen domain, and I wish you every success in harnessing this unique expertise to achieve positive and impactful outcomes into the future.



**Distinguished Professor Patsy Yates**  
**Executive Dean, Faculty of Health**

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Warmest congratulations on your well-deserved research achievements and graduating from QUT's Faculty of Health. We are committed to research excellence, and are honoured to recognise this year's graduating cohort of health researchers currently working on ground-breaking discoveries with translational impact.

Together we improve the health of individuals and communities through research innovation that is informed by industry and community connections. Research by our graduates contributes to a body of knowledge that underpins important research advances, improved health care practices and skills, and has impact in communities, industry and government across the world. The work of our alumni is advancing health and wellness to address key challenges in personalised medicine, mental health, ageing, health equity, health systems and services and disease and injury prevention.

We are extremely proud of your achievements and commend your commitment to producing research of the highest calibre and wish you every success in your future careers.

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**Professor Troy Farrell**  
Executive Dean, Faculty of Science

Congratulations on graduating from one of the nation's most collaborative research institutions. As Executive Dean of the Faculty of Science, I have the privilege of overseeing the inspiring outcomes achieved by our research teams, including our researchers in training, within the Science, Information Technology and Mathematics fields.

Collectively, we work on innovative solutions to some of the biggest challenges and opportunities facing Australia and the global community. Your contributions to these advancements are a source of great dynamism across our Faculty,

I invite you to access the QUT Momentum Program through the Graduate Research Centre. This program supports our doctoral graduates' transition from study to work. Thank you for sharing this formative part of your research journey with us and I hope that your experience at QUT has been equally rewarding. We wish you all the best for your careers in the STEM disciplines, as well as your continued pursuit of new knowledge and positive, real-world impacts.

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## 2020 ODTA Winners

At QUT we celebrate our exceptional research students with our annual Outstanding Doctoral Thesis Awards.

### QUT Business School

#### Dr Andrew Spark

Why Extraverts Become Leaders More Often than Introverts and the Implications for Psychological Well-Being  
Supervised by Prof Peter O'Connor, Prof Cameron Newton

#### Dr Heidi Zummo

Corporate Tax: An Evaluation of the Full Publicity of an Action  
Supervised by Prof Kerrie Sadiq, Dr Bronwyn McCredie

### Creative Industries Faculty

#### Dr Ehsan Dehghan

Networked Discursive Alliances: Antagonism, Agonism, and the Dynamics of Discursive Struggles in the Australian Twittersphere  
Supervised by Prof Axel Bruns, A/Prof Peta Mitchell, Dr Brenda Moon

#### Dr Petrus Johannes Loock Odendaal

Sounding relations to ground and water: responding to social-ecological change through spoken word poetry  
Supervised by Dr Keith Armstrong, A/Prof Sarah Holland-Batt, Dr Annel Pieterse

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## Faculty of Health

### **Dr Julianne Mcguire**

Exploring Barriers and Enablers in Early Childhood Education and Care Services to Meet Australian Infant Feeding Guidelines

Supervised by Prof Danielle Gallegos, Dr Kimberley Mallan, Dr Julie Smith

### **Dr Catherine Niven**

Evaluating Australian and US Consumer Product Safety Regulatory Responses to Hazardous Children's Products

Supervised by Prof Kirsten Vallmuur, Prof Ben Mathews

### **Dr Wonmongo Lacina Soro**

Towards an Understanding of Financial Influences on Heavy Vehicle Safety Outcomes

Supervised by Prof Narelle Haworth, Dr Mark King, Dr Ashim Debnath, Dr Darren Wishart

### **Dr Chloe Van Der Burg**

Understanding the Role of Innate Immune and Novel Genes in the Evolution and Regeneration of Sea Anemones

Supervised by Dr Elise Pelzer, A/Prof Peter Prentis, Adj/Prof Terry Walsh, Dr Edward Gilding

## Faculty of Education

### **Dr Shih-Han Su**

Mind-Modelling in Picture Books: A Cognitive-Literary Approach

Supervised by EM/Prof Kerry Mallan, Prof Susan Walker

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## Science and Engineering Faculty

### Dr Melina Anouche Celik

Tracing the Evolution of Australasian Mammals: Integrating Morphological, Palaeontological and Molecular Data  
Supervised by A/Prof Matthew Phillips, A/Prof Peter Prentis, Dr Vera Weisbecker

### Dr Yi Guo

The Effect of Biodiesel Soot Structure on Diesel Particulate Filter (DPF) Performance  
Supervised by Prof Zoran Ristovski, Prof Richard Brown, Dr Branka Miljevic, Dr Svetlana Stevanovic

### Dr Mark Limb

Evaluating the Implementation of Compact Activity Centres in Greater Brisbane  
Supervised by A/Prof Severine Mayere, Dr Paul Donehue, Dr Carl Grodach

### Dr Kannan Nadarajah

Customized Hydrochar from Biomass Materials for Water Treatment  
Supervised by Prof Ashantha Goonetilleke, Prof Sagadevan Mundree, A/Prof Zhanying Zhang, Dr Erick Bandala Gonzalez

### Dr Xiao Tang

Computational Investigation of 2D Functional Materials for Nanoelectronics  
Supervised by Dr Liangzhi Kou, Prof YuanTong Gu

### Dr David Warne

Computational Inference in Mathematical Biology: Methodological Developments and Applications  
Supervised by Prof Matthew Simpson, Prof Scott McCue, Prof Ruth Baker

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**Dr Chunmei Zhang**

Computational Discovery and Design of Novel Materials from Electronic Structure Engineering  
Supervised by Prof Aijun Du, Prof Steven Bottle

**Faculty of Law**

**Dr Eliana Close**

Navigating Conflicts about Life-Sustaining Treatment in a Health System with Limited Resources: Reconciling Law, Policy and Practice  
Supervised by Prof Lindy Willmott, Prof Ben White

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# Alicia Feldman

Master of Philosophy

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Country: Australia

Supervisor/s: Deanna Grant-Smith (Queensland University of Technology), Bernd Irmer (Queensland University of Technology)

## Thesis title:

Environmental Equifinality: (Re)Examining Predictors of Specific Responsible Environmental Behaviours in Australian Recreational Fishing Environments

## Description:

Environmental stewardship is essential to conserving recreational fishing areas. This thesis explores the characteristics of Australians engaged in such stewardship. A novel theoretical perspective (complexity theory) and methodology (fuzzy-set qualitative comparative analysis) uncovers complex configurational mechanisms, with multiple equifinal solutions identified as sufficient for performance of stewardship behaviours. Configurations predictive of stewardship differ between environmental organisation members and non-members. While there are numerous, varied configurations sufficient for performance among environmental organisation members, there are fewer among non-members, indicating only a specific subset of non-members perform these behaviours. These findings can inform targeted recruitment and engagement strategies for environmental stewardship participation.

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Country: Australia

Supervisor/s: Penelope Williams (Queensland University of Technology), Paula McDonald (Queensland University of Technology)

## Thesis title:

Shaping Aged Care Work Through Technology: A Senior Manager Affordance Perspective

## Description:

This research identifies the affordances of technology in aged care from the perspectives of senior managers. Interviews with Executives and Directors in a large aged care provider, an aged care industry body, and an aged care technology developer revealed the numerous ways in which technology shapes the aged care work environment. The findings suggest that government, aged care organisations, and technology providers need to balance the efficiencies of technology adoption with the humanistic nature of aged care work.

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Country: China

Supervisor/s: Janet Mack (Queensland University of  
Technology), Daifei Yao (Queensland University of  
Technology)

## Thesis title:

Does Board Gender Diversity Influence the Adoption of Conservative Accounting Policies?

## Description:

The thesis examines whether corporate board gender diversity affects corporate accounting conservatism. This study finds that board gender diversity is positively associated with corporate accounting conservatism and that the voluntary board gender requirements in Australia from 2010 to 2014 (post recommendation period) did not significantly influence the strength of the association between board gender diversity and corporate accounting conservatism. These findings serve as a good reference point for policy makers and further studies investigating gender quota recommendations in the future.

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Country: Australia

Supervisor/s: Edwina Luck (Queensland University of  
Technology), Sven Tuzovic (Queensland University of  
Technology)

## Thesis title:

How Institutional Pressures Influence Data-Driven Corporate Communications

## Description:

This study explores the use of data to guide corporate communications, a practice of which empirical research is limited, and is the first to investigate how institutional pressures influence practitioners in their work. In-depth interviews were conducted with 15 participants from a wide range of organisations in Brisbane, Australia. Additionally, the study illustrates the current state of research on big data in corporate communication in a systematic literature review. The study's findings indicate that institutional pressures influence data-driven corporate communications and are generally consistent with the results of practitioner studies around the world.

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# Liyana Arachchige Ashesha Paveena Weerasinghe

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Country: Sri Lanka

Supervisor/s: Larelle Chapple (Queensland University of Technology), Alexandra Williamson (Queensland University of Technology), Bastian Breitmayer (Queensland University of Technology)

## Thesis title:

Does CEO and Director Virtue Influence Corporate Fraud?

## Description:

This study explores Indigenous Australians' participation on Australian corporate boards and investigates how Indigenous Australians pursue listed firm directorships, confirming their significant under-representation. A content analysis of Reconciliation Action Plans of listed firms reveals the existence of organisational initiatives to support the future leadership of Indigenous Australians. Through semi-structured interviews with Australian business leaders, perceptions of cultural diversity and pathways for Indigenous Australians to ASX directorships are detailed. Interview participants' perceptions are organised under current status, views, and recommendations to improve cultural diversity. Key pathways to directorships are skills and experience, education and training, reputation, networking, and organisational support.

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Country: Netherlands

Supervisor/s: Annastiina Silvennoinen (Queensland University of Technology), Radhika Lahiri (Queensland University of Technology)

## Thesis title:

Principal Agent Theory and Blockchain Technology: Smart Contract Applications

## Description:

When economic agents have private information, the agents will be incentivised to use this information advantage by acting in a manner that does not always coincide with production and social efficiency, or the interests of the principal. This thesis investigates details specific to designing a contract with blockchain technology and smart contracts that consistently elicit efficiency and good behaviour with the best possible outcome for participating agents. We use the lens of the principal agent theory to show that implementing blockchain technology and smart contracts in contractual agreements can alleviate problems associated with information asymmetry that arise when one party holds its information private. Information asymmetry has a significant economic impact in principal agent relationships.

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# Ritesh Jain

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Country: India

Supervisor/s: Edwina Luck (Queensland University of Technology), Sven Tuzovic (Queensland University of Technology)

## Thesis title:

The Influence of Anthropomorphic Spokescharacters on Consumers' Recycling Intentions

## Description:

Environmental communicators have been using different message strategies to encourage consumers to adopt sustainable behaviours. However, use of anthropomorphic spokescharacters as endorsers in environmental communication has not been researched before, which is surprising as these characters have been quite effective in commercial marketing. The findings of this research study revealed that using popular anthropomorphic spokescharacters such as Tony the Tiger can be an effective alternate strategy which environmental marketers can pursue. Since it is a new research area, future research directions are offered for environmental marketing researchers to develop this area.

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Country: Australia

Supervisor/s: Uwe Dulleck (Queensland University of Technology), Jayanta Sarkar (Queensland University of Technology), Azhar Potia (University of Queensland)

## Thesis title:

Opportunities for Increasing Volunteering in Australia

## Description:

The focus of this thesis is to consider how incentives might be utilised to increase volunteering in Australia. Volunteering, an intrinsically motivated and often altruistic activity, is not the standard candidate for incentives; however, ruling them out categorically overlooks how incentives might be utilised to affirm, re-engage and better support volunteers. Utilising two methods: (1) a scoping study, that examines existing literature around incentives and prosocial behaviour/volunteering; (2) a quantitative examination of socio-demographic and life event determinants of volunteering in Australia. These two methods provide a basis to consider if, when and how incentives might be utilised to increase volunteering.

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# Thilini Nisansala Egoda Kapuralalage

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Country: Sri Lanka

Supervisor/s: Jayanta Sarkar (Queensland University of Technology), Dipanwita Sarkar (Queensland University of Technology), Changxia Ke (Queensland University of Technology)

## Thesis title:

Two Essays on Regional Differences in Health Outcomes of Women and Children: The Role of Female Labour Force Participation

## Description:

This thesis examines the relationship between female labour force participation and various chronic health outcomes among women and children using cross-country data over 42 years. The results suggest that in the high-income countries, higher female labour force participation is positively associated with the prevalence of obesity among women and negatively related with the prevalence of overweight/obesity among children and adolescents. However, the relationship between female labour force participation and the prevalence of other chronic diseases, such as hypertension and type 2 diabetes mellitus, is negative in these countries. The thesis uncovers interesting regional and gender variations in these relationships that are important for labour market policy.

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Country: China

Supervisor/s: Benno Torgler (Queensland University of Technology), Ho Fai Chan (Queensland University of Technology)

## Thesis title:

How Does People's Social Attachment Influence Their Investment Decision? Using Empathy to Explain Availability Bias

## Description:

By conducting an online lab experiment simulating how investors work with their financial managers, we investigate how empathy influences investors decision to maintain the working relationship with their financial managers and how empathy influences the availability bias in investors decision-making. We found that investors affective empathy is positively related to the duration of the relationship between them and their managers, even though they may have just experienced a loss. Also, investors affective and cognitive empathy positively moderates their availability bias, which means that investors with high empathy are more sensitive to information from other people.

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Country: Hong Kong

Supervisor/s: Lisa Schuster (Queensland University of Technology), Dominique Greer (Queensland University of Technology)

**Thesis title:**

The Impact of Signalling Environmental Consciousness on the Perceived Contamination and Attractiveness of Sustainable Clothing

**Description:**

This thesis examines how the type of waste recycled into textiles influences consumers contamination perceptions and other responses to sustainable clothing. Two experiments were conducted through online surveys to examine consumers responses to clothing made from materials like recycled coffee grounds and used plastic bottles. The use of recycled waste that is perceived to be more natural in manufacturing sustainable clothing reduces consumers negative contamination perception but does not increase the products attractiveness. To overcome contamination concerns, visual signalling of environmental consciousness through a logo on the clothing was investigated; however, this strategy should be undertaken with caution.

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Country: Germany

Supervisor/s: Charmaine Glavas (Queensland University of Technology), Sven Tuzovic (Queensland University of Technology)

## Thesis title:

Exploring the Concept of Creativity and Entrepreneurial Intentions to Internationalise: A Digital-born Service Firm Perspective

## Description:

This research applied the concept of creativity to the field of international entrepreneurship. Multiple case-study methodology was employed to examine how creativity is fostered within business accelerators, and secondly, how creativity influences entrepreneurial intentions to internationalise. Research findings suggest that creativity as a crucial skill for start-up success and survival is still not prioritised in accelerator programs, providing suggestions for the strategic implementation of creativity fostering structures and processes. Further, this research highlights the importance of creative potential amongst key stakeholders within the firm, particularly on the decision to engage in internationalisation, especially in the digital-born service firm context.

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Country: Australia

Supervisor/s: Char-Lee Moyle (Queensland University of Technology), Martin Obschonka (Queensland University of Technology), Per Davidsson (Queensland University of Technology)

## Thesis title:

Quality Signalling: The Effect of Innovation Programs on Innovation-Driven Enterprises

## Description:

This thesis takes a novel approach to evaluate the impact of the public policies of innovation and entrepreneurship on individual firms. This evaluation research uses 10-year time series data on Queensland businesses, Advance Queensland (AQ) program data and public datasets to investigate what types of companies get selected for the AQ program and the overall impact of these policies on innovation-driven entrepreneurship. The study found corrective general market behaviour and had a significant effect on the firms. The thesis contributes to the theory of entrepreneurial “Quality Signalling” and the governments approach to the “Picking Winners” and “Picking the Willing” phenomenon.

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# Xin Ming Chen

Master of Philosophy

Faculty of Business and Law

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Country: Australia

Supervisor/s: Edwina Luck (Queensland University of Technology), Lisa Schuster (Queensland University of Technology)

## Thesis title:

Collective Well-Being in Oceanic Esports

## Description:

Despite the focus on well-being in transformative service research, limited research examines the well-being of actors beyond consumers and service entities. This study examines collective well-being using in-depth semi-structured interviews with four crucial roles (i.e., players, tournament/league organisers, team owners/managers, and casters) in the Oceanic Dota 2 esports scene. The findings show that there is a relationship and between individual and collective well-being. Ultimately this suggest that the enhancement and destruction of actors well-being is linked with the viability of the ecosystem within which the actors are situated.

Introduction

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Country: Australia

Supervisor/s: Clinton Weeks (Queensland University of  
Technology), Hyun Jin (Queensland University of Technology)

## Thesis title:

Investigating How to Improve Consumer Engagement with Terms and Conditions (T&C).

## Description:

Online Terms and Conditions (T&C) have become increasingly complex and prevalent. This research used experimental studies to examine readership and investigate effects of fairness cues on behavioural and perceptual outcomes across T&C encounters. It confirmed low readership and found consistent habituation across encounters, even when fairness cues were utilised to inform consumers about T&C content. Manipulating T&C reasonableness, results demonstrated the need for consumers to easily be able to make fairness judgements, with fairness cues leading to significant increases in unreasonable T&C rejection, increased engagement, feelings of control, and confidence. The research can be used to inform online T&C regulation.

Introduction

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Country: China

Supervisor/s: Carol Richards (Queensland University of Technology), Helen Vidgen (Queensland University of Technology)

## Thesis title:

Identifying Opportunities for Local Food Systems Transformation: An Exploratory Study of Residents' Food Environments and Food Literacy in a Master-Planned Community

## Description:

By understanding the residents food environments and food literacy, this study identified potential opportunities for the transition to a local food system in a master-planned community. This thesis used a mixed-method approach to explore how residents described their existing food environments and to what extent their food literacy was evident. The findings provide implications for a local food system transformation that might have positive social, economic, environmental, and health effects on the community.

Introduction

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Country: China

Supervisor/s: Peter Verhoeven (Queensland University of Technology), Janice How (Queensland University of Technology), Huizhong Zhang (Queensland University of Technology)

## Thesis title:

Sustainability Information Network (SIN) and Corporate Financial Distress

## Description:

In this thesis I examine the relationship between corporate sustainability information networks (SIN) and financial distress. I propose that firms that are more central in the SIN have better access to key sustainability information which in turn results in lower financial distress. Using 5,521 in-network firms and their propensity scored matching (PSM) firms over the five-year period 2015-2019, I find strong support for my hypothesis. The findings suggest that SINs provide an important role in reducing financial distress.

Introduction

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Country: Bangladesh

Supervisor/s: Md Saiful Karim (Queensland University of Technology), Andrew Garwood-Gowers (Queensland University of Technology)

## Thesis title:

Enforcing the Environment Conservation Act in Bangladesh: Role of Legal Institutions under Statutory and Constitutional Laws

## Description:

This thesis examines the role of legal institutions in enforcing the Environment Conservation Act in Bangladesh. Applying the legal analytical method, it analyses in public law perspective how the Department of Environment, the High Court Division of Bangladesh Supreme Court, and the Special environmental courts enforce this law. The thesis argues that these legal institutions can enforce the law effectively if they adhere to the rule of law norms, particularly legitimacy, fairness, and justice in adopting environmental legal actions and measures. Effective enforcement of the law also requires strengthening of accountability systems to check breaches of such norms.

Introduction

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Country: Saudi Arabia

Supervisor/s: Janet Mack (Queensland University of  
Technology), Daifei Yao (Queensland University of  
Technology)

## Thesis title:

The Perception of Stakeholders About the Relationship Between Corporate Governance and Sustainability:  
Evidence from the Kingdom of Saudi Arabia

## Description:

This research focused on recent significant changes introduced by the Kingdom of Saudi Arabia's 2030 Vision, with respect to creating a larger role for the private sector in the economy and placing a new emphasis on social and environmental issues. Particularly this thesis assessed the perception of various corporate stakeholders to the new corporate governance framework as part of the KSA 2030 Vision for publicly listed companies on the three dimensions of sustainability (economy, society, and environment). The findings support the arguments in the literature that board structure and board characteristics have positive impacts on the three dimensions of sustainability.

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Country: Jordan

Supervisor/s: Janet Mack (Queensland University of Technology), Daifei Yao (Queensland University of Technology)

## Thesis title:

The Impact of Board CSR Orientation on CSR Strategy, CSR, and Earnings Management

## Description:

Using an international sample, this thesis examines the impact of board CSR orientation, a specific form of board-level governance, on CSR strategy, CSR performance, CSR disclosures, and earnings management. It also examines the impact of CSR strategy on CSR performance and CSR disclosures, a topic that is not yet explored. The findings support the arguments in the literature that board CSR orientation has a positive impact on CSR-related strategy, performance, and disclosures, and it reduces earnings management behaviour. The result also supports the suggestion that CSR strategies are a determinant of having a superior CSR performance and CSR disclosures.

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Country: Australia

Supervisor/s: Fiona McDonald (Queensland University of Technology), Benjamin Mathews (Queensland University of Technology)

## Thesis title:

Medical Device Regulation and Litigation: A Comparative Analysis of Australia, The United Kingdom and The United States of America

## Description:

Medical devices (e.g., vascular stents and pacemakers) are commonly used in medical procedures but pose significant risk to patients if they do not function as expected. To protect patients, many countries require that medical devices be registered prior to use. However, regulation can limit innovation and restrict access to new products, creating debate on whether reduced regulation and increased litigation could adequately protect patients. This research uses a comparative methodology to examine the risk/regulatory theory that underpins medical device regulation in Australia, the United Kingdom and the United States of America and the role litigation plays in these systems.

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Country: Sri Lanka

Supervisor/s: Jayanta Sarkar (Queensland University of Technology), Anup Basu (Queensland University of Technology), Dipanwita Sarkar (Queensland University of Technology)

## Thesis title:

Essays on Financial Decision Making

## Description:

This thesis seeks to understand and find solutions to some of the vexing issues relating to financial literacy, financial decisions and behaviour. A major part of the thesis explores how a short, focused, just-in-time financial literacy intervention can improve immediate financial decisions, and how decisions of our peers impact our own choices under various circumstances. These issues were investigated using laboratory experiments under varying socio-economic and cultural backgrounds of Australia and Sri Lanka. Finally, the thesis addresses a well-known 'wicked problem' relating to inadequate retirement saving and offers a novel behavioural insight into improving long-term saving behaviour.

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Country: Indonesia

Supervisor/s: Robyn Mayes (Queensland University of Technology), Deanna Grant-Smith (Queensland University of Technology)

## Thesis title:

Governing the Interface of Commercial Mining and Artisanal and Small-Scale Gold Mining (ASGM) in Indonesia

## Description:

This thesis examines the governance of the interface between commercial mining and artisanal and small-scale gold mining in Indonesia. It does so from the under-addressed perspective of artisanal and small-scale gold mining. Using a critical governmentality lens, the research discovered artisanal and small-scale gold miners are neglected because of governmental techniques adopted by global and national bodies to eliminate mercury use. Concurrently, these miners have created alternative knowledge and practices through counter-discourses, conduct and strategies to ensure their mining agenda can progress. This research advocates for inclusion of artisanal and small-scale miners in mining governance to promote mining sustainability.

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Country: Australia

Supervisor/s: Amisha Mehta (Queensland University of Technology), Lisa Bradley (Queensland University of Technology)

## Thesis title:

Managing Trust in a Distrusting World: Exploring Organisational and Industry Trust and Distrust

## Description:

Despite considerable exploration and acceptance of the value of trust in the public relations literature, little guidance exists on trust repair strategies within crisis contexts. This thesis seeks to address this gap first by exploring the concept that requires repair itself, trust, and the linked but understudied concept of distrust. Next, it identifies messaging strategies utilised by organisations experiencing crises and tests the effect of message strategies on organisational trust and distrust perceptions. Through this process, this research provides scholars and industry professionals with guidance on how to manage, repair and rebuild trust in what may be, a distrusting world.

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Country: Indonesia

Supervisor/s: Ogan Yigitbasioglu (Queensland University of Technology), Stuart Tooley (Queensland University of Technology)

## Thesis title:

Implementation of XBRL in the Indonesian Capital Market: An Institutional Logics Perspective

## Description:

This study examines the implementation of eXtensible Business Reporting Language (XBRL) in the Indonesian capital market. Using a qualitative method and drawing on the institutional logics perspective, this study gathers the perspectives of regulators, preparers and users to conduct multiple-level analyses of the field and organisational-level logics of XBRL reporting practices. The findings contribute to providing a multi-level approach to analysing the dynamics of organisational responses towards a mandated XBRL filing requirement. Further, this study demonstrates the importance of logics synchronisation, bridging, and embedding mechanisms that influence XBRL filing, reporting practices, and the use and usability of XBRL reports.

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Country: France

Supervisor/s: Annastiina Silvennoinen (Queensland University of Technology), Changxia Ke (Queensland University of Technology)

## Thesis title:

Four Patterns of Mispricing in Binary Option Markets

## Description:

This thesis investigates how contradictions with the efficient market theory occur in binary option markets. It is composed of four studies that use theoretical and empirical results to investigate the extent of market inefficiencies in this specific financial market. I analyse the existence of the left-digit bias, the favourite-longshot bias, the variation of security return rates depending on the-day-of-the-week and the differences in average return rates between sellers or buyers of contracts.

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Country: Sri Lanka

Supervisor/s: Amanda Gudmundsson (Queensland University of Technology), Bernd Irmer (Queensland University of Technology)

## Thesis title:

Multiple Foci of Employee Engagement

## Description:

The dissertation expands our knowledge of employee engagement through the lens of a multiple foci perspective. The studies extended employee engagement understanding by demonstrating that employees may be simultaneously engaged to different extents with multiple foci in the workplace. The research, underpinned by the target similarity model, provided a framework to identify target similar antecedents and consequences of multiple foci of employee engagement. A mixed-method design with three cross-sectional studies of public sector employees in Sri Lanka demonstrated that job and organisational employee engagement was driven by target similar related antecedents, resulting in target similar consequences.

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Country: Australia

Supervisor/s: Martin Obschonka (Queensland University of Technology), Evan Douglas (Queensland University of Technology)

## Thesis title:

Strategic Responses To Disruption by Established SMEs in a Declining Industry

## Description:

This thesis examines the successful growth strategies employed by established small and medium sized enterprises operating in the printing industry in Australia. The research uses a mixed methods approach and employs fsQCA data analysis to discover that despite facing industry disruption and decline, entrepreneurs are still able to achieve growth through the judicious selection of an appropriate suite of strategies.

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Country: Korea,(Sth) Republic Of

Supervisor/s: Yuyu Zhang (Queensland University of Technology), Larelle Chapple (Queensland University of Technology), Amedeo Pugliese (University of Padova (Università degli Studi di Padova))

## Thesis title:

Business Group Affiliation and Audit Pricing: Evidence from South Korea

## Description:

This study examines whether and to what extent risk-associated firms that are affiliated with a business group affect audit pricing decisions. The results indicate that auditors spend more audit hours and charge higher audit fees for group-affiliated firms than for other firms. Furthermore, when a group-affiliated client is economically important to auditors total revenue, higher audit fees are mainly explained by the increased audit effort. This suggests that the extent of the risk premium attached to group-affiliated firms may be limited by client firms bargaining power, especially in a competitive audit market such as Korea.

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Country: Australia

Supervisor/s: Gavin Nicholson (Queensland University of Technology), Julie-Anne Tarr (Queensland University of Technology), Myles McGregor-Lowndes (Queensland University of Technology)

## Thesis title:

How Does Director Financial Literacy Influence Financial Monitoring?

## Description:

There is a paucity of evidence into why boards such as Centro fail despite meeting normative financial governance standards. Drawing on Agency and organisational behavioural theories this mixed-method study involved developing and applying in the field a psychometrically robust measure of director financial literacy (DFL) and interviewing directors to investigate how they develop and apply this capability to financial monitoring. Findings verified that, generally, directors lack the requisite baseline DFL for financial monitoring and challenged the prevailing view that skill-based board diversity is a critical antecedent for effective board performance. Importantly, this study identifies practical strategies for strengthening DFL.

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Country: Bangladesh

Supervisor/s: Dipanwita Sarkar (Queensland University of Technology), Changxia Ke (Queensland University of Technology), Jayanta Sarkar (Queensland University of Technology)

## Thesis title:

Uplifting the Ultra Poor Through Transfer Program: Evidence from Bangladesh

## Description:

The thesis focuses on the effects of a targeted transfer program on social, economic and behavioural outcomes of the rural ultra-poor in Bangladesh. In a unique contribution, this thesis combines secondary data from a large scale randomized controlled trial with primary experimental data. Using rigorous econometric methods, the research provides the first-of-its-kind causal evidence that the transfer to ultra-poor women improves their children's occupational and educational outcomes in the long-run, and promotes patience, risk-tolerance and socio-economic empowerment among the women. This work highlights that a targeted anti-poverty intervention may confer far-reaching behavioural, social and labour market benefits, with significant policy implications.

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Country: Australia

Supervisor/s: Lindy Willmott (Queensland University of Technology), Benjamin White (Queensland University of Technology), Kelly Purser (Queensland University of Technology)

## Thesis title:

What the Doctor Would Prescribe: Medical Practitioner Perspectives and Experiences of the Voluntary Assisted Dying Act 2017 (VIC)

## Description:

This thesis is the first comprehensive empirical study of how doctors are perceiving and experiencing their statutory role under recently commenced voluntary assisted dying legislation in the Australian state of Victoria. The study uses doctrinal research and qualitative interviews to examine the centrality of doctors to the VAD system in Victoria, and the impact of their willingness to provide VAD on the systems sustainability. It concludes that stronger supports for doctors who conscientiously participate in VAD is essential, in the face of significant conscientious objection and other reasons for non-participation in VAD reported by the broader medical profession.

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Country: Indonesia

Supervisor/s: Clevo Wilson (Queensland University of Technology), Connie Susilawati (Queensland University of Technology), Duan Biggs (Griffith University)

## Thesis title:

A Multi-faceted Analysis of Indonesia's Songbird Trade Economy: An Evidence Based Market Solution

## Description:

Tackling wildlife trade requires a multifaceted approach that includes culture, economics, and psychological aspects. Implementing an intervention without considering this underlying complexity could be detrimental. This thesis explores these complexities using Indonesia's songbird trade to develop recommendations based on evidence. The thesis consists of four sections, first is the identification of priority species groups and regions, the second is the identification of motivations behind songbird keeping and competing, the third is the identification of market demand and the last is the identification of conservation priorities. The thesis recommends sustainable captive-breeding solutions coupled with community support, education, and multi-disciplinary-based monitoring.

Introduction

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Country: Australia

Supervisor/s: Kieran Tranter (Queensland University of Technology), Belinda Bennett (Queensland University of Technology), Melissa Dezwart (University of Adelaide)

## Thesis title:

Legal Adaptability to Disruptive Technology: A Case Study of Australian Law in Relation to Harm and Automated Vehicles

## Description:

This thesis investigated the effects of disruptive technological change on the Australian legal system. It employed a case study of automated vehicles to examine how the Australian legal system adapts to disruptive technology. It considered several areas of Australian law and agents of institutional change that intersect with automated vehicles to understand how the legal system responds to technological disruption.

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Country: Australia

Supervisor/s: Lisa Bradley (Queensland University of Technology), Jannine Williams (Queensland University of Technology)

## Thesis title:

Motherhood as a Protean Career for Educated Mothers in Australia

## Description:

This thesis challenges our ideas of what motherhood and 'career' means. Investigating contemporary motherhood practice, it reveals how for many educated Australian mothers, regardless of paid work engagement, motherhood is a skilled and meaningful 'job' and a 'career' in itself. The study contributes the notion of motherhood as a protean career to career theory by demonstrating how educated mothers experience motherhood over six stages - Starting Strong, Shifting Ground, Digging Deep, Aiming High, Learning Lots and Taking Stock. Motherhood as a protean career can fundamentally reshape how organisations, society and mothers themselves perceive and value the work and experience of motherhood.

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Country: Australia

Supervisor/s: Deanna Grant-Smith (Queensland University of Technology), Robyn Mayes (Queensland University of Technology)

## Thesis title:

(Re)Constructing power in the Australian Federation: Advancing Multi-level Governance as an explanation for the emergence of independent regulators

## Description:

This thesis examines the multijurisdictional National Heavy Vehicle Regulator to understand the contemporary governance of Australia as a federation. Through the application of enhanced governance models and creation of a diagnostic tool Australian Pragmatic Federalism Theory is advanced to describe, explain and potentially predict intergovernmental structures and processes in the Australian Federation. Using Actor-network Theory to reveal the (re)deployment of power amongst actors and incorporating Multi-level Governance theory into extant models revealed that while centralisation is occurring, it is not unidirectional toward the Commonwealth. Politicians and officials are willing to establish new permanent power-sharing arrangements that pool and share power.

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Country: Australia

Supervisor/s: Per Davidsson (Queensland University of Technology), Stephen Cox (Queensland University of Technology)

## Thesis title:

Growing Firm's Choice of Organic VS Acquisition-Based Modes of Growth: The Role of Firm Age, Size, Industry, Geographical Location, and Macroeconomic Conditions

## Description:

This thesis examines the question of how firms grow through the lens of growth modes: organic vs acquisition. Five independent variables derived from Penrose's Theory of the Growth of the Firm were selected to explain the variance in organic and acquired growth mode proportions: firm age, size, industry, location, and macroeconomic conditions. The hypothesized relationships were tested using two large datasets from Sweden and Germany. Results revealed firms that are younger, smaller, located in rural locations, and operate within industries exhibiting growth and during favorable macroeconomic conditions, exhibit higher proportions of organic growth.

Introduction

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Country: Indonesia

Supervisor/s: Martin Obschonka (Queensland University of Technology), Paul Steffens (University of Adelaide), Per Davidsson (Queensland University of Technology)

## Thesis title:

The Psychological Well-Being of Hybrid Entrepreneurs: Longitudinal Comparative Studies of Hybrid Entrepreneurs, Full Time Self Employed and the Paid Employed

## Description:

The phenomenon of hybrid entrepreneurship where individuals work in paid and self-employment simultaneously is prevalent. However, the psychological well-being implication of working in this unique work configuration is not yet studied. By using data from Indonesia and the United Kingdom, this thesis explains and demonstrates certain differences of hybrid entrepreneurs' psychological well-being patterns that distinguish them from their full-time paid and self-employed counterparts. In doing so, this thesis contributes to the literature of entrepreneurship and well-being by building the theoretical insight into the link between hybrid entrepreneurship and well-being, as well as providing empirical evidence from two different country settings.

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Country: Australia

Supervisor/s: Cameron Newton (Queensland University of Technology), Lisa Bradley (Queensland University of Technology), Sukanlaya Sawang (Queensland University of Technology)

## Thesis title:

The Relationship Between Stress, Social Capital, Support, Distress, and Organisational Outcomes for Infrastructure Workers

## Description:

Infrastructure workers experience high levels of distress. This research explores protective factors (social capital and social support). Study 1 used social network analysis (sociograms) on 14 construction workers. Workers without distress had larger, more diverse networks, and more emotional support compared to those with distress. Workers with distress (and a partner) did not nominate their partner as a provider of emotional support. Study 2 explored life events, social capital, and social support on distress for 220 infrastructure workers. Those with a partner who were severely distressed were unlikely to first seek support from their partner across all social support items.

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Country: Austria

Supervisor/s: Carol Richards (Queensland University of Technology), Hope Johnson (Queensland University of Technology)

## Thesis title:

The Paradoxical Economy of Food Waste Prevention: A Study of Food Waste Prevention as a Transition Pathway to Sustainable Food Systems

## Description:

This work identifies a 'prevention paradox', which arises from a failure to account for the systemic nature of food waste. Subsequently, an empirical exploration in the Australian horticulture industry accounts for the interconnected processes that underpin surplus and waste creation along the whole supply chain. Theoretically, this work advances food waste research by positioning food waste as a symptom of food system 'lock-in' into a deeply ingrained cultural, regulatory, material and economic reliance on unsustainable overproduction and food surplus. Accordingly, interventions targeting the systemic prevention of food waste emerge as pathways to transform food system characteristics toward greater sustainability.

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Country: Pakistan

Supervisor/s: Muhammad Ali (Queensland University of Technology), Erica French (Queensland University of Technology)

## Thesis title:

Demographic Diversity and Outcomes: A Multilevel Study

## Description:

This thesis is a step forward in understanding the effects of demographic diversity (age, gender and ethnicity) through proposing an integrated multilevel framework at individual and group levels of analysis. The framework was tested using a time-lagged research design in the banking sector of Pakistan. The findings suggest managers to understand the nesting phenomenon within work groups, demonstrate efforts to establish positive communication, and enhance social integration among workgroup members. Moreover, diversity training efforts need to focus on perceptions of gender diversity and age diversity to capitalise on their benefits.

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Country: Sri Lanka

Supervisor/s: Clevo Wilson (Queensland University of Technology), Boon Lee (Queensland University of Technology), Viet Ngu Hoang (Queensland University of Technology)

## Thesis title:

Impact of Climate Change Induced Disasters on Technical Efficiency and Productivity: Evidence from Sri Lanka

## Description:

This thesis is a comprehensive study on the impact of climate change, especially the impact of climate-induced disasters, on productivity and efficiency. The study examines the impact of climate-induced disasters on the efficiency of different agricultural sectors under heterogeneous agro-climatic conditions. The thesis further examines the impact on other economic sectors, including the cost of efficiency loss to the economy. In doing so, the study makes recommendations applicable to developing countries on devising and implementing climate adaptation strategies most relevant to the agricultural sector with a view to improving food security.

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Country: Sri Lanka

Supervisor/s: Kylie Pappalardo (Queensland University of Technology), Nicolas Suzor (Queensland University of Technology), Bridget Lewis (Queensland University of Technology), Hope Johnson (Queensland University of Technology)

## Thesis title:

Towards Global Policy Coherence for Tobacco Plain Packaging: Examining the Challenges for Low- and Middle-Income Countries

## Description:

This thesis examines the implementation gap of tobacco plain packaging measures between low- and middle-income countries and high-income countries, looking at the likely challenges that low- and middle-income countries face in implementing plain packaging measures. The thesis identifies three key challenges: resource constraints, intense tobacco industry interference and the threat of litigation for purported breaches of intellectual property rights. This thesis makes strong recommendations for how the global community and international law and policy can support low- and middle-income countries that want to implement tobacco plain packaging measures.

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Country: Sri Lanka

Supervisor/s: Md Saiful Karim (Queensland University of Technology), Andrew Garwood-Gowers (Queensland University of Technology)

## Thesis title:

Governance of the Bay of Bengal Large Marine Ecosystem through Ecosystem-based Fisheries Management

## Description:

This thesis assessed the current prospect for implementing an ecosystem-based management for fisheries (EBFM) in the Bay of Bengal Large Marine Ecosystem from national and regional level perspectives. A central result of the study is that the governance concept had been defined and used imprecisely in the literature. The way the different elements constitute EBFM revealed that both Bay of Bengal LME countries and existing regional fisheries organisations are unlikely to satisfy all the elements on the EBM checklist. The study also observes that the Bay of Bengal countries do not share a common understanding of EBFM.

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Supervisor/s: Peter Verhoeven (Queensland University of Technology), Dan Valeriu Nicolau (Queensland University of Technology), Richi Nayak (Queensland University of Technology)

## Thesis title:

Structures in Credit Risk Modelling

## Description:

The thesis is concerned with the design of conceptual structures in credit risk modelling. The focus is on designing mathematical constructs that serve as a unified framework for reasoning about credit risk modelling. Three contributions are made to this area of research: category theory, providing a powerful tool to study the relations of common structures underlying credit risk modelling; stacking model, to address issues of inconsistent and biased performance measurement; and the Kelly criterion, shifting the focus from dichotomous classification to optimal credit risk allocation.

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Country: Sri Lanka

Supervisor/s: Clevo Wilson (Queensland University of Technology), Annette Quayle (Queensland University of Technology), Shunsuke Managi (Kyushu University)

## Thesis title:

Tourism and Nature Conservation: An Economic Analysis of a Symbiotic Relationship

## Description:

This thesis addresses research gaps derived from the literature which centre on how and in what circumstances tourism and tourism revenue can be used as a compensation and a conservation tool. The findings of the thesis contribute to a better formulation of environmental and economic policy by examining how revenue generated from NBT could be used for nature conservation activities and wildlife stewardship. The findings focused on an assessment of the extent to which the science of economics could play a role in ameliorating the human-elephant conflict (HEC) in Sri Lanka.

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Country: Sri Lanka

Supervisor/s: Jannine Williams (Queensland University of Technology), Colin Jones (University of Southern Queensland), Rowena Barrett (Queensland University of Technology)

## Thesis title:

Contextual Determinants of Intrapreneurial Behaviour: An Integrative Perspective

## Description:

Intrapreneurs, who are entrepreneurially thinking employees, and their behaviour are the foundation of organisational innovation, renewal and the resulting competitive advantage of firms. The complex nature of intrapreneurial behaviour (IB) suggests that there could be numerous factors that influence IB and the question of what motivates it has been debated over decades. In this thesis, the contextual determinants of IB were explored in an integrative perspective considering organisational, individual and socio-cultural factors in Sri Lanka, a country where the socio-cultural influence is significant for individual behaviours. This was achieved by adopting a qualitative, multiple case study approach.

