12th Annual
Graduate Research Conference
September 6 – 7, 2018
> utas.edu.au/research
The Graduate Research Conference is the highlight of the academic year for those of us involved in graduate research. Higher Degree by Research (HDR) candidates come together as a community and celebrate research, reflect on practice, and take time to connect across disciplines.

The University of Tasmania has a long and distinguished history of innovation and research excellence. This conference is an opportunity to recognise the contribution of our HDR research community and reaffirm our commitment to world-class research. This is evidenced no better than in the poster presentations by candidates — a time when researchers from across the disciplines share ideas and chat about their research. There are some 200 posters on display this year and a legion of poster judges talking to candidates about their research. All staff and students are encouraged to take time to browse these and relish the diversity of research that is happening at the University right now. There are also prizes on offer to celebrate the quality of the posters presented.

The conference will be showcased by a keynote address from Associate Professor Elle Leane, who will discuss her book, *South Pole: Nature and Culture*. This book, and the interdisciplinary research underpinning it, arose from Elle’s fascinating and unique career path. Elle will expound on the need to be career adaptable, and how a willingness to apply skills learned to new and unexpected opportunities can be immensely fruitful.

This year the conference Q&A Panel discussion is titled, 'Innovation: what does the future mean for me if my job has not yet been created?' Panellists in this fascinating dialogue are wonderfully diverse: Jon Manning, co-founder of Secret Lab, Bianca Deans, Chemistry candidate, building designer, Marisol Miró Quesada, of Coinventa, and Clare Rutherford of the Food Agility Cooperative Research Centre.

The Three Minute Thesis (3MT) competition is always hotly contested and is a crowd favourite, so do make every effort to come and soak up the atmosphere and join us for drinks and refreshments afterwards.

I hope that the conference will provide you with excellent networking opportunities, inspiration for your current and future research and a sense of community at the University of Tasmania. I look forward to seeing you there.

Professor Clive Baldock  
*Pro Vice-Chancellor (Researcher Development)*  
& *Dean of Graduate Research*
‘WHERE IS THE SOUTH POLE? NAVIGATING A RESEARCH CAREER’

I began my academic career in science, finishing a BSc in physics at the University of Adelaide before moving into English studies.

I undertook my doctorate in English literature as a Rhodes Scholar at the University of Oxford, applying a literary critical perspective to popular physics books. This research fed into my first monograph, *Reading Popular Physics* (2007). After coming to the University of Tasmania to work in the English program, I developed a research interest in the Antarctic.

In 2004, I was awarded an Australian Antarctic Arts Fellowship, travelling to Casey and Macquarie Island stations. (I had a chance to visit the region again earlier this year, as an instructor on the University of Canterbury’s Postgraduate Certificate in Antarctic Studies, which includes a fieldtrip to Ross Island.)

Since 2013, I have held an Australian Research Council Future Fellowship split between UTAS’s School of Humanities and Institute for Marine and Antarctic Studies.

In addition to my Antarctic-related research, my areas of interest include place and literature; the relationship between literature and science; and human-animal studies. My more recent books are *South Pole: Nature and Culture* (2016) and *Antarctica in Fiction* (2012), and I’ve also co-edited the collections *Considering Animals* (2011) and *Imagining Antarctica* (2011).

I have published in a diverse range of journals, such as *Performance Research, Science Fiction Studies, The International Journal of Heritage Studies and Polar Record*; and in essay collections, including recently *The Oxford History of the Novel* (vol. 9), the *Routledge Handbook of the Polar Regions* and the *Handbook on the Politics of the Antarctic*.

I’m currently Arts and Literature editor of *The Polar Journal* and co-chair of the Standing Committee on Humanities and Social Sciences within the Scientific Committee on Antarctic Research. My book-in-progress is called *Travelling Ice: Textual Journeys through Contemporary Antarctica*. 
TOPIC: 'Innovation: What does the future mean for me if my job has not yet been created?'

We live in diverse and rapidly changing times. Innovation is a daily reality. Many of us will work in jobs that have not yet been invented. There is an incredible future ahead - come hear four fascinating speakers discuss it.

WHEN: Friday 7 September, 2:00pm - 3:00pm
WHERE; Stanley Burbury Lecture Theatre, Sandy Bay Campus

**Bianca Deans**

Bianca graduated with a Bachelor of Science (First Class Honours) from the University of Tasmania in 2014. She is currently in the final year of her PhD in chemistry. She is passionate about science engagement and outreach, which she has been actively involved with over the past 5 years.

**Clare Rutherford**

Clare is the portfolio manager for Food Agility, a $150m Cooperative Research Centre focused on digital transformation of the agrifood supply chain. Since graduating from UTAS, Clare has had a diverse career, working in government, university and private sectors, focusing in program management and business development.

**Jon Manning**

Jon is co-founder and technical lead at Secret Lab. He and his co-founder, Paris Buttfield-Addison, were jointly awarded the 2010 Pearcey Award for innovative achievements within the ICT industry. Jon formerly worked as the senior mobile Software Engineer at Meebo, and has co-authored more than 20 books for iconic technology brands, O'Reilly Media and Wiley's For Dummies, on a variety of topics such as game design, mobile development, and rocket science.

**Marisol Miró Quesada**

Marisol is an accomplished building designer and has degrees in architecture, sustainable built environment, business, marketing and events. An experienced problem solver, strategist, facilitator, and shaper, Marisol improves and creates projects and ethical enterprises by applying human-centred design, lean, and systems thinking. She is a passionate advocate for social inclusion, environmental health, and EHS (electro-hypersensitivity) accessible spaces.
<table>
<thead>
<tr>
<th><strong>Day</strong></th>
<th><strong>Time</strong></th>
<th><strong>Action</strong></th>
<th><strong>Location</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday 6th September</td>
<td>8.30am to 10am</td>
<td>Poster registration</td>
<td>Activity Centre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poster mounting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10am to 10.30am</td>
<td>Morning tea</td>
<td>Stanley Burbury Foyer</td>
</tr>
<tr>
<td></td>
<td>10.30am to 12pm</td>
<td><strong>Opening Ceremony</strong></td>
<td>Stanley Burbury Lecture Theatre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Opening Address</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Welcome to Country</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Welcome to the Conference</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Keynote: Associate Professor Elizabeth Leane</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 noon to 1.30pm</td>
<td>Lunch</td>
<td>The Refectory</td>
</tr>
<tr>
<td></td>
<td>1pm to 5pm</td>
<td><strong>Poster Presentations</strong></td>
<td>Activity Centre</td>
</tr>
<tr>
<td></td>
<td>2pm to 4pm</td>
<td>3MT rehearsal</td>
<td>Stanley Burbury Lecture Theatre</td>
</tr>
<tr>
<td>Friday, 7th September</td>
<td>8am to 9am</td>
<td>Poster registration</td>
<td>Activity Centre</td>
</tr>
<tr>
<td></td>
<td>9am to 1pm</td>
<td><strong>Poster Presentations</strong></td>
<td>Activity Centre</td>
</tr>
<tr>
<td></td>
<td>12.30pm to 2pm</td>
<td>Lunch</td>
<td>The Refectory</td>
</tr>
<tr>
<td></td>
<td>1pm to 2pm</td>
<td>HDR poster collection and removal</td>
<td>Activity Centre</td>
</tr>
<tr>
<td></td>
<td>2pm to 3pm</td>
<td><strong>Panel Discussion</strong></td>
<td>Stanley Burbury Lecture Theatre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Bianca Deans</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Jon Manning</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Marisol Miró Quesada</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Clare Rutherford</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3pm to 4.30pm</td>
<td><strong>3MT Competition</strong></td>
<td>Stanley Burbury Lecture Theatre</td>
</tr>
<tr>
<td></td>
<td>4.15pm</td>
<td><strong>Poster winner announcement and prize presentation</strong></td>
<td>Stanley Burbury Lecture Theatre</td>
</tr>
<tr>
<td></td>
<td>4.30pm to 5.30pm</td>
<td>Final Conference drinks</td>
<td>Stanley Burbury Foyer</td>
</tr>
</tbody>
</table>
Each poster presenter has been allocated a poster number within a coloured poster zone. The following floor plan is of the Activity Centre, TUU building, Sandy Bay Campus. The Activity Centre is located above the Co-op bookshop.
<table>
<thead>
<tr>
<th>NAME</th>
<th>TIME</th>
<th>DATE</th>
<th>SECTION</th>
<th>POSTER NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdu Nizam</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>23</td>
</tr>
<tr>
<td>Adera Aregawi</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>4</td>
</tr>
<tr>
<td>Acosta Mayeli</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Orange</td>
<td>12</td>
</tr>
<tr>
<td>Adcock Leeanne</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>21</td>
</tr>
<tr>
<td>Adel Atia Abuzeid Mostafa</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>44</td>
</tr>
<tr>
<td>Adulcikas John</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>45</td>
</tr>
<tr>
<td>Ahmad Tauseef</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>15</td>
</tr>
<tr>
<td>Aiyede Mimievshiofu</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>32</td>
</tr>
<tr>
<td>Alharthi Meshari</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>23</td>
</tr>
<tr>
<td>Alqarni Ahmed</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>6</td>
</tr>
<tr>
<td>Ammitzboll Hans</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>62</td>
</tr>
<tr>
<td>Angelini Marion</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>25</td>
</tr>
<tr>
<td>Ansari Misha</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>15</td>
</tr>
<tr>
<td>Arce Gonzalez Fernando</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>27</td>
</tr>
<tr>
<td>Atto Hayden</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>22</td>
</tr>
<tr>
<td>Atto Brianna</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>70</td>
</tr>
<tr>
<td>Augustine Christelle</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>8</td>
</tr>
<tr>
<td>Balasso Michelle</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>12</td>
</tr>
<tr>
<td>Baldry Kimberlee</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>27</td>
</tr>
<tr>
<td>Banks Robin</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>43</td>
</tr>
<tr>
<td>Bashyam Prashanth</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>36</td>
</tr>
<tr>
<td>Batt Christopher</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>22</td>
</tr>
<tr>
<td>Battula Sudheer Kumar</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>45</td>
</tr>
<tr>
<td>Bazoozband Azam</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>25</td>
</tr>
<tr>
<td>Belhaj Monika</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>6</td>
</tr>
<tr>
<td>Bhalli Mughees</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>41</td>
</tr>
<tr>
<td>Borchers Nicolas</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>18</td>
</tr>
<tr>
<td>Bradshaw Stephen</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>24</td>
</tr>
<tr>
<td>Breen Rachel</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>17</td>
</tr>
<tr>
<td>Brinkhoff Rose</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>38</td>
</tr>
<tr>
<td>Broad Tina</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>37</td>
</tr>
<tr>
<td>Brown Alexander</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>63</td>
</tr>
<tr>
<td>Buchanan Greg</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Yellow</td>
<td>1</td>
</tr>
<tr>
<td>Cash Catherine</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>32</td>
</tr>
<tr>
<td>Cassidy Margaret</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>52</td>
</tr>
<tr>
<td>Castles Meredith</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>57</td>
</tr>
<tr>
<td>Chear Sueanne</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>25</td>
</tr>
<tr>
<td>Chen Liang</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>18</td>
</tr>
<tr>
<td>Chen Peng</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>24</td>
</tr>
<tr>
<td>Chowdhury Md Anisuzzaman</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>13</td>
</tr>
<tr>
<td>Coates Lewellwyn</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>16</td>
</tr>
<tr>
<td>Cottrell Richard</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>65</td>
</tr>
<tr>
<td>Cox Ingrid</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>56</td>
</tr>
<tr>
<td>Crosthwaite Rob</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>37</td>
</tr>
<tr>
<td>Dar Nabeela</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>33</td>
</tr>
<tr>
<td>Dickinson Geoff</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>54</td>
</tr>
<tr>
<td>Dower Honey</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>58</td>
</tr>
<tr>
<td>Dwyer Zack</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Yellow</td>
<td>10</td>
</tr>
<tr>
<td>Dyer Marcus</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>17</td>
</tr>
<tr>
<td>Earle Jennifer</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>26</td>
</tr>
<tr>
<td>NAME</td>
<td>TIME</td>
<td>DATE</td>
<td>SECTION</td>
<td>POSTER NUMBER</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------</td>
<td>--------------------------</td>
<td>---------</td>
<td>---------------</td>
</tr>
<tr>
<td>Echevarria Emilio</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>11</td>
</tr>
<tr>
<td>Edwards Marie</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>4</td>
</tr>
<tr>
<td>Edwards Kate</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>22</td>
</tr>
<tr>
<td>Esmalifalak Hamidreza</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>46</td>
</tr>
<tr>
<td>Evans Liz</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>13</td>
</tr>
<tr>
<td>Ezegbe Vincent</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>3</td>
</tr>
<tr>
<td>Feng Zikai</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>6</td>
</tr>
<tr>
<td>Foster Catherine</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>31</td>
</tr>
<tr>
<td>Friebe Martin</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>29</td>
</tr>
<tr>
<td>Fuller Carley</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>20</td>
</tr>
<tr>
<td>Furness Cristian</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>13</td>
</tr>
<tr>
<td>Ganjalinia Atiyeah</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>39</td>
</tr>
<tr>
<td>Garton Roderick</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>26</td>
</tr>
<tr>
<td>Genovese Cristina</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Orange</td>
<td>11</td>
</tr>
<tr>
<td>George-Allen Sam</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>52</td>
</tr>
<tr>
<td>Gleeson Paige</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>23</td>
</tr>
<tr>
<td>Glor Cheryl</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>9</td>
</tr>
<tr>
<td>Grist Matthew</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>19</td>
</tr>
<tr>
<td>Gunn Matt</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>25</td>
</tr>
<tr>
<td>Haas Bianca</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Orange</td>
<td>13</td>
</tr>
<tr>
<td>Habibur Hasan Shah Mohammad</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>43</td>
</tr>
<tr>
<td>Haddon Joseph</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>39</td>
</tr>
<tr>
<td>Halbe Thomas</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>17</td>
</tr>
<tr>
<td>Halter Svenja</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Yellow</td>
<td>7</td>
</tr>
<tr>
<td>Hansen Angela</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Orange</td>
<td>10</td>
</tr>
<tr>
<td>Hemida Mohamed</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>3</td>
</tr>
<tr>
<td>Herath Manoja</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>48</td>
</tr>
<tr>
<td>Hewson Timothy</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>60</td>
</tr>
<tr>
<td>Hill Nicholas</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>26</td>
</tr>
<tr>
<td>Hillier Benjamin</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>17</td>
</tr>
<tr>
<td>Hindrum sonja</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>2</td>
</tr>
<tr>
<td>Ho Chau</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>11</td>
</tr>
<tr>
<td>Holloway Olivia</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>46</td>
</tr>
<tr>
<td>Hwang Jimin</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Yellow</td>
<td>12</td>
</tr>
<tr>
<td>Hyland Lucas</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>51</td>
</tr>
<tr>
<td>Ishaq Muhammad</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>1</td>
</tr>
<tr>
<td>Ishikawa Tetsuya</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>37</td>
</tr>
<tr>
<td>Islam Raisul</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>7</td>
</tr>
<tr>
<td>James Ivan</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>35</td>
</tr>
<tr>
<td>Ji Ruixuan</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>29</td>
</tr>
<tr>
<td>Johnson Kate</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>64</td>
</tr>
<tr>
<td>Jones Imogen</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Yellow</td>
<td>16</td>
</tr>
<tr>
<td>Jones Laurel</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>19</td>
</tr>
<tr>
<td>Joseph Dass Sabrina</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>35</td>
</tr>
<tr>
<td>Khaalel Isaa</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>33</td>
</tr>
<tr>
<td>Khan Mohammad</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>68</td>
</tr>
<tr>
<td>Kohl Amelia</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>47</td>
</tr>
<tr>
<td>Kok Zhen</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>10</td>
</tr>
<tr>
<td>Krisanski Sean</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>40</td>
</tr>
<tr>
<td>Kucina Talira</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>31</td>
</tr>
<tr>
<td>Latour Pauline</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>28</td>
</tr>
<tr>
<td>NAME</td>
<td>TIME</td>
<td>DATE</td>
<td>SECTION</td>
<td>POSTER NUMBER</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------</td>
<td>-----------------------</td>
<td>---------</td>
<td>---------------</td>
</tr>
<tr>
<td>Law Geoffrey</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>49</td>
</tr>
<tr>
<td>Le Duy</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>50</td>
</tr>
<tr>
<td>Lizarraga David</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>38</td>
</tr>
<tr>
<td>Lo Lara Marie</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Orange</td>
<td>15</td>
</tr>
<tr>
<td>Lubuulwa Kizito</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>8</td>
</tr>
<tr>
<td>Macdonald Cameron</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Yellow</td>
<td>3</td>
</tr>
<tr>
<td>Mekomere Reuben</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>8</td>
</tr>
<tr>
<td>Mardon Gabrielle</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Yellow</td>
<td>11</td>
</tr>
<tr>
<td>Marhamati Arman</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Orange</td>
<td>16</td>
</tr>
<tr>
<td>Mason Claire</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Yellow</td>
<td>4</td>
</tr>
<tr>
<td>Meijer Jan Jaap</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>40</td>
</tr>
<tr>
<td>Mekonnen Geberew Tulu</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>32</td>
</tr>
<tr>
<td>Melvin Jessica</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>16</td>
</tr>
<tr>
<td>Mohmmadalipourtofigh Aylin</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>34</td>
</tr>
<tr>
<td>Montalvo Mancheno Cristian</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>16</td>
</tr>
<tr>
<td>Moore Myles</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>19</td>
</tr>
<tr>
<td>Moran Frieda</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>55</td>
</tr>
<tr>
<td>Morgan Emily</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>1</td>
</tr>
<tr>
<td>Mostafavi Seyed Mojtaba</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>2</td>
</tr>
<tr>
<td>Mudwari Nabaraj</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>27</td>
</tr>
<tr>
<td>Murray Sandra</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>60</td>
</tr>
<tr>
<td>Nair Manoj</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>8</td>
</tr>
<tr>
<td>Nampak Haleh</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>10</td>
</tr>
<tr>
<td>Nascimento Sibele</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>7</td>
</tr>
<tr>
<td>Nath Shrutti</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>33</td>
</tr>
<tr>
<td>Nayak Minakshi</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>28</td>
</tr>
<tr>
<td>Nguyen Thi Da Thao</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>12</td>
</tr>
<tr>
<td>Nguyen Tran Minh</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Yellow</td>
<td>6</td>
</tr>
<tr>
<td>Njoku Chidiamara</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>42</td>
</tr>
<tr>
<td>Nowruz Mohsen</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>14</td>
</tr>
<tr>
<td>Obi Ifeoma</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Yellow</td>
<td>14</td>
</tr>
<tr>
<td>Odayemi Olumide</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Yellow</td>
<td>5</td>
</tr>
<tr>
<td>Olaoye Toba</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>7</td>
</tr>
<tr>
<td>Ooi Chun Kit</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>5</td>
</tr>
<tr>
<td>Page Simone</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>4</td>
</tr>
<tr>
<td>Pan Gongbu</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>53</td>
</tr>
<tr>
<td>Pandey Pratikshya</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>1</td>
</tr>
<tr>
<td>Park Chanjoo</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>40</td>
</tr>
<tr>
<td>Perez Suarez Thalia</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>18</td>
</tr>
<tr>
<td>Potts Douglas</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>14</td>
</tr>
<tr>
<td>Ramirez Mauricio</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>21</td>
</tr>
<tr>
<td>Ranasinghe Ranmali</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>23</td>
</tr>
<tr>
<td>Randall Nick</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>28</td>
</tr>
<tr>
<td>Raza Ali</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>41</td>
</tr>
<tr>
<td>Razmi Komeil</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>67</td>
</tr>
<tr>
<td>Reading Andrew</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>39</td>
</tr>
<tr>
<td>Rehman Sabah</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>22</td>
</tr>
<tr>
<td>Ridley Jeff</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>42</td>
</tr>
<tr>
<td>NAME</td>
<td>TIME</td>
<td>DATE</td>
<td>SECTION</td>
<td>POSTER NUMBER</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------</td>
<td>------------------------</td>
<td>---------</td>
<td>---------------</td>
</tr>
<tr>
<td>Rigby Alex</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>5</td>
</tr>
<tr>
<td>Robertson John</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>50</td>
</tr>
<tr>
<td>Robinson Duncan</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>20</td>
</tr>
<tr>
<td>Rocha Manuel</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>20</td>
</tr>
<tr>
<td>Ross Angela</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>5</td>
</tr>
<tr>
<td>Rubenach Andy</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>24</td>
</tr>
<tr>
<td>Russell Allanna</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Orange</td>
<td>14</td>
</tr>
<tr>
<td>Sajnani Karishma</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>49</td>
</tr>
<tr>
<td>Salarpour Simin</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>18</td>
</tr>
<tr>
<td>Sardar Abdullah</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>34</td>
</tr>
<tr>
<td>Scherelis Constantin</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>30</td>
</tr>
<tr>
<td>Schofield Lydia</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>38</td>
</tr>
<tr>
<td>Scomparin Cyril</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>27</td>
</tr>
<tr>
<td>Seneviratne Inoka Upul</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>47</td>
</tr>
<tr>
<td>Sengupta Shruti</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>59</td>
</tr>
<tr>
<td>Serra Goncalves Catarina</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>20</td>
</tr>
<tr>
<td>Shafiq Asma</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>34</td>
</tr>
<tr>
<td>Shah Anuj</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>31</td>
</tr>
<tr>
<td>Shahzad Babar</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>29</td>
</tr>
<tr>
<td>Shakourloo Ali</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>1</td>
</tr>
<tr>
<td>Shastri Sonia</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>44</td>
</tr>
<tr>
<td>Shepherd John</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Yellow</td>
<td>9</td>
</tr>
<tr>
<td>Skrastins Elga</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>36</td>
</tr>
<tr>
<td>Slinger Joel</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>7</td>
</tr>
<tr>
<td>Smith Abigail</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>4</td>
</tr>
<tr>
<td>Smyk Emily</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>57</td>
</tr>
<tr>
<td>Sutton Laura</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>6</td>
</tr>
<tr>
<td>Swann Olivia</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>14</td>
</tr>
<tr>
<td>Sward Darryn</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>2</td>
</tr>
<tr>
<td>Swarts Kevin</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>9</td>
</tr>
<tr>
<td>Tan Bi Zheng</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>66</td>
</tr>
<tr>
<td>Tanweer Mariam</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>35</td>
</tr>
<tr>
<td>Tesch Leigh</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>21</td>
</tr>
<tr>
<td>Thanabalasingam Dharushana</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>53</td>
</tr>
<tr>
<td>Thapa Deependra Kaji</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>9</td>
</tr>
<tr>
<td>Thoars Cassandra</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>48</td>
</tr>
<tr>
<td>Thomas Katy</td>
<td>12pm</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>19</td>
</tr>
<tr>
<td>Tierney Caylee</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>61</td>
</tr>
<tr>
<td>Toettenborg Alberte</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>30</td>
</tr>
<tr>
<td>Udy Danielle</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>59</td>
</tr>
<tr>
<td>Ullah Sami</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>58</td>
</tr>
<tr>
<td>Vandorou Aikaterini</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>10</td>
</tr>
<tr>
<td>Vijaya Kumar Induni</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>11</td>
</tr>
<tr>
<td>Vlcek Samantha</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>2</td>
</tr>
<tr>
<td>Wadah Jochabed</td>
<td>1pm</td>
<td>Thursday, September 6</td>
<td>Yellow</td>
<td>2</td>
</tr>
<tr>
<td>Walker Bernard</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>12</td>
</tr>
<tr>
<td>Wan Fuzhen</td>
<td>10am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>55</td>
</tr>
<tr>
<td>Wang Jiadong</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>29</td>
</tr>
<tr>
<td>Westwater Jason</td>
<td>4pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>28</td>
</tr>
<tr>
<td>Williams Natasha</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Yellow</td>
<td>13</td>
</tr>
<tr>
<td>Williams Sarah</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Pink</td>
<td>3</td>
</tr>
<tr>
<td>NAME</td>
<td>TIME</td>
<td>DATE</td>
<td>SECTION</td>
<td>POSTER NUMBER</td>
</tr>
<tr>
<td>--------------</td>
<td>------</td>
<td>---------------------------</td>
<td>---------</td>
<td>---------------</td>
</tr>
<tr>
<td>Wilson Erin</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>15</td>
</tr>
<tr>
<td>Wong Lincoln</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>69</td>
</tr>
<tr>
<td>Woods Briannyn</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>26</td>
</tr>
<tr>
<td>Xia Qing</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Blue</td>
<td>51</td>
</tr>
<tr>
<td>Xu Yiyi</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>30</td>
</tr>
<tr>
<td>Yahaghi Javad</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>36</td>
</tr>
<tr>
<td>Yang Wenli</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Orange</td>
<td>9</td>
</tr>
<tr>
<td>Zhang Qinhan</td>
<td>2pm</td>
<td>Thursday, September 6</td>
<td>Orange</td>
<td>24</td>
</tr>
<tr>
<td>Zhao Ting</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Blue</td>
<td>54</td>
</tr>
<tr>
<td>Zhao Duran</td>
<td>9am</td>
<td>Friday, September 7</td>
<td>Green</td>
<td>21</td>
</tr>
<tr>
<td>Zhou Jingen</td>
<td>3pm</td>
<td>Thursday, September 6</td>
<td>Green</td>
<td>31</td>
</tr>
<tr>
<td>Zhou Boye</td>
<td>11am</td>
<td>Friday, September 7</td>
<td>Pink</td>
<td>30</td>
</tr>
</tbody>
</table>
**Abdu, Nizam - Tasmanian School of Business and Economics**

**INVESTIGATION OF THE THREE PILLARS UNDERPINNING LIVELIHOODS OF THE BORANA PASTORAL COMMUNITY IN SOUTHERN ETHIOPIA**

The Borana pastoral community is based on cattle husbandry for their livelihood and located extreme southern part of Ethiopia. The community has traditional resources management, conflict resolution and drought coping strategies. The livelihood pillars in Borana are grazing land, water resources and livestock. The pastoralists manage their rangeland resources by creating balance between the resources and their livestock. Grazing land provides animal feed. Availability of water and its location defines pattern of the livestock movement. The traditional management of livestock helps Borana to adapt to variable climate. However, management and utilization of these three pillars have changed over time due to climate change and political factors. Bush encroachment, overgrazing, expansion of cropland and recurrent drought degraded the grazing areas. Pond construction in seasonal grazing areas aggravated the degradation. Similarly, livestock movement is restricted by private farmlands. Therefore, the objectives of the study are [1] To identify potential options to restore the grazing areas. [2] To estimate willingness to pay for construction and maintenance of pump on natural wells. [3]. To assess the traditional livestock management and its constraints. Best-worst scaling and choice experiment research methods will be applied. The outcome will be utilized to design best-bet resource policy options.

**Supervisors**

D. Hatton-MacDonald, C. Levitt

---

**Abera, Aregawi - College of Science and Engineering**

**DECISION SUPPORT MODEL FOR PATIENT ADMISSION SCHEDULING PROBLEM WITH RANDOM ARRIVALS**

Patient admission scheduling problem arises when patients arriving to the hospital system need to be allocated to beds in an optimal manner, taking into account the availability of beds and the needs of patients. We consider this problem in a dynamic environment, in which at the start of each day, we record new information about the registered patients, newly arrived patients, and future arrivals, and then determine optimal assignment of patients to rooms in order to minimize costs. We develop a probabilistic mathematical model using mixed integer programming, in which we use variables to define key parameters, hard constraints to define properties that must be met, and soft constraints to define desirable properties. The objective function includes the cost of assigning patients to rooms, the cost of transfers between the wards, as well as penalties for the violation of gender policy, overcrowding and admission delay. We assume that the length of stay (LoS) of each patient follows some probability distribution, which depends on the patient type. We aim to develop numerical examples of our model and compare it with the existing literature. We will use simulated annealing or other suitable metaheuristic techniques to find an optimal solution to the problem.

**Supervisors**

M. O'Reilly, B. Holland, M. Fackrell
Acosta, Mayeli - College of Arts, Law and Education

ENHANCING TEACHERS’ ABILITY TO DESIGN STEM LESSONS

The Ministry of Education of Colombia has focused its attention on promoting STEM education (Botero, 2017; Tiempo, 2016); however, the adoption of this approach has become challenging for primary school teachers. For example, they find difficult to integrate knowledge from Science, Technology, Engineering, and Mathematics. From this perspective, I intend to design and implement a STEM professional development that would enhance teachers’ abilities to design STEM lessons. This professional development will be conducted with six primary teachers from a public school located in the department of Cundinamarca (Colombia). This research will adopt an Action Research approach and data will be collected through questionnaires, interviews, lesson plan, and observations. I expect to design, implement, and evaluate STEM professional development for Primary school teachers and support them to design activities from an integrated perspective.

Supervisors
S. Fraser, G. Oates

Adcock, Leanne - College of Arts, Law and Education

AN ALTERNATIVE INTERPRETATION OF THE NOVELS OF HEINRICH BÖLL

Nobel laureate Heinrich Böll stated that when writing his novels, the only two themes that interested him were love and religion. But this statement is at odds with the social criticism he expressed in his works, which earned him the reputation of “the Conscience of a Nation”. Critics identify a diversity of themes as prominent when they review Böll’s narratives on an individual basis. When viewing the works as an oeuvre, scholars frequently cite Böll’s antagonism toward institutions, particularly the State, army and Church, as a prominent theme. In my thesis I offer an alternative theme, which is prominent when the narratives are examined both as individual novels and as a body of works. This theme is cultural violence. Cultural violence was defined by Johan Galtung. It occurs when people acting on their own initiative or as representatives of an institution, justify the violence they are exerting through an aspect of culture, such as religious ideology. I argue that it was cultural violence that Böll was railing against in his socially critical narratives. He wasn’t trying to change the institutions but the legitimisation of institutional violence - the cultural violence, which thereby becomes the thematic common denominator in his novels.

Supervisors
B. Badger, J. Knit
Adel Atia Abuzeid, Mostafa - College of Science and Engineering

PORTABLE ANALYTICAL SYSTEMS FOR QUALITY CONTROL AND MONITORING IN PHARMACEUTICAL MANUFACTURING FACILITIES

It is typical to execute regular analytical monitoring of equipment cleaning operations that are carried out during the manufacture of active pharmaceutical ingredients (API) either in-situ by spectroscopic tools or using a separation-based technique that have greater sensitivity but done in a laboratory and it is also time consuming and labour intensive. The potential for capillary electrophoresis (CE) to provide rapid on-line quantitation of residues on surfaces via direct analysis of swabs is attractive for pharmaceutical manufacturing equipment cleaning verification. In this study, the development of a portable or at-line CE system and method to provide acceptable quantitation of active pharmaceutical ingredients and cleaning agents is described. A range of 1-100 ppm was reached for a wide range of API. The results of this study effectively demonstrate the capability of CE to serve as an at-line quantitative analytical method. Further studies will be held to develop a miniaturized separation system that can be interfaced to a reactor, or function as a walk up to station, in a reactor hall.