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Country: Australia

Supervisor/s: Janice How (Queensland University of Technology), Peter Verhoeven (Queensland University of Technology)

## Thesis title:

Large Shareholding Networks and Equity Raising: Evidence from Bank-Holding Companies

## Description:

This thesis examines the information network created by multiple large shareholders around seasoned equity offerings (SEOs) of bank-holding companies (BHCs). Analyzing the network using social network analysis (SNA), I find the abnormal stock returns around SEO announcements are related to large shareholding network centrality, suggesting that multiple large shareholders are able to capitalize on their position in the network to mitigate agency cost and information asymmetries. The network also creates a spillover effect by transmitting information about the SEO announcements from issuers to other non-issuers belonging to the same large shareholder network.

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Country: China

Supervisor/s: Changxia Ke (Queensland University of Technology), Gregory Kubitz (Queensland University of Technology), Adam Clements (Queensland University of Technology)

## Thesis title:

Three Experimental Studies on the Design of Contests and Auctions

## Description:

This thesis uses the experimental method to examine how the design of contests and auctions affects the welfare of the organizer and the participants. Chapter 2 indicates that a contest organizer should disclose the number of contestants only when the cost of effort is concave. Chapter 3 shows that increasing competitiveness in a tournament by adding contestants, removing top prizes, or making prizes more unequal increases participants risk-taking and the skewness of the risk choice. Chapter 4 finds that indicative bidding can increase auction revenue by encouraging more bidders to participate. These findings can be used to inform future policymaking.

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# **Faculty of Creative Industries, Education and Social Justice**

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Thesis DOI: <http://doi.org/10.5204/thesis.eprints.210972>

## Thesis title:

We Can't All Be the Good Muslim Hero: Intersubjective Obstructions in Writing Arab-Australian Muslim Experience

## Description:

This thesis investigates how postcolonial pressures on the Arab-Australian Muslim identity have led to the presentation of a too-unified front in Arab-Australian storytelling. By interviewing Egyptian Muslim women living in Brisbane, and as one myself, I identify what I call intersubjective obstructions, which provide opportunities for autoethnographic interrogation. I examine how Yassmin Abdel-Magied, through her memoir *Yassmin's Story*, renders a Brisbane-based Arab-Australian Muslim hybrid identity. I find that post-colonial pressures can force the creation of the Good Muslim Hero narrative. Through my creative practice, I discover how I may resist or respond to those pressures in my memoir, *Muddy People*.

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Country: Australia

Supervisor/s: **Susan Cake** (Queensland University of Technology), **Sorin Oancea** (Queensland University of Technology), **Sean Maher** (Queensland University of Technology)

## Thesis title:

The Heroic Fairy Tale Villain Application of Vladimir Propp's Formalist Schema to the Creation of a Revisionist Cinematic Fairy Tale in which the Traditional Villain is Transformed into an Anti-hero

## Description:

This creative practice-led research examines how Vladimir Propp's formalist structural analysis of Russian fairy tales may be applied to the writing of revisionist cinematic adaptations where the traditional literary villain is transformed into an anti-hero. This was achieved by mapping Propp's 31 narrative elements to Syd Field's three-act structural paradigm which resulted in the formulation of a new screenwriting schema that may be used as an alternative to the more established The Hero's Journey model.

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Country: Australia

Supervisor/s: Bronwyn Ewing (Queensland University of Technology), Grace Sarra (Queensland University of Technology)

## Thesis title:

Pedagogical Considerations for a Culturally Responsive Reading Program for Indigenous Students: Reflections From a Critical Participatory Action Research Study

## Description:

Active student engagement in reading is a major concern of many state, national and international governments. Aboriginal and Torres Strait Islander students on average are well behind Australian standards, due to many factors, including a lack of early reading success. This study investigated what constitutes a culturally responsive reading program for Indigenous children from a critical participatory action research perspective. Culturally responsive pedagogical practices, together with the support of a critical friend with knowledge of local language and culture, contributed to student reading gains (between one and four reading levels in the 5-week data collection period).

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Country: Brazil

Supervisor/s: Jean Burgess (Queensland University of Technology), Elija Cassidy (Queensland University of Technology)

## Thesis title:

How Non-Binary People Experience Advertising on Instagram

## Description:

The automated advertising on most social media platforms targets users based on binary gender, potentially creating issues for non-binary people. Through in-depth interviews incorporating the app walkthrough method, this project engaged with non-binary participants to better understand their experience of advertising on Instagram. The research contributed new knowledge of how non-binary users interact with digital advertising and may help inform more ethical and inclusive advertising strategies.

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Country: Australia

Supervisor/s: Kristina Kelman (Queensland University of Technology), Terence Willsted (Queensland University of Technology)

## Thesis title:

Come Together: Creating a Cross-Genre Musical Community of Practice

## Description:

This practice-led research sought ways of developing and sustaining a cross-genre musical collaboration with the aim of recording and releasing an album of new music. The practice component was a collaboration between a folk singer/songwriter, and a jazz trio. Informed by Wenger's Communities of Practice theory, this research revealed learning outcomes throughout three phases of practice: Engaging, Imagining and Aligning. The central learnings include the importance of community maintenance, building trust within the community, and then using this sense of trust to be able to take the practice of this project to the wider music community.

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Country: Australia

Supervisor/s: Annette Woods (Queensland University of Technology), Lisa Van Leent (Queensland University of Technology)

## Thesis title:

Exploring the Perspectives of Community Workers Engaging with Schools in Relation to Work with Gender and Sexuality Diverse Young People

## Description:

The purpose of this qualitative study was to explore community workers' perspectives of their interactions with secondary schools in Queensland as part of the work they do with gender and sexuality diverse young people. Semi-structured interviews were used to examine what community workers reported as the enablers and constraints in their day-to-day work practices and experiences. The interview data was analysed using reflexive thematic analysis. Recommendations outline some strategies to improve community worker and school collaborations and the transformative possibilities for more inclusive schools for gender and sexuality diverse young people.

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Country: Australia

Supervisor/s: Jillian Willis (Queensland University of Technology), Nerida Spina (Queensland University of Technology)

## Thesis title:

Wrestling with Neoliberalism in Christian Schools

## Description:

This research investigated intersections between Christian schooling and neoliberal policy environments by interrogating how values and purposes of schooling are articulated within the public-facing self-authored digital texts of Christian schools. The findings show how discourses such as excellence, choice and vocation can reflect a range of underlying values when communicating to a broad audience through public websites. Texts and visual representations were analysed using Gee's discourse analysis tools and an Order of Worth framework. Methodological insights and practical support for Australian Christian Schools are provided.

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## Thesis title:

Meeting the Needs of Students: What Teachers Know About Developmental Language Disorder and Inclusive Practices

## Description:

Australian teachers must implement reasonable adjustments to ensure access to education for all students, including those with Developmental Language Disorder (DLD). Given language is the currency of learning, knowledge of DLD is necessary to correctly interpret student characteristics and implement appropriate adjustments. DLD however is a complex disorder. This project investigated what teachers know about DLD using survey methodology. Participants' self-rated knowledge was higher than their demonstrated knowledge. Participants also had difficulty interpreting student characteristics and selecting appropriate adjustments in scenario tasks. Years of experience, training, and speech pathology support were positively associated with self-rated knowledge, but not identification accuracy.

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Supervisor/s: Charles Robb (Queensland University of Technology), Rachael Haynes (Queensland University of Technology)

## Thesis title:

The Lure of Memory: Embodying and Reconstructing Fragmented Narratives Through Contemporary Art

## Description:

This practice-led research explores methods of memory-keeping, including embodiment and preservation, that have been identified in women's artistic practices within contemporary art, including my own gendered art practice. Deploying the creative methods of reconstruction and re-enactment this project investigates the instability of memory, in which affects and intentions can become confused, as reflected in my moving-image works and installations. The research is framed by theoretical considerations of nostalgia, women's memory, and affect informed through critical texts by Iris Marion Young, Marianne Hirsch, Brian Massumi, and Susan Best, and is contextualised by contemporary artists Roni Horn, Sophie Calle and Fiona Banner.

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Country: Australia

Supervisor/s: Sandra Gattenhof (Queensland University of Technology), Jeremy Neideck (Queensland University of Technology)

## Thesis title:

The Arts as a Networked Ecosystem: Visualising Relationships in Brisbane's Performing Arts Sector

## Description:

This research project explores the potential of network visualisation as a tool for stakeholder communication and academic analysis within the performing arts sector, using three Brisbane-based performing arts companies as case studies. The AusStage database was used alongside each organisation's archival data to develop network visualisations for the purpose of communication with stakeholders and furthering understandings of industry composition. The study concludes that while network visualisations may require more investment than they generate in return for individual performing arts organisations, the developed methodologies have the potential to generate new industry knowledge within broader professional and academic contexts.

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Supervisor/s: Gene Moyle (Queensland University of Technology), Marguerite Sendall (Queensland University of Technology)

## Thesis title:

Adapting and Integrating Elements of Best Practice in Dancer Wellness in Elite Adolescent Pre-Professional Dance Programmes into Private Dance Studio Contexts

## Description:

Awareness of the well-being of adolescent dance students is important for their health, safety, performance ability and longevity of participation in dance. This research project investigated current strategies for supporting adolescent dance student physical, psychological, and social well-being (i.e., dancer wellness) within elite pre-professional dance training programmes and private dance studios in Australia, identifying strengths and challenges in the implementation of dancer wellness programmes. The findings offer considerations for private dance studio teachers on potential strategies for integrating dancer wellness elements within private dance studio contexts, and may inform future research on adolescent dancer wellness.

Introduction

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Country: Australia

Supervisor/s: Susan Irvine (Queensland University of Technology), Karen Thorpe (Queensland University of Technology)

## Thesis title:

Growing and Sustaining a Professional Early Years Workforce: The Role of Multidisciplinary Networks in Supporting Professional Practice

## Description:

This thesis generated practical insights into how membership of a multidisciplinary network supported the professional practice of a small group of service leaders working in long day care in a Queensland community characterised by complexity. Nested within an Australian Research Council funded national Early Childhood Education and Care Workforce Study, this study contributes to the identification of effective strategies to grow and sustain a professional early years workforce.

Introduction

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Country: Australia

Supervisor/s: Marcus Foth (Queensland University of Technology), Mirko Guaralda (Queensland University of Technology)

## Thesis title:

Institutional Cultures and How They Affect Participatory Planning: Challenges and Strategic Responses

## Description:

This thesis provides an in-depth look at institutional barriers facing participatory planning in Queensland, Australia. It employs qualitative methods to explore institutional cultures hampering planning practitioners. Planning theory and scholarship in human geography and participatory design is used to analyse findings. The research identified institutional constraints that inhibit the public's ability to participate in urban planning. The study specifically focussed on the common issue of engagement theatre, that is, creating the appearance of public influence rather than enabling meaningful pathways to participatory decision-making processes. The study provides recommendations for practitioners to navigate institutional constraints and improve planning practices.

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Country: Australia

Supervisor/s: Sean Maher (Queensland University of Technology), Sarah Winter (Queensland University of Technology)

## Thesis title:

The Transdisciplinary Creative Producer: The Role and Practice of a Creative Producer in Festivals; Emerging and Ever-evolving

## Description:

This research project defines specific attributes and characteristics that reflect the creative role and professional practice of a Transdisciplinary Creative Producer in the context of festivals. Bridging the gap between contrasting disciplines such as art and business, highlighting an 'in-between', a Creative Producer encapsulates a multitude of disciplinary knowledge. By using transdisciplinary practices combined with servant-leadership the role is subject to leading large teams. The outcome of the research is derived through a practice-led methodology and uses three case-studies of three significant festivals in 2018: Brisbane Street Art Festival, Jungle Love Music and Arts Festival, and Ars Electronica Futurelab Academy.

Introduction

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Country: Australia

Supervisor/s: Sarah Holland-Batt (Queensland University of Technology), Rohan Wilson (Queensland University of Technology)

## Thesis title:

Knowing Anne Brennan: Lyric Poetry as Feminist Biography

## Description:

This practice-led thesis explores the use of lyric poetry as a form of feminist biography through the writing of a poetic biography, *No Camelias*, on the life of Anne Brennan, a figure of Australian literary history whose life has been sparsely recorded, and whose existing historical profile is marred by misogyny and indifference. The creative manuscript is accompanied by an exegetical essay which analyses poetry by Natalie Harkin and Jessica Wilkinson, two poets who explore marginalised histories through contrasting poetic approaches to archival research. Together, these connected components re-present Anne Brennan's life through feminist grief, subjectivity and empathy.

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Supervisor/s: Stephanie Hutchison (Queensland University of Technology), Charles Robb (Queensland University of Technology), Mark Pennings (Queensland University of Technology)

Thesis DOI: <http://dx.doi.org/10.5204/thesis.eprints.208262>

## Thesis title:

Bodies of Transmission: Embodiment, Hybridity & Transculturation in Contemporary Art & Performance Practice

## Description:

This practice-led research project investigates embodiment, transculturation and hybridity in my contemporary art and performance practice. Describing complex configurations of modern cultures, transculturation expresses the melding of hybridity, cultural landscapes and creative disciplines. As an Australian-Japanese artist-researcher whose interdisciplinary practice spans visual arts and dance, I developed a series of performances, performative videos and installation-based artworks to create sense-making technologies, rhizomatic choreographic tools for embodied practices. The research used action research and reflexive practice, contributing knowledge to experimental creative practice research, as well as future investigations into collating, archiving and developing transcultural art.

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Country: Papua New Guinea

Supervisor/s: Verena Thomas (Queensland University of Technology), Jacqueline Kauli (Queensland University of Technology), Belinda Luke (Queensland University of Technology)

## Thesis title:

Understanding Financial Management Capabilities with Community-Based Organisations in Papua New Guinea

## Description:

This thesis focuses on strengthening financial management of community-based organisations (CBOs) in Papua New Guinea. Through the use of qualitative, arts-based, and participatory action research methodologies, the findings indicated that CBOs harnessed social capital and community relations to successfully implement their work. However, their relational engagements and needs were often not adequately captured in financial and organisational plans, leading to tensions between CBOs and donors. The findings contribute to literature on CBOs, capacity building and development partnerships by highlighting that strengthening financial management requires reciprocal understanding, sharing of power and responsibility and building mutual accountability between CBOs and donors.

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Country: Nepal

Supervisor/s: Susan Walker (Queensland University of Technology), Julie Dillon-Wallace (Queensland University of Technology)

## Thesis title:

Differentiated Instruction: Understanding of Pre-Service Teachers

## Description:

Differentiated instruction is an inclusive approach that recognises and values diversities among students and adapts teaching and learning to include every student. To date, limited research has addressed pre-service teachers' understanding of differentiated instruction. The current research investigated how pre-service teachers understand differentiated instruction through the lens of epistemic cognition. Data were collected from nine Bachelor of Education students using semi-structured interviews. Findings suggest that differentiation is understood by pre-service teachers as a way of adapting teaching to support struggling learners rather than catering for all learners. The findings have implications for future research as well as teacher education programs.

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Supervisor/s: Mark Ryan (Queensland University of Technology), Paul Van Opdenbosch (Queensland University of Technology)

## Thesis title:

Suspension of Disbelief: Animating Believable 3D Nebula Visual Effects Utilising Real-Time Technology

## Description:

This practice-based research aimed to investigate and identify the key aesthetic and technical considerations for the creation of believable, real-time 3D nebula VFX as an individual animation practitioner. Real-time technology was utilised as an advancement of traditional VFX practices, improving the quality of outcomes through more creative control, faster render times and less reliance on computing power. Three cycles of creative practice were undertaken, resulting in three, 3D visualisations of nebula.

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Supervisor/s: Charles Robb (Queensland University of Technology), Rachael Haynes (Queensland University of Technology)

## Thesis title:

Tuning to Thresholds: An Object-Oriented Study of Affect and Contemporary Art Practice

## Description:

This practice-led research project explores the complex and contradictory affective responses encountered as a creative practitioner in relation to materiality. Using an Object-Oriented and New Materialist approach, I propose that affect resides between and around objects and that this relational space can be seen as a threshold.

This proposition is informed by the ideas of Melissa Gregg, Gregory Seigworth, Graham Harman, and Jane Bennett, and contextualised by the creative practices of Eva Hesse, Rachel Whiteread, and Sarah Sze. It is my contention that collaborating with the agencies of objects in the studio gives rise to the affective force of materiality.

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Technology), Tristan Coulter (Queensland University of  
Technology), Janet Karin (Australian Catholic University )

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.207087>

## Thesis title:

Psychological Skills in Ballet Training: An Approach to Pedagogy for the Fulfilment of Student Potential

## Description:

Ballet students can develop resilience, self-awareness, and artistic individuality through psychological skills that are practised in a social learning environment. When psychological skills are included in ballet training, teachers offer students opportunities for problem-solving and critical thinking that can lead to self-reliance. This research presents journaling, goal scaffolding, and the creation of cue words as psychological skills that teachers can include in their classes to promote student discovery, exploration, and reflection in dance. These activities assist students to take responsibility for their own learning so students might reach their full potential.

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# David Burton

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Supervisor/s: Kathryn Kelly (Queensland University of Technology), David Megarrity (Queensland University of Technology), Mark Radvan (Queensland University of Technology)

## Thesis title:

Playwriting Methodologies in Community-Engaged Theatre Practice in Regional Australia

## Description:

This thesis examines playwriting methodologies commonly used in community-engaged theatre practice in regional Australia. Since 2003, the Queensland Music Festival has committed to commissioning original community-engaged works in regional Queensland communities. These works, typically featuring a cast of many hundreds and audiences of many thousands, are unique examples of community-engaged theatre work. Since 2013, Burton has served as playwright on these works and has undertaken practice-based and practice-led research across four case studies, along with complementary interviews. The research positioned the playwright in a dense and complex network of stakeholders in community-engaged practice.

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Country: Australia

Supervisor/s: Lindy-Lou Burton (Queensland University of Technology), Paul Sanders (Deakin University), Katherine Copeland (Metro North Hospital and Health Service), Veronica Garcia Hansen (Queensland University of Technology)

## Thesis title:

Interprofessional User Groups and the Design of Healthcare Facilities

## Description:

The Australian and New Zealand healthcare sectors deliver vital services to their communities. Buildings that support healthcare delivery are often complex, complicated and expensive. Designers, clinicians and managers must work together collaboratively to design publicly funded healthcare facilities that are fit for purpose and responsive to their location and environment. This research investigated the 'user group' process required by government health authorities including ways it could be improved. Understanding the differing perspectives of participants may support more effective teamwork and better decision-making. The findings form the basis for the development of evidence-based guidelines for the collaborative design of healthcare facilities.

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Country: Australia

Supervisor/s: Marcus Foth (Queensland University of Technology), Gregory Hearn (Queensland University of Technology)

## Thesis title:

Intermediation as Practice: Joining the Dots Between Community, Culture and Commerce

## Description:

This thesis examines the role of the intermediary in the design of creative cross sector projects. By deploying and documenting two field work projects, the study critically reflects on the “3C - Community, Culture, Commerce” project design methodology, which is situated at the intersection of industry and research. Findings demonstrate how the 3C’s processes of creative community and industry engagement can contribute to social inclusion, add value to corporate social investment and provide jobs and professional development opportunities. The thesis advocates for the recognition of intermediation as a novel method in design practice that others can learn, use, and improve upon.

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Thesis by Monograph

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Thesis DOI: <http://doi.org/10.5204/thesis.eprints.2125297>

## Thesis title:

Ethical Challenges for Travel Journalists in the Digital World

## Description:

This thesis investigates contemporary travel journalism through an analysis of Australian travel journalists' experiences and views on maintaining ethical standards in the digital world. The project provides insight into the impact of digital disruption on traditional travel writing and journalism ethics as they relate to travel journalism, using real-world experiences of travel journalists. It provides the basis for the development of principles for ethical travel journalism as a guide for established and emerging travel journalists in the face of widespread change in methods of practice and contributes to bodies of knowledge around best practice travel journalism.

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Supervisor/s: Marianella Chamorro-Koc (Queensland University of Technology), Glenda Caldwell (Queensland University of Technology), Muge Fialho Leandro Alves Teixeira (Queensland University of Technology)

## Thesis title:

Digitally Crafted Community Futures: A Distributed Approach to Remedial Craft for Community Empowerment

## Description:

This research explores the synergistic potential between disability support practice and creative industries. It adopts an autoethnographic approach informed by the researcher's lived experience with a psychiatric disability, his interest in peer support practice, and his role as a goldsmith and jewellery designer. Project 1 investigated the field of his emergent practice as a Remedial Creative Practitioner, while Project 2 produced the Integrated Resource Design System (IRDS). The democratisation of digital technology is at the heart of this project and includes computer-aided design and manufacturing (CAD & CAM) technology and the sharing economy in a distributed approach to community empowerment.

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Thesis DOI: <http://doi.org/10.5204/thesis.eprints.213217>

## Thesis title:

How do Teachers Support Students with Twice-Exceptionality, Specific to Concomitant Autism Spectrum Disorder and Intellectual Giftedness, to Transition to Secondary School?

## Description:

This qualitative multiple case study explored teachers' knowledge of twice-exceptionality (2E), specifically concomitant autism with intellectual giftedness, and the support offered to these students to transition from primary to secondary school. The research was framed by Bronfenbrenner's Bioecological Theory with specific reference to the PPCT model. The findings identified that a lack of communication amongst teachers inhibited the support required by this cohort of students. Teachers' lack of knowledge of 2E contributed to their lack of communication and support. A recommendation is that teacher collaboration is key in supporting transition.

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Supervisor/s: Lyndal O’Gorman (Queensland University of Technology), Kerryann Walsh (Queensland University of Technology)

## Thesis title:

Children’s Understandings of Sustainability Related Topics and Issues: A Phenomenographic Investigation Seen Through Drawings and Interviews with 6-8-Year-Old Children

## Description:

This study explored and described the varying ways a group of 6-8-year-old children understood sustainability-related topics and issues. The findings of this study revealed children’s understandings were experienced across six increasingly complex and inclusive action-orientated categories: Providing; Regulating; Educating; Helping; Innovating; and Connecting. This study drew on the theory and methodology of phenomenography. The implications from this research are relevant to teaching practice and may shift the ways teachers, and educators think about the competence and capability of young children to be involved in addressing complex and multifaceted issues that are relevant to their lived world.

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Supervisor/s: Leanne Crosswell (Queensland University of Technology), Alberto Bellocchi (Queensland University of Technology), Guanglun Mu (Queensland University of Technology), Nanette Bahr (Southern Cross University)

**Thesis title:**

Brains, Beneficial Beliefs, and Science Achievement

**Description:**

This study examined Dweck's Mindset Theory, testing the relationship between the intelligence beliefs, neuroscience knowledge, self-efficacy, value beliefs, and science achievement of a sample of Australian High School students. A fixed view of intelligence was negatively correlated with neuroscience knowledge, self-efficacy, value, and achievement. Self-efficacy had the strongest correlation with achievement and fully mediated the influence of intelligence beliefs. These findings suggest that rather than employing generic "Growth Mindset" interventions to enhance achievement, educators should focus on eliminating fixed intelligence beliefs, increasing students' neuroscience knowledge, implementing value interventions, and most importantly, exposing students to sources of self-efficacy.

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Supervisor/s: Angela Romano (Queensland University of Technology), Clive Bean (Queensland University of Technology), Terry Flew (Private Individual)

## Thesis title:

The Engagement of Social Media and Traditional News Media in Joko Widodo's Communication Strategy for the 2019 Indonesian Presidential Election

## Description:

This research explored the nature of political campaigning in the digital era through a case study of the 2019 Indonesian presidential election campaign. The project studied how the incumbent President attempted to set the discussion agenda through his engagements with both Facebook and traditional news media, and the implications of the dynamics of this campaigning strategy for Indonesian democracy. The research showed that the President could use Facebook's technological features and audience reach to influence public discussion and traditional news media agendas. It also found that journalists would act independently and often followed different agendas that influenced social media.

Introduction

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Thesis DOI: <http://doi.org/10.5204/thesis.eprints.207282>

## Thesis title:

Subversive Sisters: Reimagining Biological Sisters as Gothic in Fiction

## Description:

This thesis examines the potential of reimagining the Gothic to produce more complex representations of biological sisters when writing fiction. Through writing the novel, 'The Marble Platform', this project reveals how Gothic tropes of the double, transgression, and haunting can be adapted to facilitate subversive behaviour between fictional sisters. Recognising this subversive behaviour is crucial for expanding understandings of sisters in literary narratives, and for providing creative writers with a new approach for engaging with the Gothic tradition.

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Thesis DOI: <http://doi.org/10.5204/thesis.eprints.211142>

## Thesis title:

The Implementation of Media Arts in Australian Primary Schools

## Description:

This thesis explores how primary school teachers implement the Media Arts subject strand of the Australian Curriculum: The Arts into their classrooms. The study presents three case studies that explore how teachers and students engage with the key concepts of Media Arts and what pedagogical approaches are employed to foster Media Arts learning. The thesis makes a series of recommendations, based on the findings of this study, about how to implement Media Arts in more cohesive ways into primary school classrooms.

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Supervisor/s: Marcus Foth (Queensland University of Technology), Gregory Hearn (Queensland University of Technology)

## Thesis title:

The Rise of Casual Creative Environments: Towards a Socially Embedded View of Innovation Precursors and Processes

## Description:

Many cities have tried to replicate Silicon Valley's innovation culture to achieve similarly successful innovation ecosystems and tech-focused start-ups despite criticism about its class division, overly ambitious shareholders, and neglect of societal and environmental issues. This study examines innovation precursors in Casual Creative Environments, e.g., coworking spaces or maker spaces, finding opportunities for alternative approaches to innovation. Case studies of Casual Creative Environments focusing on social innovation set examples that innovation approaches can be more inclusive and create social and environmental impacts. Findings are reflected in social, spatial and temporal precursors to innovation and translated into managerial and policy guidelines.

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Thesis by Monograph

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.213193>

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Country: Sweden

Supervisor/s: Mirko Guaralda (Queensland University of Technology), Severine Mayere (Queensland University of Technology), Janice Rieger (Queensland University of Technology), Hee-Jeong Choi (Royal Melbourne Institute of Technology)

## Thesis title:

Border Nomads: An Architectural Investigation of Transient Public Urban Place

## Description:

This thesis examined the socio-spatial border phenomenon of transient public urban places (TPUPs) in Brisbane, Australia. The research highlighted the significance of TPUPs and their crucial qualities of spatially just UPPs. The research outcome is a theoretical model that outlines the affordances of the TPUP environment to be considered by designers wanting to produce more spatially just UPPs. The value and impact of the model lie in its application by designers, with implications for spatial design, urban planning, and design philosophy. The model promotes advocacy for disadvantaged urban citizens, fostering equity in both turbulent and peaceful times.

Introduction

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Country: Thailand

Thesis by Monograph

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.225899>

Supervisor/s: Lisa Van Leent (Queensland University of Technology), Karen Dooley (Queensland University of Technology), David Nutchey (Queensland University of Technology), Donna King (Australian Catholic University)

## Thesis title:

Teaching and Learning STEM Through a Thai Cultural Context

## Description:

In rural primary schools in Thailand, students face a lack of resources for STEM education. A learning approach called Culturally Relevant STEM Education (CRSE) was proposed in this study to enhance rural students' STEM education. The CRSE approach used local materials based on the local culture to develop students' STEM knowledge and skills. This study trialled and refined the CRSE approach through collaboration between researcher and practitioner, thereby probing the potential of CRSE to advance the learning of STEM in Thailand, particularly in a rural context. It created teacher guidelines to support teachers' use of CRSE in the classroom.

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# Carla Sartori do Amaral

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Country: Brazil

Supervisor/s: Marianella Chamorro-Koc (Queensland University of Technology), Amanda Beatson (Queensland University of Technology), Sven Tuzovic (Queensland University of Technology)

## Thesis title:

Designing Digitally-Enabled Transformative Services for Vulnerable People's Mobility

## Description:

Mobility is a significant challenge that young people with physical disabilities need to overcome, and digital platforms can support mobility by providing access to information that enable people to act with self-determination. Intersecting the fields of Design, Service Design and Disability research, this thesis uncovered the enabling and disabling factors impacting young people's self-determination in their mobility experiences, revealing the concerns of both service users and providers. This thesis delivered a Transformative Service Design framework that will inform service designers and communities about how to design transformative services that improve people's wellbeing.

Introduction

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Faculty of Creative Industries, Education and Social Justice

Country: Australia

Thesis by Published Papers

Supervisor/s: Evonne Miller (Queensland University of Technology), Lindy-Lou Burton (Queensland University of Technology)

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.209146>

## Thesis title:

How Body Awareness Interventions Can Enhance the Architectural Digital Design Process

## Description:

This thesis investigates the potential for the architectural design process to be positively impacted using a simple intervention designed to reinstate through conscious awareness, the advantages of the once traditionally physical components of the design process, that are less activated in the digital design process of architecture. This study explores the impact of increasing architects' conscious awareness of their own movement and body function so as to individually maximise and improve their cognitive, emotional and physical function, including motor skills, to support their architectural decision-making.

Introduction

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Country: South Africa

Supervisor/s: [Elija Cassidy \(Queensland University of Technology\)](#), [Lesley Hawkes \(Queensland University of Technology\)](#), [Stephen Harrington \(Queensland University of Technology\)](#)

## Thesis title:

Meeting People Where They Are at: The Role of Small-scale Gender Advocacy Organisations in Promoting Digital Inclusion in South Africa

## Description:

This African feminist ethnography examines how gender's incorporation into political and economic imaginaries and gender equality's promotion through current national digital inclusion policies and major initiatives aiming to reduce the digital gender divide in South Africa could contribute to deepening, rather than reversing, this problem. The study evaluated South African digital inclusion policies and major initiatives against gender and development theoretical trends over time. The study recommends that to address the digital gender divide more effectively, research, policy, and digital gender inclusion initiatives should focus much more closely on the contributions of activists and community-based organisations in this area.

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Country: Australia

Supervisor/s: Charles Dacosta (Queensland University of Technology), Sorin Oancea (Queensland University of Technology), Christopher Carter (University of the Sunshine Coast)

## Thesis title:

Facture, Fold and the Image-Screen: The Effect of Digital Imaging on the Production of Analogue Painting

## Description:

This practice-led research project investigates digital imaging's effect on the production of analogue paintings. The research project builds on Hal Foster's conception of the Lacanian image-screen and Giles Deleuze's notion (along with Felix Guattari) of the fold, rhizome, and diagram. This exegesis establishes the interlocking of these theories as evidenced in practice through a series of exhibited paintings. The research presents facture as a primary feature of analogue painting and proposes that the use of digital imaging affects analogue painting via diagrammatic schema.

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Country: United States of America

Supervisor/s: Patrik Wikstrom (Queensland University of Technology), Kevin Sanson (Queensland University of Technology), Kylie Pappalardo (Queensland University of Technology)

## Thesis title:

Golden Pagodas and Platinum Albums: Developing and Decolonizing Copyright in Myanmar

## Description:

This thesis investigates copyright and musical artists in Myanmar. Theoretically framed by critical media industries studies and decolonizing methodologies and informed by in-depth qualitative interviews with key informants in the Myanmar music industry, this thesis illustrates how a music recording industry can flourish in the relative absence of copyright. Further, findings demonstrate how cultural conceptions of copying and authorship can shift dramatically in the absence of or prior to copyright reform. This thesis raises questions about the colonial legacy and power dynamics of international copyright regulation in the Global South.

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Faculty of Creative Industries, Education and Social Justice

Country: South Africa

Thesis by Monograph

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Thesis DOI: <http://doi.org/10.5204/thesis.eprints.208153>

## Thesis title:

Alternative Forms of Citymaking: Insights and Implications from South Africa and Australia

## Description:

This study employed a comparative urbanism methodology to explore the interrelationship between formal approaches to urban governance and urban informality in Logan, Australia and Cape Town, South Africa. Through in-depth interviews, observations and a co-design workshop, the study investigates points of disconnection in the margins and ties these to issues of power, inclusion and the notion of a 'good' city. It proposes avenues for conducting comparative urban research across Global North and South cities. The thesis furthers knowledge of co-productive research with vulnerable participants, articulates the role of intermediaries in inclusive alternative citymaking, and challenges negative assumptions of urban informality.

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Country: India

Supervisor/s: Elija Cassidy (Queensland University of Technology), Peta Mitchell (Queensland University of Technology)

## Thesis title:

Digital Media and Hijra Identity: Understanding Community-Building and Self-Representations Among Hijra Community-Based Organisations in India

## Description:

This thesis examines hijra community-based organisations' (CBOs) use of social media platforms to represent hijra identities in India. This study used social media ethnography as an approach to study the social media presence of hijra community members and involved 30 interviews. The hijra community are placed at the intersection of culture, politics, legal developments for the third gender, popular culture, and social media uses in this study. Further, it deepens knowledge on how the hijra community has framed their identity(ies) in the light of their community work after legal recognition in India.

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Faculty of Creative Industries, Education and Social Justice

Country: Egypt

Thesis by Published Papers

Supervisor/s: Debra Cushing (Queensland University of Technology), Anoma Kumarasuriyar (Queensland University of Technology), Elinor Buys (University of Queensland)

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.214245>

## Thesis title:

Refugee Architecture: A Sociospatial Reading of Planned Humanitarian Settlements in Jordan

## Description:

This study interrogated the standard refugee domestic shelter, the organisation of the shelters, and the camps as urban entities. It explained the observed physical traces of three refugee camps in Jordan using an understanding of refugee heritage, their vernacular building practices, and the cultural references to their homelands. Using phenomenology as the methodology, this study shifted the discourse to the refugee communities as the subject of the camp. The findings indicate that, over time, the built environment of the camp responds to the evolving needs of refugee communities living in a state of permanent temporariness, creating forms of 'refugee architecture'.

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Country: Australia

Thesis by Published Papers

Supervisor/s: Marilyn Campbell (Queensland University of Technology), Donna Tangen (Queensland University of Technology)

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.213019>

## Thesis title:

How Do Schools View Legal Solutions in the Prevention and Intervention of Cyberbullying?

## Description:

This study considers public calls for the law to stop youth cyberbullying. Adopting social-ecological theory, a legal approach was considered alongside roles of schools in reducing student cyberbullying. A qualitative case study of two independent secondary schools was undertaken. Data came from anti-cyberbullying policy documents, interviews with leaders, key staff, and parents, and from focus groups conducted with students and teachers. Thematic content analyses revealed a uniquely-informed understanding of legal and societal influences on schools; the role of a cyberbullying-specific law; and for inter-systemic legal and educational solutions that warrant further investigation. Recommendations included improving community responses to youth cyberbullying.

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# Elena Anderson

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Country: Russian Federation

Supervisor/s: Hitendra Pillay (Queensland University of Technology), Andy Yeh (Queensland University of Technology)

## Thesis title:

Convergence of Andragogy and E-Learning to Facilitate Employee Engagement in the Workplace Learning

## Description:

Workplace learning presents a range of challenges imposed by a lack of understanding of how to engage a mature aged workforce in e-learning practices. Noteworthy, there is potential for andragogic principles to facilitate engagement in workplace e-learning. Therefore this study seeks to investigate how to engage a mid-career workforce through theory-driven convergence of andragogy and e-learning. This study found that engagement is highly dependent on `e-learning readiness? by both employees and organisations. Also, despite being mature mid-career workers, age characteristics were not considered a barrier to being e-ready; however, educational level and cultural background appeared to be key challenges.

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Country: Indonesia

Thesis by Published Papers

Supervisor/s: Debra Cushing (Queensland University of Technology), Evonne Miller (Queensland University of Technology)

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.210468>

## Thesis title:

Qualitative Evaluation of Child Friendly Public Places in the Indonesian Urban Poverty Context

## Description:

Using a developmental-affordances framework, this thesis investigates child-friendliness of designated child-friendly public places in Jakarta by exploring how children from low-income neighbourhoods use and make meaning of these places to fulfill their psychosocial needs. The children perceived these places as 'the beyond playground' where they activated affordances for play, work and rest. Children associated these activities with their competence in forming relationships with friends and adults outside their family, exercising autonomy, and mastering cultural skills. Collaboration between stakeholders supported children to benefit from these places for their psychosocial development; while intergenerational and gender tensions constrained navigation of their play spaces.

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Country: Chile

Thesis by Published Papers

Supervisor/s: Veronica Garcia Hansen (Queensland University of Technology), Alicia Allan (Queensland University of Technology), Gillian Isoardi (Private Individual)

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.211250>

## Thesis title:

Subjective Responses to Daylight Changes in Outdoor Scenes: Implementing a Dynamic View Assessment Procedure for Urban Contexts

## Description:

This project investigated the mechanisms underlying well-being outcomes as a function of dynamic environmental attributes in window views. The hypothesis posed that changes within the outdoor visual environment, like those produced by daylight variations across the day, would mediate positive responses toward these views. To test this hypothesis, a mixed methods study was designed, combining post-occupancy evaluation, geometric labeling procedures, and immersive virtual reality techniques. The outcomes of this work lay the foundations of interdisciplinary evaluation, decision-making, and design procedures aimed at sustaining individuals' well-being in increasingly dense urban environments.

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Faculty of Creative Industries, Education and Social Justice

Country: Sri Lanka

Thesis by Monograph

Supervisor/s: Janice Rieger (Queensland University of Technology), Jill Franz (Queensland University of Technology), Megan Strickfaden (University of Alberta)

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.210530>

## Thesis title:

Design Thinking Pedagogy: A Phenomenographic Study of Design Thinking Teaching in the Higher Education Context

## Description:

This doctoral thesis adopted a phenomenographic approach to study the qualitatively different ways in which educators experience design thinking teaching in higher education at a global level. The study found four qualitatively different ways of experiencing design thinking teaching in the higher education context, and extends design thinking teaching practice to a more holistic structural understanding of design thinking pedagogy.

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Country: China

Supervisor/s: [Elija Cassidy \(Queensland University of Technology\)](#), [Jean Burgess \(Queensland University of Technology\)](#)

## Thesis title:

Queer Diaspora and Digital Intimacy: Chinese Queer Women's Practices for Using Rela and Her in Australia

## Description:

This research explores Chinese queer women's practices for using lesbian social and dating apps such as Rela and HER in Australia. It highlights how social and cultural contexts played instrumental roles in shaping the development trajectories and technological infrastructures of Rela and HER and the Australia-based Chinese queer women's digital intimacy practices. Findings in this thesis enrich our understanding of queer diasporas and their digital media use in cross-cultural and transnational contexts.

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Country: Egypt

Thesis by Published Papers

Supervisor/s: Veronica Garcia Hansen (Queensland University of Technology), Michael Cholette (Queensland University of Technology), Gillian Isoardi (Private Individual)

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.212982>

## Thesis title:

An Evaluation Method to Include Complex Fenestration Systems in the Façade Design Process

## Description:

This research aims to improve the passive redirecting Complex Fenestration Systems (CFS) design process to be incorporated into the early building design stages. This is proposed in a framework that assists the building designer in designing new CFS suitable for buildings, which are encouraged in the early design phase. The research contributes to understanding CFS design and the effect of external and climatic parameters on the final CFS design. The research contributes to enhancing the CFS design process, enhancing the indoor environmental quality within the built environment and potentially decreasing the operational energy costs within the built space.

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# Jack Williams

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Country: Australia

Supervisor/s: Michael Whelan (Queensland University of Technology), Yanto Browning (Queensland University of Technology), Andrew Arthurs (University of Southern Queensland), Philip Graham (University of Queensland)

## Thesis title:

Recording the Story: Exploring the Relationship Between Music Production and Narrative

## Description:

This thesis explores the role of music production techniques in the communication of narrative in recorded popular music through an artistic research approach. Case studies are analysed and inform the production of six recorded tracks that illustrate how the communication of narrative in popular music can be supported or enhanced through the use of music production techniques. The findings indicate that a strong relationship exists between the creative production decisions made in the creation of a recorded track and the listener's interpretation of the story being told.

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Country: United States of America

Supervisor/s: Stuart Cunningham (Queensland University of Technology), Michael Dezuanni (Queensland University of Technology)

## Thesis title:

Un-Boxing Toy Unboxing: Analysing YouTube's Toy Unboxing Creator Culture

## Description:

This thesis examines the intermingled personal, commercial, and algorithmic incentives undergirding toy unboxing creator culture. Using interviews with creators, analyses of videos, and walkthroughs of YouTube and YouTube Kids, this thesis historicizes the experiences of toy unboxing creator culture into three empirically grounded periods: an uncontested golden era for kids' content, creators joining forces to self-regulate and combat external pressures on their genre, and a new regulatory era. By bringing these creators' voices into debates about platforms, algorithms, and children's media, this thesis explains how these creators' agentic capabilities and ingenuity changed the children's media landscape.

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Country: Australia

Supervisor/s: Stephen Harrington (Queensland University of Technology), Peta Mitchell (Queensland University of Technology), Jason Sternberg (Queensland University of Technology)

## Thesis title:

Superfood Me: Negotiating Australia's Post-Gourmet Food Culture

## Description:

Over the last 10-15 years, food has become an integral part of Australian popular culture. Through analysis of interview data and texts, this thesis articulates the next phase of Australian food culture. Everyday households now have a greater interest in ethical and sustainable eating, and a greater awareness of how the industrial food system encourages consumers to buy its products. Engagement with food culture is also going beyond television and print to embrace digital spaces, but these developments do not render legacy platforms obsolete. Together, these changes in culinary concerns and forms of food media represent Australia's post-gourmet food culture.