Supervisors

M. Breadmore, J. Quirino, M. Zhang

Adulcikas, John - College of Health and Medicine

ENDOPLASMIC RETICULUM STRESS’S IMPACT ON THE INSULIN PATHWAY THROUGH PERTURBATION OF ZIP7 EXPRESSION

Type 2 diabetes mellitus (T2DM) is characterized by dysfunctional glucose metabolism in the form of insulin resistance (IR), a disorder associated with chronic endoplasmic reticulum (ER) stress. A key nutrient that plays a significant role in ER stress and subsequent IR is zinc. This metal ion can act as an insulin mimetic and activate intracellular signalling pathways that are amenable to glucose homeostasis. However, it is not clear on the association of ER stress and zinc status in IR. In this context, the main source of cytosolic zinc originates from the ER through a process called a ‘zinc wave’. A critical ‘gate-keeper’ of zinc flux into the cytosol is the ER-specific zinc transporter, ZIP7. Moreover, the levels of ZIP7 in cells are affected by ER stress. This transporter initiates the zinc wave and subsequent zinc activation of cellular signalling events. Skeletal muscle is of significance in IR and T2DM as it is the major peripheral tissue involved in glucose uptake. Accordingly, it will be critical to understand the role of ZIP7 and ER stress in this tissue system to identify potential mechanisms that are amenable to therapy in the treatment of IR and T2DM.

Supervisors

S. Myers, S. Sohal
**Ahmad, Tauseef - College of Health and Medicine**

**ANTI-INFLAMMATORY AND ANTI-CANCER EFFECTS OF FUCOIDAN**

Colorectal cancer (CRC) is the second highest cause of cancer deaths in Australia. It is well established that ulcerative colitis (UC) increases the risk of CRC. Current treatments for UC are not immune from side effects and recurrence of symptomatic episodes. For these reasons, better pharmacological interventions are now needed. Recent findings have highlighted the therapeutic importance of fucoidans, a class of sulfated polysaccharides extracted from seaweeds, for the effective management of UC. However, safety and mechanism of actions of fucoidans under chronic administration need to be elucidated. My project aims to identify the underlying cellular mechanisms and signaling pathways through which fucoidans might elicit anti-inflammatory and anti-cancer proprieties for the cure of UC and CRC. Both in vitro and in vivo studies will be carried out to identify the potential mechanism of action of fucoidans. The final objective of my project is to develop together with the Chemistry department here at UTAS, new fucoidans-derived analogues for which IP protection will be sought.

**Supervisors**

R. Eri, V. Caruso, H. Fitton, N. Guven

**Aiyede, Mimievishiofuo - College of Health and Medicine**

**INVESTIGATING THE THERAPEUTIC EFFICACY OF DP4 FOLLOWING TRAUMATIC BRAIN INJURY (TBI)**

Neuroinflammation is a major secondary injury mechanism associated with traumatic brain injury (TBI). It involves a cascade of complex events which contribute to the release of inflammatory mediators that could be beneficial or detrimental to recovery. There are currently no effective treatments available for TBI and this has instigated the need for new therapies. Dp4 is a derivative of the anticoagulant enoxaparin, which is a low molecular weight heparin with an anti-inflammatory property. Dp4 has also shown robust anti-inflammatory activities in in-vitro and in-vivo models of inflammation, but unlike enoxaparin, it does not have a risk of bleeding. Therefore, in this study, we aim to investigate the potential anti-inflammatory effects of Dp4 following experimental TBI. Mice were subjected to controlled cortical impact injury model of moderate TBI. Enoxaparin, saline (vehicle), low and high doses of Dp4 were administered either through continuous subcutaneous infusion or by multiple intraperitoneal bolus injections. Inflammatory cytokines were measured at 6 hours post-TBI using multiplex bead array assay. At 3 days post-TBI, cellular inflammation was assessed following immunohistochemical analysis to label microglia and astrocytes. Thereafter, ImageSurf program was used to quantitatively analyse all images. The results will determine whether Dp4 can attenuate early inflammatory response post-TBI.

**Supervisors**

N. Bye, N. Guven
Alharthi, Meshari - College of Arts, Law and Education

SECOND-LANGUAGE LEARNERS' PERCEPTIONS AND PRACTICES OF USING SOCIAL-MEDIA PLATFORMS FOR VOCABULARY ACQUISITION

Social media platforms are the most widely used websites by Saudis. Saudi Arabia has a high level of internet use, with the number of active users reaching about 30 million by the first quarter of 2018. This equates to approximately 91% of the population. Furthermore, around 75% of the population have an active social media account. However, research is limited in regard to the practices and perceptions of those using these platforms for the purpose of vocabulary acquisition. Therefore, this study will investigate the ways in which adult Saudi students utilize different social media platforms to learn vocabulary and will assess the general practices and perceptions of these social media platforms. The research will employ a sequential explanatory research design by incorporating a questionnaire and interviews for data collection and analysis. Quantitative data will be analyzed using computer software, such as SPSS, and qualitative data will be analyzed by employing thematic analysis. It is hoped that the results of this study will contribute to knowledge in the field of English language learning and more specifically in the Saudi context.

Supervisors
A. Bown, D. Pullen

Alqarni, Ahmed - College of Arts, Law and Education

ATTITUDES OF SECOND LANGUAGE LEARNERS OF ARABIC AND THEIR TEACHERS TO MOBILE ASSISTED LANGUAGE LEARNING (MALL)

Smartphones and tablets with ever faster cellular connectivity and increased Wi-Fi capabilities have ushered in a new way of learning known as Mobile Learning (m-learning). Many studies have confirmed the benefits of integrating these technologies into language learning. However, there is a lack of research into both learners’ and teachers’ attitudes to incorporating such technologies into the learning of Arabic as a second language (L2). This study aims to provide an overview of how L2 learners of Arabic and their teachers in Saudi Arabia currently use their mobile devices (MDs) to learn and teach Arabic. This will include who is using MDs, the types of MDs being used, how the devices are currently being used, and the perceived benefits and obstacles in the learning and teaching of Arabic.

Supervisors
A. Bown, J. Masters, D. Pullen
Ammitzboll, Hans - College of Science and Engineering

EFFECTS OF LOGGING AND BURNING SEVERITY ON THE COMPOSITION AND SUCCESSION OF SOIL MICROBIAL COMMUNITIES

Soil microbes are essential for ecosystem functions such as soil formation, the decomposition of organic matter and the cycling of important nutrients for plant growth. Soil microbes can form beneficial relationships with plants, increasing a plants ability to uptake limiting nutrients, such as nitrogen and phosphorous, as well as pathogenic relationships, inhibiting plant growth and establishment. Although their ecological importance has been established, our understanding of how soil microbial communities recover structurally and functionally from environmental disturbance is still a developing field. In the wet eucalypt production forests of Victoria and Tasmania, large areas are clear-felled and submitted to high-intensity regeneration burns, which favours eucalypt regeneration, but creates a mosaic of logging and burning severity. Prior research has shown strong impacts of these disturbance severities on soil chemistry and the regeneration of the overlying plant communities. This project aims to build on this research by investigating the impacts of logging and burning severity on the structure and function of soil microbial communities and track their ecological succession over time post-disturbance. These aims will be addressed using a combination of community fingerprinting, next-generation sequencing, soil chemistry analyses and vegetation analyses.

Supervisors
G. Jordan, S. Baker, A. Bisset, M. Hunt

Angelini, Marion - Institute for Marine and Antarctic Studies

ASSESSMENT OF INDIRECT THREATS TO THE ENDANGERED MAUGEAN SKATE: ANALYSIS OF THE IMPACT OF LOW DISSOLVED OXYGEN ON ITS PREY IN MACQUARIE HARBOUR

Understanding the threats facing endemic species is crucial to their survival: local extinction could be synonymous with global extinction. The Maugean skate, Zaeraja maugeana, is a restricted endangered species endemic to Macquarie Harbour (MH), although previously observed in Bathurst Harbour, in Western Tasmania. An increase in aquaculture over recent decades in MH has been linked to a degradation of benthic conditions and declines in dissolved oxygen (DO). Until now, studies have focused on the direct impacts of decreasing DO on this skate; in this study, we focus on the indirect threat: the response of their prey to the degrading health of the environment. As this skate has a specialised diet, any threats to these prey species could increase the extinction risk of the Maugean skate species. Firstly, field assessment of abundance/distribution of two key skate prey species, the crab Paragrapsus gaimardii and the shrimp Palaemon spp., in conjunction with an assessment of the health of the benthic assemblages where they are sampled, will be examined. Then, respirometry, blood chemistry and behaviour analysis of these prey species in response to low DO conditions will provide information on how the skate’s prey distribution/abundance may change in response to the changing environment in MH.

Supervisors
J. Semmens, Q. Fitzgibbon, J. Ross, K. Stehfest
Ansari, Misha - College of Health and Medicine

EFFECTS OF EXERCISE IN CONTROLLING BLOOD GLUCOSE IN TYPE II DIABETES MELLITUS PATIENTS

The effects of physical exercise on Diabetes Mellitus Type II (T2DM) are well documented, and physical exercise is one of the three cornerstones in the treatment of diabetes, along with diet and medication. Several reviews and meta-analyses report that increased physical exercise produce a significant improvement in glucose control in people with T2DM. The aim of this randomized controlled trial is to compare the effects of eccentric versus concentric exercise on blood glucose level, functional physical fitness, and blood lipid profiles of T2DM. The study will be conducted at Exercise clinic, School of Health Sciences, UTAS. 26 participants will be recruited. Patients will randomly be divided into 13 in each group. One group will perform downhill treadmill walking and other group will perform uphill treadmill walking, twice a week for 12 weeks with 2-3 days between sessions. Outcome measures will be assessed at baseline and after the completion of the 12-week exercise programme. The primary outcome measure of this study will be insulin sensitivity (HBA1c) and various other secondary outcome measures like blood pressure, arterial stiffness, biomarkers (irisin, IL-6, CK), muscle strength and functional physical fitness will be accessed. Data will be accessed through STATA statistical software (STATA SE v15).

Supervisors

A. Williams, S. Myers

Arce Gonzalez, Fernando - Institute for Marine and Antarctic Studies

RECONCILIATING TWO DIMENSION STATE-SPACE MODELLING OF BEHAVIOUR WITH THREE DIMENSIONAL FORAGERS

State-space modelling is one of the most advanced statistical tools available to infer behavior from movement data. Alas, its validity as an inference tool has been questioned, at least for marine organisms, who live in a three dimensional landscape. By comparing the outcome of state modelling of movement data of southern elephant seals from Macquarie Island with the changes of their body condition, based on a recently developed approach to quantify changes of buoyancy of the seals, I present some of the strengths and weakness of the state-space modelling. Largest, positive changes of body condition tend to occur when the animals exhibit ‘foraging’ behavior, as determined by the state-space models. On the other side, animals may still forage during the ‘transit’ periods, but the outcome tend to be negative to the body condition.

Supervisors

S. Bestley, C. McMahon, M. Hindell, S. Wotherspoon
ABSTRACTS OF POSTER PRESENTER

Arnott, Hayden - College of Health and Medicine

CONTROLLING NEURONAL GROWTH USING LIGHT IN ZEBRAFISH

The brain is an intricate network of 86 billion neurons organised into many different interconnecting circuits. Autism spectrum disorder and spinal cord injury (SCI) are disorders with altered neuronal connectivity. SCI is a significant health issue in Australia with approximately 400 new cases every year. Currently there are minimal treatments available for SCI due to the inability of neurons to repair themselves following injury. Neuronal circuits are initially connected by a process called axon guidance which is regulated by the intracellular messenger calcium. Our lab has found that the calcium regulator STIM1 is crucial for axon guidance both in vitro and in vivo. My project will use light activatable molecules, including a light activatable STIM1, in an aim to manipulate axon guidance in zebrafish during development and following axonal injury. These experiments will provide proof of principle that we can manipulate neuronal growth following injury in a hope to use this technique to treat SCI and associated disorders.

Supervisors
L. Foa, R. Gasperini, J. Lin

Atto, Brianna - College of Health and Medicine

EXPLOITING THE STRUGGLE FOR HAEM: A NEW RESPIRATORY PROBIOTIC CANDIDATE?

Nontypeable Haemophilus influenzae (NTHi) is a leading causative organism of opportunistic upper and lower respiratory tract infections, including otitis media, and exacerbations of chronic obstructive pulmonary disease worldwide. The rapid development of antibiotic resistance has complicated treatment, with infections frequently proving refractory to first and second line antibiotics. Development of preventative vaccination strategies has also proven unsuccessful. An alternative approach may be probiotic therapy that prevents the prerequisite step of NTHi infection, nasopharyngeal colonisation. Newly discovered strains of the closely related, Haemophilus haemolyticus (Hh) present a promising probiotic candidate. These strains of Hh not only share the nasopharyngeal niche, but also produce a novel inhibitory substance (NIS) that restricts the growth of NTHi in vitro. Ongoing research indicates the inhibitory effect of this NIS is due to its capacity to bind haem and limit the organism’s access to this essential growth factor. Disruption of haem acquisition has previously been shown to significantly dampen the pathogenic capabilities of NTHi. This research aims to investigate the therapeutic potential of NIS-producing strains of Hh in the prevention of NTHi infections through both in vitro and in vivo investigations.

Supervisors
S. Tristram, D. Kunde
Auguste, Christelle - Australian Maritime College

INVESTIGATION OF SEDIMENT TRANSPORT PROCESSES NEAR TIDAL STREAM DEVICES IN AUSTRALIA

Tidal stream turbines are one of the most advanced marine renewable energy technologies. Nonetheless, the application of the technology still faces considerable challenges, as uncertainties exist about the potential impacts of these devices on the marine environment. Understanding of local sediment dynamics is an important element for environment impact and site assessments. However, full-scale environment surveys of tidal farms are sparse and limited. One alternative to study the potential impacts on the sediment transport is numerical modelling. Nevertheless, validation of these models remains challenging with the difficulty to acquire the necessary sediment data from these high-energy sites. To address these challenges, hydrodynamic and sediment transport models are being developed using MIKE3 and MIKE21. The models are here applied to the Banks Strait, Tasmania, a promising tidal energy site. Special attention is given to the model calibration and validation methods using a varied set of in-situ data collected during the 2018 AUSTEn campaign. Once the validation is completed, the impacts and interactions of tidal stream devices with the environment using different array scenarios will be investigated. Findings from this research will provide novel insights to assist tidal project developers in selecting the best methods to perform tidal turbine environmental assessments.

Supervisors

J. Nader, P. Marsh, R. Cossu

Balasso, Michelle - College of Science and Engineering

ALIGNMENT OF RESOURCES FOR HIGHER QUALITY PRODUCTION: CHANGE AND CHALLENGES IN ALTERNATIVE USES OF FIBRE-GROWN E. NITENS PLANTATIONS

The characterisation of a plantation resource has the potential to depict regional differences in wood quality traits, and the application of segregation systems can be useful in sorting material into different product streams. Native forests resource supplies are declining whilst global demand for forest products is increasing. One of the largest global timber supply is from fibre-managed Eucalyptus plantations. This resource, however, has notably different timber quality and properties to traditional native resources making its use in contemporary wood products challenging. Improved segregation based on a better understanding of log characteristics at the time of harvest could help supply appropriate timber resources to markets and products. The variability in growing environments influence greatly the quality of trees, hence characterising the plantation resource might outline regional wood quality differences. Processes of sorting raw forest material according to its quality traits could improve the efficiency of the product chain, as the resource will be directed to the ideal processing stream. Significant benefits may derive then from predicting structural properties of the timber and from the evaluation of their impacts on the final products.

Supervisors

M. Hunt, G. Nolan, N. Kotlarewski, A. Jacobs
Baldry, Kimberlee - Institute for Marine and Antarctic Studies

CONSTRAINING PRIMARY PRODUCTION IN THE SOUTHERN OCEAN: IS IT A SUPERFICIAL PROBLEM?

The primary production of the oceans is important to constrain when studying global climate and human emissions of carbon dioxide, as it facilitates the removal of carbon dioxide from the atmosphere into the ocean, via photosynthesis, where it can be stored as organic carbon for long time periods. Phytoplankton are microscopic organisms that are responsible for most of the primary production in the world’s oceans, particularly in deep areas of the ocean that are far away from land. Chlorophyll is a green pigment contained in all phytoplankton that facilitates photosynthesis, and gives the organism a green colour, also changing the appearance of the water it lives in. Ocean colour measured from satellites has been used as a simple way to measure primary production over large areas. However, satellites can only see a shallow surface layer of the ocean (about 50m) and it is known that phytoplankton can photosynthesise much deeper. Here I will present a preliminary answer to the question “Is constraining primary production in the Southern Ocean a superficial problem?” by analysing a large number of fluorescence profiles collected from Bio-Argo floats that measure chlorophyll at depth, and assessing the influence of shape on primary production in this region.

Supervisors

P. Boyd, N. Hill, J. Llort

Banks, Robin - College of Arts, Law and Education

PUTTING UNDERSTANDING OF PREJUDICE INTO DISCRIMINATION LAW

The law is a mechanism of formal societal groupings such as countries and states to regulate behaviour to ensure the public good. Through laws, governments seek to identify and prevent behaviour that is harmful to people and society more broadly. With this in mind, this study seeks to consider how enhanced understandings of the causes and effects of prejudice could improve the scope and application of discrimination law.

Supervisors

M. Otlowski, W. Louis
Bashyam, Prashanth - College of Science and Engineering

FIELD DEPLOYABLE INSTRUMENT TO DETECT PERFLUORINATED COMPOUNDS

Perfluoroalkyl and Polyfluoroalkyl substances or Perfluorinated Compounds (PFAS or PFCS) are an emerging contaminant group which have been drawn attention globally from past two decades. These contaminants are persistent, bio accumulative, toxic and can be potential cancer promoters in living beings. These are commercially produced since 1950’s for use in synthesis of fluorinated polymers, aqueous firefighting foams (AFFF) household products and cosmetics. Due to their unusual stability, chemical resistance and biochemical degradation has led to proliferation globally without any anthropogenic activity. It is a serious analytical challenge to determine the concentration in trace levels because of presence of a large variety of perfluorinated compounds in environmental water samples. Liquid chromatography (LC) hyphenated to triple quadrupole Mass spectrometry (MS) is the most common analytical tool used in analyzing Perfluorinated compounds in environmental matrices. This approach costs time, more money and can lead to sample contamination and degradation during storage. There is a need to develop a robust field deployable or portable analyser to enable the “triage” of contaminated sites and remedial solutions to work collaboratively to evaluate the efficacy in real time. Recent studies proved Capillary Electrophoresis (CE) with universal detection would be a way to adapt in detection of Perfluorinated Compounds.

Supervisors

M. Breadmore, M. Zhang

Batt, Christopher - College of Arts, Law and Education

THE IMPACT OF FEDERALISM ON AUSTRALIAN HOUSING POLICY

Each level of the Australian Government has a role in Australian housing policy. At a Commonwealth level policy comprises a key part of national economic framework. The national environment is characterised rising house prices, declining affordability and growing consumer debt. The key policy elements are immigration, fiscal and taxation policy, including negative gearing and capital gains tax. There is also a predominant discourse around housing that makes home ownership a key national goal and a measure of success while renters are seen as less successful and are often marginalised. State, territory and local governments control areas such as residential tenancies, building laws, land transfer and planning. States and territories also impose stamp duties on property transfers and levy land taxes. Social housing which comprises about 4 per cent of the total national housing stock is largely funded through Commonwealth grants and loans to the states which implement social housing programs. As Australia’s fiscal balance favours the Commonwealth, there is an imbalance of power that disadvantages the states and territories in negotiations around social housing. This imbalance of power limits the options that are available to the states and territories and restricts their ability to address social housing issues.

Supervisors

R. Ecclestone, K. Jacobs
ABSTRACTS OF POSTER PRESENTER

Battula, Sudheer Kumar - College of Science and Engineering

EFFICIENT RESOURCE MANAGEMENT TECHNIQUES TO IMPROVE THE PERFORMANCE OF TIME-SENSITIVE APPLICATIONS IN FOG ENVIRONMENTS

Internet of Things (IoT) devices are growing rapidly due to advancements in sensor and wireless technology. Providing efficient resource management services in IoT infrastructure has become a hugely complex task. In Fog computing, failure of resources and sudden spikes of users service request could happen. This should not affect the performance of the system. Hence, resource monitoring and scalability of the system plays a vital role in improving the performance of time-sensitive applications in Fog computing environments. Many researchers have proposed different techniques for advanced services like scheduling, fault tolerance and migration by assuming that services are available. On the other hand, few researchers have considered traditional cloud and distributed computing approaches, which may not be suitable due to the limited resources, in a Fog environment. To tackle these problems, this research proposes resource management techniques to improve the performance of Fog-based applications. The evaluation of our proposed methods are implemented in the Fog computing system with time-sensitive application of transportation use case.

Supervisors
J. Montgomery, S. Garg, B. Kang

Bazooband, Azam - Menzies Institute for Medical Research

COMMUNITY-BASED ART: INCORPORATING THE INPUT OF PEOPLE LIVING WITH DEMENTIA

Currently around 70% of people with a diagnosis of dementia live in their community. For this group of people and their family members, maintaining connection to community is important. One way they might do this is to engage with participatory community arts programmes that have been shown to contribute to overall health and wellbeing. The purpose of this presentation is to present a research proposal that aims to explore how all areas of participatory community arts programmes, from planning to evaluation, might take into account the rights, needs and identity of participants with dementia. The proposed study can serve as a way to learn about unique aspects of participatory arts and to gain insights into participants’ perspectives, and experiences of their interactions with community-based art activities. Participants in the study will be older people with dementia, their carers’ and those who are involved in the delivery of community arts. Semi-structured interviews will explore current experiences of participation in community-based art activities, and will discuss expectations together with enablers and barriers to engagement of people with dementia in all aspects of community arts programs.

Supervisors
H. Courtney Pratt, K.Doherty
Belhaj, Monika - Tasmanian School of Business and Economics

UNPACKING THE HOSPITALITY PRODUCT: A "GREENFIELD" CASE STUDY

Within the general area of marketing and consumer behaviour the research-project will be analysing the relative significance of various aspects of the delivered hospitality product, within the context of a new, 'greenfield' hotel development - the recently opened MACq 01 Hotel - in Hobart, Tasmania. The MACq 01 hotel is a unique tourism offering, as this hotel is the only storytelling hotel in Tasmania and aims to become an immersive storytelling experience, as each of hotel’s 114 rooms reflects one of five Tasmanian character traits through design and story. Thus, there is a need to gain deeper insight on how tourists perceive the story, how the story is linked to the tourist’s (extraordinary) experience and satisfaction of hospitality and what is the link between the servicescapes (physical environment), storytelling, and marketing when focused on hospitality concept development. The overall aim of this research-project is to investigate the perceived significance of various aspects of the delivered hospitality product, such as: cultural heritage interpretation, service quality, sense of place, localisation of food and beverage, etc. Within a qualitative framework, field visits (observations), in-depth interviews and secondary sources, alongside a single-case study approach with the exploratory and interpretivist positioning will be considered.

Supervisors
K. Lehman, A. Hardy, D. Hanna

Bhalli, Mughees - Tasmanian School of Business and Economics

FINANCIAL INCLUSION AND FOREIGN BANKS

Policy makers and researchers at national and global level have accepted the importance of financial inclusion as a tool for economic growth and development. Financial inclusion is multi-dimensional in nature and is defined as an easy access, availability and usage of financial services by the people of an economy. Previously financial inclusion is measured and assessed by utilising individual indicators that only captures one aspect or dimension of financial inclusion. These uni-dimensional indicators reported in literature however, do not represent the true level of financial inclusion. In this study, we utilise the index based approach that captures the various dimensions of financial inclusion to see how foreign banks entry contributes in increasing the level of financial inclusion in developing and emerging economies. Initial results indicate that the entry of foreign bank in these economies, increases the level of financial inclusion significantly particularly in penetration dimension. It also changes the competitive structure of the banking system in these 62 developing and emerging economies. Other macro indicators such as legal rights, education and availability of credit information also play an important role in enhancing the level of financial inclusion across the developing world.

Supervisors
M. Raghvan, J. Vespignani
**Borchers, Nicolas - Menzies Institute for Medical Research**

HEALTH IMPACTS ATTRIBUTABLE TO 2017 MEGAFIRE IN CHILE

During summer of 2017, Chile experienced some of the most intense fire events on record. More than 500 thousand hectares were burnt and 11 direct fatalities were confirmed. Multiple fires burnt during a period of 15 days where forestry plantations, small agricultural holdings and rural villages were destroyed. During this period, PM emissions from the fires considerably affected air quality of several cities from the central zone of Chile. More than 9 million people were exposed to an average increase of fine particulate matter (PM2.5) of 26.8 ug/m³ about historical mean concentrations during 16 days, causing an estimated 76 premature deaths and 209 additional hospital admissions for respiratory and cardiovascular conditions. Results show the need to incorporate public health impacts when assessing national forest policies in the chilean context.

**Supervisors**

F. Johnston, D. Bowman, A. Palmer

---

**Bradshaw, Stephen - Institute for Marine and Antarctic Studies**

ENVIRONMENTAL DRIVERS OF SOUTHERN ROCK LOBSTER PRODUCTIVITY

The Tasmanian Southern Rock Lobster Fishery is a lucrative, limited entry fishery with a fished biomass exceeding 1000t annually which primarily tailors to live export trade to Asian markets. The species, Jasus edwardsii, demonstrates high variability in growth between spatial regions, throughout time and between sexes. This variation results in differing effort applied across the fishery, and in some areas exposing animals to increased handling, risk of damage and subsequent mortality. Here we have undertaken a study of the unfished population in the Taroona Waters Reserve. Using Bayesian inference within R, this unique, longitudinal dataset enabled the estimation of measurement error and the impact of appendage damage by type, quantity and sex upon growth. Initial survivability and catchability were assessed using a Cormack-Jolly-Seber model with covariates included for damage for each sex. These findings aim to quantify the impact on biomass in the fishery due to increased handling and discards of under-sized animals. Following research endeavours to utilise the refined Growth model to identify temporal changes in growth to implement environmental parameters prior to being applied around the state to ascertain other environmental drivers of growth. This understanding plays an important role in improving fisheries management.

**Supervisors**

K. Hartmann, C. Gardner, C. Carter, A. Hobday
ABSTRACTS OF POSTER PRESENTER

Breen, Rachel - College of Health and Medicine

USING FINANCIAL INCENTIVE PROGRAMS TO PROMOTE SMOKING CESSATION

Smoking is linked to diseases within most organs of the body. Quitting can minimise the risk of these diseases and increase life expectancy, with those who quit younger obtaining greatest improvements. Yet 16.9% of Tasmanians continue to smoke; a rate higher than the national average (12.2%) and exceeded only by the Northern Territory (18.5%). Novel methods to promote smoking cessation are therefore necessary. One such method is financial incentive (FI) programs. FIs are monetary rewards provided contingent upon behaviour change. These programs are considered effective and cost-effective for promoting smoking cessation, particularly within high-risk groups like pregnant or low socioeconomic status smokers. Yet key questions remain in areas important for program effectiveness and engagement. For example, a paucity of research on the mechanisms through which FI programs alter behaviour exists. Likewise, while research largely supports the use of FI programs, public acceptance is low. How to best address this disconnect remains unclear. The current project aims to pilot an FI program within a real-world setting, investigate the mechanisms behind FI programs, and use this information to develop an updated program. Finally, how best to ensure public opinion aligns with evidence on FI programs will be investigated.

Supervisors

S. Ferguson, M. Frandsen, M. Palmer

Brinkhoff, Rose - College of Science and Engineering

THE DETERMINANTS OF OPTIMAL LEAF AREA IN EUCALYPT PLANTATIONS

Leaf area index (LAI) is the amount of leaf area per unit ground area. It is an important driver of primary productivity, and affects water and nutrient cycling. My project will explore the influences of fertiliser and temperature on optimal LAI in eucalypt plantations. Dramatic increases in LAI have been observed under high nitrogen and phosphorous treatments in fertilisation trials. Extra leaves have both a cost and a benefit to a plant in terms of carbon balance and nutrient economics: extra leaf area increases photosynthetic area, but also incurs a respiratory cost to the plant in terms of leaf construction and maintenance. Extra leaf area may be an adaptation to store nutrients for re-translocation in times of nutrient deficit. My project will explore the relationship between nitrogen and phosphorous fertiliser treatments and total LAI, the vertical distribution of LAI and the longevity of N and P stored in leaves. I will measure rates of photosynthesis and respiration as a function of light, temperature and nutritional status. To answer these questions, I will use both new and existing fertilisation treatments along a temperature gradient in eucalypt plantations in Tasmania and on the mainland.

Supervisors

M. Hovenden, M. Hunt, D. Mendham
ABSTRACTS OF POSTER PRESENTER

Broad, Tina - College of Arts, Law and Education

START ME UP: EXPLORING THE ENTERPRISING SCHOOL-TO-WORK JOURNEYS OF YOUNG AUSTRALIAN SONGWRITERS FINDING SUCCESS IN THE CONTEMPORARY MUSIC INDUSTRY

My project’s objective is to examine the school-to-work transitions of young Australian songwriters. In particular, I am interested in those young writers who have achieved defensible measures of international success within their first decade out of high school – industry ‘outliers’ nailing the charts - and who have done so having bypassed music-related tertiary training. This is a cohort about which we know very little from the academic literature pertaining to the creative industries, music education and entrepreneurship education – three domains across which I have a special interest. Overall, I wish to examine how well, or not, their high school education prepared them for their chosen careers in the real world of today’s global industry and explore the key points in their lives at and after school that they consider formative to their careers as successful content creators. This will be a qualitative, narrative analysis of interviews conducted with up to 8 writers and will also draw on my work on the national in-school music mentoring program, SongMakers, that I run on behalf of Australia’s music industry body, APRA AMCOS. I see the project as feeding in to Australian policy debates in both education and industry development.

Supervisors
M. Hunter, M. Bryant

Brown, Alexander - College of Science and Engineering

REAL-TIME AUTOMATED PROCESSING OF ENVIRONMENTAL RECORDINGS USING A CLOUD-BASED WORKFLOW SYSTEM

Recently, there has been increasing interest in using automated bioacoustics analysis to monitor the environment. This involves using computational approaches to identify animals and other environmental phenomena from the sounds that they generate. This approach enables environmental monitoring on large scales without the need of experts to be present in the region of interest or even annotating recordings manually. While research into bioacoustics has grown significantly recently, the volume of data being recorded for these analyses is also increasing. This presents significant computational demands to perform analyses, to the point where large-scale analyses cannot be feasibly performed on single machines. As such, researchers need to look at high-performance computing options. The research outlined in this poster will examine how cloud computing can be used to perform bioacoustics analyses in real-time on large scales, where many sensors are recording simultaneously. This will particularly investigate how big data can be utilised for use in machine learning approaches to determine species from their calls, with an emphasis on utilising workflows to allow researchers to customise how models are generated to suit specific scenarios. In this poster, a research outline is presented, alongside early findings for processing high-volume bioacoustic data on a distributed system.

Supervisors
J. Montgomery, S. Garg
Buchanan, Greg - College of Arts, Law and Education

THE INFLUENCE OF BRITISH MILITARY COMBINED AMPHIBIOUS OPERATIONS ON THE EVOLUTION OF BRITISH NATIONALISM 1739-1783

The second half of the eighteenth century saw the rise of British nationalism. This emergence of a “national identity” has been directly related to the influences of war and religion resulting in the development of a “fiscal-military state” prior to the Napoleonic era. The British navy and army, with marked differences in social, political and military characteristics, represent an important aspect of this emergence. The intersection of the respective cultures of these two forces during various combined amphibious campaigns, conducted from 1739-1783, provides a basis for the examination of the influence of these operations on British nationalism. This presentation will present the rationale for adopting the conjoint operations approach, via specific case studies, as the prism for this examination and some initial research findings.