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Country: Australia

Supervisor/s: Kiley Gaffney (Queensland University of Technology), Gavin Carfoot (Queensland University of Technology), Philip Graham (University of Queensland)

## Thesis title:

I'm With Muriel: Applying a Persona-Centred Songwriting Technique to the Creation of a New Australian Musical

## Description:

This Thesis by Creative Works advances a new method of songwriting centred around the concept of persona. Drawing on Csikszentmihalyi's Systems Model of Creativity and Auslander's work on persona and popular music performance, the thesis develops a model of songwriting that is then applied in the creation of new music and lyrics for the Australian musical theatre production, Muriel's Wedding the Musical.

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Country: Australia

Thesis by Published Papers

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.208389>

Supervisor/s: Evonne Miller (Queensland University of Technology), Tracy Washington (Queensland University of Technology), Desley Vine (Queensland University of Technology), Elinor Buys (University of Queensland)

## Thesis title:

Older Adults' Subjective Experience of Home and Community Through A Person - Environment - Occupation Lens

## Description:

This thesis uses an occupational therapy perspective to identify issues of importance in contemporary older Australians' home lives, exploring the diversity of places and spaces older adults call home and the complex interrelationships among individually meaningful activities, personal and environmental factors. It explains previously under-recognised factors of importance for age-friendly communities relating to older adults' ideal household makeup, perceived bounds of physical and virtual home environments, relationships with nature and wildlife, and desire for lifelong meaningful contribution to community, which have important implications for home environments in our ageing future.

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Thesis by Monograph

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Thesis DOI: <http://doi.org/10.5204/thesis.eprints.213833>

## Thesis title:

Emotion in Motion: Bodily Expressions of Emotion for Non-Humanoid Social Robots

## Description:

Robots are poised to infiltrate our daily lives and share both our social and physical space. Realistic humanoid robots are far from commonplace due to current technological limitations, however, non-humanoid robots are proliferating. Media compensation theory suggests natural human interactions should be mirrored as much as possible when developing new interactive technologies. Thus, the thesis explores human non-verbal bodily expressions of emotions in order to make non-humanoid social robots emotionally expressive through their movements. After conducting multiple studies, a model and a design framework have been developed and validated to assist future emotionally expressive robot design.

Introduction

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# Laura Kenny

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Thesis by Creative Works

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Country: Australia

Supervisor/s: Lesley Hawkes (Queensland University of  
Technology)

## Thesis title:

'Something's Happening Here! Something's Awry!': A Creative and Critical Exploration of 'Awryness' in Contemporary Australian Attachment Trauma Fiction

## Description:

This practice-led thesis explores how an examination of 'awryness' - conceptualised as an emotional response to environmental stimuli which is characterised by feelings of disorientation and uncertainty - might generate new ways of thinking about the writing, reading, and interpretation of contemporary Australian attachment trauma fiction. In fiction, awryness occurs when the reader encounters something that is unexpected or difficult to categorise. Writing the novel, *On Either Side*, alongside textual analysis of three novels, reveals just some of the ways that awryness might be induced or evoked in order to represent the effects of attachment trauma on a character.

Introduction

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Country: Botswana

Supervisor/s: John Scott (Queensland University of Technology), Matthew Ball (Queensland University of Technology)

## Thesis title:

The Pursuit of Sex Through Tourism in Africa: An Exploration of the Experiences, Perceptions and Attitudes of Male Sex Workers Servicing Sex Tourists in Botswana

## Description:

This thesis investigates the experiences, attitudes and perceptions of gender, sexuality, race, and victimisation in male sex workers' interactions with sex tourists in Botswana. The correlation between sex work and sex tourism is very complex, especially in the African context where denial of its existence is entangled with religious disapproval and politicisation. Local dynamics are explored to understand how these cross-national interactions influence the practice and perceptions of male sex work in Botswana. In-depth face-to-face interviews were conducted with male sex workers, support groups and the police as important actors in a semi-criminalised and ambiguous legal system in Botswana.

Introduction

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Technology)

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.225930>

## Thesis title:

A Bigger Picture: Toward a Landscape-Oriented Arts Practice

## Description:

The thesis proposes an orientation shift from portrait to landscape as a metaphor for the rearrangement of aesthetic, cultural and social values between metropolitan and regional milieus. Emerging from an analysis of three spheres and their intersections (Artist as Citizen, Practice and Process and the Creative Environment) is a recurring theme of horizontality and a design for a landscape-oriented arts practice. As a way of reframing the arts narrative from a contemporary regional Australian perspective, this new conceptual paradigm offers theorists and practitioners an expansive alternative vista of the national cultural landscape.

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Country: Hungary

Supervisor/s: Gavin Sade (Queensland University of Technology), Oksana Zelenko (Queensland University of Technology), Manuela Taboada (Queensland University of Technology)

## Thesis title:

Design for Mental Health Literacy: Co-Creating Psychoeducational Resources with Young Adults, Supporters and Mental Health Professionals

## Description:

Young adults are at high risk of developing and experiencing anxiety, therefore it is important to increase their mental health literacy (knowledge and skills related to mental health). This study involved young people, their supporters and health professionals in a collaborative research process to develop and validate a conceptual framework and visual language for designing engaging and accessible educational materials on anxiety. The framework was validated through the evaluation of a proof-of-concept design resource, the Anxiety Guide, which supported a balanced representation of professional knowledge and lived experience through providing user opportunities for interactive and visual engagement.

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Thesis DOI: <http://doi.org/10.5204/thesis.eprints.207960>

## Thesis title:

Producing Leadership: Collective Memory Stories of Leaders in Early Childhood Education

## Description:

This thesis is an inquiry into leadership in early childhood education and care (ECEC). Leadership in ECEC is a key feature of contemporary early childhood policy positioned as a prerequisite for quality improvement. The method of collective biography was drawn on to investigate how leaders in early childhood produce understandings about 'good' leadership. This inquiry problematises notions of 'good' early childhood leadership. A number of ironic categories emerged that hold together competing and at times contradictory discourses, allowing for more complex understandings of leadership.

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Country: Australia

Supervisor/s: Marcus Foth (Queensland University of Technology), Gregory Hearn (Queensland University of Technology)

## Thesis title:

Planning and City Policy Responses to Remote Work in Urban Environments

## Description:

This thesis examines the impact of emerging practices of remote work and working-from-home on cities. While the study adopts a global perspective, empirical data from a case study of the City of Gold Coast, Queensland, Australia, is analysed. Insights from the thesis inform several recommended strategies guiding urban planning and design practitioners to consider the evolution of residential neighbourhoods towards mixed live/work urban environments. While the majority of data analysed in the thesis was collected before the COVID-19 outbreak, some implications for post-pandemic cities were also able to be discussed.

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Country: England

Supervisor/s: Toby Miles-Johnson (Queensland University of Technology), Angela Higginson (Queensland University of Technology)

## Thesis title:

Policing Vulnerability: An Examination of Police Policy, Training, and Perceptions of Practice Regarding Responding to Persons with Mental Illness.

## Description:

The thesis is a qualitative study of police policy, training, and perceptions of police practice regarding the provision of 'fair and just' police responses to persons with mental illness (PWMI) in crisis. The thesis suggests that police policy guidelines and training practices may not appropriately equip police to recognise, understand, and manage PWMI in a fair and procedurally just manner. In addition, police culture within the organisation, and the organisation's emphasis on paramilitary ideals is argued to limit and challenge procedurally just policing of PWMI.

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Country: Australia

Supervisor/s: Kerryann Walsh (Queensland University of Technology), Judith Howard (Queensland University of Technology)

## Thesis title:

Building Trauma Informed Teachers: A Constructivist Grounded Theory Study of Remote Primary School Teachers' Experiences With Children Living With the Effects of Complex Childhood Trauma

## Description:

This PhD study utilised constructivist grounded theory to generate a new theory, Building Trauma Informed Teachers from data collected in individual interviews with 23 teachers and a focus group with 7 teachers. Building Trauma Informed Teachers explains the social processes remote primary school teachers undergo in their work with children living with the effects of complex childhood trauma (CCT). This study contributes important insights into teachers work with children experiencing CCT and recommends ways in which cognate systems can prepare and support teachers for their role as key professionals in the lives of children who have experienced CCT.

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Thesis by Published Papers

Supervisor/s: Gene Moyle (Queensland University of Technology), Geoffrey Minett (Queensland University of Technology)

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## Thesis title:

Injury Surveillance and Monitoring During Transitions in Dance Training and Careers Including End-User Perceptions Towards Training Load Practices

## Description:

This research investigated injuries across and within a training year and career phases in ballet and contemporary dance. The perceptions of artistic and health professionals regarding training practices were also explored. In tertiary dance, 50% of students were injured in the first seven weeks of the program, and certain weeks across the program resulted in higher injury rates. Across one semester, spikes in stress leading to performances, and spikes in load and injury to recommence technique training were observed. Artistic staff were perceived to be responsible for planning training, providing insights for future research into injury prevention in dance.

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Technology)

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.212983>

## Thesis title:

Pathways and Partnerships: A Study of Private Policing Economic Crime in Australia

## Description:

This thesis comprehensively examines the policing of economic crime by Australian private investigators. The findings identify that the services afford clients a level of discretion and autonomy not found within the justice system, which is now provided by investigators who are qualified and who utilise the skills of a corporate investigator, an accountant and a lawyer. The thesis considers the competing professions within economic crime and examines the regulatory issues and challenges these present. It makes an original and substantial contribution to the knowledge of private policing by identifying the changing environment in which private investigators operate in Australia.

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Country: Australia

Supervisor/s: Lyndal O’Gorman (Queensland University of Technology), Annette Woods (Queensland University of Technology)

## Thesis title:

Experiences of Gender and Sexuality Diverse Parents in Primary Schools

## Description:

This thesis examines the enablements and constraints experienced by gender and sexuality diverse (GSD) parents within the context of their child/ren’s primary school/s. It explicates how normative notions of family can create barriers to recognition for GSD parented families in educational contexts and considers the labour this can create for families. This thesis offers a rich understanding of the productions of family within schooling contexts and implications for GSD parented families.

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Country: Australia

Supervisor/s: Helen Berents (Queensland University of Technology), Erin O'Brien (Queensland University of Technology)

## Thesis title:

Gendered Narratives of Genocide and the Ethics of Storytelling: An Analysis of Civil Society Representations of the Yazidi Genocide

## Description:

This thesis examines the reproduction of gendered insecurities in civil society advocacy surrounding the Yazidi genocide. Guided by feminist ethics, this thesis draws on an analysis of advocacy material and interviews with advocacy practitioners, finding a strong focus on narratives of sexual violence that foregrounds the victimhood of women and girls. This suggests that despite progress made at an institutional level in addressing conflict related sexual violence, this dominant framing has not changed. This thesis argues this narrative has consequences for the wellbeing of survivors and that this focus is sustained through the complex socio-political dynamics of advocacy organisations.

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Thesis by Monograph

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Technology), Guanglun Mu (Queensland University of  
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Thesis DOI: <http://doi.org/10.5204/thesis.eprints.208257>

## Thesis title:

Constructing a Validity Argument for a Locally Developed Test of English Reading Proficiency

## Description:

This mixed methods study built a validity argument for a locally developed test of English reading proficiency used by a Vietnamese tertiary institution as evidence of graduates' English reading proficiency. It drew on and contributed to the argument-based approach to language test validation, providing some supporting evidence of the interpretation and use of the test scores associated with the explanation and extrapolation inferences while also generating some rebuttals that might weaken the validity argument of the test. Implications of the study include possible revisions and future development of the test.

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Country: Thailand

Supervisor/s: Radha Iyer (Queensland University of  
Technology), Kelli McGraw (Queensland University of  
Technology)

## Thesis title:

Learner Engagement in a Collectivistic Culture: A Study of Massive Open Online Courses (MOOCs) in Thailand

## Description:

This study examines MOOC learning environment situated within the Thai cultural context and Thai cultural dimensions (Hofstede, 1997). The study draws on connectivist theory to conduct a qualitative study to investigate the four dimensions of learner engagement: behavioural, cognitive, emotional, and social engagement in online MOOC learning. Data were collected from three selected Thai MOOCs through semi-structured interviews with three instructors and 30 students. Results indicate that while instructors excluded themselves from cultural engagement within the online learning environment, learners were considered objects to adapt to institutional culture and cultural engagement was a mere additive to the pedagogy.

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Country: Australia

Supervisor/s: Alice Payne (Queensland University of Technology), Mark Neighbour (Queensland University of Technology), Jennifer Craik (Private Individual)

## Thesis title:

Towards a Queer Design Practice for Menswear: Disrupting Historical Gender(ed) Narratives

## Description:

This practice-led fashion project outlines the ways in which historical gendered narratives in the West are constructed in history and reinforced through fashion and dress by examining J. C. Flügel's 1930 thesis 'The Great Masculine Renunciation and its Causes.' Flügel's thesis identifies a moment of crystallisation for essentialist gender roles and their subsequent aesthetics and is used as a creative catalyst for practice. The project proposes a methodological framework to utilise queer methods in design practice and offers a case study for the application of these methods as a way of challenging norms of gender and class in fashion practice.

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Country: Australia

Supervisor/s: Mirko Guaralda (Queensland University of Technology), Janice Rieger (Queensland University of Technology), Leah King-Smith (Queensland University of Technology), Hee-Jeong Choi (Royal Melbourne Institute of Technology)

## Thesis title:

Enhancing Ecologies of Care for CALD Women through Care-full Creative Engagement

## Description:

Settlement conditions in Australia for Culturally and Linguistically Diverse (CALD) women are challenging. Despite an abundance of social services within the multicultural city of Logan, CALD women experience several social issues that impact their wellbeing. This study explores a creative engagement methodology to foster social connection and ecologies of care for CALD women. Findings reveal that the ecology of care in Logan is complex, hierarchical, fragmented, and difficult to navigate. The study, involving a series of creative interventions, demonstrates the potential benefits for creative engagement to enhance individual ecologies of care, and provides direction for designing more inclusive engagement practices.

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Country: India

Supervisor/s: **Stuart Cunningham (Queensland University of Technology)**, **Kevin Sanson (Queensland University of Technology)**

## Thesis title:

The 'New Screen Ecology' in India: A study in Digital Transformation of Media

## Description:

The thesis provides an in-depth study on the emergence of the Indian online audio-visual landscape by showing how the launch of a local and global suite of social media platforms like Youtube, Facebook, and portals like Hotstar, TVFPlay, Netflix shape the working conditions of above-the-line labor. Drawing on in-depth interviews with three categories of professionals: creators, platform and portal executives, and intermediaries (talent agents, multi-channel networks), this research demonstrates how the Indian screen industries are affected by social relations between these professionals and how their industrial practices blur the content and creator-based distinctions between platforms and portals.

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Thesis by Monograph

Supervisor/s: Jennifer Alford (Queensland University of Technology), Margaret Kettle (Queensland University of Technology)

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.208014>

## Thesis title:

Bilingual Curriculum Enactment in Vietnam in an Era of Economic and Social Reform

## Description:

This thesis reports on a case study of two Vietnamese primary schools' implementation of English language bilingual education to support economic and social reform in Vietnam. The study found that bilingual curricula are adopted differently depending on whether the schools are public or private; the former adopt a nationally-based curriculum while the latter use imported curricula, often in the form of textbooks. The respective curricula influence staff recruitment and parental expectations, and pedagogical issues including misalignments between students' proficiency levels and curriculum objectives. To be more effective, future bilingual education programs need to engage more closely with Vietnamese contextual conditions.

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Thesis DOI: <http://doi.org/10.5204/thesis.eprints.211435>

## Thesis title:

Exquisite Pressure: Entanglements at the Intersection of Artistry, Pedagogy and Digital Technology

## Description:

This study examines the teaching-artist's philosophies and practice in the digital arts context, interrogating the limitations and potential at the nexus of teaching-artistry, arts learning and digital technology to create enhanced learning and capitalise on the capacities of learners. The practice at the heart of this research features the performative workshop 'Creature Interactions: an interactive workshop', staged at the Out of the Box Festival, Sydney Opera House, and XinTiandi Festival in Shanghai. The performative workshop features large-scale digitally interactive projections presented in a VR CAVE environment.

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Thesis DOI: <http://doi.org/10.5204/thesis.eprints.212114>

## Thesis title:

Listening with Images: Photographs and Their Relationship to Identity in the Lives of Older People in Aged Care

## Description:

This thesis explores the role which photographs can play to assist with the reconfiguration of identity and well-being for older people after transitioning to aged care. Through practice-led research, the work draws upon photography as a method to facilitate storytelling and reminiscence with a group of older residents of an aged care facility. The methods of photo elicitation, photo voice, documentary and collaborative photography are employed using a feminist lens, combining residents existing photographs as well as collaboratively created photographs to examine ways to foster and enhance socialisation.

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## Thesis title:

Policy Enactment and Complexity: A Case Study of a Master of Philosophy

## Description:

This study contributes to understanding the master by research as a policy object, and provides insight into how policy work is done at universities. It utilises Stephen Ball's theorisation of policy enactment with theories of complexity to explore the tensions that frame aspirations for a new master by research at a large modern university. Findings identified that experiences in, and of, the MPhil are complex and, at times, contradictory and point to a need to better understand policy intentions, decisions, and experiences when creating courses and educational experiences in the future.

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Country: United States of America

Supervisor/s: Jennifer Seevinck (Queensland University of Technology), Alice Payne (Queensland University of Technology), Hee-Jeong Choi (Royal Melbourne Institute of Technology)

## Thesis title:

Seeking for Outliers: Artistic Exploration of Data Through Creative Practice

## Description:

Situating this art practice as data art in the field of digital art, I suggest a new landscape of data art by exploring data as an art material, medium, a concept-driver and as containing the current social-political issues of data bias. The creative outcomes of this research project result from my process of artistic exploration of data. This has been a journey that explored the context of data and artistic potential of outliers as a concept-driver.

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Country: Taiwan

Supervisor/s: Jared Donovan (Queensland University of Technology), Glenda Caldwell (Queensland University of Technology)

## Thesis title:

Place-Oriented Design: A Framework for Designing Interactive Installations for Public Spaces

## Description:

This PhD study develops a place-oriented design framework for developing interactive installations for public space. This framework aims to lead the designer to engage and develop a better understanding of the place where their design is installed. This PhD study draws from the concept of place and adopts 'research through design' as the methodology. The development of the framework is both reflective and iterative. The final version of the design framework is presented in the format of a metaphorical toolbox, in which each individual component provides a specific function for developing place-oriented interactive installations for public spaces.

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Faculty of Creative  
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# Zoe Vaill

Doctor of Philosophy

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Faculty of Creative Industries, Education and Social Justice

Country: Australia

Thesis by Published Papers

Supervisor/s: Marilyn Campbell (Queensland University of Technology), Chrystal Whiteford (Queensland University of Technology)

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.213220>

## Thesis title:

How do Universities Prevent and Manage Peer Bullying Amongst Students: A Policy Analysis

## Description:

This thesis explored the topic of peer bullying amongst university students with regard to the policies universities provide. With sparse research currently in this area, the thesis fills some important gaps in knowledge about the content, quality, and usability of university student anti-bullying policies. The thesis is by publication of three studies. The first and second studies analysed the content and usability of anti-bullying policies in Australian and British universities, whilst the third study aimed to better understand what university students in Australia know about these policies, their experiences with bullying, and their views on how to better inform students

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Thesis by Monograph

Supervisor/s: Daniel Mallet (Queensland University of Technology), David Nutchey (Queensland University of Technology)

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.213589>

## Thesis title:

Beliefs, Knowledge and Skills of Pre-Service Mathematics Teachers when Learning Calculus through a Technology-Enhanced Inquiry

## Description:

This research explored the beliefs, knowledge and skills of Bhutanese pre-service mathematics teachers and their preparedness to teach a reformed mathematics curriculum. Data were collected when the participants joined a series of inquiry-oriented, technology-enabled calculus workshops. These data analyses revealed many inconsistencies between the participants' espoused and enacted beliefs and misalignments between their mathematical knowledge and skills when compared to the intentions of the newly reformed curriculum. From this, implications have been drawn about the preparedness of the soon-to-graduate pre-service mathematics teachers, and recommendations are made regarding ways future pre-service teachers mathematical beliefs, knowledge and skills may be enhanced.

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Country: Sri Lanka

Supervisor/s: Melissa Teo (Queensland University of  
Technology), Stephen Kajewski (Queensland University of  
Technology)

## Thesis title:

Role of Green Human Resource Management (GHRM) to Achieve Sustainable Construction Industry

## Description:

This research study created new knowledge relating to implementation of the Green Human Resource Management (GHRM) concept in the construction industry in developing countries. A conceptual model of GHRM was built based on the state-of-the-art-knowledge of strategic human resource management and environmental sustainability. The model was refined and validated to address employee-centric challenges in sustainable construction, using extensive surveys and interviews conducted in Sri Lanka. The outcomes of this research study will facilitate construction companies to achieving sustainable construction goals and triple bottom line, and in turn minimising or eliminating impacts of construction industry on the natural environment.

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Country: Vietnam

Supervisor/s: Phong Tran (Queensland University of  
Technology), Timothy Dargaville (Queensland University of  
Technology)

## Thesis title:

Bacterial Biofilm Treatment and In Situ Antimicrobial Coatings for Orthopaedic Implant Retention Surgery

## Description:

Bacterial biofilms are involved in most device-associated infections. This thesis has developed an in-situ method to treat biofilm and a coculture for testing new antimicrobial biomaterials. We used surface immobilisation to promote Alpha-amylase and silver ion's disruption of *S. aureus* biofilms. The treatment also helped coating the surface with silver particles to prevent recurrence. We also formed a coculture of *S. aureus* and pre-osteoblastic cells and showed that bacteria preferentially attached to the osteoblasts and became more resistant to antibiotic treatment. Overall, this thesis has laid down the foundation for the development and study of new anti-biofilm biomaterials.

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Country: Australia

Supervisor/s: Yin Xiao (Queensland University of Technology),  
Yinghong Zhou (Queensland University of Technology)

## Thesis title:

Diffeomorphometric Analysis of Periodontal Tissue Regeneration

## Description:

This project evaluated several image analysis methods on the irregular morphology of bone defect models in periodontal tissues. The study advanced image improvement technology for visualization of mineralized tissue regeneration. The current work will allow scientists to circumvent the current known limitations in evaluating trabeculae microarchitecture and separate the periodontium's tissue by density value, which will significantly enhance periodontal tissue engineering and regeneration assessment.

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# Cody Alexander Fell

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Country: United States of America

Supervisor/s: Mark Allenby (Queensland University of Technology), Maria Woodruff (Queensland University of Technology)

## Thesis title:

Soft Robotic Devices for Emulating Vascular Mechanobiology

## Description:

This thesis comprises two research projects undertaken as part of the dual biofabrication master's program between Queensland University of Technology and Utrecht University. The two projects focused on leveraging biofabrication, tissue-culture, and soft robotics to develop novel methods for fabricating 3D vascular and colon tissue, respectively. The first project developed a novel approach for conditioning cells using soft robotics that emulate vascular biomechanics, whereas the second project combined bioink micromoulding and melt electrospinning writing to fabricate 3D colon organoid constructs that mimic colon crypt morphology. Together, these projects contribute innovative biofabrication methods for creating tissue-culture models with enhanced biomimicry.

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Country: Australia

Supervisor/s: William Doherty (Queensland University of Technology), Kameron Dunn (Queensland University of Technology)

## Thesis title:

Fry Drying and Pyrolysis of Municipal Solid Waste

## Description:

This research investigated sustainable resource recovery from unsorted urban, industrial and agricultural waste using fry drying and pyrolytic distillation process methods. Thermogravimetric analysis and Fourier Transform Infrared Spectroscopy were used to identify and quantify linkages between feedstock composition, process chemistry and likely end products. Distributed activation energy modelling was used as an initial step towards development of an accurate kinetic process model. It was postulated that sequential pyrolytic distillation technology be developed to create circular economies, reverse environmental pollution, recycle primary resources and produce carbon negative biofuels to replace fossil fuels such as coal, oil and gas.

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Country: England

Supervisor/s: Laura Bray (Queensland University of  
Technology), Onur Bas (Queensland University of  
Technology)

## Thesis title:

In vitro Bioengineering Applications of Melt Electrowritten and Hydrogel Composite Scaffolds

## Description:

Two-dimensional cell cultures provide an inaccurate representation of how cells develop and are affected by disease and injury. Scaffold-based tissue engineering techniques that combine novel biomaterials and printing methods could assist in the design of more physiologically relevant, three-dimensional experimental tissue models. This thesis investigated the application of carbohydrate glass as a sacrificial material toward producing perfusable hydrogel devices using melt electrowriting, the development and optimisation of a three-dimensional bioengineered bone marrow microenvironment, and a literature review of the approaches toward the development, imaging and analysis of resulting three-dimensional models.

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Country: India

Supervisor/s: Ross Crawford (Queensland University of Technology), Sarah Whitehouse (Queensland University of Technology), Michael Mcauliffe (Private Practice (self-employed))

## Thesis title:

The Supine Non-Weight Bearing Position of the Knee in the Operating Theatre and Its Position in Upright Weight-Bearing Stance - Is There a Correlation?

## Description:

This is a prospective study which examines the correlation between the pre-operative erect weight-bearing long leg radiographs and the intra-operative supine computer-assisted derived hip-knee-ankle angle measurements at the beginning and end of total knee replacement. The findings of this study will help orthopaedic surgeons better understand the interaction between their intra-operative circumstances and normal daily function. This would not only help in planning the surgical intervention better but also could form a valuable addition to standard practice.

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Country: Australia

Supervisor/s: Judith Little (Queensland University of Technology), Peter Pivonka (Queensland University of Technology), Caroline Grant (Queensland University of Technology)

## Thesis title:

Three-dimensional Analysis of Vertebral Growth and Deformity Progression in Adolescent Idiopathic Scoliosis Using MRI

## Description:

This thesis is a study assessing the three-dimensional growth at the apical vertebral body in adolescent idiopathic scoliosis (AIS). It utilized a novel reconstruction and alignment technique utilizing non-harmful magnetic resonance imaging scans to quantitatively demonstrate growth asymmetry in AIS patients with progressive deformity, with aims to further understanding of the progressive deformity in this condition.

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Country: Australia

Supervisor/s: Karen Vella (Queensland University of  
Technology), Severine Mayere (Queensland University of  
Technology)

## Thesis title:

An Evaluation of the Impact on Social Capital of Community Participation in Planning

## Description:

Participation of affected communities in the planning process is mandatory under Australian law. Research suggests this is often problematic; stakeholder objectives diverge and conflict, and there is little to suggest non-powerful participants benefit from their involvement. The practice is frequently characterised by dissatisfaction, mistrust and perceptions of placation - and research reveals this has been the case since such policies were adopted.

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Country: South Africa

Supervisor/s: Wendy Miller (Queensland University of  
Technology), Thomas Rainey (Queensland University of  
Technology)

## Thesis title:

Air Conditioning Performance During Future Climate Conditions in Queensland

## Description:

This thesis uses building simulations to assess air conditioning energy consumption and thermal comfort impacts on housing in current and future climates in three climate zones in QLD. The simulations looked at natural ventilation potential, cooling system resilience and performance as well as indoor environmental conditions. It evaluated three different air conditioning technologies under current and 2050 future climate files. Overall, the results challenge the HVAC industry to explore resilience in their design by means of increased system capacity or alternative renewable cooling technologies.

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Country: China

Supervisor/s: Yuantong Gu (Queensland University of  
Technology), Emilie Sauret (Queensland University of  
Technology)

## Thesis title:

A Data-Driven Smoothed Particle Hydrodynamics Method for Fluids

## Description:

This thesis proposed a novel Data-Driven Smoothed Particle Hydrodynamics (DDSPH) method that, instead of applying the empirical rheological models, utilizes discrete experimental datasets to close the Navier-Stokes equations for hydrodynamic modelling. Besides, the chained hashing algorithm is applied to improve the efficiency of the data retrieval and the robustness of the method with respect to the noisy data is achieved via adding a variable that qualifies the relevance of data points to the clusters. The proposed DDSPH method introduces a new avenue for hydrodynamic modelling and has great potential for modelling complex fluids with highly nonlinear rheological relationships.

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Country: Germany

Supervisor/s: Dietmar Hutmacher (Queensland University of Technology), Timothy Dargaville (Queensland University of Technology), Onur Bas (Queensland University of Technology), Christoph Meinert (Queensland University of Technology)

## Thesis title:

Mechanical Characterization of Multiphasic PCL Microfiber Hydrogel Composites for Articular Cartilage

## Description:

Polymer processing represents the backbone for Biofabrication, here two technologies are advanced to solve key limitations. The first project explores multiphasic scaffolds printed via melt electrowriting to create hydrogel composites that mimic the unique mechanical properties of articular cartilage. The constructs confirmed the biomechanics of native tissue on a global and local scale, representing a promising alternative to current approaches limited by inadequate mechanical properties. In the second project a printhead performing light guide assisted in situ photocrosslinking was developed and established for extrusion-based bioprinting. This novel crosslinking concept offers a solution to the contradicting shape fidelity and biological functionality.

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Country: Saudi Arabia

Supervisor/s: Don Vilathgamuwa (Queensland University of Technology), Mark Broadmeadow (Queensland University of Technology)

## Thesis title:

The Development of Three-Phase Cascaded H-Bridge Multilevel Inverter with DC-Side Sensor-Less Control for Applications of Independent MPPT Photovoltaic and Battery Grid-Connected Systems

## Description:

The utilization of solar energy has grown exponentially in the past years mainly due to environmental concerns. Finding ways to reduce the cost of solar energy systems and their complexity are of great importance. Among the key achievements of this project are, designing an efficient and economical photovoltaic system architecture, introducing DC-link voltage estimation to the three-phase PV system based multilevel-inverter, introducing PV current estimation to the three-phase PV system based multilevel-inverter, achieving phase balancing by injecting zero-sequence voltage utilizing the estimated values and achieving battery SOC balancing using the estimation algorithm. The proposed methods were justified using simulations.

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Country: Australia

Supervisor/s: Ashish Bhaskar (Queensland University of Technology), Krishna Behara (Queensland University of Technology), James McGree (Queensland University of Technology)

## Thesis title:

Fundamental Understanding of the Use of Mobile Phone Data for Transport Applications

## Description:

Emerging traffic data sources such as mobile phone data are becoming more and more important for traffic analysis. This masters research is focussed on having a fundamental understanding of mobile phone data and its transport applications. The research first conducts a review of the data and its applications. After the review, an experiment is conducted with some sample mobile phone data, which supports the results of the review. This research reveals the current achievements and limitations on the application of mobile phone data, giving insights for future research.

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Country: Australia

Supervisor/s: Judith Little (Queensland University of Technology), Peter Pivonka (Queensland University of Technology)

## Thesis title:

Progression of Sagittal Plane Deformity and Axial Vertebral Rotation in Adolescent Idiopathic Scoliosis Using Magnetic Resonance Imaging

## Description:

This thesis investigated the progression of Adolescent Idiopathic Scoliosis (AIS), a multifactorial, three-dimensional spinal deformity affecting 0.47-5.2% of the population. Using a sequential MRI series, spinal curves of adolescent patients with AIS were assessed in a level-wise manner for vertebral body wedge angle, vertebral body height, axial vertebral rotation and kyphosis. These measured values were then compared to the same parameters observed in a sequential MRI series of an adolescent non-scoliotic population. The main objective of this study was to improve our understanding of spinal deformity progression in AIS patients, which will hopefully aid in therapeutic planning and treatment outcomes.

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Country: India

Supervisor/s: Ashish Bhaskar (Queensland University of Technology), Michael Cholette (Queensland University of Technology), Yuefeng Li (Queensland University of Technology)

## Thesis title:

Network-Wide Traffic Congestion Visual Analytics: A Case Study for Brisbane Bluetooth MAC Scanner Data

## Description:

The research study provides a systematic framework to develop a network-level traffic congestion analytical tool ideal for traffic monitoring and road operational traffic management. Key features include identification of traffic hotspots, network congestion plots, input data quality assessment, traffic variability and evaluate congestion performance. The method utilized raw detection data collected from 2200 Bluetooth MAC scanners covering major arterial and motorway corridors of Brisbane Metropolitan region. Furthermore, a novel pattern matching algorithm has been developed to fill the missing data points.

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Supervisor/s: Emilie Sauret (Queensland University of Technology), Shahrzad Seyed Mohammad Shahi (Queensland University of Technology), Ian Mackinnon (Queensland University of Technology), Michael Deligant (Arts et Metiers ParisTech)

## Thesis title:

Design and Modelling of a Heat Recovery Cycle and Turbine for a Low Temperature Hydrogen Fuel Cell

## Description:

This thesis examines the viability of waste heat recovery from a small scale, low temperature hydrogen fuel cell, to generate additional power using a thermodynamic cycle and micro-turbine. It investigates the optimal fluid selection for an organic Rankine cycle and models a radial inflow turbine to generate power from the cycle, which was able to improve the efficiency of the fuel cell by 5%. This work optimises the cycle and turbine designs to match the operating conditions and achieve the highest efficiency and validates the result using 3D fluid simulations.

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Country: Australia

Supervisor/s: Dietmar Hutmacher (Queensland University of Technology), Vinesh Chandra (Queensland University of Technology)

## Thesis title:

Evaluating the Impacts of a STEM Research Placement Program Between a Secondary School and a Science Research Institute

## Description:

Although there are currently various programs aimed at increasing the interest of high school students in science, technology, engineering and mathematics (STEM), very few programs have explored the students' perceptions of the effectiveness of extracurricular STEM programs to their school learning and post-school aspirations. This research aimed to investigate high school students' perceptions of a STEM research placement program integrated into their school curriculum, and how it contributed to their self-efficacy, attitude towards science and motivation to pursue a career in that field. A standard operating procedure (SOP) was then developed to inform future STEM-centred high school programs.

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Country: Germany

Supervisor/s: Dietmar Hutmacher (Queensland University of Technology), Onur Bas (Queensland University of Technology)

## Thesis title:

Mechanically Programmed Fluidic Microactuators for Soft Robotics Applications

## Description:

This thesis covers two projects that connect the engineering field of robotics with the additive manufacturing of microfibre structures by melt electrowriting (MEW). One project utilizes MEW to manufacture soft robots and investigates their function, the second project uses a robotic arm to expand the capabilities of MEW for the creation of better implants in tissue engineering. Both projects result in novel applications and design space for MEW by allowing more complex geometries to be produced and enabling the processing or integration of otherwise inaccessible materials as well as expanding the use cases of the produced constructs beyond static scaffolds.

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Country: Netherlands

Supervisor/s: Jiongyu Ren (Queensland University of Technology), Maria Woodruff (Queensland University of Technology)

## Thesis title:

Effect of Particle Size on Osteoinductive Capacity of Strontium Substituted Bioactive Glasses (SrBG) in vitro

## Description:

Current clinical treatments for bone defects rely on donors or synthetic crafts, which are both associated with various complications such as limited availability, donor side morbidity and immune rejection. Thus, there is a strong need for 'off the shelf' available bone implants with the ability to induce bone regeneration by host cells. Therefore, 3D printed composite bone crafts have been developed using a cost-effective bioresorbable polymer in combination with the ceramic "bioactive glass" to improve cell attachment. Here, Bioactive glass particles were reduced in size to increase surface area to hypothetically further stimulate bone tissue deposition by the host cells.

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Country: Netherlands

Supervisor/s: Travis Klein (Queensland University of Technology), Phong Tran (Queensland University of Technology)

## Thesis title:

Enhancing the Functionality of Hydrogels Using Molecular Polymer Brushes

## Description:

This thesis studies a new approach to enhance the properties of hydrogels using Molecular polymer brushes (MPB?S). It examines the morphology of the MPB?s and the GelMA-MPB?s network, the effect of the brushes on the mechanical properties of the hydrogel and the effect of the brushes on the encapsulated cells. In doing so, a new hydrogel is developed, providing new possibilities in the field of cartilage regeneration with the potential to improve treatment for Osteoarthritis.

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# Yujian Shi

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Thesis by Monograph

Thesis DOI: <http://doi.org/10.5204/thesis.eprints.226839>

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Country: China

Supervisor/s: Sarina Sarina (Queensland University of Technology), Huai Yong Zhu (Queensland University of Technology), Eric Waclawik (Queensland University of Technology)

## Thesis title:

Visible Light Photocatalytic Conversion of Sugars to 5-HMF by Immobilized Main Group Element Complexes

## Description:

This thesis presents an in-depth study on the using main group metal elements complexes direct conversion of sugar to the value-added chemical. Overall, it was demonstrated that under visible light irradiation, Ga (III) and Sn (II) complexes exhibited good activity for the conversion of glucose to HMF under mild reaction conditions. This kind of photoreaction that can be carried out at a low temperature and the catalyst can be recycled defines a new approach for the development of green catalytic processes and expanding the applications of photocatalysis.

Introduction

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# Zexing Zhou

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Country: China

Supervisor/s: Graeme Millar (Queensland University of Technology), Azharul Karim (Queensland University of Technology), Wayde Martens (Queensland University of Technology)

## Thesis title:

Engineering Design of Thermochemical Energy Storage System to Provide Hot Water Suitable for Membrane Distillation Operation

## Description:

This thesis used Computational Fluid Dynamic Software Ansys Fluent to evaluate the design of a Zeolite 13X based Thermochemical Energy Storage System. The system is designed to provide constant hot water supply during night-time for a solar Membrane Distillation (MD) system. It overcomes the intermittent nature of solar energy to provide a sustainable energy solution for mining water treatment in Australia. The utilization of CFD also proposed a method to predict the performance of a designed TES which estimated the critical configurations such as optimal charging/discharging flow rate, temperature, relative humidity, and pipe arrangement configuration, etc.

Introduction

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Country: China

Supervisor/s: Ting Liao (Queensland University of  
Technology), Aijun Du (Queensland University of  
Technology), Yuantong Gu (Queensland University of  
Technology)

## Thesis title:

Strain Engineering of Co-N-C Catalyst Toward Enhancing the HER and ORR Electrocatalytic Activities

## Description:

This thesis presents a comprehensive review of practical strategies to enhance the catalytic activity of M-N-C materials. The practical strategies can be extended to engineer external factors to break the linear scaling relationships and to further enhance the catalytic performances. In order to design the next-generation higher-performance catalysts, this project was a step forward in developing strain and heterostructure method to achieve a superior HER performance and a ORR performance beyond the limit.

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Country: Australia

Supervisor/s: Duzgun Agdas (Queensland University of Technology), Timothy Rose (Queensland University of Technology), Carlos Rodriguez (Escuela Superior Politecnica del Litoral)

## Thesis title:

Improving Performance of Infrastructure Projects in Developing Countries: An Ecuadorian Case Study

## Description:

This project investigates the key factors influencing the successful delivery of infrastructure projects around the globe through an extensive literature review and a case study of an important Ecuadorian flood control and irrigation infrastructure project. The key learnings from the study are important steps towards improving infrastructure delivery in developing countries, which is crucial for their sustainable development. Many of the failure factors from the literature were evident in the case study, validating the literature findings and suggesting the learnings may be relevant to developing countries more widely.

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Country: Australia

Supervisor/s: Ajay Pandey (Queensland University of Technology), Ross Crawford (Queensland University of Technology), Liao Wu (Queensland University of Technology), Jonathan Roberts (Queensland University of Technology)

## Thesis title:

Application of Gestural Guided Continuum Robots in Orthopaedic Surgery

## Description:

This thesis describes the design and control of snake like concentric tube robots for the purposes of minimally invasive, orthopaedic arthroscopic procedures, although similarities can be drawn in multiple surgical contexts. It analyses multiple aspects of delivering the technology, including different forms of robot hardware, the role of robots in surgery and different control modalities including gesture recognition. A prototype tube robot developed by the Australian Centre for Robotic Vision is tested and end user feedback provided to further refine its development.

Introduction

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Country: Australia

Supervisor/s: Travis Klein (Queensland University of  
Technology), Karsten Schrobback (Queensland University of  
Technology)

## Thesis title:

A Novel Approach to the Identification of Osteoarthritis Biomarkers Using Mass-Spectrometry Based Proteomics

## Description:

This research explored the relationship between joint loading and the expression of osteoarthritis related biomarkers in subjects at risk of developing the disease. The aim of the project was to determine whether there are certain biomarkers in early arthritis that may be useful targets for early diagnosis and management. The outcome was that while some biomarkers showed promise, more work is required to determine their significance.

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Country: Australia

Supervisor/s: Sara Couperthwaite (Queensland University of Technology), Graeme Millar (Queensland University of Technology), Valentino Te'O (Queensland University of Technology), Dominic Alexander (Queensland University of Technology)

## Thesis title:

Assessment of Microorganisms Found in Coal Seam Water Holding Ponds and in Brine

## Description:

The research investigated predominant culturable microorganisms within coal seam water and coal seam concentrated brine, which were then assessed on specific threshold conditions (temporal and salinity). The main outcomes found were a consistent optimal temperature across all microorganisms and varying impacts of salinity on their growth. This research will aid the coal seam gas industry in their investigation of microbial impact in coal seam water treatment systems.