Supervisors

A. Page, G. Daly

Cash, Catherine - College of Arts, Law and Education

COVARIATIONAL REASONING DEVELOPMENT IN SECONDARY SCHOOL STUDENTS

‘Covariational reasoning’ (CR) refers to the ability to reason about dynamic situations involving multiple varying quantities. When students view mathematics through a CR perspective they can construct powerful and meaningful conceptual understandings. Unfortunately few students are adequately engaging in CR during their education. A failure to attend to covariation has been shown to limit students’ understanding across a number of topics, including function and calculus. Students’ difficulties with graphs are particularly well-documented and have been attributed to a failure to recognise graphs as representing a dynamic, covariational relationship. Thus, underdeveloped CR skills are likely to significantly contribute to students’ underachievement across several Secondary School Mathematics topics. While advanced CR involves sophisticated reasoning processes, the skills can be developed, and benefits leveraged, well before students’ encounter ‘sophisticated’ mathematical situations. Theoretical frameworks for CR suggest that it is developmental in nature, however descriptions of its development are yet to be empirically validated in a secondary student population. By analysing students’ responses to online dynamic tasks, the aim of the current study is to create valid descriptions of the stages of CR experienced by students. Results will enhance our understanding of an important mathematical reasoning skill and inform strategies to facilitate CR progression.

Supervisors

T. Muir, H. Chick, N. Fitzallen
Cassidy, Margaret - College of Arts, Law and Education

ISLAND PARADISES? - AUSTRALIAN VISUAL IMAGERY OF THE SOUTH PACIFIC AND SOUTH PACIFIC IMMIGRANTS IN AUSTRALIAN NEWSPAPERS

While the South Pacific is of strategic importance for Australia and indeed Australia is the largest foreign aid donor in the region, both news stories from the South Pacific and the South Pacific community of immigrants in Australia are often accompanied by photographic stereotypes of undeveloped island paradises and primitive people represented as “other” or from Edward Said’s orient. My study examines the Australian visual imagery to be found in Australian newspapers of the South Pacific and South Pacific immigrants over the last ten years. This poster provides an overview of my proposed topic and a summary of my findings so far in exploring possible methodologies that can be used in the analysis of images within framing analysis, and offers a cogent model for the future content analyses that will form the central research of my Ph.D. Photographs are an important part of contemporary Australian newspapers. Even as the readership of newspapers reduces, the importance of photojournalism, of telling news stories through visual images, becomes more important.

Supervisors

D. Reid, R. Julian

Castles, Meredith - College of Science and Engineering

AN INVESTIGATION INTO THE EFFECTIVENESS OF TELT TECHNOLOGY TO ENHANCE DIGITAL LITERACY AND ACCESSIBILITY FOR USERS WITH BARRIERS TO LEARNING

Technology Enhanced Learning and Teaching (TELT) is a globally recognised, multi-disciplinary research field concerned with bringing innovative technology solutions to the learning environment. As technology has evolved from computers to mobile devices to increasingly ubiquitous solutions, the TELT space must expand to meet current and future needs of students and teachers with a variety of accessibility requirements. This research project aims to examine if existing TELT and Information and Communication Technology (ICT) models are appropriate to be applied to the technology solutions available today and into the future, with a particular lens on the different accessibility needs of people with barriers to learning and those requiring alternative access to information. The proposed methodology incorporates the principles of action research and case studies to explore the application of these models in detail, with data collection taking place across a number of UTAS units over 3 semesters. This research questions the existing TELT field in the following ways: How can the student experience be organically enhanced through technology? How can the development of digital literacy be TELT supported? And, can technology requirements for student learning be universalised based on future technologies yet to be made available?

Supervisors

L. Ellis, J. Scanlan, K. de Salas
ABSTRACTS OF POSTER PRESENTER

Chear, Sueanne - College of Health and Medicine

PATIENT-SPECIFIC STEM CELL MODELS OF BATTEN DISEASE

Batten disease is a fatal childhood neurodegenerative disorder caused by mutations in one of 14 different ceroid-lipofuscinosis neuronal (CLN) genes, designated CLN1 to CLN14. Mutations in either the CLN2 or CLN3 genes are the most common forms of Batten disease. Animal models have been instrumental in studying disease processes of Batten disease. However, due to genetic and physiological differences between animals and humans, animal models do not fully recapitulate aspects of the corresponding human disease. Consequently, drug discovery efforts are hindered. This raises the need for human cell-based models that can exhibit patient-specific disease phenotypes, upon which drug screening can be established for novel therapy discovery in Batten disease. This project will develop two novel human cell-based models from patients' induced pluripotent stem cells (iPSCs) harbouring variants in either the CLN2 or CLN3 gene. First, we aim to use clustered regularly interspaced short palindromic repeats (CRISPR)/CRISPR-associated (Cas) protein genome editing to create isogenic iPSC lines of each variant. Second, we will generate neurons from the isogenic iPSC lines to identify variant-specific disease phenotypes. We expect to develop unique cell lines for cell-based screening of known compound libraries and novel drugs to identify potential treatments for CLN2 and CLN3 diseases.

Supervisors
A. Cook, A. Hewitt, A. King

Chen, Liang - College of Science and Engineering

ELECTROFLUIDIC THREAD-BASED ANALYTICAL DEVICES (ETAD) WITH AMBIENT IONISATION MASS SPECTROMETRY

This project aims to explore and develop a ground breaking new approach and technology for the direct and rapid characterisation of chemical and biochemical species, separated from complex mixtures and matrices. The project will develop fibre-based electrophoresis and isotachophoresis coupled with ‘on-fibre’ ambient ionisation mass spectrometry, specifically desorption ionisation electrospray (DESI). The project will explore new fibre materials for their electrophoretic performance and material compatibility with DESI, and demonstrate the advantages of simplicity, flexibility, speed and selectivity for the targeted separation and characterisation of complex biomolecules and biological samples (including blood, plasma, urine). The project is significant as it explores a totally new approach to separation and detection of complex systems, which will utilise low cost disposable fibre substrates as the separation platform. This project will have outcomes and potential in fields of bioanalysis, pharmaceutical and medical science and environmental analysis.

Supervisors
B. Paull, S. Thickett
Chen, Peng - Menzies Institute for Medical Research

TNF PROMOTES M1 DIFFERENTIATION AND SUPPRESSES M2 DIFFERENTIATION IN MS

Aim: To determine the effect of TNF on the differentiation of M1 and M2 macrophages in multiple sclerosis (MS). Methods: Ficoll density centrifugation and autoMACS with CD14+ beads were used to obtain monocytes from human blood. M-CSF was used for 6 days on monocytes to induce macrophages, and IFN-γ and IL-4, in the presence or absence of TNF were used for 24 hours to induce M1 and M2 phenotypes differentiation on the 6th day, respectively. Quantitative PCR (qPCR) was conducted to detect the expression of M1 and M2 macrophages markers. The transcription factors involve in M2 differentiation will be detected by qPCR and immunohistochemistry (IHC) to analyze the mechanism of TNF on M2 macrophages differentiation. MOG-EAE mouse model of immune-mediate demyelination will be performed to analyze MS, and anti-TNF durgs will be used on these mouse. Flow cytometry (FACS) and IHC will be conducted to determine the effect of anti-TNF treatment on EAE mouse. SPSS 20.0 was used to analyze the data. Results: The expression of M1 markers (IDO, IL-10) decreased and the expression of M2 marker (CD206) increased after silencing TNF in human blood. Conclusion: TNF can promote M1 differentiation and suppress M2 differentiation in health people.

Supervisors
H. Korner, K. Young, S. Beasley

---

Chowdhury, Md Anisuzzaman - College of Health and Medicine

DEVELOPMENT OF A POINT OF CARE DEVICE FOR MEASURING BIOMARKERS OF NEURODEGENERATION IN THE BLOOD

Neurodegenerative disorders, such as Alzheimer’s disease (AD) are associated with the build-up of proteins aggregates as well as gradual loss of nerve cells in the brain. Protein aggregates and proteins released from degenerating nerve cells act as biomarkers of disease present in biofluids such as CSF. Detecting these biomarkers generally relies of ELISA techniques using antibodies. Recent advances in technology, such as Single molecule array (SIMOA), which is up to 1000-fold more sensitive than conventional ELISA, have now enabled detection of these proteins in the blood, making point-of-care screening devices possible. The goal of this project is to develop a point-of-care device for the detection of blood biomarkers of brain degeneration. One limitation of current detection is the use of antibodies, which are variable and expensive. Aptamers are short RNA or single-stranded DNA oligonucleotides that can fold into unique three-dimensional (3D) conformations, binding to a target in a similar way to antibodies. However, application of aptamers to the field of biomarkers of neurodegeneration has been limited. Thus, in the first stage of the project we will use the SELEX technique to produce aptamers targeting known protein biomarkers of neurodegeneration and to test different methods of biosensor detection.

Supervisors
A. King, M. Breadmore
Coates, Lewellwyn - College of Science and Engineering

DEVELOPMENT OF A MODULAR ANALYTICAL SEPARATION TECHNOLOGY (MAST) TO MONITOR BIOMOLECULES IN COMPLEX MATRICES

Drug manufacturers worldwide have a common objective to achieve the best quality in drugs that they manufacture, both from the perspective of optimising productivity as well as patient safety. In order to achieve this objective, the pharmaceutical industry has defined a need for miniaturising analytical separation instruments, such as the high performance liquid chromatograph (HPLC), to enable testing at the point of source within the manufacturing environment. Current HPLC systems can’t meet this need as they are bulky, expensive, utilise high amounts of solvents and requires equipment knowledge for efficient operation. One of the leading pharmaceutical companies, Pfizer, have developed a concept known as PCMM, or “Portable, Continuous, Miniature and Modular”, the program was launched in 2013 in conjunction with Pfizer’s partners to produce prefabricated pharmaceutical manufacturing PODs. The PODs will also require modular analytical separation technology for continuous process monitoring and Quality control both at-line and in-line analysis within the POD manufacturing sites. Hence a modular, miniature and portable liquid chromatographic equipment which are automated, with smart control systems, using minimal organic modifiers, and smaller equipment setup and run –time will pave the way for faster and better quality in drug manufacturing through PCMM POD technology.

Supervisors

B. Paull, P. Haddad, A. Gooley, H. Wirth

Cottrell, Richard - Institute for Marine and Antarctic Studies

FOOD PRODUCTION SHOCKS ACROSS LAND AND SEA

Sudden and unpredictable losses (shocks) to food production can threaten food security and livelihoods across land and sea. Yet our understanding of global exposure to production shocks is limited by a lack of standardized assessment across agricultural and seafood systems. Here we investigate historical global trends in frequency, size, recovery times and drivers of shocks to crop, livestock, fisheries, and aquaculture production. Despite large geographical differences in frequency and driver influence, we show extreme weather and political instability to be the dominant drivers of shocks on land, with overfishing and aquaculture disease primary drivers in seafood systems. Geopolitical crises tended to produce larger shocks and longer recovery times than other drivers. Critically, we demonstrate increasing shock frequency and diversity across all food sectors through time. In a more shock-prone world, where individual crises can reach across multiple sectors, social protection measures and bold domestic food policies may be central to adaptation.

Supervisors

J. Blanchard, E. Fulton, R. Watson, A. Fleming
Cox, Ingrid - Menzies Institute for Medical Research

ASSESSING THE BURDEN AND ECONOMIC IMPACT OF IDIOPATHIC PULMONARY FIBROSIS IN AUSTRALIA

Idiopathic Pulmonary Fibrosis (IPF), the most prevalent and devastating form of pulmonary fibroses (PF) is a severe and progressive lung disorder with a median survival rate of 2-5 years from diagnosis, making it worse than many cancers. Recent studies in mostly the United States and Europe have proposed an incidence range of 3-9 per 100,000 per year and have suggested trends of increasing incidence. Data from the Australia Bureau of Statistics (ABS) suggests an incidence of 5 per 100,000 per year. Currently there are no published studies estimating the burden of IPF in Australia, but limited data suggests that the burden on the healthcare system is high and healthcare costs are likely to be increasing. The purpose of this project is to develop an epidemiological map for IPF in Australia, quantify the economic burden and impact on quality of life. This will be informed by an observational longitudinal study with ongoing recruitment over two years. This design will allow for evaluating the changes in quality of life, resource utilisation and associated costs as IPF progresses. Ultimately the data will be used to build a disease simulation model which will predict patient outcomes and evaluate the cost-effectiveness of interventions for IPF.

Supervisors
A. Palmer, B. de Graaff, H Walters

Crosthwaite, Rob - College of Arts, Law and Education

VALUES, ENVIRONMENTAL AND ECONOMIC SUSTAINABILITY, AND THE PLANNING SYSTEM. THE ADVOCACY COALITION FRAMEWORK AND THE MANAGEMENT OF TASMANIA’S COASTAL ZONE

The Tasmanian Coastal Policy, adopted in 1996, was the policy response to many years of concern about the management of the Tasmanian Coastal Management Zone. Mandated reviews of the policy since 2004 have failed to effectively address deficiencies identified by actors and interests affected by the policy. Rooted in the requirement of sustainability of economic development and environmental protection, the policy has languished between moderately effective and paralysed by persistent administrative and legal challenge. This thesis traces the impetus for the development of a Tasmanian Coastal Policy, its adoption, the progress of the mandated reviews and the present hiatus in its evolution, revision and application as an element of the Tasmanian Planning System. The data sources for the project include publicly available information, statements and opinions expressed by the various actors engaged in the several reviews of the policy conducted since its adoption. The Advocacy Coalition Framework (ACF) provides the theoretical canvas on which the engaged actors and their behaviours are examined in order to discover the reasons for the hiatus and therefore the need for its persistence as a tool for the management of the Tasmanian Coastal Zone.

Supervisors
M. Haward, M. Alessandrini
Dar, Nabeela - College of Science and Engineering

ACCUMULATION OF SESQUITERPENE LACTONES IN PYRETHRUM EXTRACT

Tanacetum cinerariaefolium known as Pyrethrum is a perennial daisy and is well known for its insecticidal properties (Freemont, Littler et al. 2015). It has high efficacy and attacks the nervous system of insects. It is used in agriculture and veterinary applications. (Gnadinger 1936; Casida & Quistad 1995). In Australia, the crop is grown on more than 3000 ha across Victoria and Tasmania (Ryan, Bishop et al. 2002). Botanical Resources Australia (BRA) is the sole supplier of pyrethrins in Australia and supplies 60% of the global market (Acil Allen Consulting 2016). The final pyrethrin product is a mixture of six active compounds but other plant derivatives such as sesquiterpene lactones (STLs) are co-extracted. The STLs are allergenic (Rodriguez, Towers et al. 1976). The major STL from pyrethrum flower is known as pyrethrosin (C17H22O5) (Thoms 1891). During storage of the extracted pyrethrum oil, STLs precipitate (Rose & Haller 1937; Schechter & Haller 1939). This study is to investigate the stability and solubility of pyrethrosin in the presence of antioxidants, blending oils and solvent with view to maximising the removal of STLs in the industrial process.

Supervisors

S. Garland, D. Close, A. Gracie

Dickinson, Geoff - College of Arts, Law and Education

APPLYING THEORIES OF INTERGENERATIONAL FAIRNESS: A TASMANIAN CASE STUDY

Intergenerational fairness philosophy theories sound convincing but complicated concepts exist within each theory. Context and perspective modify each theory when applied in real-world situations.

The intent of this thesis is to advance the understanding of fairness values between youth and aged cohorts as they affect overlapping or adjacent generations and the relationship of public policy, demographic change, and age-related policy and polity transfers using real world data. Data analysis of available census data between 1947 and 2016 of past expenditures per person, per age, per polity will facilitate insight into the application of fairness theories and future financial projections. Tasmania is the test domain as representative of Australian States.

Supervisors

J. Chase, D. Coady
Dower, Honey - College of Arts, Law and Education

THE IMPACT OF SEPARATE TREATMENT ON PORT ARTHUR CONVICTS

The Separate Prison at Port Arthur intended to reform the most hardened criminal sent to the Van Diemen's Land penal colony. Constructed from 1848, the prison was modelled on Pentonville Prison in London, where a new form of penal system known as "separate treatment" aimed to shift prisoner punishment from the body to the mind through sensory deprivation, and moral and religious intervention. Further punitive measures like solitary confinement were designed to encourage a prisoner's self-reflection on his allegedly inherent criminality. Despite emerging anxieties around the detrimental effect of isolation on prisoner health, convicts continued to be exposed to separate treatment until 1877, well after problems were discovered at other sites of separate treatment. This thesis takes a qualitative and quantitative approach in determining the psychobiological effects and post-confinement impact of isolation-based punishments on over one thousand convict life courses.

Supervisors

H. Maxwell Stewart, S. Petrow

Dwyer, Zack - College of Arts, Law and Education

IS IT 'MORE THAN JUST A RUN'? A CRITICAL EXPLORATION OF PARKRUN AND SOCIAL CAPITAL

This research aims to understand the structure and quality of interpersonal bonds formed in the socio-fitness phenomenon ParkRun. ParkRun refers to a collection of free, weekly, five-kilometre running events held every Saturday morning at various parkland locations around the world. Applying a social capital framework, the project examines ParkRun's inclusive ethos and 'community' philosophy against persuasive arguments declaring an erosion of strong and durable bonds in the contemporary West. While evidence suggests these contribute to the declining involvement in Australian sporting clubs and organisations, ParkRun has emerged despite these claims. With a burgeoning participant base and emphasis on sociability, ParkRun seemingly facilitates the construction of durable and valuable relational ties. Utilising a mixed-method methodology, surveys and interviews will collect data detailing the nature of these connections. The Club Social Capital Scale (CSCS) will investigate (N = 700) underlying social capital factors present in ParkRun. Follow-up in-depth interviews with ParkRunners (N = 20) will expand on these results and examine social capital outcomes.

Supervisors

N. Hookway, C. Palmer
Dyer, Marcus - College of Health and Medicine

INVESTIGATIONS OF NEURONAL EXCITABILITY IN A MOUSE MODEL OF ALS WITH MISLOCALISED TDP-43 IN THE BRAIN

ALS (amyotrophic lateral sclerosis) is the most common type of motor neuron disease with no effective treatments or a cure. For this reason there is a desperate need to uncover new pathways involved in the disease that can be used as targets for therapeutics. In ALS, a protein called TDP-43 aggregated in 97% of cases. In a new mouse model, it is possible to move TDP-43 out of the nucleus of the cell and into the cytoplasm of neurons, where the aggregates are found in ALS cases. In this mouse model the gene encoding the cytoplasmic TDP-43 can be suppressed with a harmless drug, this means that it is possible to turn on the gene only in adulthood, mimicking human ALS. Electrophysiology is a technique that can measure the electrical activity and the number and strength of connections between neurons in the brain. It is possible to see how neurons are changed when TDP-43 is moved into the cytoplasm of brain neurons with this technique. Using electrophysiology accompanied by assessments of motor and cognitive function in the mice the aim is to identify altered pathways at the earliest stages of ALS.

Supervisors
C. Blizzard, T. Dickson, A. Woodhouse, K. Lewis

Earle, Jennifer - College of Arts, Law and Education

STEM IN THE WORKPLACE: PERSPECTIVES FROM INDUSTRY

As Australia competes in a global economy there has been an escalation of national focus on meeting the needs of current and future workplaces through educational reforms that develop skills in science, technology, engineering and mathematics (STEM). There is an imbalance between growth of a STEM-qualified and literate population against growth of STEM in the workplace, which implies a need for developing high level STEM literacy across the workforce, as well as establishing a reliable pipeline of STEM graduates into workplaces through a core STEM education for all students. A lack of shared understanding of the STEM capabilities needed to be learned by students to prepare them for the workforce is contrasted by a wealth of educational STEM projects underway in Australia, STEM articles published in practitioner journals, and innovative integrated STEM classroom activities. This research explores STEM industry workplace practices to generate a STEM Capabilities Framework (inclusive of knowledge, skills, attitudes and dispositions) that has the potential to underpin discussions on educational outcomes that meet the STEM capability needs of workplaces now and into the future. This framework may also contribute knowledge to inform the design of STEM curricula and pedagogical approaches.

Supervisors
S. Fraser, N. Fitzallen
Echevarria, Emilio - Institute for Marine and Antarctic Studies

GLOBAL TO COASTAL IMPLICATIONS OF SURFACE CURRENT MODULATION OF THE WIND-WAVE FIELD

Wind-waves and ocean surface currents interact via a number of processes. Waves can be refracted by currents, shift their frequency via a Doppler effect and also suffer changes in their amplitude. While these processes have been studied in localised scales (e.g., the influence of tidal currents on localised wave fields), the broad scale implications of the oceanic circulation on the global wave field are unknown. The current generation of global wind-wave hindcasts (for example the CAWCR wave hindcast) overlook these important processes, and biases relative to observed wave conditions may be explained by this mechanism. Besides, current-induced refraction can have a significant impact in coastal processes, changing the direction of the incoming waves. Therefore, this project will assess the influence of global currents on the wind-wave field, and will also focus on the influence of the East Australian Current on the wave field of the Tasman Sea and its potential to affect different coastal processes. Besides, directional wave spectra data will be used to provide the most complete representation of the wave climate and assess how ocean currents affect different wave modes.

Supervisors

N. Holbrook, M. Hemer

Edwards, Marie - College of Arts, Law and Education

HOW DOES THE RELATIONSHIP BETWEEN RISK AND SELF-REGULATION IMPACT STUDENT ENGAGEMENT?

Risks pose threats to children and restrictions are put in place to protect them. Yet, children generally seek out and prefer risky play and use it to test their limits and capacities. In an educational landscape of increased risk reduction, are we denying children opportunities to develop self-regulation through negotiating risks, thus hampering student engagement? This research aims to explore the relationship between risk and self-regulation and gauge its impact on student engagement. By working with teachers and students to understand what self-regulation is and how it can be applied within an educational context, providing a series of lessons including risk options for students to opt in to, and investigating the relationship between the chosen risk option and resulting self-regulation, can we learn more about this relationship and how it affects student engagement?

Supervisors

K. Swabey, T. Muir, D. Thomas
Edwards, Kate - College of Health and Medicine

HIGH CARBOHYDRATE INTAKE DOES NOT PREVENT KETOSIS IN SELF-SUPPORTED MULTI-STAGE ULTRAMARATHON RUNNERS

Ultra-endurance athletes accumulate an energy deficit throughout their events. Whilst the presence of urinary ketones has previously been noted in ultra-endurance exercise and attributed to insufficient carbohydrate (CHO) intake, not all studies have reported concomitant CHO intake. Athletes competing in self-supported multi-day events are particularly vulnerable to nutritional insufficiencies due to load carriage considerations while racing. Our aim was to determine changes in blood ketone concentrations over five days of a self-supported multi-day ultramarathon in combination with quantification of energy and macronutrient intakes. Blood glucose and ketones (β-hydroxybutyrate) were measured every day immediately post-running and food diaries were completed daily. Here we show that CHO intakes of 301 ± 106 g·day-1 were not sufficient to avoid ketosis (ketones: 1.1 ± 0.6 mmol.L-1) in any participant during the race. This suggests that competing in a state of ketosis may be an inevitable consequence of multi-day events. Given the negative impacts associated with such a metabolic shift in athletes unaccustomed to carbohydrate and energy restriction (fatigue, increased perceived effort and changes to the hormonal milieu), keto-adaptation could be a useful strategy to improve health and performance in these athletes.

Supervisors

C. Kitic, J. Fell

Esmalifalak, Hamidreza - Tasmanian School of Business and Economics

EUCLIDEAN GEOMETRY OF ASSET PRICE FLUCTUATIONS

In this research, we provide a geometric representation of stock price fluctuations that relies on the application of Euclidean distance and the functions developed up on that to detect the structure and dynamics of (dis)similar assets or groups of assets in a financial network platform. Euclidean measure, quantifies (dis)similarities considering the risk return profile of financial assets along with their correlation property. In the network structure, we measure the spatial loci and centrality of financial elements (stocks and portfolios) that provides a static view on their individual and collective return behavior. In the network dynamics, we measure the scale and direction of change in the spatial loci of network elements when state (market condition) changes from one to another. Specifically, we demonstrate that change in the prevailing state of the market is an important determinant of a global and self-organized dynamics of stock return.

Supervisors

N. Jeyasreedharan, M. Dungey
Evans, Liz - College of Arts, Law and Education

A FEMINIST PSYCHOANALYTIC CRITIQUE OF CONTEMPORARY DOMESTIC NOIR FICTION

Contemporary domestic noir is a sub-genre of psychological suspense fiction that focuses on the hidden traumas of family dynamics, and represents the home as essentially unreliable. Intimate relationships give rise to secrets, lies and betrayals but the prevailing psychodrama of successful novels such as Gone Girl, Girl On A Train, Sleep With Me, He Said, She Said and The Liar’s Chair unfolds at the expense of central female characters (often narrators), being portrayed as unreliable, unstable, or pathological. Meaningful context, relating to a character/narrator’s environment, interpersonal complexities and/or circumstance is either minimal or absent, and family dynamics that contribute to, or engender complex trauma, are rarely presented with depth or insight. This ensures lack of empathy and/or understanding on the reader’s part towards female characters, and prioritises one-dimensional stereotypes of female madness over careful considerations of complex psychological states, particularly in response to the female experience of domestic life and family dynamics. By critiquing domestic noir through the lens of selected feminist and Jungian psychoanalytic theory, my exegesis will show how the genre currently reinforces negative beliefs concerning female psychology. Through my own piece of creative writing, I aim to demonstrate the subversive potential of this type of fiction.

Supervisors

D. Wood, H. Stark

Ezegbe, Vincent - Menzies Institute for Medical Research

EXPOSURE TO PARENTAL SMOKING IN EARLY LIFE AS A RISK FACTOR FOR POORER CARDIOVASCULAR HEALTH IN ADULTHOOD

There are limited data on the role of passive smoke exposure during early life on cardiac structure and function later in life. This pilot study used data from a birth cohort born between January 1988 and March 1990 in Tasmanian. The same cohort were part of other follow up studies we linked. We made use of information on maternal and other adults smoking during pregnancy, postnatal period, childhood and during early adulthood. Cardiovascular structure and function were measured with echocardiography and by brachial oscillometry and applanation tonometry. There were 96 participants (female - 41.8%, mean age – 27.0 ± 0.7). Maternal smoking during pregnancy was significantly associated with increase in central diastolic blood pressure on adjusted and unadjusted analysis. Maternal smoking during pregnancy was significantly associated with increase in central systolic blood pressure on unadjusted analysis but was not significant on adjusted analysis. Unadjusted analysis yielded no significant association between total vascular resistance and passive smoking but had a significant association with maternal smoking during pregnancy and during postnatal period on adjusted analysis. Exposing children to tobacco smoke in-utero has an adverse effect on their central diastolic blood pressure and total vascular resistance later in life as young adults.

Supervisors

S. Gall, C. Magnussen, A. Neil
Feng, Zikai - College of Science and Engineering

EVALUATION OF SHORT CHAIN QUINONES AGAINST DIABETES MELLITUS AND RELATED COMPLICATIONS

Diabetes mellitus (or diabetes) is a group of severe complex metabolic disorders, which affects the entire body. Without treatment, diabetes can develop into many acute complications (such as diabetic ketoacidosis) and long-term complications (such as diabetic retinopathy). In diabetes, especially in type 2 diabetes and its associated complications, the involvement of mitochondria has become of increasing interest, yet the relationship and mechanisms between mitochondria and disease initiation, progression and symptoms remain controversial. Currently, mitochondrial dysfunction in diabetes is an emerging area that is widely discussed. Observations suggest a link between abnormal mitochondrial function and insulin resistance. As for diabetes and its complications, there is an increasing need to develop new drugs that aim to utilize novel targets such as the mitochondria, since patients are characterised by a significant reduction in their quality of life. Towards this objective, a new series of more than 140 idebenone SCQ analogues have been designed and synthesised in collaboration between the School of Natural Sciences) and the School of Medicine at UTAS. Based on in vitro and in vivo characterisations, the overall goal of this project is to identify the most promising compound to develop towards the treatment of diabetes and its related complications.

Supervisors

J. Smith, N. Guven

Foster, Catherine - Menzies Institute for Medical Research

PERICYTE DYSFUNCTION: LIMITING ENERGY SUPPLY IN ALZHEIMER’S DISEASE

Alzheimer’s disease (AD) is the most common form of Dementia, however, there is no current treatment to halt the progression of AD. AD pathology is characterised by the accumulation of amyloid-beta (Aβ) and neurofibrillary tangles in the brain, leading to extensive neuronal loss and subsequent cognitive decline. However, vascular-related changes including reduced cerebral blood flow (hypo-perfusion), neuro-inflammation and blood-brain barrier (BBB) breakdown, have been found to also occur in AD, suggesting vascular dysfunction may be contributing to the development of AD. A possible mediator for causing these neuro-vascular changes are pericytes, a contractile cell located in the neurovascular unit (NVU). Pericytes modulate cerebral blood flow and maintain the BBB to ensure homeostasis of transport exchange with neuronal tissue. Impairment of pericytes in other diseases has been shown to result in neuro-vascular dysfunction, leading to neuro-inflammation, BBB leakage, reductions in blood flow and reduced clearance of toxic substances. The possibility of pericytes mediating neurovascular dysfunction leading to the development of AD pathology is unknown. Therefore, determining whether pericyte-mediated neurovascular dysfunction is contributing to AD, may lead to the identification of novel treatments to target pericytes to prevent or treat AD.

Supervisors

B. Sutherland, A. Canty, L. Landowski, D. Howells
Friebe, Martin - Australian Maritime College

INCLUSION OF SYSTEM RELIABILITY IN A SURVIVABILITY ASSESSMENT FRAMEWORK

Naval vessels are designed to be survivable to protect their crew in combat. However, survivability assessments are performed under the assumption of perfectly reliable systems. However, this assumption may cause naval designs to be less survivable than anticipated. The previous paper presented a model which performed a deterministic equipment survivability assessment that was then converted into probabilistic failure relationships. In the study these failure relationships are extended to include system reliability as part of the survivability assessment. The integration of system reliability into the survivability assessment provides a more realistic performance prediction of a naval vessel during combat.

Supervisors

J. Binns, R. Abbassi, V. Garaniya

Fuller, Carley - College of Science and Engineering

SPILLOVERS IN CONSERVATION LANDSCAPES

Rigorous impact assessment should guide management of existing protected areas and inform establishment of new protected areas, and quantitative assessment is increasingly possible thanks to the availability of remote-sensed data. However, impact evaluations could be confounded if spillovers to non-target areas are not accounted for, and leakages could offset the benefits achieved by protected areas. Here we present a systematic review of studies that acknowledge spillovers and provide data to quantify deforestation spillovers to reserves’ unprotected surroundings. We extracted spillover outcomes from 3,400 protected areas and found that, of the reserves effective within their boundaries, only 11.8% exhibited what we define as leakage, the problematic type of spillover. Of 17 individual reserves that leaked deforestation pressures to their surroundings, four were calculated to have had completely offset the benefits achieved inside the protected area. However, additional case studies evaluated with more consistent methods are needed to provide a sufficient evidence base for understanding the extent to which protected areas may do harm to their surroundings. Although in this review, leakage was the least frequently calculated spillover outcome, further study is necessary to understand the conditions under which leakage threatens the biodiversity that reserves were established to protect.