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Country: Bangladesh

Supervisor/s: Sabrina Fawzia (Queensland University of Technology), David Thambiratnam (Queensland University of Technology), Xiao-Ling Zhao (Monash University)

## Thesis title:

Mitigation of Seismic and Cyclic Loading Actions on Steel Structures by FRP Strengthening

## Description:

This thesis aimed to develop an effective technique to mitigate the cyclic and seismic loading actions on steel structure by FRP strengthening. Extensive study has been done to understand the structural performance of FRP strengthened steel members, beam-column connections under monotonic and cyclic loading and FRP strengthened steel frames under seismic loading through experimental testing, finite element (FE) modelling and theoretical approach. The developed finite element and theoretical model predicted the structural responses of FRP strengthened steel structures accurately. The results showed that the FRP strengthening can effectively mitigate the cyclic and seismic loading actions on the steel structure.

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Country: China

Supervisor/s: William Doherty (Queensland University of Technology), Zhanying Zhang (Queensland University of Technology), Huai Yong Zhu (Queensland University of Technology), Kostyantyn Ostrikov (Queensland University of Technology)

### Thesis title:

Selective Catalytic Conversion of Lignocellulosic Biomass Components to Chemicals

### Description:

The PhD research program investigated a novel biorefinery process to convert entire lignocellulosic biomass to high value-added products. This green process involves: (a) the direct depolymerization of sugarcane bagasse to bioaromatics with high yield via one-pot oxidation-hydrogenation method, (b) production of the alkylated mono-sugars, and (c) simple carbohydrate-to-5-HMF conversion by a cheap and effective photocatalyst. The advantages of this approach include no acid, base or toxic chemicals are used, worked under relatively mild operating conditions, and the use of green solvents and solar energy. Products obtained from this project can be further upgraded to high performance materials and chemicals.

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Country: Australia

Supervisor/s: David Thambiratnam (Queensland University of Technology), Hung Chan (Queensland University of Technology)

## Thesis title:

Soil-Pile-Superstructure Systems Under Combined Horizontal and Vertical Strong Ground Motions

## Description:

Highway bridges considered as important but possibly vulnerable superstructures must be studied under natural hazards, such as earthquakes, tsunamis, hurricanes. This thesis was a novel investigation on reinforced concrete bridges under coupled horizontal and vertical ground motions. A variety of ground motions has been examined for different classification of bridges and novel conclusions have been presented in the probabilistic and deterministic frameworks.

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Country: Iraq

Supervisor/s: Frederic Maire (Queensland University of Technology), Feras Dayoub (Queensland University of Technology)

## Thesis title:

A Dynamic Planner for Object Assembly Tasks Based Learning the Spatial Relationships of its Parts from a Single Demonstration

## Description:

The main application of collaborative robots is helping workers during assembly tasks. Most assembly task robots are limited to fixed scenarios that do not require reasoning. To address the current limitations, this thesis introduces a goal-directed dynamic AI system that enables robots to help workers during assembly tasks. After observing an object being assembled, our AI system can induce a 3D model of the assembled object. This induced model encodes the spatial relationships between the components of the object and allows a dynamic planner to repair assembly plans when the worker deviate from the initial plan.

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Country: Russian Federation

Supervisor/s: Jayasiri Rajapakse (Queensland University of Technology), Graeme Millar (Queensland University of Technology)

## Thesis title:

Synthesis of High Quality Zeolite from Alum Sludge for Water Treatment Applications

## Description:

Conventional drinking water treatment plants generate large volume of wastes, such as alum sludge, which is associated with environmental liability and adds to the cost of water purification. Hence, there is a crucial need to develop an alternative 'green' strategy of alum sludge reuse. This thesis is the first comprehensive investigation of alum sludge recycling by conversion into high value product, LTA zeolite, and its successful application in water treatment industry for hardness removal. This pathway effectively contributes to the improvement of waste management and more sustainable water treatment operations as a crucial component of circular economy.

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Country: Iran

Supervisor/s: Thomas Rainey (Queensland University of Technology), Richard Brown (Queensland University of Technology), Jerome Ramirez (Queensland University of Technology), Zoran Ristovski (Queensland University of Technology)

## Thesis title:

Fractional Distillation of Hydrothermal Liquefaction Biocrude

## Description:

This thesis describes fractional distillation as an upgrading method for improving the quality of hydrothermal liquefaction (HTL) biocrude as a green-based biofuel. Firstly, as a part of the biomass to fuel pathway, aqueous phase recycling in the HTL process increased the yield of biocrude production and reduced the nitrogen content. Secondly, fractional distillation improved the biocrude quality (e.g., lower nitrogen content, viscosity, etc), co-processing ability (with conventional fuels) and improved stability during storage. Finally, the learnings from fractional distillation facilitated more accurate process modelling of biocrude assisting biocrude application in the current fossil fuel supply chain.

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Country: Australia

Supervisor/s: Prasad Yarlagadda (Queensland University of Technology), Zhiyong Li (Queensland University of Technology), Tuquabo Tesfamichael (Queensland University of Technology)

## Thesis title:

Mechanics of Bacterial Interaction and Geometry Enhancement on Nanopatterned Surfaces

## Description:

This thesis investigated the deformation and resulting antibacterial activity of bacteria on nanopatterned surfaces, to understand how these surfaces elicit their physical killing action and how they can be optimised. Through finite element and experimental investigation, it was demonstrated that nanopatterned surfaces kill bacteria at their tips by delivering lethal deformation which can be enhanced by reducing key nanopattern dimensions. The findings help towards the development of a new generation antimicrobial materials to combat biofilm infection, fomite transmission and emerging resistance.

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Country: Bangladesh

Supervisor/s: Subramanian Sridharan (Queensland University of Technology), Clinton Fookes (Queensland University of Technology), Simon Denman (Queensland University of Technology)

## Thesis title:

Deep Learning for Person Re-Identification

## Description:

This thesis addresses the problem of correctly re-identifying a target person in a crowded environment, in a multi-camera surveillance system to ensure the safety of people in mass gatherings. Using deep neural networks, we provide effective solutions to the challenges caused by variations in lighting conditions, viewing angles, background, and occlusion in a camera network, and demonstrate the efficacy of the novel algorithms and frameworks that we have developed for accurate person re-identification in real world scenarios.

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# Anna Jaeschke

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Country: Germany

Supervisor/s: **Laura Bray** (Queensland University of Technology), **Dietmar Hutmacher** (Queensland University of Technology), **Elizabeth Williams** (Queensland University of Technology), **Ian Vela** (Queensland University of Technology)

## Thesis title:

Dissecting the Role of Tissue-Specific Cancer-Associated Fibroblasts in the Prostate Tumour Microenvironment

## Description:

Much of what we know today about prostate cancer is derived from studying cancer cells grown on a 2D plastic substrate, not representing the complex structure of a three-dimensional tumour. In this work, bioengineered cancer models provided physiologically relevant research platforms to gain novel insights into the interactions between different cell types present in the tumour. Distinct features of the cancerous and healthy tissues were found that have the potential to be explored for new diagnostic approaches. Advanced toolkits were developed to support the use of bioengineered models to their full potential, and to be utilised for further research questions.

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Country: India

Supervisor/s: Ajay Pandey (Queensland University of Technology), Kostyantyn Ostrikov (Queensland University of Technology), Soniya Yambem (Queensland University of Technology), Samarendra Singh (Shiv Nadar University)

## Thesis title:

Enhancing the Electrical Performance of the Donor-Acceptor Conjugated Polymer Based Organic Field Effect Transistors through Device Engineering for Electronic Applications

## Description:

This thesis is a step towards developing all solution processed, low operating voltage, Donor-Acceptor Conjugated Polymers based Organic Field Effect Transistors (OFETs) for printed and flexible electronics. Main emphasis has been devoted to developing series of highly tailored device engineering strategies that bring sequential improvements to electrical characteristics. Research outcomes are guided by structure-property evaluation, including semiconductor-dielectric interface engineering for optimal response, and work-function tuning with application of self-assembled monolayers to circumvent loss mechanisms. It also investigates the impact of packaging for air stable operation using Cytop as a passivation cum threshold voltage stabilizing layer in dual-gate OFET operation.

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Country: China

Supervisor/s: Sobana Goonetilleke (Queensland University of Technology), Godwin Ayoko (Queensland University of Technology), Llewellyn Rintoul (Queensland University of Technology), An Liu (Shenzhen University)

## Thesis title:

Availability and Mobility of Microplastics in River Sediments

## Description:

This research study systematically investigated the presence of different microplastics in urban river sediments, assessed the factors which influence microplastics distribution, and evaluated the environmental risks of microplastics on sediment quality. Furthermore, the research project developed a three-dimensional mathematical modelling framework on the dispersal and transport processes of different sedimental microplastics. The outcomes of this research study will contribute to the informed management of waste plastics and formulation of effective mitigation measures.

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Country: Australia

Supervisor/s: Lin Ma (Queensland University of Technology),  
Michael Cholette (Queensland University of Technology)

## Thesis title:

Design to Maintenance: A New Construction Design and Building Life Cycle Management Approach

## Description:

The thesis develops a systematic and innovative approach to integrating commercial building design and maintenance so as to advance the body of knowledge of building life cycle management. Different from other studies, this approach extended the beneficial outcomes beyond the traditional capital focused outcome to the whole building life cycle. Participatory action research was employed and a number of mega commercial project case studies have demonstrated the research has improved traditional engineering practices significantly by linking design and error costs to maintenance, which resulted in improving asset life and values.

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Country: Sri Lanka

Supervisor/s: Chaminda Gallage (Queensland University of Technology), David Thambiratnam (Queensland University of Technology), Jeffrey Lee (ARRB Group), Jothi Ramanujam (Department of Transport and Main Roads)

## Thesis title:

Performance of Geogrid-Reinforced Unpaved Pavements Under Cyclic Loading

## Description:

Composite geogrids can successfully be used as a pavement-reinforcement material to increase the performance of pavement structures. This thesis presents a comprehensive study that has investigated the effectiveness of composite geogrids as subgrade reinforcement in unpaved granular pavements that are subjected to cyclic loading and constructed with local materials available in Queensland, Australia. The research outcomes suggest guidelines to design and construct unpaved granular pavements with the composite geogrid reinforcement at the base-subgrade interface. These guidelines benefit the industry by reducing construction and maintenance costs, and environmental pollution.

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## Thesis title:

The Role of Reverse Logistics on Supply Chain Performance

## Description:

This thesis examines the effect of reverse logistics practices on supply chain performance in the construction sector that adversely impacts the environment. Mixed-method was adopted to examine the role of reverse logistics practices, environmental impacts of reverse logistics strategies, and the effect of reverse logistics on supply chain performance. Results revealed that waste management is the mere focus of reverse logistics in the industry, reuse is environmentally the best option, and reverse logistics favourably impact most of the performance criteria. The study provided recommendations for strategic decision and policy making for successful reverse logistics at macro, meso, and micro levels.

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Country: Australia

Supervisor/s: Luis Mejias Alvarez (Queensland University of Technology), Alan Woodley (Queensland University of Technology), Frederic Maire (Queensland University of Technology)

## Thesis title:

Automated Detection of Flooded Areas Using Machine Learning Methods

## Description:

This thesis provides an analytical study to develop a generalised classification method for faster detection of flooded areas from multispectral remote sensing images. The method is based on the neighbouring spectral information to obtain flood probability information from images. The project also develops an optimization algorithm for refining the probability measures for pixels occluded by cloud cover or cloud shadows using ancillary elevation information of the Australian landscapes. This project investigated different flooding events that occurred in different parts of Queensland and northern New South Wales.

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Country: Korea,(Sth) Republic Of

Supervisor/s: Subramanian Sridharan (Queensland University of Technology), Clinton Fookes (Queensland University of Technology), Peyman Moghadam (Commonwealth Scientific and Industrial Research Organisation)

## Thesis title:

Multimodal Dense Map-Centric SLAM

## Description:

This thesis focuses on the problem of LiDAR sensor-based mapping where conventional methods has difficulties with the long-term operation or sensor integration. A new mapping system framework has been proposed to overcome the shortcomings of the conventional methods and we demonstrate its advantages on multiple map datasets collected from various environments. The outcome of the research will be useful for several applications where long-term mapping required, such as security robots, autonomous cars, and service robots.

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Country: Germany

Supervisor/s: Dietmar Hutmacher (Queensland University of Technology), Jacqui MCGovern (Queensland University of Technology), Abbas Shafiee (University of Queensland), Boris Michael Holzapfel (University of Wuerzburg (Julius Maximilian University))

## Thesis title:

Tissue-Engineering Humanised Bone Sarcoma Models in Rodents - A Preclinical Study Platform For Orthopaedic Research

## Description:

This thesis is a step forward in preclinical in-vivo disease modelling, designed to find new diagnostic and therapeutic options, to ultimately improve the poor outcome of patients with primary bone cancer. Combining the principles of tissue-engineering, 3D-printing and advanced gene editing techniques the preclinical animal models developed in this thesis have important clinical implications that could shape future innovative treatment plans. Particularly the translation of a humanised osteosarcoma model from a mouse into a newly engineered severely immunocompromised rat will facilitate preclinical primary bone cancer research by opening up new experimental avenues for complex surgical resection and reconstruction models.

Introduction

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Country: Australia

Supervisor/s: Feras Dayoub (Queensland University of  
Technology), Michael Milford (Queensland University of  
Technology)

## Thesis title:

Epistemic Uncertainty Estimation for Object Detection in Open-Set Conditions

## Description:

This thesis addresses the problem of unreliable perception from vision models, particularly when encountering new, unexpected inputs. The research contributions presented in this thesis enable vision models to jointly predict visual information alongside an uncertainty for this prediction, allowing the model to indicate when it does not know. These methods are designed for the application of robotics, where complex vision models must operate accurately, robustly, and subject to computational constraints.

Introduction

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Country: Australia

Supervisor/s: Peter Corke (Queensland University of  
Technology), Jurgen Leitner (Queensland University of  
Technology)

## Thesis title:

Robotic Grasping in Unstructured and Dynamic Environments

## Description:

Grasping and transporting objects is a fundamental trait that underpins many robotics applications, but existing works in this area are not robust to real-world challenges such as moving objects, human interaction, clutter and occlusion. In this thesis, we combine state-of-the-art computer vision techniques with real-time robotic control to overcome these limitations. We present a number of algorithms that can compute grasps for new items in a fraction of a second, react to dynamic changes in the environment, and intelligently choose improved viewpoints of occluded objects in clutter.

Introduction

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Country: Iran

Supervisor/s: Don Vilathgamuwa (Queensland University of Technology), Gerard Ledwich (Queensland University of Technology)

## Thesis title:

Modelling, Analysis and Control of Compensation Networks in Inductive Power Transfer Systems

## Description:

In this thesis, improvement of the power flow and stabilization and control of WPT systems are the main objectives. To investigate the flow of power, Graph Set Method is proposed. Then a new topology of power converter known as the expandable n-legged converter is used to control the flow of power in a WPT system. Next, a new technique of PWM-synchronized sampling is proposed to sample the state-variables of WPT systems. Based on this technique, the single-oriented PWM synchronized sampling technique is proposed to stabilize and control the state variables of WPT systems.

Introduction

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Country: Bangladesh

Supervisor/s: David Holmes (Queensland University of Technology), Michael Cholette (Queensland University of Technology), Yuantong Gu (Queensland University of Technology), Pietro Borghesani (University of New South Wales), Suvash Saha (University of Technology, Sydney)

## Thesis title:

Study of Pipe Leak Fluid Dynamic Characteristics and Their Influences on Acoustic Emission Generation

## Description:

Developing a robust pipe leak monitoring tool is essential as it continuously monitors pipeline health without disrupting normal operation. It is critical to understand the physical phenomena in the leakage area to develop a robust pipeline condition monitoring. This research project provides a better understanding of pipe leakage fluid dynamics and their influences on acoustic emission signal generation. The findings obtained from this project lay the groundwork for the development of a robust pipeline condition monitoring technique that could be implemented without disrupting normal operation. Such a monitoring tool would have significant financial, environmental, and social benefits.

Introduction

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Country: Italy

Supervisor/s: Michael Cholette (Queensland University of Technology), Lin Ma (Queensland University of Technology), Pietro Borghesani (University of New South Wales), Giampaolo Manzolini (Polytechnic University of Milan (Politecnico Di Milano))

## Thesis title:

Modelling of Critical Components in Solar Tower Plants for Degradation Assessment and Maintenance Planning

## Description:

This thesis investigates the detrimental effect of degradation phenomena in key equipment of solar tower plants, paving the path for their optimal maintenance. Physical models were developed to assess the thermal behaviour of central receivers, accurately estimate the soiling of heliostats, and mitigate the impact of optical efficiency losses in the solar field through optimized cleaning strategies. A hypothetical plant located in Woomera (South Australia) was exploited as a case study to evaluate the effectiveness of the optimizations, while successful synergies between thermal and soiling models proved their suitability for the development of comprehensive degradation prediction tools.

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Country: Australia

Supervisor/s: Adrian Bridge (Queensland University of Technology), Jason Gray (Queensland University of Technology)

## Thesis title:

Causes of Delay in Power Transmission Projects in Bangladesh

## Description:

Power transmission (PT) sits at the heart of the electric power sector linking power generation and power distribution to contribute to global economic growth. This study presents the first empirical study on causes of delays in PT projects to identify the critical delay attributes with a recommendation to minimize the delay. This research determines the overall ranking of the delay factors with the top-ranked factors being right of way problems of transmission line (TL), frequent changes in TL routes, and accessibility to the TL tower locations. Finally, recommendations are made to help minimize delay in PT projects across the globe.

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Country: India

Supervisor/s: Yin Xiao (Queensland University of Technology),  
Prashant Sonar (Queensland University of Technology),  
Cedryck Vaquette (University of Queensland)

## Thesis title:

Fabrication of Hierarchical Scaffold and the Development of Patient-Specific Bioink for Bone Tissue Engineering

## Description:

Tissue engineering provides a potential solution for the repair and regeneration of bone defects and fractures healing. A biomedical scaffold is one of the ideal approaches to achieve effective structure for bone cell growth and bone formation in the desired shape. This study has developed an ideal three-dimensional scaffold architecture with improved biological functionality, which has a physically stable and structurally porous shape, with interconnected channels and defined topography for guided bone regeneration.

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Country: Saudi Arabia

Supervisor/s: Madhav Nepal (Queensland University of  
Technology), Bo Xia (Queensland University of Technology)

## Thesis title:

Developing a Sustainability Assessment Model for Public Building Projects

## Description:

This study developed a comprehensive sustainability assessment model for public building projects. The study has considered a unique socio-economic, cultural, environmental and climatic context of Saudi Arabia and its rapidly developing construction industry in the design, implementation and testing of the model. The study developed 11 sustainability categories and 57 evaluation criteria along with the appropriate weighting system to assess and evaluate sustainability of new public building construction projects. The developed model contributes to facilitate sustainable construction practices and provides a systematic approach to developing a rating system to other building stocks.

Introduction

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Country: Australia

Supervisor/s: Chaminda Gallage (Queensland University of Technology), Leslie Dawes (Queensland University of Technology), Ryan Hackney (Geofabrics Australasia)

## Thesis title:

Investigation of the Hydraulic Performance at the Geosynthetic Clay Liner Overlap

## Description:

Geosynthetic clay liners (GCL) are a critical barrier component in containment systems such as landfills and mines. This thesis presents a laboratory testing method and a numerical modelling technique to evaluate the hydraulic performance of Geosynthetic clay liner overlaps. The outcome of the thesis allows practitioners to evaluate specific GCL products and optimise the liner system performance based on the environmental conditions of the specific barrier applications. The industry benefits by reduced long-term experimentation and minimised financial costs, and improvement of service life of barrier systems, thereby minimising potential ground water contamination and contributing to environmental protection.

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Country: Australia

Supervisor/s: Michael Milford (Queensland University of Technology), Leslie Dawes (Queensland University of Technology)

## Thesis title:

Condition-Invariant Surface-Based Visual Localisation for Multiple Domains and Environments

## Description:

Camera-based positioning systems are critical for robotic navigation, but currently rely on supplementation from other sensors to achieve the required accuracy for many applications. We present a new approach that uses the surface a robot moves relative to, such as the road, to improve the accuracy achievable and increase system deployability with an automated process for optimal parameter selection. Our techniques are demonstrated to work across a diverse range of platforms in challenging aerial and ground-based real-world environments, providing a much-needed capability on the quest towards ubiquitous robotics.

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Country: Australia

Supervisor/s: Jonathan Roberts (Queensland University of Technology), Margot Brereton (Queensland University of Technology), Bernd Ploderer (Queensland University of Technology), Anjali Tumkur Jaiprakash (Queensland University of Technology)

## Thesis title:

Development of Interfaces for Orthopaedic Surgeons to Control Minimally Invasive Surgical Robots During Knee Arthroscopy

## Description:

This thesis uses a human centred design approach to explore novel approaches that allow a surgeon to cooperatively perform knee arthroscopies with a robot. This research consists of three studies, through which a set of insights about the challenges that surgeons face and ways to mitigate them was developed. The thesis contributes findings about key challenges orthopaedic surgeons face during knee arthroscopy, findings about surgeons' preferences when interacting with a robot, and a novel method to elicit design feedback from surgeons.

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Country: Papua New Guinea

Supervisor/s: Bo Xia (Queensland University of Technology),  
Ronald Skitmore (Queensland University of Technology),  
Miljenka Perovic (Queensland University of Technology), Qing  
Chen (Private Individual)

## Thesis title:

Understanding the Behaviour of the Australian Retirement Village Industry - A System Dynamics Modelling Approach

## Description:

This thesis was a step forward in examining the underlying behaviour of the Australian retirement village industry and the effect of social sustainability on its behaviour. Three system dynamic models were developed to simulate future growth of the Australian retirement village industry when no social sustainability, base social sustainability and maximum social sustainability were taken into consideration. These models reveal the growth pattern of the industry and quantify the significant impact of social sustainability on its future growth until the end of this century.

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Country: Colombia

Supervisor/s: Zhiyong Li (Queensland University of  
Technology), Davide Fontanarosa (Queensland University of  
Technology)

## Thesis title:

Patient-Specific Computational Biomechanical Analysis of Carotid Atherosclerotic Plaques Based on MRI

## Description:

This thesis focuses on the biomechanical analysis of carotid atherosclerosis based on medical imaging. The rupture of carotid atherosclerotic plaques is the leading cause of acute cardiovascular events, such as stroke. For this analysis, patient-specific and image-based carotid models were developed for computational analysis to assess factors associated with plaque development and rupture. This study provided further knowledge in areas such as fluid dynamics of carotid arteries with stenosis, the role of the carotid plaque components, and a new technique for structural analysis of carotid plaques. These approaches will help clinicians in the diagnosis and treatment of carotid atherosclerosis.

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Country: Bhutan

Supervisor/s: David Thambiratnam (Queensland University of Technology), Tatheer Zahra (Queensland University of Technology)

## Thesis title:

Strength and Serviceability Assessment of Aged Masonry Arch Bridges

## Description:

This thesis investigated strength and serviceability of aged masonry arch bridges which exist in rail track networks in Australia. The method is based on the measurement of structural responses under operating loads and experimental tests. Two typical bridges were investigated for Australian Rail and Track Corporation Ltd (ARTC) and found that the bridges are safe against the operating loads, despite having undergone aging phenomenon.

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Country: Korea,(Sth) Republic Of

Supervisor/s: Timothy Dargaville (Queensland University of Technology), Nathalie Bock (Queensland University of Technology)

## Thesis title:

Poly(2-oxazoline) Architectures for Drug Delivery Systems

## Description:

The overall aim of my PhD research was to develop biocompatible materials, namely poly(2-oxazoline)s, in terms of chemical structures and chemical and physical properties for drug delivery systems. This thesis demonstrated novel strategies and unique approaches towards sophisticated drug delivery formulations. A combination of crosslinking chemistry, thermoresponsive properties, and drug conjugation was introduced to overcome common issues in typical drug delivery devices such as burst drug release and low drug efficiency. Ultimately, this thesis aimed to promote poly(2-oxazoline)s as the most promising emerging polymers in the future.

Introduction

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Country: Australia

Supervisor/s: Jason Ford (Queensland University of  
Technology), Christina Kazantzidou (Queensland University  
of Technology), Alejandro Donaire (University of Newcastle)

## Thesis title:

Wave-Induced Marine Craft Motion Estimation and Control

## Description:

Marine craft at sea are affected by environmental disturbances including long-term ocean currents and relatively higher frequency wave disturbances. These disturbances impact on vessels resulting in wave-induced motion which reduces the performance of motion control systems and impacts on the safety of crew and cargo. This thesis investigates parameter estimation techniques for the online estimation of wave-induced motion models and platform control of marine craft in the presence of environmental disturbances.

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Country: Bangladesh

Supervisor/s: Azharul Karim (Queensland University of Technology), Michael Cholette (Queensland University of Technology), Gerard Fitzgerald (Queensland University of Technology), Douglas Morel (Redcliffe Hospital)

## Thesis title:

Lean Integrated Optimisation Model of Emergency Department for Improved Patient Flow

## Description:

This research attempts to improve the patient flow of Emergency Department by focusing on the identification of key factors that influence patient flow, evaluating the factors, and developing an optimisation model that integrates a lean concept. A mixed method strategy is utilised to analyse qualitative and quantitative data to identify the key factors that contribute to overcrowding. A comprehensive review of the literature is conducted, and retrospective and observational data have been utilised which were collected from the Emergency Departments of two major hospitals in Brisbane, Australia.

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Country: Bangladesh

Supervisor/s: Timothy Rose (Queensland University of Technology), Duzgun Agdas (Queensland University of Technology), Stephen Kajewski (Queensland University of Technology)

## Thesis title:

The Impact of Social Capital and Extrinsic Drivers on Innovation Ambidexterity in Australian Construction Project-Based Small and Medium Size Enterprises

## Description:

The thesis explores the impact of social capital dimensions on the innovation capabilities of Australian construction project-based small and medium enterprises (PB-SMEs). The study explores the close-knit network of PB-SMEs, and their benevolence, immediate reciprocal behaviour, and shared understanding about innovation. These are amongst the social capital dimensions identified that enable and motivate PB-SMEs to mutually share innovation knowledge and simultaneously focus on short-term profit and long-term industry survival. PB-SMEs' combined strategy of extension and protection of company reputation facilitates as an extrinsic driver to share innovation knowledge. Moreover, these reputation strategies impact the formation of PB-SMEs' social capital.

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Country: Iraq

Supervisor/s: Jasmine Banks (Queensland University of Technology), Kien Nguyen Thanh (Queensland University of Technology), Inmaculada Tomeo-Reyes (University of New South Wales), Vinod Chandran (Queensland University of Technology)

## Thesis title:

White Blood Cells Classification Using Higher Order Spectra and L-Moments Invariant Features

## Description:

This project was a step forward in development of methods to investigate white blood cells and their types. The thesis investigated segmentation and classification methods for white blood cells and their nuclei from other components, such red blood cells, platelets and background, using signal processing, image processing and machine learning techniques, in order to generate automated reports. The outcome of the project was to enhance the accuracy of pathologists' decisions and their efficiency, and overall benefit patients for faster and more accurate diagnosis of diseases under varying laboratory conditions in the future.

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Country: Sri Lanka

Supervisor/s: Thierry Peynot (Queensland University of  
Technology), Jonathan Roberts (Queensland University of  
Technology), Navinda Kottege (Commonwealth Scientific and  
Industrial Research Organisation)

## Thesis title:

Probe-before-step Gait Framework for Multi-legged Robot Locomotion over Terrains with Risk of Collapse

## Description:

In many risky tasks such as search and rescue, it is often safer and cost-effective to send robots in place of humans. Multi-legged robots are good at traversing rough terrain, but handling terrain deformations is still a challenge. This thesis proposes a framework allowing multi-legged robots to safely probe the terrain using their legs and test it for subsidence before walking. Two new robot motion control algorithms were introduced that enabled the subsequent development and implementation of two new crawling gaits for hexapod robots. Thanks to this method, the robot can walk safely on dangerous, locally collapsible terrain.

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Country: Australia

Supervisor/s: Geoffrey Kent (Queensland University of Technology), Ian O'Hara (Queensland University of Technology)

## Thesis title:

A GIS-Based Integrated Modelling Framework for Optimal Positioning of Biomass Energy Plants

## Description:

This project developed a new method to address sustainability aspects relevant to the location of biomass energy plants. The method is based on an integrated geographical information system model to identify optimal sites for biomass energy supply, incorporating spatial biomass availability, and economic, environmental and biomass specific uncertainties in the biomass supply chain. The analysis was carried out in Queensland, Australia as a case study, demonstrating the potential of multiple biomass sources for biomass energy supply.

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Country: France

Supervisor/s: Dietmar Hutmacher (Queensland University of Technology), Nathalie Bock (Queensland University of Technology), Christoph Meinert (Queensland University of Technology)

## Thesis title:

Photocrosslinkable Hydrogels for Controlled Local Drug Delivery

## Description:

Drug systemic side effects or acquired drug resistance are ongoing clinical challenges. In this Ph.D., a biodegradable hydrogel polymer system was developed to provide controlled localized delivery of drugs typically administered systemically. The system was characterised for anticancer and antibiotic applications with proven efficacy in vitro and high tailorability of the release profiles. Furthermore, the water content of the hydrogel system was investigated on a molecular level to provide more insight into its diffusive properties with changing environmental cues. Finally, a guideline was provided for drug release characterisation methods to address the lack of standardisation in the field.

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Country: Italy

Supervisor/s: Ross Crawford (Queensland University of Technology), Ajay Pandey (Queensland University of Technology), Marie-Luise Wille (Queensland University of Technology), Anjali Tumkur Jaiprakash (Queensland University of Technology), Christian Micheloni (Università degli Studi di Udine)

**Thesis title:**

4D Ultrasound Image Guidance for Autonomous Knee Arthroscopy

**Description:**

This thesis proposes a novel guidance concept for autonomous surgical robots using ultrasound imaging and advanced artificial intelligence techniques. Automatic real-time interpretation of the images acquired during the operations allows the robots to navigate the surgical space safely and identify the target anatomy correctly. In particular, automatic image quality assessment, outlining and tracking structures and tools, and uncertainty management were implemented in a surgical platform. The first application on the knee through cadaver and volunteer studies showed the feasibility and produced results comparable to clinical standards.

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# Mario Strydom

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Thesis by Monograph

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Country: Australia

Supervisor/s: Jonathan Roberts (Queensland University of Technology), Ross Crawford (Queensland University of Technology), Anjali Tumkur Jaiprakash (Queensland University of Technology)

## Thesis title:

Robotic Manipulation of a Human Leg for Knee Arthroscopy

## Description:

This research developed an automated leg manipulation system that is coupled with essential measurement and guidance algorithms, to build the fundamental pillars toward robotic knee surgery. It enables joint manipulation through joint identification, joint measurement, and kinematic modelling. Algorithms are developed and evaluated to consider the problems of identifying and measuring the space inside the knee joint. To robotically manipulate a human leg safely, a nine degree of freedom kinematic model is presented and verified through tracking of anatomical points inside the leg. It demonstrates that robotics can make a significant contribution to improve the outcomes for the medical community.

Introduction

Faculty of Business  
and Law

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Industries, Education  
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# Matthew Cooper

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Country: Australia

Supervisor/s: Jason Ford (Queensland University of Technology), James McGree (Queensland University of Technology), Timothy Molloy (University of Melbourne)

## Thesis title:

Bayesian System Identification for Nonlinear Dynamical Vehicle Models

## Description:

This thesis investigates the use of novel Bayesian system identification techniques to estimate unknown parameters in nonlinear vehicle dynamics. In the first part of this thesis, a dual merging particle filter is proposed that accurately estimates non-Gaussian posterior parameter distributions for different vehicle models. In the second part of this thesis, a novel myopic sequential technique is proposed to design informative experiments for estimating the unknown parameters of a real-world robotic vehicle. This myopic technique is extended in the last part of the thesis to incorporate a rolling horizon to design superior experiments with non-myopic utilities.

Introduction

Faculty of Business  
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# Melissa Chan

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Country: Malaysia

Supervisor/s: William Coffey (Queensland University of  
Technology), Madhav Nepal (Queensland University of  
Technology)

## Thesis title:

The Role of Strategic Motivation, Organisational Behaviour and Social Mechanisms in Collaborative Contracts

## Description:

The research investigated the effects of strategic motivation, behaviours and social mechanisms on collaborative contracting performance. A conceptual framework was utilised to examine collaborative contracting, and a case study analysis was undertaken of four projects using data collected from interviews and a survey. Findings indicate the importance of deploying a mechanism of managing projects comprising shared goals and cooperation (social mechanisms); knowledge transfer and transaction cost (strategic motivation); commercial frameworks and structural specifications (behaviour mechanisms). Organisations entering into collaborative contracts that utilise and integrate the framework elements are more likely to achieve better overall performance.

Introduction

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Country: Australia

Supervisor/s: Ross Crawford (Queensland University of Technology), Sarah Whitehouse (Queensland University of Technology)

## Thesis title:

Alteration of the Coronal Plane Soft Tissues of the Knee by Osteoarthritis and Total Knee Arthroplasty and the Impact of this on Surgical Outcomes

## Description:

This thesis examines how osteoarthritis alters the coronal plane tissues of the knee and subsequently how these tissues are affected by total knee replacement surgery. It progresses to document which peri-articular soft tissue parameters have the greatest influence on post-operative patient reported outcomes. This allows surgeons to consider their surgical hierarchy regarding soft tissue balancing. A novel surgical technique to achieve soft tissue balance is described. The thesis allows consideration of what may constitute optimal future adjunctive technology to help address the significant residual dissatisfaction that is reported in up to 20% of patients after a total knee replacement.

Introduction

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Country: Iran

Supervisor/s: Dietmar Hutmacher (Queensland University of Technology), Beat Schmutz (Queensland University of Technology), Martin Leary (Royal Melbourne Institute of Technology)

## Thesis title:

Design and Additive Manufacturing of Biomimetic Scaffolds for Large-Volume Soft Tissue Engineering

## Description:

Sustained large-volume soft tissue regeneration is a clinical challenge and requires well-controlled inter-scale interactions between mechanics, biology and topology. In this thesis, multi-material printing of medical-grade polymers was combined with rational design strategies, based well-understood material properties, to provide a translatable customization pathway for multi-functional scaffolds with tailored structural-mechanical properties which address multifaceted challenges associated with large-volume soft tissue regeneration.

Introduction

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Country: Iran

Supervisor/s: Richard Brown (Queensland University of Technology), Scott Mccue (Queensland University of Technology), Kabir Adewale Suara (Queensland University of Technology), Julius Sumihar (Deltares)

## Thesis title:

Improving Flow Characterisations in Complex Estuary and Coastal Waterways Using Lagrangian Drifter Data

## Description:

By utilising new measurement technologies and advances in numerical models, especially through the use of open-source software, this project paves a way for the better understanding of estuarine hydrodynamics. Using state-of-the-art GPS-tracked drifters and an ensemble-based data assimilation approach, this research presents several novel methods to improve the accuracy of hydrodynamic models for shallow estuaries. It opens new opportunities for researchers/engineers to use Lagrangian data to better employ hydrodynamic models to understand real-time and future estuarine dynamics.

Introduction

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Country: India

Supervisor/s: Sobana Goonetilleke (Queensland University of Technology), Cheryl Desha (Queensland University of Technology)

## Thesis title:

Exploring a Transition Strategy for Hydrocarbon-Dependent Rentier States: A Focus on Qatar

## Description:

It is timely for hydrocarbon-dependent rentier states (countries) to transition to a low carbon economy, given the rapidly changing global energy landscape and increasing climate change mitigation pursuits. However, there is a lack of knowledge - particularly for small hydrocarbon-intensive states - about how to diversify and decarbonize. This thesis comprised a thorough analysis and synthesis of transition discourses, drivers, challenges, and barriers to enabling an immediate transition. Qatar was used as a case study for exploration and sense-checking purposes. A 'Transition Policy Framework' was created to guide states who are fiscally dependent on energy exports, to create viable bespoke low carbon pathways.

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Country: Iran

Supervisor/s: Zhanying Zhang (Queensland University of Technology), Ian O'Hara (Queensland University of Technology), Valentino Te'O (Queensland University of Technology), Leigh Gebbie (Private Individual)

## Thesis title:

Biorefining of Sugarcane Bagasse Based on Acid-Catalysed Glycerol Pretreatment

## Description:

The thesis investigated biorefining of sugarcane bagasse into value-added products. A glycerol-based fractionation method was developed at laboratory and pilot scales to convert sugarcane bagasse into fermentable sugar and high-quality lignin. The fermentable sugar was used for microbial oil production with applications in biofuel, biochemical, food and feed industries. The generated lignin had physico-chemical properties suitable for biochemical and polymer production. The thesis proposes methods to generate new revenue streams for Australian sugarcane industry.

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Country: Iran

Supervisor/s: Wendy Miller (Queensland University of Technology), Veronica Garcia Hansen (Queensland University of Technology)

## Thesis title:

Identification and Classification of Key Features of Balconies to Promote Thermal Comfort Under Natural Ventilation Mode

## Description:

Occupants of high-rise apartments often rely on mechanical air conditioning for cooling, impacting on greenhouse gas emissions and energy costs. This research investigated how balconies can reduce air conditioning use by increasing natural ventilation. Computational Fluid Dynamics was used to examine how balcony depth and the size of the balcony door impacts on air entering the apartment, and how that air moves around the apartment. It showed that a higher cooling effect was gained by reducing the door opening size and that shallow balconies result in non-uniform indoor air distribution. These results may lead to better building design and operation.

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Country: Australia

Supervisor/s: Stephen Kajewski (Queensland University of Technology), Bo Xia (Queensland University of Technology), Arun Kumar (Royal Melbourne Institute of Technology)

## Thesis title:

Assessing Innovation in Comparative Tender Assessment in the Road Sector

## Description:

Innovation in the field of road construction offers significant industry benefits by making an important contribution to economic growth and enhancing the quality of roads. However, achieving innovative road development practices has become a challenge for the road industry. This research examines the factors related to innovation in the bid evaluation process. It proposes a model of innovation and bid evaluation to explore a variety of components and factors of innovation. The result shows that road contractors' experience in the use of innovative materials is essential, this could boost the bidders' confidence and lead to improved road quality.

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Country: Indonesia

Supervisor/s: Douglas Baker (Queensland University of  
Technology), Mellini Sloan (Queensland University of  
Technology)

## Thesis title:

Improving Disaster Risk Communication in Various Disaster Scenarios

## Description:

This thesis investigates information channels the public trust and use for emergency information across different hazards and threats. Data analysis involved the use of the Friedman Test for ranked data, followed by pairwise comparisons with a Bonferonni correction applied to reveal levels of trust in different information sources. Research findings highlight the importance of emergency authorities maintaining their presence in a diverse range of media. The analysis also suggests that people interact with multiple sources of information in everyday situations and when they are under time pressure and facing uncertainty.

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Country: India

Supervisor/s: Sara Couperthwaite (Queensland University of Technology), Graeme Millar (Queensland University of Technology), Wayde Martens (Queensland University of Technology), Rachel Pepper (Queensland University of Technology), Talitha Santini (University of Queensland)

## Thesis title:

Prediction of Weathering Behaviour of Bauxite Residue and Speciation and Mobility of its Trace Elements Through Geochemical Modelling

## Description:

This study provided detailed insight on the effect of different weathering processes of bauxite residues using both experimental and geochemical modelling. The work has proposed a robust and novel modelling approach that used mineralogical composition data as the input for the model that can assist in informing management strategies for bauxite residues.

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Country: Iran

Supervisor/s: [Geoffrey Walker \(Queensland University of Technology\)](#), [Gerard Ledwich \(Queensland University of Technology\)](#)

## Thesis title:

Integration of Non-Isolated Converters in Battery Storage Systems - Topology Development, Evaluation and Optimisation

## Description:

This thesis examines topological variations of non-isolated DC-DC converters and their implications on design parameters and configurations of battery-integrated-converter systems. Furthermore, the opportunity of increased reliability with battery-integrated-converter systems is discussed with examples for both DC-DC and DC-AC converter applications, by taking into account the module voltage, redundancy level, scheduled maintenance and converter topology factors. Moreover, the optimisation and other practical trade-offs associated with the selection of the voltage rating of battery power modules (BPMs) in a battery-integrated-converter-system from an efficiency perspective is investigated.

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Country: Australia

Supervisor/s: Maria Woodruff (Queensland University of Technology), Mark Allenby (Queensland University of Technology), Sean Powell (Queensland University of Technology)

## Thesis title:

Advanced 3D Biofabrication Approaches for the Treatment of Microtia

## Description:

This thesis explored the application of advanced manufacturing technologies; 3D scanning, 3D modelling, 3D printing, and automated colour matching, in the fabrication of prosthetic options for children with microtia. The application of these technologies lowers cost, increase accessibility to patients, and reduces the skill required for technicians. These contributions involved developing a preliminary framework; developing a semi-automated parametric solution in which a high-quality complete ear model was deformed to match scan data from low-cost options; and developing methods of automated colour matching of silicone samples to participant skin tones with a low-cost spectrophotometer.