Supervisors

B. Brook, J. Buettel, S. Ondei
ABSTRACTS OF POSTER PRESENTER

Furness, Cristian - College of Arts, Law and Education

CHANGE IS ON THE HORIZON: SHIFTING ATTITUDES TOWARD DIVINISATION IN SECOND TO THIRD CENTURY BIOGRAPHY AND THEIR LATER RECEPTION

The research project aims to better clarify and represent the philosophical significance of the late antique Ancient Greek biographical tradition. It aims to do this through close engagement with the Neoplatonic reading curriculum and associated commentary tradition applied to the interpretation of Plato's philosophical works. It utilises interpretive strategies advocated by Neoplatonist commentators, operating within a shared textual-community of philosophical engagement and practice. It incorporates recent scholarly assessments of philosophy as a 'way of life' and the concept of 'performative philosophy' when characterising these cultural practices. A key concept to be explored is that of divinisation, or 'likeness to god' advocated in Plato (Theaetetus, 176a-c). This concept is often attributed to escapist notions of philosophical retreat; however, a more nuanced approach emphasises the importance of ethics and attaining philosophical virtues according to a scale of ascent. The examination of 'lives' of such figures hopes to better represent the worldly interactions of the philosophically minded toward their beneficiaries. The primary objective is to identify reading strategies espoused by Neoplatonists and, with reference to their developing philosophical positions, apply these strategies to the interpretation and exegesis of relevant episodes from biographical texts specifically featuring lives of philosophers, sophists, sages and folk heroes.

Supervisors
G. Miles, D. Baltzly

Ganjalinia, Atiyeah - College of Science and Engineering

GET READY FOR 3D PRINTED EVERYTHING

The world of the small is intriguing and fascinating. At this scale water behaves like honey and cells can be made to glow like Christmas lights "Albert Folch". 3D printing technologies offer a natural path from prototype to commercialization that should engage many ongoing efforts in microfluidics. In biomedicine, shortening the time from prototype to product enables personalized devices, accelerates R&D, and helps reduce the cost of access to healthcare. However, while there is great interest in 3D printing for microfluidic device fabrication, to-date the achieved feature sizes have not been in the truly microfluidic regime. Taking advantage of physio chemical phenomena at the microscale often requires dimensions of 5-50 µm. Therefore, my project is focused on the combinations of changes to the printer material chemistry to realize microfluidic structures with channels <50µm in realistic print times.

Supervisors
S. Thickett, M. Breadmore
Garton, Roderick - College of Health and Medicine

EQUIVALENT ADAPTATION OF RESPONSE-SPECIFIC THRESHOLDS BY YOUNGER AND OLDER ADULTS TO EVENT PROBABILITY CUES

In speeded choice response tasks, caution across responses increases with age, producing slower overall response times from early to late adulthood. How does this relate to caution that is specific to each response, which decreases with greater stimulus-response probability? Does the capacity to adapt to response-probability cues also decline with age? Experiment involved a two-alternative colour discrimination task with manipulation of both block- and trial-wise cues as to the most likely correct response, comparing performance of adults younger than 30 years with adults aged 63-76 years. As expected, age-related slow-down and cued relative frequency speed-up were observed. There was no interaction of the effects age and cued relative frequency, with older adults speeding-up just as much to more likely events as did younger adults. A sequential sampling (Linear Ballistic Accumulator) model of response latency and proportions confirmed that age-related slowing was subserved by greater overall response thresholds and not by lesser evaluation efficiency, that the effect of relative frequency was subserved by response-specific threshold adaptation and not evaluation bias, and that this adaptation occurred at least as reliably among older as among younger adults. Further studies decomposing the processes contributing to these other biases in choice response tasks are suggested.

Supervisors
A. Heathcote, J. Sauer

Genovese, Cristina - Institute for Marine and Antarctic Studies

THE ROLE OF ORGANIC IRON-BINDING LIGANDS ON THE DISTRIBUTION OF DISSOLVED IRON (DFE) IN ANTARCTIC SEA ICE

The incorporation and the release of iron in forming and melting sea ice are fundamental mechanisms for primary productivity in polar environment. It is thought that organic iron-binding ligands (Lt) can help in stabilizing dissolved iron (DFe) at surface seawater, with > 99.9% of DFe organically bound. The aim of the PhD project is to understand if/how iron-binding organic ligands can be responsible for DFe distribution around the continent, primarily in sea ice (pack and landfast), but also in brine, snow and seawater. Here, in order to test the hypothesis that Lt control the DFe distribution in Antarctic pack ice, iron organic speciation during SIPEX-2 voyage (2012) was investigated. Organic iron-binding ligands and dissolved iron had similar profiles and showed strong correlation, suggesting that Lt control DFe distribution in Antarctic pack ice. The binding strength found was intermediate/strong type (logK'Fe3+L = 12.2 ± 0.4), likely biologically-mediated, and organic ligands were not saturated with iron (Lt/DFe > 1). Flux estimates showed that pack ice would release 0.45 μmol/m2/d of Lt during spring melt, 0.21 μmol/m2/d of which are free of Fe, and therefore available for further complexation.

Supervisors
D. Lannuzel, K. Wuttig, S. Moreau
ABSTRACTS OF POSTER PRESENTER

George-Allen, Sam - College of Arts, Law and Education

COVENS AND COMPETITIONS: ADDRESSING NARRATIVES OF FEMALE RIVALRY THROUGH AUTOETHNOGRAPHIC CREATIVE NON-FICTION

This project investigates the complexities of female collaboration, solidarity and rivalry through both creative non-fiction and a study of the autoethnographic process. I am writing to demonstrate the power and pleasure of working with other women, and against a cultural conspiracy to keep us apart. The creative component, a book-length work of creative non-fiction called 'Witches: what women do together', is grounded in personal experience and feminist theory, and built up with extensive research to form a commercial non-fiction text in the vein of current feminist publications like 'Bad Feminist' by Roxane Gay, 'Things That Helped' by Jessica Friedmann and 'Men Explain Things To Me' by Rebecca Solnit. This is accompanied by an exegetical examination of the process of writing creatively in the autoethnographic mode. Both the creative and exegetical components of my research engage with questions on how collectives of young women operate as agents of social change while negotiating socially constructed obstacles like female rivalry; how creative practice can connect with this demographic to write both for and about them, in ways that work to address and reverse the narrative of compulsory rivalry; and how to render these academic ideas readable and commercially viable.

Supervisors

H. Stark, D. Wood

Gleeson, Paige - College of Arts, Law and Education

COLLECTING CULTURE, BUILDING EMPIRE - AUSTRALIA IN OCEANIA 1875-1915

My research seeks to uncover and trace imperial networks of artefact and photographic exchange, demonstrating the connections between artefacts and photographs and the potential they hold in illuminating the fluid boundaries of the expansive oceanic territory to which Australia belonged in the late nineteenth and early twentieth centuries. The history of Australia in the Pacific, and in particular Australia’s connection to Papua New Guinea, can be accessed through archives of photographs and artefacts, shedding light on social networks and connections central to colonial governance, the development of anthropological knowledge, and consolidation of Australian national identity. I explore the moment Australia began developing a definitive identity as a nation state, independent from Britain’s Empire. Rather than relying on a framework of all-encompassing imperial domination resonating outward from Britain as centre, I turn toward a conception of Australia as one of many islands, in a sea of islands, connected to New Zealand, Papua New Guinea, Fiji, Samoa, the Solomon Islands, through ocean. I question the role of Australia’s own imperial ambitions and its relationship to a global, unifying racial discourse based on skin colour, in colonial museum collections which have previously been primarily considered as spoils of Britain’s Empire.

Supervisors

P. Edmonds, K. Harman
ABSTRACTS OF POSTER PRESENTER

Glor, Cheryl - Institute for Marine and Antarctic Studies

COMPARISON OF VOLCANIC SULFUR FROM AURORA BASIN NORTH TO ANTARCTIC COASTAL AND INLAND ICE CORES

To completely understand the impacts of human-induced climate changes, natural drivers of climate change need to be assessed. Volcanic eruptions are one of the most important short-term natural climatic drivers with their debris altering the atmospheric reflectivity and thus the energy balance of the planet. In the absence of satellite or historical accounts of eruptions, the chemical climatic proxies found in ice cores can provide information needed for climate models to properly represent the climate response of eruptions and better understand the impacts humans are having on the planet. However, Antarctic ice cores only represent one location on the continent. To appreciate the impacts from any single eruption, an array of ice cores characterizing multiple eruptions is required. In this study, the sulfate (SO4²⁻) deposition from 10 eruptions will be compared across 10 ice cores distributed across Antarctica, with special attention paid to a new ice core from Aurora Basin North, East Antarctica. The relative sizes of each eruption in this core will be compared to published records to better understand the unique SO4²⁻ deposition observed. Finally, the SO4²⁻ content from the Tambora (1815) eruption will be compared to determine its efficacy as an indicator of devastating climate impacts.

Supervisors
A. Fraser, M. Curran, C. Tozer

Grist, Matthew - College of Arts, Law and Education

ATTRACTION AND ATTRITION: LEARNER SELF-EFFICACY BELIEFS IN TERTIARY-LEVEL, FOUNDATIONAL LANGUAGE COURSES

Online delivery modes are opening up foreign language study to a broader range of students, while a growing focus on cross-disciplinary engagement also sees more students choosing languages as elective subjects. This has diversified the student cohort, affording a timely opportunity to: 1) investigate what beliefs and expectancies are at work in drawing students to study a foreign language at university, and to 2) learn how these beliefs change under the influence of their experience in a foundational language course – in what, for many of these students, will also be their first encounter with tertiary study. My PhD research explores the place students envisage for language learning within the contemporary tertiary education landscape, what they understand as the goals of learning a foreign language, what personal goals they hope to reach through language study, and how achievable they consider these goals and aspirations to be. Additionally, by interviewing students early in the semester and again at its end, I will probe the extent to which their experience of tertiary language study interacts with their perceptions of both the value and the attainability of the linguistic skills they have been working towards.

Supervisors
I. Wang, F. Fan
ABSTRACTS OF POSTER PRESENTER

Gunn, Matt - College of Science and Engineering

CONJECTURE AND EMBODIMENT: LEARNING INTO A GROUNDLESS ARCHITECTURE

Within architectural education and practice there is a tendency to direct the practitioner away from the ‘big pictures’ that emerge by initial intuition and conjecture. This way of working through the design process is seen as illogical through its subsequent period of post-rationalisation; the student is seen as taking shortcuts through what is generally hypothesised to be the most rational approach to design problems in the real world – the adoption of multiple perspectives and testing to find a ‘best fit’ to an objective reality ‘out there’. This project challenges this logic through a practical application of an embodied practice of learning that I hypothesise to be literally one of deep and interrelated coupling to the world. This occurs through fundamental cognitive functions of meaning-making that emerge through multiple levels of perception, and hierarchies of relevance realisation between the observer and their environment.

Supervisors
C. Owen, T. Fry, A. Steen

Haas, Bianca - Institute for Marine and Antarctic Studies

LINKS AMONG REGIONAL FISHERIES MANAGEMENT BODIES AND THE SDGS AND THE PARIS AGREEMENT

Oceans and marine resources play an essential role for millions of people in providing food, income and well-being. However, food security and livelihoods of many countries are jeopardized by overfishing. Regional Fisheries Management Organisations (RFMOs) are authorised to establish binding conservation and management measures and cover almost all areas in the ocean. RFMOs are influenced by international environmental agreements and one of the newest agreements is the United Nations Sustainable Development Goals (SDGs) which seek sustainable development in the social, economic and ecological sectors. SDG 14, one of 17 goals, calls for conservation and sustainable use of the oceans, seas and marine resources for a sustainable development. Another relevant agreement is the 2016 Paris Agreement for Climate Change and its scope to limit global temperature rise. The aim of my research project is to examine the response and connection of RFMOs to the SDGs and the Paris Agreement. This study will be a valuable contribution to the growing literature regarding the SDGs and the Paris Agreement and will improve our understanding of the connection between RFMOs and the two agreements. Furthermore it will increase the awareness of the SDGs and the Paris Agreement in RFMOs.

Supervisors
M. Haward, J. McGee, A Fleming
Habibul Hasan, Shah Mohammad - Tasmanian School of Business and Economics

THE ROLE OF FOREIGN DIRECT INVESTMENT (FDI) AND ITS VOLATILITY ON ECONOMIC GROWTH IN DEVELOPING ECONOMIES; A COMPARATIVE ANALYSIS OF DIFFERENT MACROECONOMIC AND INSTITUTIONAL VARIABLES

Foreign Direct Investment is considered as one of the important element/ingredient of economic growth and development. Such international capital flow results from the interactions of economic, social, cultural, historical, environmental, and political events in regional as well as global perspective. Empirical studies has shown substantial differences in covariates explaining FDI without little consensus. This study simultaneously explores the macroeconomic, financial, political, demographic and institutional variables/determinants for low income and lower middle-income countries over a period of 1971-2017. Generalized Method of Moments (GMM) with Fixed and Random Effect models will be applied to estimate the determinants and effects of FDI. GMM is used to control for the potential endogeneity for between FDI and explanatory variables. Additionally, IV regression will also be performed to check robustness of the results. The study will also attempt to model the volatility of annual FDI inflow in sample countries by using ARCH/GARCH model. FDI volatility is to be measured by taking the standard deviations of the error from autoregressive equation for FDI/GDP ratio lagged over three periods and time trend. The interaction term of FDI with each of the macroeconomic and institutional variables will also be included to assess the potential impact of FDI on growth.

Supervisors
P. Blacklow, J. Vespignani

Haddon, Joseph - College of Arts, Law and Education

MODERNITY IN WORLD SOCIETY

Conceptions of global political activity beyond the confines of the nation-state have formed a key contribution to the ‘globalisation debate’ in international relations (IR). Focussing on social and normative elements, English School theory has devoted much of its research agenda to this problematic - an emerging ‘world society’ paradigm has been the result. Unfortunately, and despite its great promise, the concept of world society remains riven by conflicting normative commitments and its continuing use as a ‘catch-all’ analytical category. This thesis proposes that engagement with the fundamental metanarrative of ‘modernity’ underwriting the concept will allow us to more effectively diagnose its problems. Drawing on an emerging body of critical and reflexive sociology, ‘world society’ is found to be far less than global in its scope, neutered by its unwitting complicity in Eurocentric narratives of progress and ideational homogenisation. By beginning from a base proposed by this sociology - a focus on ‘interconnections’ - the concept of world society can be renegotiated along with its preexisting antecedents to enshrine its contribution to both the English School and IR more broadly.

Supervisors
M. Killingsworth, C. Goetze
Halbe, Thomas - College of Health and Medicine

DETERMINING THE EPIGENETIC REGULATION OF SMARCA4 IN PROSTATE CANCER

Prostate cancer is the most commonly diagnosed cancer in men and has the second highest mortality rate of male cancers. The disease is complex and research to date has revealed that the development and progression of tumors involves both genetic and epigenetic factors. Meaning "above DNA", epigenetics refers to a group of mechanisms that coordinate DNA behaviour without altering the genetic sequence, including the ability to change the amount of protein a gene produces. Here, we focus on an important gene called SMARCA4, which is of interest due to its ability to control DNA structure. The SMARCA4 protein is produced at higher levels in prostate cancer and our study will determine whether abnormal epigenetic activity may explain its changes in production and function. To do so, we will first map DNA structure and measure a number of different epigenetic marks across the SMARCA4 gene in various prostate cancer cell lines before expanding our line of investigation to prostate cancer clinical samples. We will then alter the amount of SMARCA4 in prostate cancer cell lines to determine whether the change in SMARCA4 increases the cells’ migration, indicating a role in cancer progression.