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# Rokilan Mahenthirarasa

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Country: Sri Lanka

Supervisor/s: Mahadeva Mahendran (Queensland University of Technology), Anthony Ariyanayagam (Queensland University of Technology)

## Thesis title:

Cold-Formed Steel Compression Members Exposed to Extreme Temperature Environments

## Description:

This thesis investigated the behaviour of cold-formed steel compression members under extreme temperature environments using experimental and numerical studies. It proposed both new and improved design models for (1) the elevated and sub-zero temperature mechanical properties of cold-formed steels and (2) the compression capacities of cold-formed steel members exposed to uniform and non-uniform elevated temperatures and uniform sub-zero temperatures. The proposed design models are likely to be adopted by the Australian and American cold-formed steel structures standards, while the new knowledge will enable increased applications of cold-formed steel members in the building industry.

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Country: China

Supervisor/s: Kostyantyn Ostrikov (Queensland University of Technology), Robert Speight (Queensland University of Technology), Kateryna Bazaka (Queensland University of Technology)

## Thesis title:

Low-Temperature Discharge Plasmas in Liquids Assisted Biomass Conversion

## Description:

This project contributed to the establishment of the plasma-based, sustainable, and energy-efficient biorefinery platform. By introducing in-liquid discharge plasmas and understanding plasma-liquid interactions, this thesis explored the engineering and scientific basis of using such plasmas for bioresource conversion, and developed a 'plasma-assisted reforming' process for fast biomass liquefaction and selective ethanol conversion into higher-value products at near-ambient conditions.

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Country: Sri Lanka

Supervisor/s: Tan Yigitcanlar (Queensland University of  
Technology), Sobana Goonetilleke (Queensland University of  
Technology), Md Kamruzzaman (Monash University)

## Thesis title:

Opportunities and Challenges of and Perceptions on Digital Technology-Driven Innovative Disaster Management Approaches

## Description:

This thesis examines the opportunities of and perceptions on digital technology driven innovative approaches such as crowdsourcing and artificial intelligence-based game playing exercises to manage disasters. The study first identified unique attributes and characters of crowdsourcing and AI-based gamification to be used in disaster emergencies. The methodology developed in the study used location related social media data to assess disaster severity and use of AI-based gamified applications to increase disaster related community awareness. This study also, examined user perceptions and user engagements towards social media and AI-based gamifications related to disasters.

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Country: Bangladesh

Supervisor/s: Karen Vella (Queensland University of  
Technology), Marc Miska (Queensland University of  
Technology)

## Thesis title:

Risk Governance Analysis of Informal Floating Food Supply System in Metropolitan Dhaka

## Description:

This thesis is a step forward in analysing the Informal Floating Food supply system (IFFSS) in Dhaka. The daily appropriation and regulation of the IFFSS trading in Dhaka illustrate the conflicts in space, authority, and state, which always provokes arguments and becomes of prime importance in struggles and actions. The research undertakes a qualitative approach and integrates the Institutional analysis and development framework developed by Ostrom to describe how the IFFSS is governed in metropolitan Dhaka and inherent risk factors that break down the system's functionality.

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Country: Iran

Supervisor/s: Mariam Darestani (Queensland University of Technology), Bijan Samali (Western Sydney University), Graeme Millar (Queensland University of Technology)

## Thesis title:

Innovative Natural Zeolite-Based Geopolymers for Water Treatment

## Description:

Geopolymers are inorganic materials with three-dimensional networks and have attracted much attention in several water treatment practices. This research investigates the behaviour of zeolite based geopolymers and to have a better understanding of the properties of the geopolymers, the effect of zeolite particle size, curing temperature, solid-to-activator solutions ratio, the alkaline solution concentration and curing time on the geopolymer amorphous content and mechanical strength. Synthesized geopolymer materials were used in fixed bed column trials for lead and ammonium ions removal. Overall, the geopolymer sorbents were found to be exceptional in the removal of monovalent and divalent ions.

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Country: Sri Lanka

Supervisor/s: Cheng Yan (Queensland University of Technology), Anthony O'Mullane (Queensland University of Technology), Esa Jaatinen (Queensland University of Technology)

## Thesis title:

Fabrication and Characterization of Silicon Based Electrodes for Li-Ion Batteries

## Description:

This thesis presents the synthesis and characterization of silicon electrodes to address critical challenges in development of high capacity Li-ion batteries. Failure mechanisms of silicon electrodes are investigated at different material length scales and effective strategies are proposed to overcome them, which will benefit in developing high performance next-generation rechargeable Li-ion batteries.

Introduction

Faculty of Business  
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# Sebastian Eggert

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Country: Germany

Supervisor/s: Dietmar Hutmacher (Queensland University of Technology), Christoph Meinert (Queensland University of Technology)

## Thesis title:

Design and Development of an Open-Source Technology Platform for Automated Manufacturing and Screening of 3D Cell Culture Models - A Systems Engineering Approach

## Description:

This PhD thesis developed, engineered and applied a novel open-source technology platform for automated manufacturing and screening of 3D cell culture models. The modular approach not only enabled agile and inexpensive development of automated solutions, but also facilitated reproducible, scalable, and efficient workflows. The results indicated that such automated solutions are a much-needed tool for in vitro research applications as well as pharmaceutical studies to increase reproducibility and throughput, resulting in time, labour, and consequently cost reductions.

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Country: Sri Lanka

Supervisor/s: Jonathan Bunker (Queensland University of Technology), Ashish Bhaskar (Queensland University of Technology), Marc Miska (Queensland University of Technology)

## Thesis title:

Modelling Cell-Based Quality of Service and Capacity in Bus Rapid Transit Station Platforms

## Description:

This research identifies highly congested areas in Bus Rapid Transit (BRT) platforms and apply measures to improve Quality of Service and capacity. It developed a novel model that partitioned BRT platforms into cells and examined passenger activities to evaluate variation in area available per passenger across the platform. It was identified that areas available for stationary and circulating passengers in a platform cell differed significantly. BRT platform operation during the COVID-19 pandemic was evaluated. Significant variations exist in waiting passenger distributions between the Before COVID-19 and During COVID-19 cases.

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Country: China

Supervisor/s: Yin Xiao (Queensland University of Technology),  
Yinghong Zhou (Queensland University of Technology)

## Thesis title:

The Effect of Macrophages on Osteocytes and Mineralisation in Inflammatory Bone Remodelling

## Description:

This thesis reported the effects of immune cells on bone cell differentiation and bone formation. The study unveils the critical role of immune cells in regulating bone mineralization and the quality of bone structure. This work generates knowledge to understand bone biology and pathophysiological changes of bone tissues.

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Faculty of Business  
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Country: Bhutan

Supervisor/s: Leslie Dawes (Queensland University of Technology), Stephen Hughes (Queensland University of Technology)

## Thesis title:

The Feasibility of Using Siphons to Drain Glacial Lakes to Provide Electrical Power to Remote Communities in Bhutan

## Description:

This study developed a scientific basis for the feasibility of using siphons to drain glacial lakes and provide power to the remote mountain communities in Bhutan. The results from the intensive laboratory and field experiments proved the viability of siphons in de-watering glacial lakes under practical local conditions. Analysis of data were used to design curves to inform the field results and application of siphons as a smart siphon. The findings of the study support decision makers in reducing the risk of floods due to glacial lake outburst in communities downstream of the glacial lakes and thus contribute to Gross National Happiness in Bhutan.

Introduction

Faculty of Business  
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# Stephen Pahoff

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Country: Australia

Supervisor/s: Christoph Meinert (Queensland University of Technology), Travis Klein (Queensland University of Technology), Dietmar Hutmacher (Queensland University of Technology)

## Thesis title:

Fibre-Reinforced Hydrogels for Functional Cartilage Tissue Engineering

## Description:

This thesis outlines the development of a mechanically functional tissue-engineered cartilage construct that may assist in the repair of damaged joint surfaces. By integrating 3D-printed scaffolds within engineered cartilage, the thesis demonstrates that it is possible to closely recapitulate the complex mechanical behaviour of native tissue. Furthermore, it is shown that the functionality of engineered cartilage can be further improved by optimisation of scaffold properties and mechanical loading in specialised bioreactor systems. By enabling the manufacture of biologically and mechanically relevant cartilage tissues, this work represents an important step towards the translation of functional tissue engineering principles into clinical practice.

Introduction

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Country: Iran

Supervisor/s: Dietmar Hutmacher (Queensland University of Technology), Onur Bas (Queensland University of Technology)

## Thesis title:

Design, Advanced Manufacturing and Characterization of Multiphasic Scaffolds for Tissue Engineering Applications

## Description:

This study takes advantage of combining two tissue engineering scaffold fabrication techniques, namely melt extrusion-based 3D printing and porogen leaching, to develop multiscale scaffolds, consisting of an interconnected network, in order to address the requirements of the tissue regeneration process. The scaffolds were characterised and the effect of the microporous surface on cell response and microporous structure on drug release were investigated. The results of this study show microporosity and macroporosity can be modified to optimize scaffold properties based on the requirements of a specific application.

Introduction

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Country: Bangladesh

Supervisor/s: Ajay Pandey (Queensland University of Technology), Ross Crawford (Queensland University of Technology), Soniya Yambem (Queensland University of Technology), Jonathan Roberts (Queensland University of Technology)

## Thesis title:

Interplay of Singlet and Triplet Excitons in Organic Semiconductor Heterojunctions

## Description:

This thesis is a step towards exploiting singlet and triplet excitons in organic semiconductors for multi-functional diodes. It details the device design and fabrication processes for realisation of reversible organic optoelectronic diodes that can sense as well as emit light on demand. It explores new avenues for multi-exciton harvesting and triplet energy transfer in organic semiconductors in conjunction with physical mechanisms of singlet fission and triplet-triplet annihilation. It details optoelectronic characteristics of multi-chromophore, organic cascades that operate as photodetectors, light-emitting diodes and photovoltaic device with spectral response extending from visible to NIR.

Introduction

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Country: Sri Lanka

Supervisor/s: Sobana Goonetilleke (Queensland University of Technology), Weerawickramage Egodawatta (Queensland University of Technology), James Mcgree (Queensland University of Technology), Shameen Jinadasa (University of Peradeniya)

## Thesis title:

Mathematical Conceptualisation of Stormwater Pollutant First Flush in Urban Catchments

## Description:

This thesis forms a comprehensive investigation of the quantification of first flush in urban catchments where a high concentration of pollutants are washed-off at the initial stage of stormwater runoff. It examined the influence of rainfall-runoff and catchment characteristics on first flush behaviour. The study outcomes can contribute to technically robust and effective design of stormwater treatment systems.

Introduction

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Country: Vietnam

Supervisor/s: **Melissa Teo** (Queensland University of  
Technology), **Sobana Goonetilleke** (Queensland University of  
Technology)

## Thesis title:

Engaging Ethnic Minorities in Rural Water Supply Project Planning in Viet Nam

## Description:

This research developed a theoretical framework to better understand the role and influence of social capital in ethnic minority communities, and elucidated how the social capital can promote community participation through social capital changes. In doing so, the research has laid a foundation for better engagement for ethnic minority population using social capital with a view to achieving better project planning and success of rural water supply projects in the developing country context and beyond.

Introduction

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Country: Australia

Supervisor/s: Jonathan Roberts (Queensland University of Technology), Matthew Dunbabin (Queensland University of Technology), Paul Flick (Commonwealth Scientific and Industrial Research Organisation)

## Thesis title:

Dynamically Configurable Centre of Rotation Wheels

## Description:

This thesis reinvents the wheel to develop a locomotion system that exhibits high efficiency and exceptional obstacle clearing ability, the Posable Hub. This is achieved by using a rigid rim with an actively movable centre hub, through the use of linear actuators. The centre hub can be adjusted in a number of ways, exhibiting functionality that ultimately increases the wheel's traversability.

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Country: Vietnam

Supervisor/s: Yue Xu (Queensland University of Technology),  
Yuefeng Li (Queensland University of Technology)

## Thesis title:

Semantic-based Topic Evaluation and Application in Information Filtering

## Description:

Topic modelling techniques are used to find the main themes in a collection of documents automatically. This thesis presents effective topic evaluation models to measure the quality of the discovered topics. The proposed techniques use human defined knowledge to solve the problems of evaluating topics in terms of semantic meaning of the topics. The thesis also proposed methods to modelling user interest based on the topic model generated from the user's documents. The proposed techniques help to measure the quality of the topics and significantly improve the performance of text mining applications.

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Country: Papua New Guinea

Supervisor/s: Sara Couperthwaite (Queensland University of Technology), Jose Alarco (Queensland University of Technology), Wayde Martens (Queensland University of Technology), Rachel Pepper (Queensland University of Technology)

## Thesis title:

Production of Ferric Ammonium Sulfate Dodecahydrate: A Strategy to Recover and Utilise Iron and Sulfur from Mine Wastes

## Description:

This thesis is a study on the production of ferric ammonium sulfate (FAS) dodecahydrate, a double sulfate salt used in tanning and dyes, etching electronic components, adiabatic refrigeration and most importantly wastewater treatment. Baseline studies were conducted using synthetic solutions to study and establish the fundamentals of FAS synthesis and then extended to acid mine drainage (AMD) and pyrite leach solutions. AMD is known to contain high levels of impurities, hence this study also investigated the effects of impurities on crystal nucleation and formation, incorporation into FAS and to identify any new phases formed.

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Country: China

Supervisor/s: Hongxia Wang (Queensland University of Technology), Tuquabo Tesfamichael (Queensland University of Technology)

## Thesis title:

Structural and Defects Engineering of Electrode Materials for Enhanced Supercapacitors Performance

## Description:

This PhD project aims to address the low energy storage issues of electrode materials for supercapacitors through morphological and defect engineering. The key scientific contribution in this thesis includes: revealing the superior intrinsic electrochemical properties of NiCo-sulfide to hydroxide/oxides, demonstrating a facial defect engineering to enhance electrochemical properties of  $\text{Co}_x\text{Ni}_{1-x}\text{S}_2$  by low temperature plasma, developing a new method for synthesis of high-performance carbon material derived by biomass.

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Country: China

Supervisor/s: Dietmar Hutmacher (Queensland University of Technology), Timothy Dargaville (Queensland University of Technology), Onur Bas (Queensland University of Technology), Elizabeth New (University of Sydney)

## Thesis title:

Fabrication, Properties and Applications of PEGDA Hydrogels in Biomedical Science

## Description:

This thesis focuses on realising better understanding of properties of PEGDA hydrogels, improving fabrication methods for PEGDA hydrogels and finally applying PEGDA hydrogels for biomedical applications. The finding of this thesis includes development of a Type II photoinitiator system for visible light lithography of PEGDA hydrogels, investigation of swelling and other inherent properties, the mechanism of interaction between water and PEGDA polymer, and development of a shape-morphing of PEGDA hydrogel via PCL fibrous network for potential biomedical applications.

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Country: China

Supervisor/s: Ronald Skitmore (Queensland University of Technology), Bo Xia (Queensland University of Technology), Heng Li (Hong Kong Polytechnic University)

## Thesis title:

Improving the Long-Term Use of Case-Based Reasoning Model in Early Construction Cost Estimation

## Description:

This study aims to improve the long-term use of case-based reasoning for estimating the likely tender price of construction work in the early design stages. The research was conducted from three perspectives of the model's setting, the robustness of the knowledge structure, and the efficiency of the case-base system analyzed over a large sample of residential buildings. The results contribute to maintaining the efficiency of case-bases by enhancing the stability of their knowledge structures over time.

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Country: China

Supervisor/s: Hongxia Wang (Queensland University of Technology), Huai Yong Zhu (Queensland University of Technology)

## Thesis title:

Fabrication of Cost-Effective Carbon Based Stable Planar Perovskite Solar Cells

## Description:

This project aims to explore new methods for fabrication of low-cost and stable perovskite solar cells (PSC) by using carbon-based materials. Innovative fabrication techniques for the carbon electrode and new inorganic hole transport materials were developed for PSCs, leading to enhanced interfacial contacts and higher conductivity of the carbon electrode. Consequently, PSCs with excellent stability and significantly enhanced power conversion efficiency were achieved. Moreover, this project has also demonstrated a method for fabrication of self-charging perovskite solar capacitors by integrating a PSC with a supercapacitor, which has the potential to provide reliable off-grid power supply in the future.

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Country: Indonesia

Supervisor/s: William Coffey (Queensland University of Technology), Yan Lamari (Queensland University of Technology)

## Thesis title:

Improving the Relationship Between Main Contractors and Sub-contractors in Indonesian Transportation Infrastructure Projects

## Description:

This study adopted a mixed methodology approach to investigate the way that relationship management has been implemented in Indonesian transportation infrastructure projects. The research examines the relationships between main contractors and subcontractors during project execution phases, and finds that there is an interplay between project culture and relationship quality in improving project performance. The research recommends that it is essential for projects to instill a positive project culture into the downstream supply chain (subcontractors and suppliers), so that a more harmonious working atmosphere can be established in these organisations, which in turn can support the achievement of project performance.

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Country: Pakistan

Supervisor/s: Ronald Skitmore (Queensland University of Technology), Ka Hung Hon (Queensland University of Technology), Jason Gray (Queensland University of Technology)

## Thesis title:

Impact of Performance Drivers on Schedule and Cost Indices of Infrastructure Projects

## Description:

Infrastructure construction projects worldwide are notorious for their substantial time and cost overruns and this research represents a step forward to improving the situation by amalgamating the SCOR and EVM models prevalent in the industry into a holistic model linking the performance drivers of Stakeholder Performance, Reliability, Responsiveness and the contractor's Standard Ratings criteria, with the time and cost of projects. The model was tested and validated for its usefulness in conjunction with a variety of stakeholders.

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Country: China

Supervisor/s: Yuantong Gu (Queensland University of  
Technology), Emilie Sauret (Queensland University of  
Technology)

## Thesis title:

Characterisation of Red Blood Cell Phagocytosis and Assessment of Nanoparticle Uptake by Monocytic Cells

## Description:

This thesis explored interactions between monocytes and IgG sensitised RBCs as well as synthetic particles for clinical and biomedical application. A monocyte monolayer assay was developed for Red Cell Reference Laboratory in Australia to predict transfusion outcomes, and mechanism and immune modulation associated with this assay and biomedical potential of polystyrene particles were explored using genetic and biological studies. The results obtained will contribute to improved transfusion safety and patient management and contribute knowledge in the fields of biomedical research using nanomaterials.

Introduction

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Country: China

Supervisor/s: Suvash Saha (University of Technology, Sydney), Robert Flower (Australian Red Cross Lifeblood), Melinda Dean (Australian Red Cross Lifeblood)

## Thesis title:

Characterisation of Red Blood Cell Phagocytosis and Assessment of Nanoparticle Uptake by Monocytic Cells

## Description:

This thesis explored interactions between monocytes and IgG sensitised RBCs as well as synthetic particles for clinical and biomedical application. A monocyte monolayer assay was developed for Red Cell Reference Laboratory in Australia to predict transfusion outcomes, and mechanism and immune modulation associated with this assay and biomedical potential of polystyrene particles were explored using genetic and biological studies. The results obtained will contribute to improved transfusion safety and patient management and contribute knowledge in the fields of biomedical research using nanomaterials.

Introduction

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Country: Australia

Supervisor/s: Azharul Karim (Queensland University of Technology), Matthew Simpson (Queensland University of Technology)

## Thesis title:

A Multiscale Approach to Moisture Diffusivity for Drying Plant-Based Food Materials

## Description:

This thesis was an investigation into the multiscale nature of moisture movement within food material during drying. It examines the moisture composition within cells and pores and how it evolves with time to develop an accurate and generalised property approach for moisture diffusivity. In the future, the work will aid in the development of optimum drying systems with improved food quality.

**Introduction**

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Country: Australia

Supervisor/s: Ian Stewart (Queensland University of  
Technology), Kelly Stewart (Queensland University of  
Technology)

## Thesis title:

The Effects of Diet and Exercise on Human Body Water Turnover

## Description:

The project investigates the dietary factors that influence a person's hydration status, primarily by measuring body water turnover. Body water turnover is commonly reported as a marker of hydration status for its measurement of total fluid gains and losses over a 24-hour period and can be particularly useful in predicting (and hence managing) fluid loss in individuals experiencing large losses. The study found that active individuals have faster water turnovers, explained by the larger water volumes they consume but also their overall fibre intake. This research has important implications for the impact of dehydration on physical and/or cognitive declines.

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Country: Nepal

Supervisor/s: Prakash Adhikari (Queensland University of Technology), Andrew Zele (Queensland University of Technology), Beatrix Feigl (Queensland University of Technology)

## Thesis title:

Supplemental Light Exposure for Sleep Disturbances Associated with Type 2 Diabetes

## Description:

This experimental case series provides a proof of concept for the beneficial effect of supplemental light to improve sleep behaviour in people with type 2 diabetes with no clinical retinopathy. Photoreceptor dysfunctions identified using novel pupillometry protocols in this population point towards sub-optimal entrainment of the master clock leading to sleep and circadian disruption. These preliminary data will guide future clinical trials in early-stage diabetes to develop light therapy for managing sleep disturbances.

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Country: Australia

Supervisor/s: Honor Hugo (Queensland University of  
Technology), Erik Thompson (Queensland University of  
Technology)

## Thesis title:

Investigating the Contribution of Extracellular Matrix to Mammary Cell Behaviour in Association with Mammographic Density

## Description:

This thesis explores the direct contribution of extracellular matrix (ECM) and its mediated stiffness to breast cancer cell migration, invasion, and progression. A novel ex vivo breast tissue model was developed by the application of two established decellularization techniques, to predict cellular adhesion and gene expression fluctuations of breast cancer cells bound to high and low mammographically dense tissue. Results obtained within this thesis provide further insight as to mechanotransductive effects of the ECM to mammary cell behaviour within the context of mammographic density, thus contributing to the development of potential therapeutics for patients at risk of developing breast cancer.

Introduction

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Country: Vietnam

Supervisor/s: Larisa Haupt (Queensland University of Technology), Rachel Okolicsanyi (Queensland University of Technology), Lynette Griffiths (Queensland University of Technology)

## Thesis title:

Membrane Heparan Sulfate Proteoglycans in the Breast Cancer Microenvironment

## Description:

This project investigated the role of the cellular microenvironment in regulating human breast cancer (BC) models by examining members of the Heparan Sulfate Proteoglycan (HSPG) family of glycoproteins. Small interfering RNAs were used to in vitro to inhibit HSPG gene expression and examine effects on target gene expression, cell proliferation and cell migration in BC cell lines. Findings suggested HSPGs (i.e., Syndecan 1/4, SDC1/4) promote BC proliferation via Akt/Wnt signalling and also influence BC cell migration. As such the SDC1/4 HSPGs can be considered as potential biomarkers for the early diagnosis and treatment of BC.

Introduction

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Country: Australia

Supervisor/s: Ian Stewart (Queensland University of  
Technology), Geoffrey Minett (Queensland University of  
Technology), David Borg (Griffith University)

## Thesis title:

Influence of Hormonal Variations on the Performance and Pacing of Female Cyclists in the Heat

## Description:

The menstrual cycle may influence the performance of athletes competing in the heat. Reproductive hormones that fluctuate across the menstrual cycle alter how efficiently the body can lose and gain heat, potentially leading to the earlier onset of thermal fatigue and impair exercise performance. This thesis investigates the effect of reproductive hormones on the performance of female cyclists in hot humid conditions. Athletes performed simulated Tokyo Olympic time trials in the early follicular and mid-luteal phases of the menstrual cycle. There was some evidence that performance improved in the mid-luteal phase, however, further investigation to confirm this finding is required.

Introduction

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Country: Australia

Supervisor/s: Anjali Tumkur Jaiprakash (Queensland University of Technology), Ross Crawford (Queensland University of Technology), Joel Dulhunty (Queensland Health (Department of Health))

## Thesis title:

Bacteria Isolated from Orthopaedic Patients in North-Eastern Australia: Epidemiology, Multi-drug Resistance and The Impact of Environment and Season

## Description:

In orthopaedic medicine, post-operative infections are associated with increased morbidity, mortality and higher health care costs. There exists a need to improve understanding of factors influencing infection rates and antimicrobial resistance. Particularly for orthopaedic surgery performed in hotter, wetter climates where the tropical microbial niche presents unique challenges. This clinical research analyses the risks of orthopaedic post-operative infections associated with weather and climatic variables. Detailed epidemiological data is presented which describes features of bacteria complicating orthopaedic surgery in North Eastern Australia and the relationship between multi-drug resistance, geographic location, season and weather. Antimicrobial prescribing recommendations are also provided.

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Country: Bangladesh

Supervisor/s: Christopher Watling (Queensland University of Technology), Gregoire Larue (Queensland University of Technology), Mark King (Queensland University of Technology)

## Thesis title:

Biomedical Signal Based Drowsiness Detection Using Machine Learning: Singular and Hybrid Signal Approaches

## Description:

Drowsiness is one of the main contributors to road crashes. This research program examines the utility of drowsiness detection based on singular and hybrid approaches using physiological signals of EEG, EOG, and ECG. Four supervised machine learning models were developed to detect drowsiness levels, using physiological features known to be associated with drowsiness and performance impairment. The ground truth was subjective sleepiness responses while performing a repetitive reaction time task. The outcome of the study indicates that the selected features provided higher performance in the hybrid approaches than the singular approaches, which could be useful for future research implications.

Introduction

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Country: Australia

Supervisor/s: Donald Wharton (Queensland University of Technology), Toby Pavey (Queensland University of Technology), Anthony Rossi (Western Sydney University)

## Thesis title:

Assessment in Health and Physical Education (HPE) - An Exploratory Investigation into Teacher Assessment Practices in the Motor Domain

## Description:

Historical studies regarding assessment in Health and Physical Education resonate with concerns regarding quality and consistency. This thesis explored the assessment behaviours of four junior secondary Health and Physical Education teachers when making judgements about motor performance. The Three Key Attributes of Quality Assessment theoretically underpinned qualitative analysis of field observations, semi-structured interviews and focus group sessions. A lack of teacher assessment literacy and insufficient resourcing highlighted concerns regarding initial teacher education and support offered through compulsory professional development which, consequently, were identified as significant factors that influenced how teachers make judgements about physical performance in Health and Physical Education.

Introduction

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Country: Australia

Supervisor/s: Chamindie Punyadeera (Queensland University of Technology), Kai Tang (Queensland University of Technology), Lizbeth Kenny (Royal Brisbane and Women's Hospital)

## Thesis title:

The Clinical Utility of Salivary Exosomes as Biomarkers in Oral Squamous Cell Carcinoma

## Description:

The project was a step forward in a new area of translational medicine - liquid biopsy - and its diagnostic potential in oral squamous cell carcinoma. A panel of protein markers was identified from isolated salivary exosomes, which was able to discriminate between cancer-free healthy controls, at-risk patients with oral pre-malignant disorder, and early-stage oral squamous cell carcinoma patients. Saliva collection methods were also investigated, with the unstimulated 'drool' method being the most effective method for yielding exosomes of high quality and quantity.

Introduction

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Country: Australia

Supervisor/s: Leila Cuttle (Queensland University of  
Technology), Damien Harkin (Queensland University of  
Technology), Christine Andrews (Mater Research Institute)

## Thesis title:

A Histological Analysis of Burn Wound Progression

## Description:

This thesis investigates the pathological mechanisms occurring in burn wounds responsible for burn wound progression. It utilises histological analyses of porcine burn wound models to identify multiple burn damage markers and their role in causing further tissue damage. A novel method of burn assessment was developed to measure burn intensity, advancing current burn assessment research. The examination of burn wounds at various times post-burn demonstrated that the blockage of blood vessels played a significant role in the progression and intensity of burn depth over time.

Introduction

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Country: Australia

Supervisor/s: Johanna Kenyon (Queensland University of Technology), Makrina Totsika (Queensland University of Technology), Flavia Huygens (Queensland University of Technology), Ruth Hall (University of Sydney)

## Thesis title:

Variation of Surface Polysaccharides in the ST25 Clonal Lineage of *Acinetobacter Baumannii*

## Description:

This project provides a novel insight into the genetics of complex surface structures present in the ST25 lineage of the multi-drug resistant bacteria, *Acinetobacter baumannii*. The thesis employs a newly developed tool, Kaptive, to aid global tracking efforts of this pathogen and uncovers new structure variants which inform future therapeutic options.

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Country: Pakistan

Supervisor/s: Selena Bartlett (Queensland University of Technology), Arnauld Belmer (Queensland University of Technology), Andrew Battle (Queensland University of Technology)

## Thesis title:

Sugar Consumption and Expression of Neuronal Nicotinic Receptors in the Nucleus Accumbens

## Description:

High sugar and fat intake lead to a higher probability of developing obesity, dementia, and cardiovascular diseases. It causes significant changes in the brain such as the expression of neuronal nicotinic acetylcholine receptors (nAChRs) involved in the consumption of nicotine and alcohol. Long-term consumption of sugar effect on nAChRs in the Nucleus Accumbens (NAc) was examined. Varenicline, an FDA approved smoking cessation drug, significantly reduced sugar intake in mice when it was administered to the NAc. Targeting nAChRs as a potential pharmacotherapeutic strategy to reduce sugar intake, may open a new avenue and treatment strategy to flatten the obesity epidemic.

Introduction

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Country: Australia

Supervisor/s: Vincent Kelly (Queensland University of  
Technology), Geoffrey Minett (Queensland University of  
Technology)

## Thesis title:

The Differences Between Training and Match Play for Semi-Professional and Development Netball Players

## Description:

This thesis investigated development and semi-professional netball players across an entire season. It examines the differences between conditioning training and match play and explains that semi-professional netball players may not be exposed to sufficient loads during training to meet match play. The outcomes of this research provide coaches and performance staff with practical implications that may ensure optimal performance and athletic development through the standards of play in netball.

Introduction

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Country: Malaysia

Supervisor/s: Janet Davies (Queensland University of  
Technology), Kirsten Spann (Queensland University of  
Technology)

## Thesis title:

The Interaction Between Grass Pollen Allergen and Respiratory Virus on the Immune Response in Allergic Rhinitis and Asthma

## Description:

This thesis examined the impact of the clinically relevant allergen of *Paspalum notatum* grass pollen on allergic sensitization profiles in Australian allergic rhinitis patients, and on the immune response towards human rhinovirus in adults with grass pollen allergy, and adolescents with allergic rhinitis and asthma. This thesis demonstrates the difference in geographical distribution and immunological recognition between subtropical and temperate grass pollen allergen sources and the need for specific diagnosis and treatment. It also establishes an effect of grass pollen allergen on the innate immune response towards rhinovirus. These outcomes have implications for the co-management of allergic rhinitis and asthma.

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Country: Australia

Supervisor/s: Francesca Frentiu (Queensland University of Technology), Xiaodong Huang (Queensland University of Technology), Elvina Viennet (Australian Red Cross Lifeblood), Rachael Murray (Queensland University of Technology)

## Thesis title:

Identifying Drivers of Chikungunya Virus Transmission in the Asia-Pacific

## Description:

This research project investigates the climate drivers and transmission potential of the mosquito-borne chikungunya virus (CHIKV) in the Asia-Pacific region. The thesis utilises statistical and mathematical modelling to gain epidemiological insight into CHIKV transmission and understand the weather patterns that can influence transmission in Australia and Singapore. By further understanding lessons of the past, this project can assist in future public health preparedness plans and improve predictions of virus transmission using climate forecasts.

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Country: Sri Lanka

Supervisor/s: Dale Nyholt (Queensland University of  
Technology), Divya Deepak Mehta (Queensland University of  
Technology)

## Thesis title:

Identifying Novel, Conditional and Joint Genetic Effects on Parkinson's Disease Risk

## Description:

This study is an analysis of existing ExomeChip-based genome-wide association data to demonstrate the utility of genotype imputation with whole genome sequence-based haplotype reference panels, and recently developed statistical and machine learning approaches to identify novel common and rare genetic variants and their interactions associated with Parkinson's disease risk.

Introduction

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Country: Australia

Supervisor/s: Anthony Shield (Queensland University of Technology), Gabriel Siqueira Trajano (Queensland University of Technology)

## Thesis title:

Hamstring Activation in Variants of the Romanian Deadlift: A Functional MRI and Surface EMG Study

## Description:

Hamstring strain injuries continue to be expensive and time consuming for running based sports. Of the hamstring group, the biceps femoris long head is the most often injured. To date, hamstring injury rehabilitation and prevention methods have focussed predominantly on knee flexion exercises, despite the fact that hip extension exercises better activate this muscle. The aim of this thesis was to compare hamstring activation during variants of the hip extension based Romanian deadlift, to explore the patterns of hamstring and other hip extensor muscle activation. Data from this thesis can be used as a basis for future training studies.

Introduction

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Country: Australia

Supervisor/s: Vivienne Tippett (Queensland University of Technology), Leonie Cox (Queensland University of Technology)

## Thesis title:

An Exploration of How LGBTQ+ Paramedic Experiences of Exclusion and Inclusion Can Inform Policy and Cultural Safety in a State Funded Ambulance Service

## Description:

This research is a qualitative study which explores the workplace experiences of LGBTQ+ paramedics through narrative based interviews and thematic analysis. This research also compares the workplace policies, procedures and strategies related to inclusion in the workplace against three existing benchmarking tools. The model of cultural safety is applied as a post analytical lens and recommendations for improving the workplace inclusion of LGBTQ+ paramedics are discussed.

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Country: New Zealand

Supervisor/s: Geoffrey Minett (Queensland University of Technology), Ian Renshaw (Queensland University of Technology)

## Thesis title:

An Investigation into GPS Brand Reporting Differences and Validation of a Between-Brand Calibration Tool for Football

## Description:

The number of GPS devices brands, commercially available to football teams has risen significantly in the past two decades. As players continue to change between teams such as club, country, youth, professional, their activity may be tracked with two or more brands. Discrepancies between device brand reporting can affect the decisions to adjust individual training load and place players at a higher risk of injury when multiple brands are being used. This project of research has investigated discrepancies between commercial GPS brands and provided a correction tool to be used when comparing GPS derived data between different brands.

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Country: Australia

Supervisor/s: Donald Wharton (Queensland University of Technology), Toby Pavey (Queensland University of Technology), Anthony Rossi (Queensland University of Technology)

## Thesis title:

The Effects of Outdoor Learning Environments on Engagement Levels of Primary School Children

## Description:

Outdoor Education is colourful and multifaceted with many diverse narratives that account for its growth and complexity. This study has attempted to identify the educational behaviours of students when learning in outdoor environments and determine whether the outdoor setting can influence student engagement with learning. Results suggest that participants do have elevated levels of cognitive, behavioural, and emotional engagement when learning is delivered in an outdoor environment and that they are more enthusiastic and committed to learning. Consequently, this study presents a case that suggests Outdoor Education be considered a pedagogical framework as opposed to a stand-alone subject.

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Country: Australia

Supervisor/s: Lisa Nissen (Queensland University of Technology), Gregory Kyle (Queensland University of Technology), Andrew Hale (Queensland Health (Department of Health))

## Thesis title:

A Comparison Between a Doctor-pharmacist Collaborative Model and the Usual Medical Model for Perioperative Prescribing of Medications in an Anaesthetic-led Pre-admission Clinic

## Description:

Pharmacist prescribing in an anaesthetic-led pre-admission clinic. This thesis investigates if a doctor-pharmacist collaborative prescribing model provides better care than the usual (medical) prescribing model in a medium sized hospital, anaesthetic-led pre-admission clinic setting. The doctor-pharmacist collaborative prescribing model was found to improve safety and quality of prescribing patients' usual home medications, and provided better compliance for appropriate surgical antibiotic prophylaxis prescribing versus the usual prescribing model of care. Other benefits are saved doctor time and high patient satisfaction.

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Country: Australia

Supervisor/s: Peter Lazzarini (Queensland University of Technology), Jason Warnock (Metro North Hospital and Health Service), Sieds Van Netten (Queensland University of Technology), David Kavanagh (Queensland University of Technology)

## Thesis title:

The Impact of Motivational Interviewing Training for Podiatrists Treating People with Diabetes-Related Foot Disease

## Description:

Diabetes-related foot disease (DFD) - which includes foot ulceration and infection - often leads to hospitalisation and amputation without good clinical care and self-care. Motivational interviewing (MI) has shown promise in promoting self-care changes in persons with DFD. This thesis designed, implemented and investigated the effects of a MI-related training course for podiatrists who treat people with DFD on their MI-related skills and experiences in clinical practice. Findings indicated that podiatrists who treat people with DFD can improve their MI-related skills in the short-term following MI-training. However, additional training and support may be required to sustain these effects in the longer-term.

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Country: Malaysia

Supervisor/s: Erik Thompson (Queensland University of Technology), Shivashankar Hiriyur Nagaraj (Queensland University of Technology), Elizabeth Williams (Queensland University of Technology), Melissa Davis (Walter and Eliza Hall Institute of Medical Research)

## Thesis title:

Functional Roles of EMP-Associated Targets in Breast Cancer Models

## Description:

Epithelial mesenchymal plasticity in cancer generally refers to the ability of a cancer cell to transform into a different cell form, which facilitates the metastatic spread of a cancer. This thesis explores the roles of four cancer-associated genes that affect the transition of the cell state during cancer metastasis, and includes extensive research on two of the four gene targets, namely TRIM28 and TGFBI. The effects of these genes in breast cancer systems indicated great potential for improving therapeutic responses towards cancer drugs, which would alleviate the suffering of breast cancer patients.

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Country: Australia

Supervisor/s: Hilary Bambrick (Queensland University of Technology), Danielle Gallegos (Queensland University of Technology)

## Thesis title:

A Qualitative Exploration of the Impacts of Climate Change on Food and Nutrition Security and Diet-Related Non-Communicable Diseases in Vanuatu

## Description:

This thesis explores the impacts of climate change on food, nutrition, and health in the island nation of Vanuatu. It demonstrated that climate change exacerbates existing food and nutrition insecurities and promotes dietary trends towards nutrient-poor, energy-dense imported foods and increased risk of diet-related noncommunicable diseases, such as cardiovascular disease and diabetes. Climate change impacts beyond physical health were evident, such as threats to food sovereignty, traditional foodways and practices, culture, and spirituality. This research strengthens the broader call for ambitious climate action by industrialised nations to drastically reduce emissions and increase and transform the support for locally-led adaptation.

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Country: Jordan

Supervisor/s: Helen Edwards (Queensland University of Technology), Kathleen Finlayson (Queensland University of Technology), Peter Lazzarini (Queensland University of Technology)

## Thesis title:

Adherence to Wearing Removable Cast Walkers in Patients with Diabetes-related Foot Ulcers: A Mixed Methods Investigation

## Description:

Adults with diabetes-related foot ulcers are at high risk for frequent hospitalisation, non-traumatic amputation, and increased mortality rate. Offloading is the primary recommended treatment to manage diabetic foot ulcers. This research aimed to understand patients' adherence to wearing removable offloading devices by conducting a mixed-methods investigation. The results revealed that patients with DFUs have low adherence to wearing their removable offloading devices. A combination of psychosocial, physiological, and environmental factors were identified to impact adherence. Therefore, clinicians should firstly adopt non-removable offloading devices. However, when removable offloading devices are needed, the adherence factors found in this research should be considered.

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Country: Australia

Supervisor/s: Lynette Griffiths (Queensland University of Technology), Larisa Haupt (Queensland University of Technology), Kirsty Wright (Department of Defence), Janet Williams (Griffith University)

## Thesis title:

A Genomic Ancestry Panel for Australian and Japanese WWII Military Remains Recovered in the Asia-Pacific

## Description:

The Ghaiyed population-specific panel (GPSP) is an ancestry prediction strategy comprised of ancestry-informative DNA markers that was developed to assist Unrecovered War Casualties-Army (UWC-A) in the accounting of historical military remains. The GPSP was able to significantly increase the proportion of individuals that could be assigned ancestry compared to conventional methods used by the Forensic Science community and previous UWC-A methodology. The GPSP is supported by the novel application of admixture simulation tools and a modified Chi-square Automatic Interaction Detector/Probability Decision Tree (CHAID/PDT) method for ancestry classification, to more reliably account for the remains of those fallen in previous conflicts.

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Country: India

Supervisor/s: Dale Nyholt (Queensland University of  
Technology), Divya Deepak Mehta (Queensland University of  
Technology), Rohit Gupta (Medgenome)

## Thesis title:

Integration of Multi-Omics Data in Cancer

## Description:

Cancer is a complex disease with multiple molecular (omics) factors influencing the risk, development, prognosis, and treatment. Availability of largescale multiple omics data has provided the opportunity to jointly analyse these data using advanced statistical approaches and identify cancer drivers and regulatory pathways underpinning the disease. In the first study, this thesis provides the much-needed guidance for conducting multi-omics analysis using open-source software tools. Next, it introduces an enrichment pipeline developed using imputation-based integration of multi-omics data and was applied to breast and prostate cancers to identify the associated biomarkers and genes.

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Country: Australia

Supervisor/s: Kristiann Heesch (Queensland University of Technology), Tracy Washington (Queensland University of Technology), Nicholas Petrunoff (National University of Singapore)

## Thesis title:

Promoting Active Commuting to Increase Physical Activity Among Office Workers: A Social Cognitive Approach

## Description:

In this research, social cognitive theory was used to develop, implement and evaluate the “Commuter Choices” program, a workplace based health promotion program that supported office workers to add regular physical activity to their routine through active commuting (walking or cycling to work). The intervention group added an average of 47 minutes/week of additional physical activity to their commuting. The program addressed behavioural and social factors to support workers to increase their active commuting, and the process evaluation identified that strategies addressing self-regulation were the most effective at increasing participants’ physical activity.

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Country: Australia

Supervisor/s: Michael Doran (Queensland University of  
Technology), Elizabeth Williams (Queensland University of  
Technology)

## Thesis title:

NSG Mice Bone Marrow Cell Characterisation and Humanisation of the Stromal Compartment for the Purpose of Studying Prostate Cancer Metastasis

## Description:

Dr Nowlan's PhD focused on efforts to better understand the biology of mouse bone marrow and to improve the utility of mouse model used to study prostate cancer bone marrow metastasis. She developed a new way of characterising the blood forming stem cells in the bone marrow mouse strains commonly used in the study of human cancers. Subsequently, she optimised methods to partially humanise mouse bone marrow with human bone marrow stromal cells, and then studied how the human stromal cells influenced the formation of prostate cancer lesions in mice.

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Country: Australia

Supervisor/s: Patricia Yates (Queensland University of  
Technology), Alexandra Mccarthy (Queensland University of  
Technology)

## Thesis title:

A Discursive Construction of Head and Neck Cancer

## Description:

This research investigated how discourse influences patients' and healthcare professionals' response to head and neck cancer. Using a critical constructionist lens, the study explored how common discourse is created and maintained through power relationships between health professionals, people living with the illness and the disease itself. Findings indicate that the social construction of head and neck cancer is shaped by a discourse of deviance, managed by historical institutional power structures, and presented as a journey of survival. An open dialogue is recommended to promote reflection on the way cancer discourses are presented, contextualised, and consumed.

Introduction

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# Claire Nelson

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Country: Australia

Supervisor/s: [Merrilyn Banks \(Queensland University of Technology\)](#), [Mary Hannan-Jones \(Queensland University of Technology\)](#), [Kathleen Finlayson \(Queensland University of Technology\)](#)

## Thesis title:

Nutrition and Chronic Lower Leg Wounds: Assessing Patient Status, and Exploring Health Professionals' Self-Perceived Competence

## Description:

This research determined the nutrition status of people with chronic lower-leg wounds and explored nutrition care from the perspective of health professionals working with chronic wound populations. The study found that despite high BMI of the group, nearly 20 percent of participants were malnourished and, that in chronic wound care settings malnutrition screening and management may be insufficient. The research was conducted within a nutrition-focused socio-ecological framework. Nutrition status was determined by considering dietary intake, health, demographic profile and validated malnutrition assessment. This study supports guidelines which recommend nutrition screening, assessment and management be standard care in this population.

Introduction

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Country: Ghana

Supervisor/s: Patricia Yates (Queensland University of  
Technology), Shirley Chambers (Queensland University of  
Technology)

## Thesis title:

Exploring Health Service and Supportive Care Needs of Women with Advanced Breast Cancer in Ghana

## Description:

This mixed methods PhD project explored the health service and supportive care needs of women with advanced breast cancer in Ghana from their perceptions as well as from those of relevant healthcare professionals and key informants from breast cancer organisations. The thesis provides evidence that this cohort has numerous and complex needs. The project's findings can help guide health policy and the development of evidence-based tailored health and supportive care services, programs and interventions in Ghana to address these women's needs, which will empower the women to better manage their day-to-day lives to maintain and/or improve their quality of life.

Introduction

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Country: Australia

Supervisor/s: Stephen Vincent (Queensland University of Technology), Michael Collins (Queensland University of Technology)

## Thesis title:

The Influence of Scleral Lens Parameters and Fitting Characteristics on Corneal Oedema Under Open and Closed Eye Conditions

## Description:

Scleral lenses are large rigid contact lenses used to treat diseases that affect the front surface of the eye. This thesis examined how scleral lens fitting characteristics can be optimised to reduce corneal tissue swelling. The results provide clinical guidance for contact lens practitioners and patients worldwide.

Introduction

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Country: Nepal

Supervisor/s: Katrina Schmid (Queensland University of Technology), David Atchison (Queensland University of Technology), Marwan Suheimat (Queensland University of Technology)

## Thesis title:

Ciliary Muscle Function and Accommodation in Myopia

## Description:

Myopia (short-sightedness) is a progressive condition often associated with near work. This research investigated the accommodation system during treatment with myopia-control multifocal spectacles. Meta-analysis of prior work showed that effectiveness of multifocal spectacles reduces with time, even after the first six months. During accommodation, the anterior ciliary muscle thickens, and its overall length reduces, in both emmetropes and myopes. Myopes have the larger lags of accommodation. Multifocal spectacles initially decrease the lags, but over-time the lags increase, and upgrading addition power by 0.50D restores the initial effect. Modifications to add power can sustain the treatment effect for longer periods.

Introduction

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Country: Australia

Supervisor/s: Remco Polman (Queensland University of Technology), Tristan Coulter (Queensland University of Technology)

## Thesis title:

Stress and Coping in Esports

## Description:

The purpose of this programme of work was to investigate the psychological factors associated with success in competitive and elite esports athletes. More specifically, this thesis explores the stress and coping process, mental toughness, and the factors that esports athletes perceive make them successful. The methods incorporated cross-sectional, longitudinal, and qualitative approaches to enhance understanding of the psychological determinants of success in esports. With the rapid growth of esports competitions the findings of this PhD programme inform practitioners working with competitive and elite esports athletes and guide future investigations into the psychology of esports

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Country: Australia

Supervisor/s: Narelle Haworth (Queensland University of Technology), Naohide Yamamoto (Queensland University of Technology), Divera Twisk (Queensland University of Technology)

## Thesis title:

Motor Vehicles Passing Cyclists: The Cyclist and Driver Perspectives

## Description:

Motor vehicles passing cyclists too closely is both unsafe and feels unsafe. The aim of this research was to increase understanding of the factors that influence passing distances and perceived risk, using the Comfort Zone Model. The Comfort Zone Model predicted the factors influencing the passing distances chosen by drivers which include traffic, road, and cyclist attributes. Passing distances and other factors such as motor vehicle speed, vehicle size and car parking then predict the perceived risk of passes for both cyclists and drivers.

Introduction

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Country: Nigeria

Supervisor/s: Dale Nyholt (Queensland University of  
Technology), Lynette Griffiths (Queensland University of  
Technology)

## Thesis title:

Common Comorbid Disorders in Endometriosis Patients

## Description:

This PhD project advances our understanding of the relationship between endometriosis and its common comorbid disorders with a focus on asthma, depression, and migraine. Appropriate sets of well-regarded statistical genetic approaches were utilised in the analysis of world-leading genetic data. Findings confirm a comorbid association between endometriosis and each of asthma, depression, and migraine, largely due to shared genetics and biological mechanisms. Causality assessment suggests a potential causal relationship between endometriosis and depression. Further analyses implicate causal links between each of endometriosis and depression and at least one abnormal condition of gastric mucosa-gastritis and gastroesophageal reflux disease.

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Country: Canada

Supervisor/s: Michael Doran (Queensland University of Technology), Travis Klein (Queensland University of Technology), William Lott (Private Practice (self-employed))

## Thesis title:

Optimisation of Methods for Driving Chondrogenesis of Human and Ovine Bone Marrow-Derived Stromal Cells

## Description:

This thesis investigated the effects of different molecules and oxygen levels on the quality of engineered cartilage tissues produced using both human and sheep bone marrow-derived stromal cells. As damaged cartilage cannot repair naturally, it is hoped that cell-based repair strategies can delay the need for joint replacement surgery due to osteoarthritis, which affects 1 in 10 Australians.

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Country: Australia

Supervisor/s: Lisa Chopin (Queensland University of Technology), Penelope Jeffery (Queensland University of Technology), Inge Seim (Queensland University of Technology)

## Thesis title:

The Role of Novel Antisense Long Non-Coding RNA, GHRLOS, in Prostate and Endometrial Cancer

## Description:

Long non-coding RNAs are genes with important regulatory functions acting at the RNA level in normal physiology and are dysregulated in cancer. Our group studies the appetite regulating gene, ghrelin (GHRL), and discovered a long non-coding RNA for the ghrelin gene, termed GHRLOS. This thesis is the first comprehensive characterisation of this long non-coding RNA in cancer, focusing on prostate and endometrial cancer. In both cancer types it promotes a more aggressive cancer phenotype and regulates a range of other genes. GHRLOS might be a useful treatment target for cancer and a useful predictive biomarker for prostate cancer therapy.

Introduction

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Country: Australia

Supervisor/s: Esben Strodl (Queensland University of  
Technology), Mary Hannan-Jones (Queensland University of  
Technology)

## Thesis title:

A Good Fit: Health-Oriented Size Acceptance and Australian Dietetic Practice

## Description:

This thesis explored the suitability of health-oriented, size-accepting approaches for use in Australian dietetics counselling with weight-concerned adults. Across three studies, this work established that such an approach has an acceptable evidence base to drive Australian dietetics practice and may be a superior method to support higher dietary quality and lower eating disorder risk when compared with weight-centric approaches.

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Country: Australia

Supervisor/s: Elizabeth Beattie (Queensland University of Technology), Elaine Fielding (Queensland University of Technology), Carol Windsor (Queensland University of Technology)

## Thesis title:

Do Hospital Nurses Recognise Pain in Older Agitated Patients with Cognitive Impairment? A Descriptive Correlational Study Using Virtual Simulation

## Description:

Agitation and aggression are challenging symptoms commonly experienced by hospitalised cognitively impaired patients. Pain is one well-established cause; however, nurses may not recognise pain-related agitation. This descriptive correlational study examined the clinical decisions of 274 nurses in a virtual simulation of pain-related agitation. Despite high formal knowledge about pain, 95% failed to recognise pain-related agitation and 89% administered antipsychotics. Experiential knowledge, the unconscious but accurate classification of available cues, was identified as crucial to performance. To develop accurate experiential knowledge about pain-related agitation, workplaces may need conditions for deliberate practice, where nurses receive immediate and accurate feedback about their performance.

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Country: Sri Lanka

Supervisor/s: Ann Bonner (Queensland University of Technology), Shirley Chambers (Queensland University of Technology), Louise Purtell (Queensland University of Technology)

## Thesis title:

Contributing Factors to Health-Related Quality of Life in People with Chronic Kidney Disease in Sri Lanka

## Description:

Globally chronic kidney disease is increasing. This study examined the factors contributing to health-related quality of life of people with chronic kidney disease in Sri Lanka. As the disease progressed, alterations in biological function, symptoms, general health perceptions, individual and environmental characteristics influenced the deterioration in health-related quality of life, making everyday life more complex and challenging. The present study provided new insights into understanding the impact and burden of this disease on quality of life. It also provided new knowledge for clinical practice and for healthcare policies to improve the well-being of people with chronic kidney disease.

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Country: Australia

Supervisor/s: Esben Strodl (Queensland University of Technology), Patrick Johnston (Queensland University of Technology), Otto Johnson (Private Individual)

## Thesis title:

Boundary Conditions of Acquisition and Post-Retrieval Extinction in Fear Conditioning: Individual Differences and Methodological Factors

## Description:

This thesis examined a range of potential reasons as to why people differ in how well the fear associated with a memory can be reduced. These reasons included the strength of the initial fear memory and individual differences such as the level of female hormones, strength of stress reaction, type of emotion regulation used, optimistic and neurotic personalities, and mood. The thesis revealed that stronger initial fear memories did not prevent the effective treatment of a fearful memory. It was also found that pessimism and hormonal contraception use prevent the effective reduction of the fear associated with memories.

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Country: Australia

Supervisor/s: Shivashankar Hiriyur Nagaraj (Queensland University of Technology), Erik Thompson (Queensland University of Technology)

## Thesis title:

Identification and Functional Characterisation of TGFB - Regulated and Cell Surface Candidates in Pancreatic Cancer

## Description:

This thesis is an investigation into the role of novel proteins that may influence pancreatic cancer cell migration and thereby tumour progression. Multiple approaches were used to select 41 candidate proteins for in-vitro loss-of-function experiments and several lead candidates were generated including GPRC5A and CRLF1. Further investigation is warranted to better define their cellular roles in pancreatic cancer.

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Country: Australia

Supervisor/s: Lynette Griffiths (Queensland University of Technology), Larisa Haupt (Queensland University of Technology), Kirsty Wright (Department of Defence), Janet Chaseling (Griffith University)

## Thesis title:

Multigenerational mtGenome Analysis for Identification of Historical Military Remains

## Description:

Using the unique Norfolk Island pedigree, this dissertation focused on extended pedigree analysis to evaluate the suitability of whole mitochondrial genome analysis for historical casework, and to provide one of the first mutation rate estimates for the entire mitochondrial genome. This research also provided a mitochondrial DNA control region database representing World War II-era Australian soldiers that has been used by the Australian Defence Force for human identification. It is expected that this work will help to reduce the incorrect identification of military remains and will assist the forensic community for cases involving familial matching.

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Country: Australia

Supervisor/s: Lisa Nissen (Queensland University of Technology), Gregory Kyle (Queensland University of Technology), Michele Clark (Queensland University of Technology), Andrew Hale (Queensland Health (Department of Health))

## Thesis title:

The Personality Traits and Skills of Australian Pharmacists

## Description:

This study evaluated the personality traits and skills of Australian Pharmacists to better understand factors that may influence the implementation of pharmacy practice change. Using theoretical frameworks of personality and advanced practice, this research evaluated the personality traits of Australian Pharmacists and pharmacy students, evaluated the leadership domain of an advanced pharmacy practice framework, and included interviews of pharmacists implementing prescribing models of care in the Queensland public hospitals. Implementing new pharmacy practice models of care is complex and is the confluence of a pharmacist's personality, skills and the context in which they are working.

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Country: United States of America

Supervisor/s: David Kavanagh (Queensland University of Technology), Esben Strodl (Queensland University of Technology), Jennifer Connolly (Queensland University of Technology)

## Thesis title:

Innovative Psychological Strategies for the Management of Distress Amongst Young People with Cystic Fibrosis

## Description:

Cystic Fibrosis (CF) and its treatment pose challenges to young people and their families. This research identified the psychological needs of young people with CF, assessed the feasibility of a brief treatment, and examined whether aspects could be delivered by a social robot. Thoughts young people had about their distress were an important target. The new treatment helped the young people develop a positive story of life they shared with their family, and resulted in reduced distress. Use of a social robot was feasible, and aided engagement. The research provides a foundation for further work in the area.

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Country: Australia

Supervisor/s: Matthew Brown (Queensland University of Technology), Tony Kenna (Queensland University of Technology)

## Thesis title:

Investigating the Mechanisms of Ankylosing Spondylitis-Associated Genetic Variants

## Description:

Ankylosing spondylitis (AS) is an inherited chronic immune-mediated disease, with a complex genetic and immunological basis. This thesis examined the effect of ankylosing spondylitis-associated genetic changes on DNA methylation and gene expression in isolated immune cell subsets. This study confirmed several pathways associated with disease, such as CD8+T-cell activation, and posed new evidence for the mechanisms of disease. The final chapter developed a signature for distinguishing individuals who have AS from healthy individuals by leveraging genetic profiling, gene expression and DNA methylation. This is the largest study of gene expression or DNA methylation in ankylosing spondylitis to date.

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Country: China

Supervisor/s: Graham Kerr (Queensland University of Technology), Karen Sullivan (Queensland University of Technology), Simon Smith (University of Queensland), Marcus Meinzer (Greifswald University Hospital)

## Thesis title:

The Effects of Transcranial Direct Current Stimulation (tDCS) on Balance Control in Parkinson's Disease (PD)

## Description:

This thesis examined single tDCS over L-DLPFC on balance control in healthy adults and people with Parkinson's disease. Balance ability was tested with and without a dual task on different surfaces. This thesis also investigated the neural basis of tDCS by measuring neural activation using fNIRS. Current findings suggest that postural stability was worse with dual tasking and when standing on a foam surface. Contrarily, L-DLPFC tDCS resulted in deteriorated postural stability but improved the secondary cognitive task. Greater neural activation of the prefrontal cortex was observed during dual task relative to the single task, independent of systemic effects.

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Country: Malta

Supervisor/s: Hilary Bambrick (Queensland University of Technology), Alvaro Correa-Velez (Queensland University of Technology), Stefano Moncada (University of Malta)

## Thesis title:

Climate Change, Food Security and Health in Kiribati; Investigating Community Resilience and Opportunities for adaptation in Kiribati

## Description:

This thesis examines the interactions between climate change, food security and public health outcomes in Kiribati. Food security is known to be a strong determinant of health outcomes. This study found Kiribati to be overly reliant on imported food of low nutritious quality, with strong negative public health outcomes such as increasing prevalence of diabetes and hypertension. Identified environmental problems are worsening with climate change; these affect and imperil domestic food production. This study also identifies the strengths of Kiribati communities, providing recommendations on improving food security and climate resilience based on suggestions of islanders and scientific evidence.

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Country: Australia

Supervisor/s: Areana Eivers (Queensland University of Technology), Mark Brough (Queensland University of Technology), Jennifer Alford (Queensland University of Technology)

## Thesis title:

Power and Knowledge in Dyadic Discursive Therapy : Complexity and Contradictions in Australian Policy and Practice

## Description:

This research makes visible the ways power operates in the therapeutic interaction, to support and/or constrain the co-production of children's knowledge regarding their mental health experiences. Enacting Fairclough's (2003) Critical Discourse Analysis (CDA) and a Foucauldian conceptualisation of power (1991), a three-phase research program was designed. In phase one, mental health policy and discursive therapy texts from the macro-domain are investigated. In phase two, therapy transcripts were analysed and in phase three, therapist interviews drawn from the micro-context were also reviewed. The findings show the complexity and contestation of competing discourses in the therapeutic encounter. This research makes a significant contribution to the child and youth mental health therapy field. Key practice implications point to the importance of a reflexive and deconstructive stance on the part of the therapist, to navigate the complex matrix of power relations in the therapy room.

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Country: Australia

Supervisor/s: Esben Strodl (Queensland University of Technology), Robert King (Queensland University of Technology)

## Thesis title:

Emotion Focused Therapy for Binge-Eating Disorder

## Description:

This thesis explored the feasibility and efficacy of individual emotion-focused therapy for binge-eating disorder, and the role of beliefs about emotions and emotional expressivity as potential mechanisms of change. The unique findings of this research will assist clinicians and patients by providing another treatment option for binge-eating disorder, which is important given mounting evidence of the comparatively high prevalence and clinical significance, and the paucity of proven effective treatment approaches for this condition compared to other eating disorders such as anorexia nervosa and bulimia nervosa.

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Country: Bangladesh

Supervisor/s: Lynette Griffiths (Queensland University of Technology), Larisa Haupt (Queensland University of Technology), Rachel Okolicsanyi (Queensland University of Technology)

## Thesis title:

Functional Association of Micornas with Molecular Subtypes of Breast Cancer

## Description:

This research study investigated the association of microRNA related single nucleotide polymorphisms (miRSNPs) with breast cancer susceptibility in Australian Caucasian women. The thesis then progressed with developing an in silico methodology for miRNA-target identification followed by the validation of miRNA-target relationships regarding the distinctive molecular subtypes of human breast cancers.

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Country: Australia

Supervisor/s: Lisa Nissen (Queensland University of Technology), Gregory Kyle (Queensland University of Technology), Judith Singleton (Queensland University of Technology), Jane Sheridan (Queensland University of Technology)

## Thesis title:

An Investigation into the Factors That Underpin the Delivery of Medicinal Cannabis by Health Professionals in Australia

## Description:

This thesis examines the factors that underpin the delivery of medicinal cannabis by Australian health professionals. While this pursuit is not particularly novel, this thesis utilises behavioural theory to present a fresh perspective of these factors. In doing so, this thesis recognises behaviour to be the beginning of the question, not the answer. Ultimately, it is only with a thorough understanding of human behaviour that one can ever hope to change human behaviour. This thesis represents a first step towards developing effective strategies to change the delivery of medicinal cannabis, the likes of which are grounded in evidence.

Introduction

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Country: Australia

Supervisor/s: Dimitrios Vagenas (Queensland University of Technology), Lynette Griffiths (Queensland University of Technology), Janet Williams (Royal Australian Air Force), Kirsty Wright (Department of Defence)

## Thesis title:

DNA-MAP, A Knowledge-Based Decision Support System for Australian Defence Force Forensic Ancestry Prediction

## Description:

Development of a Knowledge-Based Decision Support System to predict ancestry of the remains of missing World War Two soldiers in South-East Asia. By utilizing biological and historical information provided by the user, ancestry is assigned based on complex statistical analyses searching for distinctive patterns in the DNA that distinguish between the Australian and Japanese populations. Important features taken into consideration are the detection of a rare event, the effect of sample size and the impact of natural variation.

Introduction

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Country: Australia

Supervisor/s: Fiona Coyer (Queensland University of Technology), Kathleen Finlayson (Queensland University of Technology), Jill Campbell (Queensland University of Technology)

## Thesis title:

Microcirculatory Dysfunction and Skin Failure in Critically Ill Patients: An Exploration of the Phenomenon

## Description:

This research investigated the role cutaneous microcirculatory dysfunction plays in the development of acute skin failure by examining cell, tissue, and blood flow changes in critically unwell, intensive care patients. This first of its kind research has advanced the construct of skin failure as a phenomenon in the critical care setting and delivered valuable insights into the current understanding and aetiological development of this condition.

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Country: Nepal

Supervisor/s: Joanne Wood (Queensland University of  
Technology), Alexander Black (Queensland University of  
Technology)

## Thesis title:

Low Luminance Vision and Function in Older Adults with Visual Impairment from Age-related Macular Degeneration

## Description:

Low light levels are encountered during everyday activities yet decrease the available visual information for balance and navigation and increase falls risk. This is relevant for those with age-related macular degeneration (AMD), the leading cause of irreversible visual impairment in older adults. This research measured exposure to low light levels and associated physical activity; effects of low light levels on postural stability and stepping performance in older adults with and without AMD. Findings suggest that older adults with AMD have similar magnitudes of exposure and activity levels under low light conditions, and these conditions reduce postural stability and stepping performance.

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Supervisor/s: Michael Dunne (Queensland University of Technology), Reece Hinchcliff (Queensland University of Technology), Amina Tariq (Queensland University of Technology), Amaya Gillespie (Queensland University of Technology), Luu Hoat (Hanoi Medical University)

## Thesis title:

Contribution of Private Healthcare to Universal Health Coverage: an Investigation of Private over Public Health Service Utilisation in Vietnam

## Description:

Achievement of Universal Health Coverage (UHC) is a desirable goal for all countries. Complementary public and private services are essential. This study examined factors that influence consumer choice for private and public health care services in Vietnam. Thirty senior healthcare professionals were interviewed and secondary data on over 35,000 episodes of healthcare gathered during national health surveys in households were analyzed. For Vietnam and similar low and middle-income countries to achieve UHC, it is necessary to overcome incomplete social health insurance coverage, variable quality of private and public health services, unregulated quality in advertising and inefficient competition between sectors.

Introduction

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Country: Australia

Supervisor/s: Derek Richard (Queensland University of  
Technology), Kenneth O'Byrne (Queensland University of  
Technology)

## Thesis title:

Intra and Extracellular Responses to DNA Damage

## Description:

The DNA damage response is aberrant in cancer development, and understanding it will improve patient outcomes. This thesis further investigates a DNA damage response component known to be important to tumor development, hSSB1. This project elucidates novel hSSB roles in base excision repair and the communication of DNA damage beyond the cell. In line with this, a novel chemotherapeutic against hSSB1 has been developed, and its mechanism of action is further explained.

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Country: India

Supervisor/s: Anthony Parker (Queensland University of Technology), Zee Upton (Queensland University of Technology), Kapaettu Satyamoorthy (Manipal University)

## Thesis title:

Characterisation of Insulin-like Growth Factor-I Signalling in Cellular Responses to Ultraviolet Radiation

## Description:

The exposure of human skin to ultraviolet-B radiation (UVBR), causes damage in skin cells, which if not repaired may lead to cell death or skin cancer. This research aimed to understand how IGF-I, a growth factor secreted by some skin cells protects adjacent cells from the damaging effects of UVBR. Using 2-dimensional cell co-cultures and 3-dimensional skin models that closely mimic cellular interactions in native skin, the molecular mechanisms of the rescue effects were investigated. The findings may have implications in the development of treatment strategies against sunburns or photodamage.

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Country: China

Supervisor/s: Katrina Schmid (Queensland University of Technology), Catherine Edwards (Queensland University of Technology), Luisa Holguin Colorado (Queensland University of Technology)

## Thesis title:

Imaging of the Ocular Surface with Relevance to Meibomian Gland Dysfunction

## Description:

This project assessed the methods used to image the eyelid margin structures and meibomian glands. Experimental work showing how improvements to imaging protocols was made to ensure repeatable measures of the structures, anatomical area and tissue depth. This included procedures to optimize the imaging techniques and the image analysis methods used. An application of the new methods was described. This included evaluating associations between, clinical tests, meibography parameters, IVCN parameters, diet and lifestyle to determine relationships and propose early markers of MGD.

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Country: Australia

Supervisor/s: Carolyn Mountford (Queensland University of Technology), Lynette Griffiths (Queensland University of Technology), Peter Malycha (Queensland University of Technology), Graham Galloway (University of Queensland)

## Thesis title:

Proton Magnetic Resonance Spectroscopy to Evaluate in vivo Breast Tissue Chemistry at 3.0 Tesla

## Description:

The research utilised in vivo 2D magnetic resonance spectroscopy in conjunction with standard breast MRI to investigate MR-visible characteristics associated with breast density and menopausal status. Statistically significant differences were recorded in various neutral lipids and metabolites, and with further development, may enable non-contrast MRI to evaluate breast cancer risk, avoiding the use of gadolinium-based contrast media. The tentative assignment of methylmalonic acid (MMA), which has been associated with cancer proliferation, was also made. Another spectral region was identified relating to polyunsaturated fatty acid content in breast tissue. PUFAs have been shown to have a protective effect against breast cancer.

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Country: Australia

Supervisor/s: **Monika Janda** (Queensland University of Technology), **Kimberly Alexander** (Queensland University of Technology), **David Wyld** (Royal Brisbane and Women's Hospital)

## Thesis title:

Implementing Patient - Reported Outcomes in a Medical Oncology Setting

## Description:

This program of research implemented routine symptom self-reporting for oncology patients. Before this program of work, standardised reporting of symptoms had been reported in the research setting as promising to improve quality of life and survival. However it was unknown if this could also be done in the very complex setting of routine cancer care. Doctors, nurses, allied health professionals and patients were interviewed and surveyed to make this intervention useful and usable. The study team facilitated successful integration of this intervention into the allocated clinics, which improved how the healthcare teams addressed patients' symptoms.

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Country: Vietnam

Supervisor/s: Kirsten Spann (Queensland University of Technology), Robert Flower (Queensland University of Technology), Helen Faddy (Australian Red Cross Lifeblood), Eileen Roulis (Australian Red Cross Lifeblood)

## Thesis title:

Perusing Peripatetic Pathogenic Viruses: Hepatitis B Virus and Severe Acute Respiratory Syndrome Coronavirus 2

## Description:

This project characterised the genetic diversity of hepatitis B virus (HBV) and SARS-CoV-2, which reflects viral evolution, and drives transmission, viral pathogenesis, and clinical outcomes. Genomes and coding genes of these viruses were analysed using next-generation sequencing, bioinformatic tools and publicly available viral sequences. HBV nucleotide diversity was identified amongst HBV sequences from Australian and non-Australian blood donors. In addition, the frequency of HBV mutants circulating in Southeast Asia, Australia and New Zealand was identified. Europe and East Asia were shown as major sources of Australian SARS-CoV-2 during the beginning of the pandemic in 2020.

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Country: China

Supervisor/s: Wenbiao Hu (Queensland University of Technology), Kerrie Mengersen (Queensland University of Technology), Shilu Tong (Queensland University of Technology), Michael Kimlin (Queensland University of Technology), Maigeng Zhou (Chinese Center for Disease Control and Prevention)

**Thesis title:**

PM2.5 and Lung Cancer Mortality in China: Spatial and Temporal Analysis

**Description:**

Lung cancer has become the leading cause of cancer-related deaths in China. The effect of ambient particulate matter with a diameter of 2.5µm or less (PM2.5) on lung cancer has received wide public attention. This thesis identified the spatial and temporal patterns and trends of lung cancer mortality among different subpopulations in China. The robust spatial and temporal regression models were used to assess the short- and long-term relationships between PM2.5 and lung cancer mortality. The findings will help policy-makers design more targeted and stringent PM2.5 control measures to curb lung cancer mortality in China.

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Country: Australia

Supervisor/s: Ross Young (Queensland University of Technology), Bruce Lawford (Queensland University of Technology), Divya Deepak Mehta (Queensland University of Technology), Joanne Voisey (Queensland University of Technology), David Colquhoun (University of Queensland)

## Thesis title:

Symptoms, Molecular Markers and Mechanisms in the Development of Coronary Artery Disease in Individuals with Post-traumatic Stress Disorder

## Description:

This thesis examines the link between Post Traumatic Stress Disorder, depression, and coronary artery disease in Australian Vietnam veterans. It investigates this link using a syndemic framework with a meta-analysis, symptom cluster analysis, and gene association studies. The work concludes that inflammatory genes are likely mediators of the relationship between the disorders, with comorbid depression and coronary artery disease. This thesis furthers the link between psychological illnesses and cardiovascular diseases and contemplates the possibility that a syndemic process is at play in veterans leading to clustering of both disorders in this population because of the inflammatory consequences of trauma exposure.

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Country: Egypt

Supervisor/s: Lynette Griffiths (Queensland University of Technology), Larisa Haupt (Queensland University of Technology), Heidi Sutherland (Queensland University of Technology)

## Thesis title:

Investigating the Molecular Basis of Concussion Using Whole Exome Sequencing and Bioinformatics

## Description:

This thesis investigated the genetic influences of concussion development and outcomes. People react differently to similar head trauma; some may recover within a few weeks and some may develop long term symptoms for months or years. This thesis used a combination of genetic sequencing methods and machine learning to create pilot models for predicting these outcomes. The long-term goal of this work will allow for personalised treatments in the wake of concussion, tailored rest recommendations, as well as potential new drugs to help with management.

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Country: Brazil

Supervisor/s: Geoffrey Minett (Queensland University of Technology), Gabriel Siqueira Trajano (Queensland University of Technology), Donald Wharton (Queensland University of Technology)

## Thesis title:

Thermoregulatory and Neuromuscular Responses to Passive Heating in 42°C Hot Water

## Description:

This thesis examined the thermoregulatory and neuromuscular responses to passive heating in 42°C hot water. The data suggest that hot-water immersion at 42°C is an efficient, safe and tolerable method for passive heating therapy. Moreover, a single session of hot-water immersion can increase rapid force production and improve muscle contractile function. Findings from this thesis indicate that passive heating via hot baths may improve physical function in the older and patient populations and assist healthy people during sports injury recovery.

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Country: China

Supervisor/s: Erik Thompson (Queensland University of Technology), Kostyantyn Ostrikov (Queensland University of Technology), Derek Richard (Queensland University of Technology), Xiaofeng Dai (Jiangnan University)

## Thesis title:

Strategy and Molecular Mechanism Study of Cold Atmospheric Plasma Applications in Oncotherapy, Virucide and Nanotechnology

## Description:

This thesis is the study of cold atmospheric plasma (CAP) applications in cancer, anti-viral treatments, and nano-biotechnology. The optimal treatment strategy, potential molecular mechanism and methods to increase selectivity and efficiency of plasma treatment were investigated for each application. In the near future, CAP or plasma activated medium (PAM) would likely become a widely used, high-efficiency and targeted clinical therapeutic tool.

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Country: Vietnam

Supervisor/s: Michael Dunne (Queensland University of Technology), Philip Baker (Queensland University of Technology), Jerico Pardosi (Queensland University of Technology)

## Thesis title:

Violence and Adversity Among Pregnant Women and New Mothers in Central Vietnam

## Description:

This thesis examines the cyclical nature of interpersonal violence and its adverse impact on birth outcomes and maternal wellbeing in Vietnam. The mixed-methods design included a systematic review and meta-analysis, a qualitative needs and resources assessment with health and social care professionals, and a short-term prospective birth cohort study with women recruited in the third trimester of pregnancy. Exposure to violence during pregnancy is associated with mothers' mental distress and adverse birth outcomes. The study also reveals health problems linked with the mothers' exposure to violence when they were children. Findings can be applied to improving maternal healthcare services.

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Country: Malaysia

Supervisor/s: Jyotsna Batra (Queensland University of Technology), Dylan Glubb (QIMR Berghofer Medical Research Institute), Tracy O'Mara (QIMR Berghofer Medical Research Institute)

## Thesis title:

Genetic Epidemiology of Endometrial Cancer

## Description:

Endometrial cancer is the fifth most common cancer diagnosed in women in developed countries. This research used genetics to assess relationships between endometrial cancer and, previously identified and novel, risk factors. This work brings new insights by providing evidence that HDL and LDL cholesterol levels are linked to endometrial cancer risk. Further, I have shown that two gynaecological diseases, which are comorbid with endometrial cancer, also share genetic risk architecture with endometrial cancer. This work also advances the understanding of biological mechanisms of endometrial cancer by identifying candidate susceptibility genes.

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Country: Saudi Arabia

Supervisor/s: Ioni Lewis (Queensland University of Technology), Mark King (Queensland University of Technology), Katherine White (Queensland University of Technology), Ali Al Rashidi (Naif Arab University for Security Sciences)

## Thesis title:

An Application of an Extended Theory of Planned Behaviour (TPB) to Speeding in Saudi Arabia

## Description:

This program of research investigated the psychosocial factors that influence drivers' speeding in Saudi Arabia. The research provided some support for the application of an extended Theory of Planned Behaviour to understand factors that influence drivers' intention to speed. The research also found that additional factors including moral norm, descriptive norm, and past behaviour could assist in explaining speeding intentions in certain contexts. The research offered important theoretical and applied implications whereby the findings may help to inform strategies such as public awareness initiatives to reduce speeding.

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Country: Australia

Supervisor/s: Joanne Wood (Queensland University of Technology), Scott Read (Queensland University of Technology), Shelley Hopkins (Queensland University of Technology)

## Thesis title:

Vision and Ocular Characteristics of Australian Indigenous Children

## Description:

This research presents the first comprehensive analysis of the vision and ocular characteristics of Australian Indigenous children including the prevalence of vision condition such as refractive error, and assessment of macula retinal thickness, optic nerve head dimensions, and ocular biometry. Findings revealed important differences in the process of emmetropisation, and in several ocular structures which may impact the risk for and detection of ocular diseases in adulthood. Additionally, while Indigenous and non-Indigenous children exhibited similar rates of vision conditions, Indigenous children were less likely to have received an eye examination, highlighting the importance of improved eyecare services for Indigenous Australians.

Introduction

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Country: Australia

Supervisor/s: [Danielle Gallegos \(Queensland University of Technology\)](#), [Julie-Anne Carroll \(Queensland University of Technology\)](#)

## Thesis title:

Exploring Household Food Insecurity Through the Livelihoods Framework

## Description:

This thesis used the Sustainable Livelihoods Framework to explore the lived experience of women with children living with household food insecurity in south-east Queensland. The research was a phenomenological, qualitative longitudinal study that involved women from diverse economic backgrounds with a variety of household structures. The thesis identified that women used food and financial strategies that were pragmatic and were willing to sacrifice their self-identity in order to maintain social identity. The research highlighted that food insecurity in high income countries is a complex condition that involves a range of trade-offs that focus on maintaining household livelihoods.

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Country: Bangladesh

Supervisor/s: [Wenbiao Hu \(Queensland University of Technology\)](#), [Michelle Gatton \(Queensland University of Technology\)](#), [Hilary Bambrick \(Queensland University of Technology\)](#), [Shilu Tong \(Queensland University of Technology\)](#)

## Thesis title:

Exploring the Effects of Socio-ecological Factors and Climate Variability on Dengue in Australia

## Description:

Dengue, a mosquito borne disease, is a serious public health problem in many tropical and subtropical countries including Australia. Both climate and socio-ecological factors play significant role in dengue transmission cycle. This thesis applied spatiotemporal analytical approach to explore the joint effects of socio-ecological factors and climate variability on dengue and assess the response of dengue to climate variability across different climate zones. The findings of the thesis provide valuable information for developing early warning systems especially suitable for particular climate zone; and hence improves existing surveillance and disease prevention efforts.

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Country: Nepal

Supervisor/s: Alvaro Correa-Velez (Queensland University of Technology), Kate Murray (Queensland University of Technology)

## Thesis title:

International Migration of Adult Children and its Effects on the Health of Left Behind Older Parents in Nepal

## Description:

International migration of Nepali youth has been on a rise alongside the population share of older Nepali adults. This mixed-methods study involving older Nepali parents of migrant and non-migrant children explored how adult children's emigration affects left-behind parents. Outcomes were assessed using quality of life, nutritional status, and psychosocial effects. Quantitative analyses showed children's migration alone did not significantly affect the first two outcomes, but several sociodemographic factors did. Qualitative synthesis showed that parents of migrant children longed for the children's presence in their lives, especially in their final days, but were uncertain of that ever being a reality.

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# Samaneh Farashi

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Thesis by Published Papers

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Country: Iran

Supervisor/s: Srilakshmi Srinivasan (Queensland University of Technology), Jyotsna Batra (Queensland University of Technology), Thomas Kryza (Mater Research Institute), Judith Clements (Queensland University of Technology), Puya Gharahkhani (QIMR Berghofer Medical Research Institute)

## Thesis title:

Identification and Characterisation of Prostate Cancer-Associated Genetic Variations Modulating the MIRNA Regulome

## Description:

This thesis has studied the genetic regions that are associated with the risk of prostate cancer. The results from this thesis provide insights into causative miRNA genes that contribute to prostate cancer. The identified prostate cancer risk regions in the genome have valuable potential in utilising in investigating pathogenic mechanisms in prostate cancer. This greatly help with a broader range of treatment options according to the targetable gene networks and pathways. As the elderly population increases in Australia, the social and economic consequences of prostate cancer will increase unless successful means of prevention or treatment are found.

Introduction

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Country: Sri Lanka

Supervisor/s: Muhandiramalage Kularatna (Queensland University of Technology), Nicholas Graves (Duke University), Helen Healy (Metro North Hospital and Health Service), Keshwar Baboolal (Metro North Hospital and Health Service), Adrian Barnett (Queensland University of Technology)

## Thesis title:

Prediction of Graft Survival and Cost Effectiveness of Kidney Transplantation According to Donor Quality Levels in Australia

## Description:

This thesis sought to better understand how quality of donor kidneys and allocating kidneys based on the presumed longevity can increase value for money in donor kidney use. It showed that remaining on dialysis in the hope of receiving a superior-quality kidney is not a cost-effective strategy for any age group. If the Australian kidney allocation system can enable low-quality kidneys for older recipients, this will reduce discard rates, and promote the best value for all donated kidneys. The new index developed to predict graft failure demonstrated adequate potential to make pre-transplantation predictions about the longevity of a donated kidney.

Introduction

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Country: Iran

Supervisor/s: Kate Murray (Queensland University of Technology), Nigar Khawaja (Queensland University of Technology), Zahra Izadikhah Najafabadi (University of Southern Queensland)

## Thesis title:

Examining the Impact of Trauma on Young People's Social Adjustment: Developing a Multi-Dimensional Intervention

## Description:

Trauma-related difficulties with social adjustment can be resistant to improvement in response to psychological interventions because the specific links between trauma and social adjustment difficulties have been overlooked in the designs of these interventions. To address this gap, an intervention mapping exercise was conducted to design a preliminary intervention protocol based on research literature reviews, meta-analytical and mixed methods studies. Based on the findings, this research identified and integrated the most effective therapeutic strategies into a short-term intervention to target impaired capacities of social adjustment in young people with a trauma history.

Introduction

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Country: Saudi Arabia

Supervisor/s: Philip Baker (Queensland University of  
Technology), Darren Wraith (Queensland University of  
Technology)

## Thesis title:

Investigating Riyadh's Public Health Inspectors' Ability to Conduct Risk-Based Food Inspection, and Their Professional Needs: A Mixed-Methods Research Study

## Description:

Globally, the responsibilities of Food Safety Inspectors have dramatically evolved in recent times. The major change is the shift from a diagnostic and traditional food safety assessment role to a proactive and risk-based evaluation, resulting in better protection from foodborne illnesses. The aim of this study was to investigate the knowledge and skills required by food inspectors in Riyadh, Saudi Arabia, that will enable continuous improvement to food safety inspection practices by using proactive and risk-based evaluation methods. The result being that the implementation of more effective food inspection practices will result in the provision of safer food for consumers.

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Country: India

Supervisor/s: Flavia Huygens (Queensland University of Technology), Irani Rathnayake (Queensland University of Technology)

## Thesis title:

Understanding the Diabetic Foot Ulcer Microbiome and its Impact on Wound Severity

## Description:

This research investigated the three major dimensions of the Diabetic Foot Ulcer (DFU) bioburden: microbial diversity, microbial load, and pathogenic determinants. Next generation sequencing was used to determine the impact of bacterial diversity on healing and non-healing DFUs. Healing DFUs have a significantly greater bacterial diversity compared to non-healing DFUs. For healing DFUs, bacterial species were identified that could be further investigated for their probiotic potential to promote wound healing. This research generated a significant body of knowledge to the three dimensions of DFU bioburden and these findings suggest that the DFU microbiota may be a biomarker for clinical outcomes.

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Country: Korea,(Sth) Republic Of

Supervisor/s: Andreas Moller (Queensland University of Technology), Terence Walsh (Queensland University of Technology), Louise Bishop (Queensland University of Technology)

## Thesis title:

The Role of Breast Cancer Derived-Exosomes in the Tumour Micro-Environment

## Description:

The findings in this thesis demonstrate that cancer-derived exosomes play a critical role in the tumour microenvironment, which greatly expands our understanding of the mechanisms underlying cancer progression and metastasis. This research provides novel approaches at allowing improved utilisation of cancer-derived exosomes as diagnostic biomarker tools or for therapeutic interventions for cancer treatment.

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Country: Malaysia

Supervisor/s: Michael Collins (Queensland University of Technology), Scott Read (Queensland University of Technology)

## Thesis title:

The Eye's Response to Defocus and Diffuse Blur

## Description:

Two common sources of blur are defocus (eg. due to lenses) and diffusers (eg. frosted glass). This thesis provided a comprehensive analysis of vision quality with various levels of diffuse and defocus blur. Diffuse blur leads to excessive eye growth in animals (known as form deprivation myopia), but the underlying mechanism is unknown. Short-term studies of eye length were conducted with humans wearing diffusers and defocus lenses to investigate if certain aspects of the visual image were critical for the control of growth. The level of vision loss was not responsible for the short-term eye length changes.

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Country: Australia

Supervisor/s: Laura Gregory (Queensland University of Technology), Fatemeh Chehrehasa (Queensland University of Technology), Mark Plenderleith (Queensland University of Technology), Clare Berry (Queensland Health (Department of Health))

## Thesis title:

Introducing Age and Sex Dependent Volumetric Standards for Basal Nuclei Using Magnetic Resonance Imaging

## Description:

This project mapped age-related subcortical volume change to create age-dependent and sex-specific reference standards. These reference volumes have the potential to form the basis for new diagnostic methods for neurodegenerative diseases, potentially before the symptomatic onset of disease. This research also mapped the subcortical volume changes associated with Parkinson's disease and investigated sexually dimorphic traits of both this condition and healthy cerebral anatomy.

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Country: Australia

Supervisor/s: Pamela Rowntree (Queensland University of Technology), Lisa Nissen (Queensland University of Technology)

## Thesis title:

The Impact of Virtual Reality Training on the Clinical Skill and Confidence of Medical Radiation Science Students

## Description:

This study investigates the impact of virtual reality simulation training on medical radiation science students. It evaluates this by comparing clinical skills between students using traditional learning methods and those trained with the inclusion of the VR simulator and assesses the impact on student clinical confidence. This study's outcomes have highlighted the advantages of using such an innovative technique whilst demonstrating that the software itself is not enough to guarantee student learning. Instead, it requires purposeful inclusion into the curriculum with educators ensuring knowledge of the technology and appreciating the students' individual learning needs.

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Country: Vietnam

Supervisor/s: Julie King (Queensland University of Technology), Nicole Edwards (Queensland University of Technology), Michael Dunne (Queensland University of Technology)

## Thesis title:

Women with Physical Disabilities in Northern Vietnam: The Lived Experiences of Pregnancy, Childbirth, and Maternal Healthcare

## Description:

This thesis examines how Northern Vietnamese women with physical disabilities experienced pregnancy, childbirth, and maternal healthcare. A critical interpretative phenomenological approach and intersectional lens were utilised to understand the complexity of their experiences. The women demanded the right to pregnancy and motherhood, however, they encountered multiple challenges associated with powerful socio-cultural beliefs that intersected with gender, disability, and motherhood identities. This nexus produced and contributed to stigma, discrimination, poverty, and inaccessible environments. The findings emphasise the need for their lived experiences to shape the development and evaluation of maternal healthcare policies, programs, training, and services that impact their lives and well-being

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Country: India

Supervisor/s: David Atchison (Queensland University of Technology), Marwan Suheimat (Queensland University of Technology)

## Thesis title:

Subjective Measurement of the Stiles-Crawford Effect

## Description:

The Stiles-Crawford effect (SCE) is the differential effectivity of light entering the eye at different positions in the pupil. Its parameters are directionality (rate of change across the pupil) and peak location in the pupil. Using a spatial light modulation system, I investigated influences of field size, accommodation (focusing), and flicker frequency on the subjectively-measured SCE. SCE directionality increased with increase in field size, while peak location shifted temporally in the pupil with increase in focusing, but the SCE was not affected by a range of flicker frequencies. The field size results support a photoreceptor absorption model of the SCE.

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Country: China

Supervisor/s: Matthew Brown (Queensland University of Technology), Tony Kenna (Queensland University of Technology), Paul Leo (Queensland University of Technology), Zhixiu Li (Queensland University of Technology)

## Thesis title:

Immunogenetics of Acute Anterior Uveitis and Comparison to Ankylosing Spondylitis

## Description:

This thesis comprehensively applies genome-wide association study, Mendelian randomization analyses, and cytokine proteomics to investigate the genetic basis and immunopathogenic mechanisms of acute anterior uveitis (AAU). Multiple susceptibility loci, environmental risk factors, and potential biomarkers are identified, and a polygenic risk score for AAU developed. These findings provide novel insights into the immunogenetics in AAU, and contribute to clinical translational studies.

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Country: Korea,(Sth) Republic Of

Supervisor/s: Leisa-Maree Toms (Queensland University of Technology), Nicole White (Queensland University of Technology), Rosana Pacella (University of Chichester)

## Thesis title:

Investigating Endocrine Disrupting Chemicals and Reproductive Disorders in Australia

## Description:

This thesis was a step forward in investigating the relationship between human reproductive health effects and endocrine-disrupting chemicals. These chemicals are commonly found in our environment, industries, homes, and food, and have been detected in the human population. In Australia, concentrations of some endocrine disrupting chemicals have decreased over time but are still detected in humans. By conducting multiple projects including a cross-sectional study using follicular fluid, a health risk assessment using blood serum samples, and interpretation of Global Burden of Disease data, the effects of the chemicals were examined with regards to current reproductive health risk.

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Country: Australia

Supervisor/s: Nathan Subramaniam (Queensland University of Technology), Daniel Wallace (Queensland University of Technology), Gautam Rishi (Queensland University of Technology)

## Thesis title:

Identification and Analysis of Genetic and Chemical Modulators of Iron Metabolism

## Description:

This dissertation focused on identifying novel chemical and genetic modulators of iron homeostasis. Iron is an essential element for human health. Disorders such as anaemia and haemochromatosis can develop when iron levels are not maintained within a normal physiological range. The findings of this program included the identification of a new iron chelating compound, demonstration of iron chelation in a haemochromatosis mouse model by a flavonol, identification of iron metabolism-related genes and variants which may assist in distinguishing suitable blood donors, and the identification of novel genes which may contribute to modulating iron homeostasis by regulating the iron exporter ferroportin.

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Country: Australia

Supervisor/s: Rachael Murray (Queensland University of  
Technology), Annalese Semmler (Queensland University of  
Technology)

## Thesis title:

Characterising the Intracellular Trafficking of Matrix Metalloproteinase 14 in Macrophages

## Description:

This thesis further elucidated the intracellular trafficking pathway of matrix metalloproteinase 14 (MMP14) in macrophages. It specifically investigated the trafficking pathway utilised by MMP14 for surface delivery in macrophages and the regulatory proteins that aid in this trafficking pathway.

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Country: Bangladesh

Supervisor/s: Richi Nayak (Queensland University of  
Technology), Yue Xu (Queensland University of Technology)

## Thesis title:

Tensor Modelling for Fine-grained Type Entity Inference in Knowledge Graphs

## Description:

Knowledge Graphs (KGs) are playing an increasingly important role in advancing the intelligence of the Web. Fine-grained type entity inferencing in a KG is very useful for enriching Semantic Web search results and allowing queries with a well-defined result set. This thesis developed two approaches based on tensor modelling for fine-grained type entity inference. In the first approach, it developed methods for utilising both embedded knowledge inside KGs and linked entity supplementary information outside KGs to improve inference accuracy. In the second approach, this thesis exploits type hierarchical path sampling technique to minimize the computational complexity of large-scale KG factorization.

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Country: Australia

Supervisor/s: Robyn Araujo (Queensland University of  
Technology), Pamela Burrage (Queensland University of  
Technology)

## Thesis title:

Mathematical Modelling of Scaffold-Mediated Signalling Pathways

## Description:

This thesis concerns the role of specialized molecules called scaffold proteins in the processing of signals in cellular protein networks. In particular, comprehensive mathematical models are developed of the mitogen-activated protein kinase cascade (MAPK) - an evolutionarily conserved signalling motif. Due to the complexity of the biological systems being modelled, an original method of algebraic analysis was used to ease computation time. These novel models and analysis provide new evidence that scaffold proteins have significant and unexpected potential to increase the possibility of switch-like responses known as bistability and ultrasensitivity.

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Country: Iran

Supervisor/s: Yuchu Tian (Queensland University of  
Technology), Maolin Tang (Queensland University of  
Technology)

## Thesis title:

Resource Hiring Cost Minimisation for Constrained MapReduce Computations in the Cloud

## Description:

This research tackles the problem of reducing the cost of cloud-based MapReduce computations while satisfying their deadlines. It is a multi-constrained combinational optimisation problem, which is challenging to solve. The minimisation goal is achieved by pre-planning and dynamic scheduling of virtual machine provisioning during computations. The proposed optimisation models and algorithms have been implemented and quantitatively evaluated in comparison with existing approaches. They are shown to reduce the costs of cloud-based computations by hiring fewer VMs and scheduling them more efficiently.

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Country: Australia

Supervisor/s: Emad Kiriakous (Queensland University of Technology), Anthony O'Mullane (Queensland University of Technology), Godwin Ayoko (Queensland University of Technology)

## Thesis title:

Development of an Electrochemical Immunosensor for Phenylketonuria Monitoring

## Description:

The project explored biosensors to potentially develop a home health monitor for people with phenylketonuria (PKU). The thesis included studies of biochip design and preparation, design of a reader unit and concept design for on-chip reagent handling. The biosensor comprised anti-phenylalanine antibodies assembled on a gold electrode, when exposed to human serum would produce an electrochemical response. The research found strong evidence for the potential health benefits of such a monitor for a variety of individual situations and concluded that enzymatic methods may present the best opportunity for successful commercialisation.

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Country: Australia

Supervisor/s: Grant Hamilton (Queensland University of Technology), Simon Denman (Queensland University of Technology)

## Thesis title:

Machine Learning for the Automated Detection of Deer in Drone and Camera Trap Imagery

## Description:

To effectively manage the growing population of invasive deer in Australia, adequate monitoring techniques are essential. Traditional methods of detecting and monitoring deer such as scat surveys, spotlighting, or piloted aerial surveys can be expensive and time consuming. To overcome these issues, camera traps and remotely piloted aircraft systems (RPAS or drones) are increasingly being used to detect and monitor deer populations. This thesis presents a new method for assessing the imagery provided by RPAS and camera traps using Machine Learning, reducing the time and cost of assessing deer populations, providing the opportunity for more efficient management.

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Country: Australia

Supervisor/s: Irene Hauxwell (Queensland University of Technology), James McGree (Queensland University of Technology)

## Thesis title:

Phylosymbiosis and the Microbiome of the Native Australian Stingless Bee *Tetragonula carbonaria*

## Description:

*Tetragonula carbonaria* (Smith 1854) is a native Australian stingless bee, hosting a diverse range of bacterial symbionts. *T. carbonaria* is used as a model to explore how relationships between host insects and the microbiome occur and can be detected within a single species, shedding light on how host-microbiome associations arise and are maintained across the corbiculate bees. Host-microbiome relationships are considered through the lens of phylosymbiosis. Methods for detecting phylosymbiosis are explored; different bioinformatics and statistical techniques are compared, with implications for future studies. Bayesian modelling is used to predict possible routes of acquisition of bee symbionts.

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Country: Australia

Supervisor/s: Lidia Morawska (Queensland University of Technology), Emil Jayaratne (Queensland University of Technology), Phong Thai (University of Queensland)

## Thesis title:

Building an Internet of Things (IoT) Air Quality Sensing Platform on Amazon Web Services (AWS)

## Description:

This thesis explores the design and development of the cloud based IT infrastructure for an Internet of Things (IoT) network of low-cost air quality sensors. The platform is developed on Amazon Web Services (AWS) and includes the network infrastructure, data storage, post processing and various web visualisations supporting the research endeavour.

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Country: Australia

Supervisor/s: Steven Bottle (Queensland University of Technology), James Blinco (Queensland University of Technology)

## Thesis title:

Nitroxide Trapping of Radical Species Formed from the Reaction of Sulfoxides with Reactive Oxygen Species

## Description:

This project focussed on an in-depth evaluation of an established methodology that uses dimethyl sulfoxide (DMSO) as a reactive solvent with a profluorescent nitroxide (PFN) to detect and quantify particulate matter-derived ROS (Reactive Oxygen Species). Additionally, a novel approach which utilized cyclic sulfoxide tetrahydrothiophene-1-oxide (THTO) as the reactive solvent was investigated. The reactions of these sulfoxides with ROS generated from multiple sources in the presence of nitroxide radical scavengers were investigated. The results of these experiments show that nitroxides can display much broader reactivity than the simple radical scavenging processes that have previously been accepted.

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Supervisor/s: Wasana Bandara (Queensland University of Technology), Guy Gable (Queensland University of Technology)

## Thesis title:

Synthesising Business Process Management Maturity Models: Their Anatomy and Assessment

## Description:

Business Process Management (BPM) maturity models are tools that help organizations in determining the capabilities required to progress in their BPM ambitions. However, the disparity of key components across different maturity models and lack of assessment tools to gauge maturity, limits the applicability of the models. Following Design Science Research and Content Analysis methods, this research presents two artifacts to address these issues: (i) a meta-model that captures the structure of BPM maturity models and (ii) a maturity grid for BPM Strategic-Alignment capabilities as an example of a 'ready to use' assessment tool to measure BPM maturity in organizations.

Introduction

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Country: Portugal

Supervisor/s: Matthew Simpson (Queensland University of Technology), James Mcgree (Queensland University of Technology)

## Thesis title:

An Approach for the Identification of the Go or Grow Phenotype Using ABC Methods

## Description:

We explore a novel approach for the identification of a microscopic characteristic of a population of cells known as the go or grow phenotype. Implementing a mathematical model that simulates a population with the phenotype and another which does not, we analyse three macroscopic characteristics as data types of the population for model selection purposes. Bayesian inference via Approximate Bayesian Computation (ABC) is used to assess if the data was generated by the go or grow model or the alternative model. Our results show the usefulness of theoretical characteristics as well as the accuracy of continuum models for model selection.

Introduction

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Country: Iran

Supervisor/s: Peter Grace (Queensland University of Technology), Massimiliano De Antoni Migliorati (Queensland University of Technology), David Rowlings (Queensland University of Technology), Clemens Scheer (Queensland University of Technology)

## Thesis title:

Assessing Soil Nitrogen Dynamics in Vertosols Cropped to Cotton in Subtropical Australia

## Description:

This project assessed the contribution of Vertosols to the nitrogen supply of cotton in Darling Downs region, Australia. Two years of nitrogen dynamics measurements throughout the soil profile under field and laboratory conditions demonstrated that, on average, 87 per cent of nitrogen was supplied by the soil to the cotton crop. This research provides a practical framework for establishing a sustainable nitrogen management strategy to enable efficient use of nitrogen in irrigated cotton production. The results of this research are potentially applicable to similarly managed cropping systems in vertosols.

Introduction

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Country: Australia

Supervisor/s: Christopher Drovandi (Queensland University of Technology), Michael Bode (Queensland University of Technology)

## Thesis title:

Cost Effective Functional Response Experiments via Sequential Design

## Description:

Functional response experiments are commonly used to explore predator-prey systems, where we are interested in learning about the number of prey consumed per predator as a function of prey density. Currently, functional response experiments are designed in an ad-hoc manner and may require significant experimentation to learn about the underlying system. In this thesis, we developed statistically principled functional response designs to learn about the true mathematical model driving the predator-prey dynamics as quickly as possible. This can lead to functional response experiments with reduced monetary costs and less sacrificing of animals.

Introduction

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Country: Australia

Supervisor/s: Robert Speight (Queensland University of Technology), Laura Navone (Queensland University of Technology), Karen Robins (Queensland University of Technology)

## Thesis title:

Enzymatic Degradation of Keratinous Materials from Livestock Processing to Generate Value Added Products

## Description:

Livestock is a major industry that generates a range of wastes and low value co-products such as keratinous hair, horns, feathers and hooves. Enzymatic hydrolysis of keratin could generate products with added value, although process challenges arise from the highly recalcitrant nature of the material. Outcomes of this work include an optimised process with over 85% of the solid material solubilised by hydrolysis, and an understanding of keratinase enzyme performance that will aid future process development towards the generation of value-added products from low value livestock keratin.

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Country: Australia

Supervisor/s: Christopher Drovandi (Queensland University of Technology), Michael Bode (Queensland University of Technology), Daniel Pagendam (Commonwealth Scientific and Industrial Research Organisation)

## Thesis title:

A Novel Bayesian State-Space Model for Estimating Mosquito Populations

## Description:

This thesis is a study into estimating *Aedes aegypti* mosquito populations. It uses data from a novel mosquito suppression technique in Far North Queensland to create a robust model capable of estimating populations at the suburb level. This approach provides new insight into population trajectories, important mosquito life processes and spatial heterogeneity that was used to make inference about residential landscapes. Our findings have documented the effectiveness of the suppression program and could provide a new operational tool for future applications.

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Country: Australia

Supervisor/s: Jennifer Macleod (Queensland University of Technology), Joshua Lipton-Duffin (Queensland University of Technology), Ting Liao (Queensland University of Technology)

## Thesis title:

Ullmann Dehalogenation of Dibromoferrocene for the Formation of Surface-confined Molecular Rotors

## Description:

This thesis is an experimental investigation into the potential of ferrocene for fabricating surface-confined molecular rotors. The investigation was performed in ultra-high vacuum on gold and silver 111 surfaces, utilising Ullmann dehalogenation of dibromoferrocene as a method of forming stable organometallic assemblies. Analysis was performed using X-ray photoelectron spectroscopy, scanning tunnelling microscopy and near edge X-ray absorption fine structure quantitative methods. A density functional theory investigation of the rotational barriers of gas-phase ferrocene and dibromoferrocene, as well as surface adsorbed ferrocene geometry optimisation on silver 111, was also performed. Results indicate potential methods for forming surface-confined molecular rotors from dibromoferrocene.

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Country: China

Supervisor/s: Bernd Ploderer (Queensland University of Technology), Peta Wyeth (Queensland University of Technology), Ross Brown (Queensland University of Technology)

## Thesis title:

Designing Mobile and Tangible Interaction for Music Education with Young Children

## Description:

This thesis investigated how music educators can employ digital technology in early childhood education. Based on a technology review and music workshops with children, this thesis showed that digital technology can promote music education through collaboration, challenges, fantasy, and curiosity. Based on these findings, this thesis presents three new digital technology designs and recommendations for design researchers and educators.

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Country: Australia

Supervisor/s: David Hurwood (Queensland University of Technology), Peter Prentis (Queensland University of Technology)

## Thesis title:

Investigating Incipient Speciation in the Widespread Freshwater Shrimp, *Paratya Australiensis* (Kemp 1917)

## Description:

While the notion of species is central to our understanding of biological processes, it has been impossible to arrive at a consensus regarding a single, widely applicable or functional concept. This project provides insight into the progression through the speciation process by a widespread species of freshwater shrimp, *Paratya australiensis*. Using mate choice experiments and genetic analysis, multiple reproductive barriers were identified indicating strong divergence between two populations. These barriers are consistent with requirements for species separation under various species concepts, providing strong evidence to support taxonomic revision of this cryptic species complex.

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Country: Australia

Supervisor/s: Yanming Feng (Queensland University of  
Technology), Anagiyaddage Jayalath (Queensland University  
of Technology)

## Thesis title:

Predictive Analysis for Electromagnetic Radiations Generated by 5G Radio Frequencies

## Description:

Radiofrequency electromagnetic spectrum consists of non-ionizing radiations in the frequency range of 3kHz-300GHz. The 5th generation is planned to use much higher frequencies to accommodate the exponential increase in the demand of data traffic. The research thesis performs predictive analyses of radiations that will be emitted by 5G for different frequencies allocated for its utilization and their compliance with existing radiation limitation standards. Numerical results show that the radiations to be generated through 5G new radio to be marginal contributor and acceptable according to the limits set by national and international organizations.

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Country: India

Supervisor/s: Wayne Kelly (Queensland University of Technology), Maolin Tang (Queensland University of Technology)

## Thesis title:

Automatic Parallelization of Stream Programs for Resource Efficient Embedded Processors

## Description:

This thesis considers how to exploit the specific characteristics of data streaming functions and multi-core processors to increase throughput through appropriate software process mappings. The hypothesis is that large numbers of low-power processors can achieve high throughput for streaming applications if a good mapping is provided. The innovation is to use compilation principles to guide the mapping, rather than heuristics. Three increasingly complex approaches are developed that focus on computational bottlenecks, then adds communication overheads, and lastly adds the costs of splitting and merging operations. Using this approach demonstrates that the successively more complex models can achieve correspondingly greater throughput.

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Country: Colombia

Supervisor/s: Jennifer Firn (Queensland University of Technology), David Rowlings (Queensland University of Technology), Ramona Maggini (Queensland University of Technology), Geoff Pegg (Department of Agriculture and Fisheries)

## Thesis title:

Ecological Impact of Myrtle Rust (*Austropuccinia Psidii*) In a Wet Sclerophyll Forest

## Description:

This project evaluated the impact of myrtle rust, a fungal pathogen that threatens the persistence of one of Australia's most iconic plant families Myrtaceae. Five tree species were studied in a wet sclerophyll forest in the Tallebudgera Valley and showed a decreasing survival probability over time. This mortality led to an increase in canopy gap fraction-a surrogate measure for light availability; although no significant difference was found in plant composition below living and dead trees. After just four years of infection forest structure is changing which is increasing light and could lead to an increase in weeds.

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Country: China

Supervisor/s: Ziqi Sun (Queensland University of Technology),  
Ting Liao (Queensland University of Technology), Anthony  
O'Mullane (Queensland University of Technology)

## Thesis title:

Rational Design of Bi-transition Metal Oxide Electrocatalysts for Hydrogen and Oxygen Evolutions

## Description:

This thesis mainly focuses on the rational design and preparation of bi-transition metal oxide materials for high-performance electrochemical catalysis, such as hydrogen evolution reaction (HER) and oxygen evolution reaction (OER). To address the challenges of sluggish kinetics and large overpotentials in HER and OER, the effective strategy of morphology engineering, introducing a secondary metal element and supporting on carbon-based materials were carried out and discussed.

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Country: Australia

Supervisor/s: Jason Watson (Queensland University of Technology), Chun Ouyang (Queensland University of Technology)

## Thesis title:

Network Ties and Their Effect on Employee Collaboration in Enterprise Social Networks

## Description:

There has been a rapid growth and widespread adoption of social media technologies across all industries. Despite the growing importance of enterprise social networks (ESN), there has been limited research in examining the role of employee relationships (ties) in these networks. To gain an in-depth understanding of ties and collaboration outcomes, a mixed method research was conducted. StackExchange data was collected and processed, social network analysis and qualitative analysis of data has been done and the findings are presented in the form of an empirically derived theoretical model. Study provides novel insights into importance of negative ties and reciprocal ties.

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Country: Australia

Supervisor/s: Pascal Buenzli (Queensland University of  
Technology), Matthew Simpson (Queensland University of  
Technology)

## Thesis title:

Spatial Control and Cell Guidance in Evolving Biological Tissues

## Description:

In this thesis, a mathematical model for tissue growth under curvature control and directed cell guidance is derived. The model extends previous mathematical work by adding a tangential cell velocity. A numerical solver is implemented to solve the model and the solutions show that new cases of tissue growth can now be simulated thanks to the extension derived in this thesis. Finally, the model is fit to data on bone pore infilling and is used to examine hypotheses about atypical tissue growth.

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Country: Australia

Supervisor/s: Lidia Morawska (Queensland University of Technology), Emil Jayaratne (Queensland University of Technology)

## Thesis title:

Application of Low-Cost Sensing Technologies Towards Advancement in Atmospheric Science and Citizen Engagement

## Description:

This project contributed towards advancement of low-cost air quality sensor networks. Two sensor networks were deployed with the aid of local communities, and data were collected via the 3G network to a cloud-based server. Data analysis involved using least square regression lines to determine temporal changes in air quality, and students t-tests to determine how air quality differed over space. The thesis investigated air quality results of two campaigns and evaluated the success of installing these networks with community aid. The methods demonstrated the robustness of a new low-cost sensor network and quantified how cruise ships deteriorate local air quality.

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Country: Hong Kong

Supervisor/s: [Stuart Parsons \(Queensland University of Technology\)](#), [Susan Fuller \(Queensland University of Technology\)](#)

## Thesis title:

Roost Selection Preferences of Bat Species Present in the Yugar Tunnel

## Description:

This thesis examines the roost selection preferences of bat species present in the Yugar tunnel. The aim of this study is to increase knowledge of bats roosting in artificial structures in anthropogenically modified landscape. The Yugar Tunnel in South-East Queensland is thought to be inhabited by three species of insectivorous bats. Little is known about the bats roosting there, and this project aimed to study three key aspects of their roosting and foraging behaviour. In doing so, this thesis examines the bat species and population size, along with the emergence and return patterns, and the roosting selection preferences.

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Country: China

Supervisor/s: Huai Yong Zhu (Queensland University of  
Technology), Sarina Sarina (Queensland University of  
Technology)

## Thesis title:

Bimetallic Alloy Based Catalyst Design for Aerobic Oxidation of 5-Hydroxymethyl-Furfural

## Description:

This thesis presents an in-depth study on the alloying effect of Ag-Pd nanoparticles to control product formation selectively under room temperature and ambient pressure. Overall, it was demonstrated that Ag-Pd boundary surface sites exhibited the most effective activity for the selective oxidation of HMF to FDCA under mild conditions. This study may inspire the design of efficient catalysts for application to the selective oxidation of different functional groups in a wide range of reactants.

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Country: Australia

Supervisor/s: Mark Gaede (Queensland University of Technology), Christoph Schrank (Queensland University of Technology), David Gust (Queensland University of Technology)

## Thesis title:

Impact of Crystallographically Preferred Orientation on Dehydration Kinetics of Gypsum

## Description:

This thesis contributes to our understanding of temperature driven dehydration of rock forming minerals. It investigates the impact of crystallographic preferred orientation (CPO) on the dehydration of gypsum to bassanite through in-situ heating experiments on natural gypsum rock. The dehydration progress was monitored with synchrotron transmission, small- and wide-angle X-ray scattering (SAXS/WAXS) and tracked by the intensity evolution of three discrete Bragg diffraction peaks. A comparison of the conversion rates for satin spar (strong CPO) with whole-rock alabaster (weak CPO) reveals that a strong CPO decreases the reaction rate of dehydration.

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Country: Australia

Supervisor/s: Peter Bruza (Queensland University of Technology), Andrew Gibson (Queensland University of Technology), Catarina Pinto Moreira (Queensland University of Technology)

## Thesis title:

Modelling Contextuality Amidst Causal Influences by Means of a Computationally Tractable Combinatorial Approach

## Description:

This thesis is concerned with modelling contextuality in the fields of Quantum Information Science and Quantum Cognition. It extends the combinatorial approach by contributing computational tractable variants of the Foulis-Randall product and Weighted Fractional Packing Number for arbitrarily large contextuality experiments. The thesis also presents a set of techniques that allow contextuality to be differentiated between causal influences and noise.

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Supervisor/s: Sagadevan Mundree (Queensland University of Technology), Linh Hoang (Queensland University of Technology), Brett Williams (Queensland University of Technology), Thomas Higgins (Commonwealth Scientific and Industrial Research Organisation)

## Thesis title:

Improvement of Helicoverpa Armigera Resistance in Pigeonpea (Cajanus Cajan) Through 'Omics and Breeding

## Description:

Pigeonpea (*Cajanus cajan*) is a sub-tropical and tropical pulse rich in plant-based protein, carbohydrates, minerals, and vitamins. *Helicoverpa armigera* is the most devastating insect pest in pigeonpea. This study focussed on deciphering the molecular host plant resistance (HPR) mechanisms applied by *Cajanus scarabaeoides* a wild pigeonpea against insect using transcriptomic and proteomic studies. These HPR mechanisms were transferred to the cultivated pigeonpea via interspecific hybridisation, and they are stable at F2 generation. The study outcome provides a unique insight into the insect resistance mechanisms employed by *C. scarabaeoides* and lays the foundation for further studies and applications.

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Country: Sri Lanka

Supervisor/s: Alistair Barros (Queensland University of Technology), Colin Fidge (Queensland University of Technology), Artem Polyvyanyy (University of Melbourne)

## Thesis title:

Microservice-Based Reengineering of Enterprise Systems for Cloud Migration

## Description:

Enterprise systems, such as enterprise resource planning and customer relationship management are widely used in corporate sectors and are notoriously large and monolithic. They are challenging to decouple because they manage asynchronous, user-driven business processes and business objects (BOs) having complex structural relationships. This thesis presents the modularization technique combined with novel microservice patterns which utilizes both semantic properties of enterprise systems, i.e., BO structure, together with syntactic features of their code, i.e., methods and interactions, for identifying suitable parts of enterprise systems which can be run as fine-grained microservices in highly scalable Cloud systems while achieving high performance characteristics.

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Country: Philippines

Supervisor/s: Lidia Morawska (Queensland University of Technology), Mery Thompson (Queensland University of Technology), Mandana Mazaheri (Department of Planning and Environment), Luke Knibbs (University of Queensland)

## Thesis title:

Urban Ambient Particles: Long-term Spatio-temporal Trends and Impacts of Different Control Measures

## Description:

This thesis is a quantitative analysis of the spatial and temporal variability as well as trends of the particulate matter concentrations in the ambient urban air. The outcome provided a clear understanding on how the different metrics (particle number, particle mass and oxidative potential) were affected by mitigation measures and other important drivers such as emission sources and meteorological factors.

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Country: India

Supervisor/s: Prashant Sonar (Queensland University of Technology), Kostyantyn Ostrikov (Queensland University of Technology), Deepak Prakash Dubal (Queensland University of Technology)

## Thesis title:

Synthesis of 2D Nanomaterial and Their Application in Opto-electronic Devices and Sensing

## Description:

This study demonstrates carbon dots synthesis from an inexpensive bio-waste precursor and their use in optoelectronic devices including flexible organic light emitting diodes (OLEDs) and optical sensors. This work is a pioneering demonstration of controlled and ordered growth of carbon nanomaterials into thin films and their flexible devices. It successfully demonstrates the use of two-dimensional carbon dots array as an active layer in flexible blue-cyan OLEDs. Furthermore, composite layer of carbon dots together with perovskites was used for green flexible OLEDs. Such human hair derived carbon dots have also been successfully used in sensors for chloroform detection at ppb level.

Introduction

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Country: India

Supervisor/s: **Matthew Simpson (Queensland University of Technology)**, **Scott Mccue (Queensland University of Technology)**

## Thesis title:

Stochastic and Continuum Descriptions of Population Dynamics With Spatial Structure

## Description:

Spatial structures are ubiquitous in populations of plants, animals and cells, typically occurring as clustering or segregation. These spatial structures influence how individuals interact and the overall population dynamics. Yet, these details are rarely accounted for in classical population dynamics models. Through Individual-based and continuum models, I show that spatial structures can dramatically alter population dynamics. The thesis specifically explores the role of spatial structure in biologically and ecologically relevant scenarios, such as the movement of cells in the presence of biological obstacles, directional movement of animals in response to interaction with others (chase-escape dynamics), predator-prey dynamics, and Allee kinetics.

Introduction

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Country: Australia

Supervisor/s: Jinglan Zhang (Queensland University of  
Technology), Laurianne Sitbon (Queensland University of  
Technology), Dhaval Vyas (University of Queensland)

## Thesis title:

Designing for Refugees and Asylum Seekers: Social Inclusion and Empowerment

## Description:

This thesis presents a conceptual framework for understanding the challenges that refugees and asylum seekers face in Australia and the role of ICT in rebuilding their social capital. It has been built based on four studies that involved a mix of contextual inquiry, cultural probes, and participatory design methods. The framework offers implications for technology design, policies, and the theory of social capital. The collective contributions of this research will inform designers of appropriate technologies that support social capital in the refugee and asylum seeker context. It will also inform policymakers to implement policies that affect this demography.

Introduction

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Country: Scotland

Supervisor/s: Margot Brereton (Queensland University of Technology), Bernd Ploderer (Queensland University of Technology), Laurianne Sitbon (Queensland University of Technology), Elizabeth Saggars (Queensland University of Technology)

**Thesis title:**

Co-Design Beyond Words with Minimally-Verbal Children on the Autism Spectrum

**Description:**

Minimally-verbal children on the autism spectrum are often overlooked in the process of technology co-design. This thesis describes methodological, conceptual, and technological ways in which participatory designers, researchers, and other stakeholders can support the self-expression of minimally-verbal children on the autism spectrum. The work contributes a novel methodological approach - Co-Design Beyond Words - and several co-designed digital and tangible design prototypes through which we might better support the design 'voice' of minimally-verbal children on the autism spectrum.

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Country: Sri Lanka

Supervisor/s: Susan Fuller (Queensland University of  
Technology), Matthew Phillips (Queensland University of  
Technology)

## Thesis title:

Conservation Biology of Threatened Native Olives (*Notelaea* Spp., Oleaceae) in Southern Queensland

## Description:

Due to the limited resources available, it is necessary to prioritise the conservation action for taxa most at risk of extinction. This study investigated the systematics, population genetics and life-history traits of the two least studied threatened native olive species (*Notelaea ipsviciensis* and *N. lloydii*) in Australia, to improve our knowledge of their conservation biology. The results obtained from the genome wide molecular, morphological and comparative life-history trait analysis between rare and common *Notelaea* spp. in southern Queensland revealed that the taxonomic status of these two species should be re-evaluated and conservation priorities should be revised accordingly.

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Country: China

Supervisor/s: Aijun Du (Queensland University of Technology),  
Kostyantyn Ostrikov (Queensland University of Technology)

## Thesis title:

Computational Exploration of Two-Dimensional Materials with Novel Electronic, Optical and Magnetic Properties

## Description:

This project was a step forward in discovering new two-dimensional (2D) structures for electronic and spintronic applications. This work comprehensively investigates seven intriguing 2D structures with novel electronic, optical and magnetic properties on the basis of the global structural search and first-principles calculations. These findings not only highlight the promising materials platforms for advanced nanodevices but also provide the theoretical guides for designing multifunctional 2D materials.

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Country: Trinidad And Tobago

Supervisor/s: Bill Fisher (Queensland University of Technology), Sylvia Edwards (Queensland University of Technology), Elham Sayyad Abdi (Queensland University of Technology)

## Thesis title:

Towards Transformative Engagement: the International and Foreign Student Stakeholder in the Academic Library; a View from the Subaltern

## Description:

This mixed-method study focused on the perceptions of international and foreign students as stakeholders of the academic library at a university in the Caribbean. It draws on a social justice theme to redress inequalities in the system and give voice to this minority group. Findings reveal this group of students are resilient and focused but challenged by the exclusionary organisational and managerial practices embedded by the host library. Among their main concerns were a lack of institutional support in adjusting to their new learning environment and culturally insensitive interactions.

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Country: Germany

Supervisor/s: Yvonne Barner (Queensland University of Technology), Christopher Barner-Kowollik (Queensland University of Technology), Thorsten Hofe (Polymer Standards Service GmbH)

## Thesis title:

Around the Globe: New Concepts for Polymer Microsphere Design

## Description:

The thesis explores critical aspects of polymeric micron- and nano-sized particle synthesis, functionalization and application. It identifies three major elements that can be utilized for the development of new and unique polymeric materials thereof: shape, composition and chemical functionality. By applying advanced macromolecular synthetic strategies on each element, the thesis establishes functional polymer micro- and nano-spheres for analytical methods and biomedical applications.

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Country: Australia

Supervisor/s: Alireza Nili (Queensland University of Technology), Evonne Miller (Queensland University of Technology), Elinor Buys (University of Queensland), Guy Gable (Queensland University of Technology)

## Thesis title:

Older Workers' Adaptation to Information Technologies in the Workplace: A Study in the Context of Non-Standard Employment

## Description:

Growing diversification of working arrangements, greater labour decentralisation and increasing reliance on often changing workplace information technologies (ITs) are turning many older workers to Non-Standard Employment (NSE). This study therefore sought to explore the motivations for participation in and IT adaptation behaviours of older workers in NSE. Using qualitative methods, and an Expectancy-Value-Cost theoretical perspective, factors pertaining to the NSE context were found to drive specific adaptation expectancies, values and costs, which led to problem-focused and emotion-focused strategies for older workers dealing with IT adaptation. Meanwhile, financial stability, flexibility, continued activity, socialisation, and maintaining self-identity were motivators for NSE participation.

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Country: India

Supervisor/s: James Hogan (Queensland University of Technology), Wayne Kelly (Queensland University of Technology), Pravesh Biyani (Indraprastha Institute of Information Technology, Delhi)

## Thesis title:

Learning Representations for Molecular Sequences

## Description:

This thesis explores the utility of representation learning for bioinformatics applications. It proposes approaches for generating low dimensional embeddings for molecular sequences, which proved effective for downstream bioinformatics tasks such as protein classification and protein-protein interaction prediction. One specific theme of this thesis is to develop a scalable and computationally effective solution for large scale sequence comparisons and two successful approaches - one based on a hierarchy of models, the other on a hybrid of two methods - are presented. The representation learning approaches proposed in this thesis are generic and can be adapted for similar problems within bioinformatics and other domains.

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Country: Chile

Supervisor/s: Bernd Ploderer (Queensland University of Technology), Margot Brereton (Queensland University of Technology), Alessandro Soro (Queensland University of Technology)

## Thesis title:

Relation-Centred Inquiry: Designing for Position Exchange in Families

## Description:

This thesis presents Relation-Centred Inquiry: a new method to design interactive technologies for parents and their adult children to better reflect their unique perspectives. The method is based on empirical insights into changes in the relationship after children leave home as well as how these changes influence communication through interactive technologies. The method encourages dialogue between parents and children to better understand each other's perspectives and to imagine new technology designs. A trial study demonstrates how interactive technologies can mediate an ongoing exchange of perspectives in everyday life.

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Country: Australia

Supervisor/s: Grant Hamilton (Queensland University of Technology), Simon Denman (Queensland University of Technology)

## Thesis title:

Monitoring and Modelling Vulnerable Wildlife Populations Using Remotely Piloted Aircraft Systems and Machine Learning

## Description:

In this thesis a new method for monitoring wildlife using drones and machine learning was developed and used to accurately detect threatened koalas in natural, complex forest habitats for the first time. The new automated detection method was robust, efficient, and was not subject to biases affecting ground surveys or manual analysis of thermal images from drones. A new statistical modelling approach was also developed that allowed accurate estimates of abundance to be made from automated detections of wildlife in drone surveys.

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Country: Germany

Supervisor/s: Christopher Barner-Kowollik (Queensland University of Technology), James Blinco (Queensland University of Technology)

## Thesis title:

Chemiluminescent Self-Reporting Macromolecular Transformation

## Description:

The present doctoral thesis established advanced optical read-out and characterisation methods for the in-depth analysis of chemical reactions, such as the quantification of reaction events or kinetic analysis, via state-of-the-art chemiluminescence systems. Critically, an optical read-out for the quantification of para-fluoro - thiol reaction events was established employing the chemiluminescence of Schaap's dioxetane on the one hand, and peroxyoxalate chemiluminescence was employed for the qualitative assessment of single-chain nanoparticle unfolding on the other hand. Both chemiluminescence systems present promising tools for the in-depth characterisation of macromolecular architectures and their transformations.

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Country: Italy

Supervisor/s: Peter Grace (Queensland University of Technology), David Rowlings (Queensland University of Technology), Lucy Reading (Queensland University of Technology), Clemens Scheer (Queensland University of Technology), Louis Schipper (University of Waikato)

## Thesis title:

Nitrate Removal and Nitrous Oxide Production of Denitrifying Woodchip Bioreactors under Subtropical and Tropical Climates

## Description:

Bioreactors are a low-cost water treatment technology to mitigate nutrient runoff from agricultural areas. Bioreactors are woodchip-filled trenches installed in the soil, which convert nitrate to dinitrogen, a harmless gas in the atmosphere. Nitrate removal and greenhouse gas production of five on-farm bioreactors were monitored for the first time in Queensland, to reduce the nutrient runoff to the Great Barrier Reef. The bioreactors effectively removed nitrate, with negligible emissions of greenhouse gases. This research expanded the knowledge on bioreactors installed in Subtropical and Tropical climates and contributed to the development of guidelines for the application of bioreactors on Queensland farms.

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Country: Bangladesh

Supervisor/s: Kerrie Mengersen (Queensland University of  
Technology), Paul Wu (Queensland University of Technology)

**Thesis title:**

New Insights into Bayesian Models for Spatial Data

**Description:**

Spatial data is often aggregated into small area. It is challenging to analyse these data. Two new statistical techniques were developed to tackle these challenges. Bayesian meta-analysis models were used to unveil geographic disparities in cancer using the Australian Cancer Atlas. More flexible Bayesian Empirical Likelihood models were used to analyse more complex data including COVID19 deaths. Both methods provided new insights into the analysis of spatial data.

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Country: Germany

Supervisor/s: Christopher Barner-Kowollik (Queensland University of Technology), James Blinco (Queensland University of Technology), Tanja Weil (Max Planck Institute for Polymer Research)

**Thesis title:**

Reading Information From Sequence-Defined Macromolecules

**Description:**

Coding and decoding information into and from (bio)macromolecules is of pivotal importance for most processes in nature. A simple readout methodology constitutes a key challenge for data-storage in artificial molecules. The determination of the comonomer-order in synthetic sequence-defined macromolecules, however, requires elaborate analytical techniques. The herein presented work focuses on the synthesis of sequence-defined macromolecules via photochemical ligation reactions, and ultimately the development of a novel fluorescence-based readout of the comonomer-order. The synthesis of rigid multifluorophore sequence-defined macromolecules employing an iterative exponential growth strategy additionally resulted in the development of novel, highly efficient photochemical transformations.

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Country: India

Supervisor/s: Richi Nayak (Queensland University of  
Technology), Md Abul Bashar (Queensland University of  
Technology)

## Thesis title:

Unsupervised Visual Perception-based Representation Learning for Time-series and Trajectories

## Description:

Representing time-series without relying on the domain knowledge and independent of the end-task is a challenging problem. The same situation applies to trajectory data as well, where sufficient labelled information is often unavailable to learn effective representations. This thesis addresses this problem and explores unsupervised ways of representing the temporal data. The novel methods imitate the human visual perception of the pictorial depiction of such data based on deep learning.

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Country: Ghana

Supervisor/s: Patrick Hayman (Queensland University of Technology), David Gust (Queensland University of Technology)

## Thesis title:

Volcanic Architecture of the Hounde and Boromo Greenstone Belts, West-Africa: Implications for Terrane Evolution

## Description:

The Archean-Proterozoic transition 2.5 billion years ago marks a major period of change in Earth's history, including a switch to 'modern-style' plate tectonics, and the best-preserved rocks from this time occur in West Africa. In this study, the evolution of the 2.3-2.1 billion-year-old Houndè and Boromo rock assemblages, south-western Burkina Faso, are investigated to provide geological constraints for this important period. Methods employed include field studies, whole-rock geochemistry, petrology, and isotopic dating (samarium-neodymium and uranium-lead). The findings provide constraints on, and insights into, geological processes during the early Proterozoic, including volcanism, environmental conditions, tectonics, continent formation, and mantle composition.

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Country: Sri Lanka

Supervisor/s: You-Gan Wang (Queensland University of Technology), Jerry Ho (Queensland University of Technology), Min Zhu (University of Queensland)

## Thesis title:

Bias, Bias Reduction and Implications in Predictive Regression

## Description:

Predictive regression models are often used to forecast future possibilities of a given finance variable. For that, we rely on statistical inference: estimation and hypothesis testing. Inaccurate estimation results make inaccurate inference for a scientific question. So, it is important to develop methodologies to reduce the bias in the estimation providing a sounder basis for statistical inference. Hence, the contribution of this research is to deliver more reliable estimators in terms of bias and the level of persistence of the predictor variable, and to develop a corresponding inferential framework with time-series and longitudinal data.

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Country: Nigeria

Supervisor/s: **Guy Gable** (Queensland University of Technology), **Erwin Fieft** (Queensland University of Technology), **Meng Zhang** (Private Individual)

## Thesis title:

Digital Platform Innovation: An Extensible Theory Testing Case Study

## Description:

Employing an extensible theory testing case study approach, this thesis examines how modularity influences digital platform innovations. It explains how the different levels of coupling between digital platform layers, in combination with platform generative mechanisms, determine how organisations innovate over time. In doing so, the thesis establishes the role a platform's technical architecture, social processes, and procedures play, in the creation of sustainable digital platform innovation and the consequent organisational ability to maintain competitive advantage.

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Country: Australia

Supervisor/s: Kerrie Mengersen (Queensland University of Technology), Kate Helmstedt (Queensland University of Technology), Michael Schmidt (Department of Science, Information Technology and Innovation)

## Thesis title:

Extending Decision Tree Methods for the Analysis of Remotely Sensed Images

## Description:

One UN Sustainable Development Goal focuses on monitoring the presence, growth, and loss of forests. The cost of tracking progress towards this goal is often prohibitive. Satellite images provide an opportunity to use free data for environmental monitoring. However, these images have missing data due to cloud cover, particularly in the tropics. In this thesis I introduce fast and accurate new statistical methods to fill these data gaps. I create spatial and stochastic extensions of decision tree machine learning methods for interpolating missing data. I illustrate these methods with case studies monitoring forest cover in Australia and South America.

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Country: Germany

Supervisor/s: Christopher Barner-Kowollik (Queensland University of Technology), James Blinco (Queensland University of Technology)

## Thesis title:

Wavelength-dependent Photoreactivity for Macromolecular Material Design

## Description:

This thesis is a study of light-induced chemical reactions and the dependence of their reactivity and selectivity on the wavelength of light. Both experimental methods using tunable laser systems and light emitting diodes as well as computational simulation methods are developed that establish an understanding of light-induced bond-forming reactions. Information on wavelength-dependent reactivity is used to predict the rate of LED light induced reactions. The design of systems with chemical reaction pathways that are fully controllable by the wavelength of light paves the way to advanced 3D micro- and nano-printing of macromolecular materials through direct laser writing.

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Country: Australia

Supervisor/s: Zoran Ristovski (Queensland University of Technology), Branka Miljevic (Queensland University of Technology), Graham Johnson (Queensland University of Technology)

## Thesis title:

Emission Sources, Cloud-Relevant Properties and Variability of Aerosol Over the Southern and Pacific Oceans

## Description:

Cloud-forming aerosol over the Southern Ocean currently contribute a major source of uncertainty in global atmospheric models. This work presents the seasonal changes in marine aerosol over the Southern Ocean, between the summer and winter months. The observations, obtained during two ship-based voyages south of Australia and New Zealand, revealed the impact of meteorology and marine biological productivity on the concentration and cloud-relevant properties of the marine aerosols. Comparison was made against an array of published empirical models for sea spray production to investigate their relevance for this region.

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Country: Germany

Supervisor/s: Christopher Barner-Kowollik (Queensland University of Technology), Yvonne Barner (Queensland University of Technology), Bryan Tuten (Queensland University of Technology), Alben Lederer (Leibniz Institute of Polymer Research)

## Thesis title:

In-Depth Understanding of the Folding Behavior of Single-Chain Polymer Nanoparticles

## Description:

The current thesis provides an in-depth analytic study of a class of complex macromolecular architectures, i.e., single chain nanoparticles (SCNPs). Several advanced and modern characterization methods with orthogonal physicochemical operating principles are fused to examine the folding process of polymer chains and the resulting SCNPs, driven via simple and effective chemical transformations. In doing so, the thesis introduces powerful coupled analytical avenues towards SCNPs structure elucidation that will inform their effective design for catalytic applications.

Introduction

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Country: Australia

Supervisor/s: Christopher Barner-Kowollik (Queensland University of Technology), Kathryn Fairfull-Smith (Queensland University of Technology), Yvonne Barner (Queensland University of Technology)

## Thesis title:

Photocycloadditions as Tools for Particle Synthesis

## Description:

Highly specialised, customisable polymeric materials are an important area of research. The work herein develops a platform for utilising photochemical cycloadditions for the synthesis of polymer microspheres. A number of systems were developed based on the nitrile-imine mediated tetrazole-ene cycloaddition (NITEC) reaction and o-methylbenzaldehyde (oMBA)-based photo-enol chemistry, providing access to polymer particles with novel properties and functionality. Highlighting the suitability of these reactions in polymer particle synthesis - with advantages over common thermal and radical based methods - opens the door for further development in the synthesis of novel polymer particles using step-growth reactions.

Introduction

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Country: Thailand

Supervisor/s: Yanming Feng (Queensland University of  
Technology), Anagiyaddage Jayalath (Queensland University  
of Technology)

## Thesis title:

Studies of Communication and Positioning Performance of Connected Vehicles for Safety Applications

## Description:

Connected vehicles for safety applications play a significant role on reduction of the risks of road accidents. However, the performance of communication and positioning approaches is a major concern. This thesis establishes a connectivity framework based on publish-subscribe architecture for high-timeliness vehicle-to-vehicle data exchanges and determines the performance requirements for precise vehicle positioning for various safety use cases. Extensive experimental results demonstrated the performance benefits of the communication and positioning solutions for vehicle safety applications.

Introduction

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Country: Germany

Supervisor/s: Christopher Barner-Kowollik (Queensland University of Technology), Yvonne Barner (Queensland University of Technology)

## Thesis title:

From Precision Photochemistry to Advanced Microsphere Design

## Description:

This thesis explores polymer chemistry in three distinct fields of real-world applications. First, the design of polymers with reversible remote control over their degree of polymerization and three-dimensional shape purely by application of light constitutes a critical first step towards truly recyclable materials. Second, investigations of polymer coated surfaces, one of the largest fields of application for functional materials, to characterize light driven reactions on solid-liquid interfaces gave critical insight for enabling the synthesis of advanced functional interfaces. Third, the development of well-defined nanopatterned materials for the analysis of polymeric materials afforded nature-inspired particle shapes for advanced chromatographic applications.

Introduction

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Country: England

Supervisor/s: Christoph Schrank (Queensland University of Technology), Luke Nothdurft (Queensland University of Technology)

## Thesis title:

Planar Localisation Bands in the Shallow Regions of the Southern Hikurangi Subduction Wedge: Effects of Tectonic Setting and Lithology

## Description:

This thesis examined how deformation structures hosted in sedimentary rocks of the Wairarapa, New Zealand, record subduction initiation and the development and evolution of subduction wedges. Field and laboratory techniques are employed to assess the control of tectonic setting and lithology on the nature and spatial distribution of small-scale deformation structures in the shallow parts of subduction wedges. The results provide insights into the failure modes of, stress and strain state within, and mechanisms of fluid movement through subduction wedges, which represent key tectonic settings for geochemical exchange and material recycling between the Earth's surface, crust, and mantle.

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Country: Australia

Supervisor/s: David Hurwood (Queensland University of Technology), Peter Prentis (Queensland University of Technology)

## Thesis title:

A Genomics Perspective of Species and Speciation in an Atyid Shrimp (*Paratya australiensis*)

## Description:

The speciation debate in evolutionary science is long and protracted, evidenced by the multitude of concepts regarding species and speciation. Understanding the nature of species however, is of central importance in the study of biology and ecology. The purpose of this study was to investigate the genetic architecture of freshwater shrimp (*Paratya australiensis*) from two distinct lineages and of individuals across a known hybrid zone to gain insight into the process of speciation at the molecular level. The results of this study indicate that *P. australiensis* lineages sit in an advanced position along the speciation continuum, thus warranting taxonomic revision.

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Country: Germany

Supervisor/s: Steven Bottle (Queensland University of Technology), Mark Harrison (Queensland University of Technology), William Doherty (Queensland University of Technology)

## Thesis title:

The Conversion of Cotton Gin Waste into Pharmaceutical Precursors and Value-added Chemicals

## Description:

Over 98 per cent of all available pharmaceutical drugs are produced from non-renewable, fossil fuel derived sources. This research project set out to find alternative, sustainable resources for the production of one important drug, the anti-depressant drug Escitalopram. Towards this goal, the carbohydrate waste material from cotton gins was converted through a number of novel steps to give the base chemical CMF, which can then produce the desired pharmaceutical precursors for Escitalopram. In the process of conducting the research, a new synthetic method to produce plasticisers from cotton gin waste was also discovered.

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Country: China

Supervisor/s: Mirko Guaralda (Queensland University of Technology), Selen Turkay (Queensland University of Technology), Jeremy Kerr (Queensland University of Technology)

## Thesis title:

Playable Digital Intervention in Public Spaces: Opportunities for Engaging Young Office Workers with Public Space

## Description:

This project explores the potential of playful digital placemaking. The focus of the research is enquiring the concept of pleasure, deriving from the field of digital interaction and game design, applied to research into future urban design. Through qualitative and quantitative research in the context of Guiyang, China, the project has established different typologies of intervention, informed by a new design-led model for Playable digital intervention in public space.

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Country: Australia

Supervisor/s: David Rowlings (Queensland University of Technology), Peter Grace (Queensland University of Technology), Daniele De Rosa (Queensland University of Technology), Clemens Scheer (Karlsruhe Institute of Technology)

## Thesis title:

Quantifying Denitrification Losses from Intensively Managed Pastures and Evaluating the Mitigation Potential of Irrigation and Fertiliser Management

## Description:

This thesis investigated the effect of irrigation and rainfall on nitrogen (N) cycling and fertiliser efficiency in subtropical pastures. Data gathered from field trials suggested that large rainfall events play a significant role in soil microbial processes and N losses, but by using irrigation to prevent the excessive drying of the soil profile, N losses can be reduced and pasture yield increased. Field data was then used to simulate field management scenarios in the biogeochemical model, LandscapeDNDC and seasonal irrigation and fertiliser recommendations were able to be made to maximise profitability and environmental sustainability in response to changing rainfall conditions.

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Country: Sri Lanka

Supervisor/s: Erwin Fielt (Queensland University of  
Technology), Marek Kowalkiewicz (Queensland University of  
Technology)

## Thesis title:

The Organizing Visions of Digital Innovations: The Case of Blockchain Using the Twitter Discourse

## Description:

This thesis examines the community discourse on new digital technologies, which influences how they are adopted and diffused over time. It investigates the Blockchain discourse on Twitter using both computational and qualitative methods. The thesis presents a life cycle model that explains the different phases of the community discourse and an evolutionary process model that explains the underlying generative mechanism of how community ideas about a digital technology evolve. It also highlights the emerging role of social bots in the diffusion of new technologies. In doing so, the thesis shows the importance of social media for learning about new technologies.

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Country: Australia

Supervisor/s: Luke Nothdurft (Queensland University of Technology), Mark Gaede (Queensland University of Technology), Jody Webster (University of Sydney)

## Thesis title:

Spatial and Temporal Evolution and Internal Sedimentary Architecture of Holocene Halimeda Bioherms; Northern Great Barrier Reef

## Description:

This research investigates the initiation and growth of Holocene Halimeda algal limestone build-ups in the Great Barrier Reef. Legacy sediment samples and newly acquired analytical data were combined to explain inter-reef Halimeda bioherm origins, temporal growth and development, spatial distribution, geomorphology, carbonate volume, nutrient source, and habitat significance. Halimeda bioherms are much more complex than previously thought. The project contributes a significant new understanding of the Halimeda bioherm geological and ecological system in space and time, elevating the importance of Halimeda bioherms as Holocene sedimentary archives and modern inter-reef benthic habitats.

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Country: Germany

Supervisor/s: Christopher Barner-Kowollik (Queensland University of Technology), James Blinco (Queensland University of Technology)

## Thesis title:

Multi-Material Microstructures with Novel Stimuli-Responsive Properties

## Description:

This thesis presents the development of two novel materials that undergo drastic changes when exposed to a certain trigger. One of them becomes harder and stiffer when exposed to visible light of a certain wavelength and one of them degrades when exposed to a certain enzyme. The properties of the materials were investigated thoroughly. The advanced 3D printing technique direct laser writing was used to fabricate microscopic structures from both materials. Such microstructures possessing highly adaptable properties could be used as scaffold materials for cells in order to study their development as a response to the triggered changes.

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Country: Belgium

Supervisor/s: Christopher Barner-Kowollik (Queensland University of Technology), James Blinco (Queensland University of Technology)

## Thesis title:

Continuous Photoflow for Macromolecular Design

## Description:

The current thesis critically advances the synthesis of precision macromolecular structures via photochemical approaches. The work examines the use of continuous photoflow setups to facilitate scalable synthesis of various polymeric architectures, and helps to overcome limitations that hinder photochemistry to be incorporated more frequently into industrial processes. This thesis demonstrates the flexibility and versatility of continuous photoflow and its potential to be developed further, to exceed currently existing photochemical procedures based on traditional batch approaches.

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Country: Australia

Supervisor/s: Brett Williams (Queensland University of  
Technology), Sagadevan Mundree (Queensland University of  
Technology)

## Thesis title:

Increasing Anthocyanin Accumulation in Plant Stress

## Description:

This research investigated the application of natural plant pigments as agricultural indicators for abiotic stress in plants and evaluated their subsequent impact on plant health. Overall, this project generated and tested prototype indicator plants for water stress, using inducible regulation of anthocyanin biosynthesis in model plant *Nicotiana tabacum*. Additionally, this research employed next generation sequencing to identify additional regulatory motifs that could be used to drive gene expression in plant stress. This thesis demonstrates the utility of anthocyanins as agricultural indicators and adds to our understanding of gene changes in the early time points of stress.

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Country: Australia

Supervisor/s: Anthony Clarke (Queensland University of Technology), Matthew Phillips (Queensland University of Technology), Jane Royer (Department of Agriculture and Fisheries)

## Thesis title:

Systematics and Evolution of the Australian Dacini (Diptera: Tephritidae)

## Description:

This thesis investigates the drivers of fruit fly speciation in Australia. Utilising genetic and fossil data, a dated phylogeny was produced and used to investigate trait evolution across the tribe. Morphological data was evaluated for its utility in phylogenetic reconstructions and found to have limited signal. Biogeographic analysis showed flies entered Australia from PNG, and into the Western Pacific from both PNG and Australia. Additionally, the study documented new fruit fly species, new distributions, and new lure records. The results help refine the taxonomy and systematics of the tribe and support future work in pest management.

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Country: Australia

Supervisor/s: Nunzio Motta (Queensland University of Technology), Jennifer Macleod (Queensland University of Technology), Kostyantyn Ostrikov (Queensland University of Technology)

## Thesis title:

Investigating The Surface of Graphitic Electrodes for Supercapacitors

## Description:

Storing electrical energy is a concern for a sustainable future. Supercapacitors store energy, like batteries do. They cannot yet store as much charge as batteries, but they offer the advantages of faster charging, and longer lifespan. This project produced new graphene-based materials and processes for improving supercapacitor electrode capacity and developed an original technique to measure their surface area, using microscope images.

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Country: Australia

Supervisor/s: [Scott Mccue \(Queensland University of Technology\)](#), [Michael Dallaston \(Queensland University of Technology\)](#), [Timothy Moroney \(Queensland University of Technology\)](#)

## Thesis title:

Interfacial Instability Analysis of Viscous Flows in a Hele-Shaw Channel

## Description:

When a less viscous fluid displaces a more viscous fluid inside a quasi-two-dimensional channel, the interface separating the two fluids can become highly unstable and perturbed. By assuming that the more viscous fluid is finite in volume, this thesis uses analytical and computational methods to investigate the effect of two fluid interfaces. The results could have implication in fields such as oil extraction, geology, and advanced manufacturing.

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Country: Iran

Supervisor/s: Leonie Simpson (Queensland University of Technology), Xavier Boyen (Queensland University of Technology), Ernest Foo (Griffith University), Josef Pieprzyk (Macquarie University)

## Thesis title:

Privacy-Preserving Authentication and Key Management for Cooperative Intelligent Transportation Systems

## Description:

Car accidents kill or injure millions of people. Cooperative Intelligent Transportation Systems (C-ITS) can increase road safety and reduce accidents through the application of information and communication technologies for communicating vehicles. However, C-ITS applications are vulnerable to potential cyber-attacks involving message manipulation, where messages may be altered intentionally or fake messages sent, compromising the safety goals. Cryptographic techniques can be used to solve this, but this must be done in a way that preserves driver privacy, so that unauthorized surveillance and tracking of drivers is not possible. This research develops a secure conditional privacy-preserving authentication scheme for C-ITS applications.

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Country: Bangladesh

Supervisor/s: Anthony Clarke (Queensland University of Technology), Ranawelle Silva (Queensland University of Technology), Katharina Merkel (Private Individual)

## Thesis title:

Demographic Structure and Aging in *Bactrocera tryoni* (Diptera: Tephritidae) in Subtropical Australia

## Description:

Queensland fruit fly is a destructive horticultural insect pest. Knowing the age-structure of fly populations, that is the relative proportion of young, middle-age, and old-age flies within a population at a given time, is critical for effective management. The thesis combined behavioural ecology with a novel mathematical analysis to identify the seasonal changes in the age of a wild Queensland fruit fly population. The study showed that the abundance and age-structure of the fly changed predictably with the season, strongly suggestive of an endogenous mechanism that helps the fly cope with seasonal changes in resource availability.

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Country: China

Supervisor/s: Lidia Morawska (Queensland University of Technology), Godwin Ayoko (Queensland University of Technology)

## Thesis title:

Novel Applications of Modelling Techniques to Understand and Predict Global Urban Air Quality Trends

## Description:

The aim of this study was to explore novel applications of modelling techniques to advance analytical methods towards addressing urban atmospheric environment problems and possible solutions. Four selected models known as SVR, STL, WRF, and LSTM were used to investigate: the correlation between social development and air quality, the trend of severe air pollution episodes on a global scale, urban heat island effect mitigation measures, and how to extend the use of air quality monitoring data. This study led to improved analysis of global urban atmospheric environment problems and the formulation of more effective urban air quality management policies.

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Country: Australia

Supervisor/s: Elliot Carr (Queensland University of  
Technology), Ian Turner (Queensland University of  
Technology)

## Thesis title:

Analytical, Numerical and Macroscopic Modelling Approaches for Diffusive Transport Processes in Heterogenous Media

## Description:

This project used mathematical modelling to better understand diffusion in composite materials. It resulted in new analytical, numerical and macroscopic modelling techniques that can be applied to a greater variety of problems, are more efficient than existing methods and yield more accurate and efficient simulations of complex diffusion processes.

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Country: Australia

Supervisor/s: Scott Bryan (Queensland University of Technology), Henrietta Cathey (Queensland University of Technology), Patrick Hayman (Queensland University of Technology), David Gust (Queensland University of Technology)

## Thesis title:

Tectono-magmatic Setting of Seafloor Massive Sulfide Systems: Investigating Solwara 1 Cu-Au Deposit

## Description:

This thesis investigates the tectonic and magmatic setting of a Copper-rich seafloor massive sulfide deposit. Integrated multi-scale data analysis produced a regional to deposit-scale framework to constrain how, why and where these types of mineral deposits form. Outcomes from this research advance our understanding of 1) regional tectonic evolution of the East Manus Basin, and 2) volcanic and magmatic processes conducive to seafloor massive sulfide deposit formation.

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Country: Australia

Supervisor/s: Mery Thompson (Queensland University of Technology), Kerrie Mengersen (Queensland University of Technology)

## Thesis title:

Methods for Personalised Predictive Modelling of Developmental Milestones for Children with Disabilities

## Description:

This thesis developed methods for personalised modelling of developmental milestones for children with disabilities. Using data containing 348 milestone measurements from a small sample of children with a diverse range of disabilities, methods were developed to create a comprehensive personalised developmental profile for each child. These profiles incorporate multiple developmental domains and are designed to be updated in real time so that parents can be provided with feedback as their child develops. The outputs of the methods developed in this thesis will be used to help inform decision-making and assist with personalised intervention planning at the Developing Foundation.

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Country: Australia

Supervisor/s: Ian Turner (Queensland University of Technology), Troy Farrell (Queensland University of Technology), Daniel Lester (Queensland University of Technology)

## Thesis title:

Dual-scale Modelling of Two-dimensional Flow in Porous Media

## Description:

The standard approach to modelling fluid flow through a porous medium was developed decades ago, when computational resources were insufficient to feasibly simulate the flow directly. In this thesis, the feasibility of such flow simulation with modern computing power is demonstrated via the development of three accurate and efficient dual-scale models of porous media flow. An important outcome of the research is that the new dual-scale modelling framework accurately and efficiently simulates flows with a range of Reynolds numbers through a variety of heterogeneous porous media.

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Country: China

Supervisor/s: Jingsan Xu (Queensland University of  
Technology), Godwin Ayoko (Queensland University of  
Technology)

## Thesis title:

Hydrogen-bonded Coordinate Supramolecular Networks toward Functional Materials

## Description:

This thesis examined crystal transformations enabled by competitive interactions between hydrogen bonding and covalent bonding, which is a step forward in understanding the interplay of multi-supramolecular interactions. A series of novel hydrogen bonded coordinate aggregates like macroscopic robust membrane, hydrogel/aerogel, novel supramolecular crystals based on melamine/cyanuric acid were created. Those newly developed aggregates demonstrate remarkable properties in mechanics, optics, photoluminescence, etc.

Introduction

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and Law

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Country: Sri Lanka

Supervisor/s: James Mcgree (Queensland University of  
Technology), Helen Thompson (Queensland University of  
Technology), Patricia Menendez (Monash University), Julian  
Caley (Australian Institute of Marine Science)

## Thesis title:

Model-Based Adaptive Monitoring: Improving the Effectiveness of Reef Monitoring Programs

## Description:

The goal of this thesis was to develop innovative adaptive design methods for enhancing the effectiveness of ecological monitoring. This was demonstrated for monitoring the health of our coral reefs where new statistical methods were developed to collect highly informative data at reduced sampling costs when compared to current survey practices. These new methods are expected to encourage adaptive design approaches for reef/ ecological monitoring in the future.

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Country: Indonesia

Supervisor/s: Yue Xu (Queensland University of Technology), Yuefeng Li (Queensland University of Technology), Stewart Trost (Queensland University of Technology), Kelly Clanchy (Griffith University), Dian Tjondronegoro (Southern Cross University)

## Thesis title:

Knowledge-based Approach for Personalisation in Health E-Coaching System: Case Study on Physical Activity Promotion for Individuals with Brain Impairments

## Description:

This research constitutes a knowledge-based approach for selecting suitable health e-coaching strategies and goals. This research needs to acquire the knowledge from health experts in selecting and deciding on relevant physical activity program strategies and goals that need to be available to increase physical activities among individuals with brain impairments. A 'proof-of-concept' prototype has confirmed the feasibility of the proposed knowledge-based approach collected from health experts. A comprehensive evaluation, consisting of both expert-based and user-based validations to the prototype, was conducted. The outcome of the evaluation indicates that PHE-COACH can generate correct outputs compared with health experts' decisions.

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Country: China

Supervisor/s: Prashant Sonar (Queensland University of Technology), Steven Bottle (Queensland University of Technology), John Bell (Queensland University of Technology)

## Thesis title:

Rational Molecular Design for Multi-functional Organic Semiconducting Materials

## Description:

This thesis demonstrates a comprehensive study of multifunctional applications of low-cost solution-processable organic semiconducting materials. It presents a series of rationally designed predominantly dye based innovative soft semiconductors with their generic optoelectronic properties. The performance of these materials' application in various devices, including transistors, solar cells, memory devices and displays, are evaluated through world class collaboration to establish the structure-property relationship. In doing so, we not only developed several high-performance materials but also found that fused ring incorporation into the conjugated backbone is an effective strategy to construct multifunctional semiconductors towards flexible and printed electronics.

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Country: Australia

Supervisor/s: Stephen Blanksby (Queensland University of Technology), Berwyck Poad (Queensland University of Technology), Carl Sadowski (University of Bern)

## Thesis title:

Mapping Changes to Lipid Metabolism Within Cancer Using Next-Generation Mass Spectrometry Technologies

## Description:

This thesis developed new methods to probe the molecular structure of lipids (fats) that are key components of cellular membranes. Applications of these technologies led to the discovery of previously undescribed lipids and allowed the mapping of their formation and fate in cancer cells and tissues. These fundamental insights into cancer metabolism suggest new targets for the detection and treatment of cancer.

Introduction

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Country: Bangladesh

Supervisor/s: Lucy Reading (Queensland University of  
Technology), Leslie Dawes (Queensland University of  
Technology)

## Thesis title:

Nutrient and Pesticide Dynamics Through the Vadose Zone in the Wet Tropics, Australia

## Description:

This thesis involves the implementation of a vadose zone monitoring system (VMS), which has not previously been installed in Australia or in the Wet Tropical environments. Using this VMS, the fluctuations of water content at various layers was found correlating with the magnitude of the rain events, plant uptake and the site lithology. It also enables the characterization of pesticide migration with respect to rainwater infiltration, sugar cane growing phase and pesticide application. The possible nutrient dynamics (ammonium, nitrite, nitrate and vice versa) with respect to their application regime, local rain patterns and infiltration dynamics are also defined.

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Country: United States of America

Supervisor/s: Jason Watson (Queensland University of Technology), Kate Davis (Queensland University of Technology), Sylvia Edwards (Queensland University of Technology), Christine Bruce (James Cook University), Kristen Radsliff Rebmann (San Jose State University)

## Thesis title:

Digital Stories Promoting Scalable Social Presence: A Qualitative Case Study of an Undergraduate Distance Learning Environment

## Description:

This thesis is a qualitative case study of an undergraduate distance learning higher education course exploring how student developed digital stories promoted scalable peer-to-peer perceptions of social presence. Findings from this study informed a Digital Storytelling Community design model capable of promoting scalable peer-to-peer perceptions of social presence in an online education environment using information and communication technologies (ICT).

Introduction

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Country: Germany

Supervisor/s: Christopher Barner-Kowollik (Queensland University of Technology), James Blinco (Queensland University of Technology)

**Thesis title:**

Lambda-Orthogonal Photoresists

**Description:**

Light-driven additive manufacturing spans applications from materials technology to the field of medicine. The success of light-based fabrication techniques is founded on the spatiotemporal control over light-induced reactions, allowing to control when and where a material is made. Since different molecules absorb different colours of light, selecting a precise colour of light allows to execute one specific reaction from complex mixtures, while all other molecules remain untouched (a concept called lambda-orthogonality). By embedding such lambda-orthogonal groups into photoresists, it becomes possible to control not only when and where, but also which material is made ? all from one photoresist.

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Country: Iran

Supervisor/s: Graham Johnson (Queensland University of Technology), Kirsten Spann (Queensland University of Technology)

## Thesis title:

The Role of Relative Humidity and Aerosol Composition in Airborne Respiratory Virus Survival

## Description:

This thesis presents and tests a novel hypothesis that attempts to predict the relative humidity (RH) dependent survival of airborne respiratory viruses in protein-enriched saline aerosols. The hypothesis proposed that virus-laden respiratory aerosols exist in either an effloresced (solid) or deliquesced (liquid) state, depending on the ambient air RH and that the survival of viruses embedded in such aerosols changes with that state. Experiments confirmed as predicted, that rhinovirus and influenza virus exhibited a V-shaped surviving fraction dependence on RH. Implications concerning the survival of these viruses under seasonal conditions are discussed along with strategies to control indoor airborne infection.

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Country: Pakistan

Supervisor/s: Emad Kiriakous (Queensland University of Technology), Godwin Ayoko (Queensland University of Technology), Mohd Islam (Queensland University of Technology)

## Thesis title:

Novel Nanoformulations and Nanosensors for Bioactive Molecules of Biomedical Significance

## Description:

This thesis demonstrates novel nanosensors and nanomaterials for the sensitive detection of bioactive molecules (antibody therapeutics and antibiotics) in complex biological matrices utilizing thiol chemistry for label-free SERS detection. In addition to biomedical analysis, formulation development of dry powder inhalers overcomes the issues of adverse effects associated with parenteral or oral route of drug administration. It is expected to accomplish the key requisites like aerosolization properties, physicochemical characteristics, biocompatibility, and biodegradation with minimal side effects. Therefore, this study provided a motivation to address current advancement of detection techniques and development of novel drug delivery systems for the bioactive molecules.

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Country: Australia

Supervisor/s: Kerrie Mengersen (Queensland University of Technology), Nicole White (Queensland University of Technology), Catriona Hargrave (Queensland University of Technology), Nicholas Graves (Duke University), Tanya Holt (Queensland Health (Department of Health))

## Thesis title:

Hydrogel Spacers in External Beam Radiation Therapy of Prostate Cancer: Patient Selection and Cost-Effectiveness

## Description:

This research compared statistical models for the prediction of rectum-related side-effects following a course of high-dose external beam radiation therapy for prostate cancer. This allowed patient sub-cohorts with a higher risk of developing long-term side-effects to be identified as suitable for a dose limiting internal organ spacer known as hydrogel. High-risk sub-cohorts were used in a cost-effectiveness analysis of hydrogel spacer to determine both clinical and economic value of this intervention in the Australian health care setting.

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Country: Australia

Supervisor/s: Kathleen Mullen (Queensland University of Technology), John Mcmurtrie (Queensland University of Technology)

## Thesis title:

Active Metal Template Synthesis of [2] Rotaxanes

## Description:

This thesis describes the use of metals to simultaneously catalyse and template large molecules into a mechanically interlocked system. This mechanical interlocking results in unique properties but is difficult to achieve. In this thesis, techniques to create this mechanical interlocking are developed and improved upon both in solution and on surfaces. In addition, the complex molecules that are created display unique properties and this behaviour is analysed in depth.

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Country: China

Supervisor/s: You-Gan Wang (Queensland University of  
Technology), Christopher Drovandi (Queensland University of  
Technology)

## Thesis title:

Statistical Modeling and Machine Learning in Longitudinal Data Analysis

## Description:

This thesis mainly concerns the statistical modelling and machine learning methods for the analysis of longitudinal data. As a contribution to this area, this thesis provides theoretical discussion and empirical illustrations of longitudinal data analysis. The first contribution is developing methods to obtain robust and efficient variance estimators when the cluster size is large. The second one is comparing a traditional parametric approach, the linear mixed model with machine learning methods in longitudinal data analysis. The last one is extracting new features to improve sheep behaviour classification accuracy of different machine learning algorithms.

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Country: Canada

Supervisor/s: Jennifer Firn (Queensland University of  
Technology), James McGree (Queensland University of  
Technology)

## Thesis title:

Managing the Community: Assessing the Efficacy of Invasive Plant Control Strategies in Australian Grassy Ecosystems from Deserts to Dairy Country

## Description:

This thesis investigated how management affects plants, seedbanks, and rhizospheric bacterial communities in grasslands. Control strategies studied reduced invasive grass cover in desert grasslands even though the invader holds unique root-associations with bacteria. Seedbank stores of invaders were high in both desert and dairy-country grasslands suggesting control strategies should also reduce seedbanks.

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Country: Germany

Supervisor/s: Christopher Barner-Kowollik (Queensland University of Technology), James Blinco (Queensland University of Technology), Stephen Blanksby (Queensland University of Technology)

## Thesis title:

Single Chain Nanoparticles and Their In-depth Characterization via Mass Spectrometry Coupled to Size Exclusion Chromatography

## Description:

The thesis investigated new methods to examine single chain nanoparticles, which are protein-inspired, self-compacting polymer systems. A new analysis method combining two separation techniques was developed to provide additional information on the size reduction of these systems depending on the number of compaction reactions. The development of new analysis techniques aims at a deeper understanding of these materials to ultimately provide a platform towards synthetic proteins.

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Country: Bhutan

Supervisor/s: Margot Brereton (Queensland University of Technology), Paul Roe (Queensland University of Technology), Jinglan Zhang (Queensland University of Technology), Michael Towsey (Queensland University of Technology)

## Thesis title:

Engaging Remote Communities In Technology Design for Connecting People to and Through Nature

## Description:

Dominant citizen science paradigms to support species conservation typically rely on large, distributed populations to gather or analyse data. Engagement approaches are primarily utilitarian and individualistic. This dissertation rethinks the way we engage citizens and communities to combat the problem of species loss. Long-term socio-technical design research was carried out focusing on the critically endangered, White-bellied Heron in remote communities of Bhutan. The thesis contributes practical design outcomes, a co-design method that emphasizes 'network of relations' and findings from a long-term technology trial. It shifts design foci towards 'stewardship beyond monitoring' with a holistic view to enhancing nature engagement.

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Country: Vietnam

Supervisor/s: Robert Speight (Queensland University of Technology), Leigh Gebbie (Queensland University of Technology), Mark Harrison (Queensland University of Technology)

## Thesis title:

Development of New Enzymes and Microbial Cells for the Enhancement of Livestock Feeds Based on Sugarcane Fibre

## Description:

The microorganisms growing in sugarcane bagasse piles during storage can metabolise lignocellulose and survive in this relatively extreme environment. These microbes have potential fibre degradation applications, such as in livestock feed. This thesis isolated and characterised new microorganisms and enzymes with a focus on lignin degradation. A specific *Thielavia terrestris* fungal strain was identified as an efficient lignin degrader. The strain could use sugarcane bagasse as a low-cost carbon source to grow and produce thermostable ligninolytic enzymes. The strain and enzymes have a variety of industrial applications, including for the improvement of bagasse as a component of livestock feed.

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Country: Australia

Supervisor/s: **Stuart Parsons** (Queensland University of Technology), **Irene Hauxwell** (Queensland University of Technology), **Ramona Maggini** (University of Queensland), **Monika Rhodes** (Department of Environment and Heritage Protection)

## Thesis title:

The Ecology and Conservation of the Large-Footed Myotis (*Myotis Macropus*) in an Urban Environment

## Description:

The large-footed myotis (*Myotis macropus*) is a specialist trawling bat that can be found roosting in concrete culverts under roads, throughout urban environments. This study used a multidisciplinary approach to investigate culvert roost selection and urban landscape use by a specialist species in a subtropical city. The foundational ecological information detailed in this thesis concerning culvert roost selection and availability, urban movement patterns and gene flow between culvert roosts, will assist in planning future urban conservation initiatives of this specialist bat.

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Country: Germany

Supervisor/s: Michael Bode (Queensland University of  
Technology), Petrus Van Heijster (Queensland University of  
Technology)

## Thesis title:

Ecological Models for Threat Management; Considering the Unknowns Using Numerical Analysis and Machine Learning

## Description:

The thesis tackles the problem of uncertainty in the modelling of ecosystems of any complexity. This uncertainty can originate from many sources including missing knowledge of interactions or low data availability. The major contribution of the thesis is a new workflow that extends on the traditional scientific method to allow for the thorough investigation of uncertainty in especially data poor system utilising new techniques such as machine learning.

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Country: Sri Lanka

Supervisor/s: Joshua Lipton-Duffin (Queensland University of Technology), Jennifer Macleod (Queensland University of Technology), Kathryn Fairfull-Smith (Queensland University of Technology)

## Thesis title:

Assembly and Reactions of Carboxylic Acids on Metal-Passivated Silicon

## Description:

Thesis explores the self-assembly and reaction of molecules on surfaces. Initial focus was on understanding these molecular behaviours on metal surfaces by examining the chemical and electronic properties. Unfortunately, metal surfaces are unsuitable for electronic applications. Hence, subsequent focus was on transitioning the experiment to non-metallic and low-cost silicon surfaces. Silicon requires to be passivated with metal atom layers due to its high reactivity. Molecular behaviour was examined by varying the metal layer thickness. Metal layers with 20 atoms thickness mimics the bulk metal surfaces, thus provide an economical and practical alternative platform for the study of molecular dynamics.

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Country: China

Supervisor/s: Lidia Morawska (Queensland University of Technology), Emil Jayaratne (Queensland University of Technology), Mandana Mazaheri (Department of Planning and Environment)

## Thesis title:

Developing a Scientific Basis for Utilisation of Low-Cost Sensing Technologies Towards Quantitative Assessments of Air Pollution and Its Sources

## Description:

This thesis develops a scientific basis for the use of low-cost sensing technologies for quantitative assessment of air pollution and its sources. It has extensively identified the capabilities and limitations of low-cost sensors in laboratory and field environments. Essentially, it has demonstrated that low-cost sensors are capable of monitoring air quality with a high degree of accuracy in different locations (e.g., highly polluted areas) and for different purposes (e.g., citizen science projects for raising environmental awareness).

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Country: Iran

Supervisor/s: Mark Harrison (Queensland University of Technology), Peter Strong (Queensland University of Technology), Robert Speight (Queensland University of Technology)

## Thesis title:

Transformation of Sugarcane Biorefinery Feedstocks into Fungal Protein

## Description:

Microorganisms are alternative sources of protein for animal feed and can produce protein more rapidly than plants. Further, just like plant sources of protein in feed, microbial cells also provide dietary lipids, micronutrients, and vitamins, as well as unique bioactive compounds that can affect the intestinal microbiome. By-products from sugarcane biorefineries are unsuitable as substrates for bacteria or yeast fermentation but were shown to be well-suited for production of filamentous fungi in both submerged and solid-state fermentation. Biorefinery feedstocks were transformed into Ascomycete and Zygomycete biomass for livestock feed applications.

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Country: Australia

Supervisor/s: Daniel Johnson (Queensland University of Technology), Selen Turkay (Queensland University of Technology), Peta Wyeth (Queensland University of Technology)

## Thesis title:

Narrative Gamification of Online Civic Interactions

## Description:

This thesis presents a conceptual framework for the meaningful gamification of online civic interactions and demonstrates how narrative gamification can be incorporated into these interactions to make them more valuable and more meaningful experiences for citizens. The thesis reports the results of three online quantitative studies that identified the impact narrative gamification has on a range of measures for the user experience of motivation and meaningfulness. These studies ascertained that different doses of narrative gamification do have different effects on the user experience; and determined that the effects of narrative gamification are different for autonomously motivated and extrinsically motivated participants.