Supervisors
P. Taberlay, A. Holloway

Halfter, Svenja - Institute for Marine and Antarctic Studies

SMALL THINGS MATTER - HOW ZOOPLANKTON CONTROL THE BIOLOGICAL CARBON PUMP

Mesozooplankton affects the marine carbon cycle in different ways: (1) they produce fast-sinking fecal pellets by feeding on phytoplankton. (2) They also fragment particles and consequently change the particles' sinking velocity and nutritional content. (3) Diel vertical migration (DVM) by some zooplankton groups leads to an active transport of carbon to deeper depths of the ocean. (4) Additionally, their respiration rate (production of CO2) is influenced by DVM mainly due to temperature changes in different water depths. The importance of zooplankton in the Biological Carbon Pump varies with community composition, plankton ecology as well as environment. In this PhD project, twenty years of sediment traps samples from different zones and depths of the Southern Ocean are analysed to evaluate the long-term trend in species composition related to carbon flux. Additionally, the role of different subantarctic zooplankton species in the carbon pump is studied with laboratory-based experiments, especially regarding fecal pellet production and respiration. Finally, a new tool (ZOORESPIRE) is developed to measure in situ respiration rates of the subantarctic plankton community. Based on these results, the future efficiency of carbon sequestration in the subantarctic zone is predicted under climate change conditions.

Supervisors
P. Boyd, K. Swadling
Hansen, Angela - Institute for Marine and Antarctic Studies

ANTHROPOGENIC DEBRIS INGESTED BY AUSTRALIAN WATERFOWL IN A RAMSAR WETLAND IN TASMANIA

Native waterfowl are essential components of freshwater systems, and indicators of ecosystem health. Across the globe, wetlands are altered and degraded due to human activities, including pollution. Contamination from plastic and trace elements occurs in numerous wetlands. Worldwide, plastic pollution impacts on waterfowl and their freshwater habitats are poorly documented. This study 1) determines if native Australian waterfowl species are ingesting anthropogenic debris such as plastic and metal shot, and 2) quantifies the scope and severity of plastic contamination in a key Tasmanian Ramsar wetland (Moulting Lagoon). Birds were collected from recreational hunters in 2017 and 2018, and environmental samples from the wetland just prior to the 2018 hunting season. Gizzard contents, surface water, and benthic sediment samples were analyzed for plastic debris and spent metal shot (>200 μm). Metal shot was found in gizzard contents, and plastic fragments and fibres in water samples from Moulting Lagoon. Benthic sediment was also analyzed for debris, and shoreline surveys conducted to identify types of macroplastic debris accumulating in the habitat. This study has produced baseline data for this important wetland in Tasmania, and furthered our understanding of the scope and severity of anthropogenic pollution in Tasmania.

Supervisors
A. Fischer, J. Lavers, E. Woehler, A. Bond

Hemida, Mohamed - College of Science and Engineering

PORTABLE LIQUID CHROMATOGRAPHY PLATFORM FOR ONLINE ANALYSIS IN PHARMACEUTICAL MANUFACTURING SITES

Liquid chromatography has become the most widely separation technology employed for the analysis of chemical mixtures, offering substantial performance and analytical capabilities. There is a strong drive to decrease liquid chromatography footprint and to reduce the scale of the instrument in research and industry. In this work, we report the recent progress on development of miniaturized systems with focus on miniaturized UV-Vis and MS detection. We are investigating UV-Vis based photometric detection options for miniaturized capillary liquid chromatography which offers detection capabilities with multiple wavelength and an order of magnitude higher sensitivity with small size and weight. With the aim of miniaturisation and portability, a 3D-printed fibre-optic interface for a portable UV-Vis detector was designed and utilised in conjunction with ESI-MS detection. Several parameters including emission spectra, effective pathlength and stray light, were assessed to characterise the newly developed detectors. The calculated effective pathlength was approx. 1.1 mm for a capillary flow through a z-cell with 1.2 mm pathlength with high sensitivity, and linearity with stray light 0.03%. Finally, in this work we present small chromatographic systems based on low-cost detection capabilities for portable analytical technologies. Performance of the developed platform is under demonstration with separations of compounds of pharmaceutical samples.

Supervisors
B. Paul, S. Thickett, P Haddad
ABSTRACTS OF POSTER PRESENTER

Herath, Manoja - College of Health and Medicine

HOW DOES GESTATIONAL DIABETES AFFECT THE BODY COMPOSITION OF INFANTS?

The incidence of gestational diabetes mellitus (GDM); glucose intolerance that begins during pregnancy, is increasing in Australia along with the growing prevalence of pre-pregnancy obesity. Despite several short- and long-term health consequences for the mother and offspring, women’s understanding of the causes and effects of GDM is limited. Furthermore, body composition during infancy can predict the risk of obesity and related diseases, including type-2 diabetes and cardiovascular disease, in adulthood. While a growing body of literature suggests an association between GDM and neonatal body composition, the findings have been inconsistent and contradictory. Therefore, we aim to 1) identify the health information-seeking behaviour during pregnancy and 2) assess the body composition of infants born to mothers with and without GDM, at birth and 3-month intervals up to 1-year of infancy using the air displacement plethysmography (PEA POD) and deuterium dilution techniques. We will also explore whether infant body composition differs according to sex, feeding behaviour, tobacco exposure, sleeping duration and maternal body composition during the postpartum period. Findings could help healthcare providers to improve awareness of GDM among pregnant women, and extend our knowledge of the influence of postnatal factors on the body composition of infants exposed or not to GDM.

Supervisors

K. Ahuja, A. Hills, N. Byrne, J. Beckett

Hewson, Timothy - College of Science and Engineering

THE GRADED RING OF MARKOV INVARIANTS ON TWO STATE BINARY TREES

It is possible to take a statistical model of a phylogenetic tree and transform it into the realm of group representation theory. This allows for the new structure to be analysed in terms of invariant functions, that is, algebraic identities that are intrinsic to the model itself rather than the data used to derive it. These objects are of interest in their own right and are amenable to being studied from several perspectives using a variety of tools, both theoretical and practical. The approach taken in this project is to expand on the three taxa case by investigating the ring of invariants that occur on a quartet tree and higher number of taxa. Software has been developed to calculate the potential invariant functions and these are then compared against pre-existing software to ensure the correct counts. The objects identified are then sorted and transformed yet again in order to check for uniqueness. This whole process operates incrementally and by repeated applications a compatible structure emerges. The final part of the project will involve situating the results in the relevant body of existing theory.

Supervisors

J. Sumner, P. Jarvis
Hill, Nicholas - Institute for Marine and Antarctic Studies

PERFORMANCE OF AUSTRALIAN FISHERIES RELATIVE TO TARGET OBJECTIVES

An increasing number of fisheries within Australia are being managed under harvest strategies. These often aim to maintain stocks at or near a target reference point (TRP) and minimise the probability of stocks falling below a certain level or limit reference point (LRP). A number of sustainability classification schemes have been developed which designate stocks as sustainable if they are at or above the LRP. This can lead to a performance gap whereby some groups will consider a sustainable classification as sufficient evidence that a stock is well managed, even when the stock is not at or near levels targeted by management. Using the Status of Australian Fish Stocks, a national fisheries performance reporting platform, this study explores this ‘performance gap’, collating those species that contain an estimate of stock biomass relative to unfished biomass and comparing this against its assigned TRP. If an explicit TRP has not been defined, a proxy TRP will be assigned. This study will provide an assessment of Australian fisheries performance in terms of maintaining stocks at target levels rather than merely being sustainable.

Supervisors
J. Lyle, B. Moore, R. Little, K. Hartmann

Hillier, Benjamin - College of Arts, Law and Education

INVESTIGATING THE AUSTRALIAN SOUND IN AUSTRALIAN EXTREME METAL

This poster provides an overview of the existing literature relevant to my PhD project examining Australian extreme metal bands, their practices, and opinions about the distinct characteristics of Australian extreme metal. This is a diverse style of music that often resists homogenous classification and reflects complex relationships with regard to culture and identity. As such, the aim of this poster is to provide context for my work investigating the potential of an Australian sound whilst also introducing some of the prevalent musicological concerns within the emergent field metal studies. This discussion will be divided into four main domains: the broad field of metal studies; specific musicological work on metal music; specific texts that discuss metal music in Australia and; work that has been carried out on the presence and detail of a unique Australian identity and sound in our music. From this position, I will posit some of my hypotheses about the Australian sound in Australian extreme metal.

Supervisors
C. Philpott, G. Hodges
Hindrum, Sonja - College of Arts, Law and Education

MAKING THE UNFAMILIAR FAMILIAR WHILST EXTENDING UPON TRADITIONAL CONSTRUCTION AND CRAFT TECHNIQUES WHEN WORKING WITH SCOBY, AND OTHER SINGLE-CELLED ORGANISMS. DR HALL DR KRATZ

Whilst there is much research and writing on methods behind this multidisciplinary approach of using familiar to help bridge the unfamiliar this research looks to extend upon this, using the unfamiliar – in this case bacteria and living organisms as materials. In order to progress the emerging field of bioart, biodesign and the influence of biomimicry, new frameworks can be developed that can help artists, cultural institutions, scientists and science institutions engage with and understand the various issues at play when making and exhibiting such works. The aim is to ultimately open up new avenues for participation, engagement and possible new ways of creating wearable items. Looking at practitioners and their work such as Donna Franklin - Fiber Reactive, Suzanne Lee - Biocouture and Anna Dumitriu - Antibiotic Resistance Quilt, Sonja Bäumel, The textured Self, they have all explored and worked with living organisms and textiles. What these three works have in common (as do a number of other textile bioartists) is they are still using traditional craft methods to construct/create their works, using the familiar to introduce the unfamiliar. Can a single-celled organisms grow into a wearable form (or accessory)? Can this be done via non-traditional craft techniques of construction?

Supervisors

K. Hall, S. Kratz

Hingley, Rebecca - College of Arts, Law and Education

ANTARCTIC GEOPOLITICS AND ANTARCTIC HERITAGE

The geopolitical impact of countries’ Antarctic heritage is yet to be fully investigated and appreciated, an event that would reveal valuable insight into the international politics of the Antarctic region. This project will endeavor to examine how spaces of Antarctic heritage such as museums, monuments or nominated sites represent a non-traditional yet highly fertile forum for International Relations. In order to expose the political significance of these heritage spaces, the field of critical polar geopolitics from the neighbouring discipline of Political Geography offers a suitable foundation for analysis. This field satisfactorily traces the nuanced relationship between power relations, cultural phenomena, representation and storytelling at a national scale. The two disciplines work together to provide concepts and frameworks that ultimately construct a more meaningful understanding of Antarctic heritage and its ramifications for how countries behave and conduct themselves in Antarctica and the Southern Ocean region.

Supervisors

E. Leane, J. Jabour, C. Goetze
Ho, Chau - College of Health and Medicine

LEGACY EFFECTS OF BASELINE BLOOD PRESSURE 'TREATMENT NAIVETY' IN THE ANTIHYPERTENSIVE AND LIPID LOWERING TREATMENT TO PREVENT HEART ATTACK TRIAL (ALLHAT)

Background As per Australian guidelines for the primary prevention of heart disease and stroke, BP lowering drug treatment could be initiated at a threshold of 160/100 mmHg in low risk individuals. Many GPs have expressed a concern that delaying drug treatment may lead to irreversible damages, a so called 'legacy effect'.

Aims To investigate the effects of delayed BP lowering therapy on those with elevated BP over a spectrum of absolute risk (AR) on all-cause and deaths due to heart and stroke disease.

Method Post-trial survival study of the ALLHAT trial. ALLHAT was a multicentre, double-blind randomised controlled trial. In this study, we will compare the effect of treatment in participants who did (previous treatment) or did not receive (treatment naïve) BP lowering drug treatment before enrolling. Short and long-term morbidity and mortality of heart attack or stroke will be examined. Also, a subgroup analysis by absolute risk will be performed. Results To date we reached a consensus on data sharing with the ALLHAT trialists. Our analysis is in process. The analysis might be completed by 08/2018 and the results will be presented if available.

Conclusion The findings will contribute to improving the adoption of absolute risk based guideline in clinical practice.

Supervisors

M. Nelson, M. Breslin, C. Reid, J. Doust

Holloway, Olivia - College of Health and Medicine

THE 'PRIMED' SUSPECT: POTENTIAL LINK BETWEEN BRAIN INJURY AND ALZHEIMER'S DISEASE

The brain's immune defence consists of innate microglia as well as peripheral circulating cells. Microglia are cells that respond first to any change to the brain's environment, responding through the production of inflammatory markers. However, microglia are a double-edged sword. Their response can be protective or toxic, thereby capable of preventing or enabling further damage. Therefore, there is a hypothesised role of microglia in the pathogenesis of Alzheimer's disease (AD).

In AD there are non-modifiable and modifiable risk factors. Ageing is an example of a non-modifiable risk factor, whereas, an example of a modifiable risk factor is a traumatic brain injury (TBI). Past literature has linked mild and severe TBI to a greater risk of developing AD. Following a TBI, microglia adopt a 'primed' profile. Primed microglia have a higher inflammatory marker profile - suspected to be detrimental and cause an exaggerated response to any subsequent immune challenges to the brain, which may lead to a heightened risk of AD. This project aims to characterise behavioural outcomes and microglial changes in an AD rodent model with a mild TBI. This study hypothesises primed microglia will increase the chances of developing AD, as well as quickening disease progression and severity.

Supervisors

J. Ziebell, J. Vickers, M. Kirkcaldie
ABSTRACTS OF POSTER PRESENTER

Hwang, Jimin - Australian Maritime College

ADAPTIVE SAMPLING IN AUTONOMOUS UNDERWATER VEHICLE MISSIONS

An oil spill is one of the most devastating anthropogenic disasters amongst all of human activities. It can have fatal consequences for the marine living organisms due to a variety of toxic chemicals released into the environment. The Antarctic is the most remote and isolated continent on the planet and it has a relatively undisturbed adjacent marine environment. In spite of many efforts, such as the ban of heavy fuel oil use in the Antarctic region by the International Maritime Organization (IMO) since 2011, the risk of pollution in Antarctic Ocean increases because of the gradually growing interest by tourists, scientist and researchers. When an oil spill occurs in the Antarctic sea region, its environmental impact is far more severe than in other parts of the ocean. This research will propose an adaptive sampling system utilizing an autonomous underwater vehicle (AUV) that is capable of sensing, interpreting and reacting upon unpredictable situations during survey. The proposed system will provide a safer way to complete the mission objectives, allowing the vehicle to flexibly modify the mission plan based on the collected in-situ data in real time.

Supervisors
S. Fan, N. Bose, K. Tenekedjie

Hyland, Lucas - College of Science and Engineering

DETERMINING THE SPIRAL STRUCTURE OF THE MILKY WAY

The exclusive association of Class II methanol masers and water masers with high mass star formation regions and in turn spiral arms, makes them ideal tracers of spiral structure. The bright and compact nature of masers also makes them good sources for Very Long Baseline Interferometry, with their fluxes visible on some of the longest terrestrial baselines. The ongoing success of the Bar and Spiral Structure Legacy (BeSSeL) project demonstrates the use of masers in large-scale high-precision trigonometric parallax surveys, the results of which are able to constrain the size, mass, shape and dynamics of our galaxy. We present new trigonometric parallax results from BeSSeL and discuss the future outcomes of southern hemisphere surveys.

Supervisors
S. Ellingsen, J. Dickey
ABSTRACTS OF POSTER PRESENTER

Ishaq, Muhammad - College of Health and Medicine

OBESITY RESEARCH: ASPERULOSIDE, A NEW COMPOUND IMPORTANT FOR WEIGHT LOSS

Background: Obesity is a major global health problem that requires urgent action to prevent a wide range of obesity-related health problems including diabetes, cardiovascular diseases, and some types of cancer among other consequences. The real challenge for the cure of obesity is the sustainability of weight loss, and recent improvements in the understanding of peptidergic-signalling of hunger and satiety have opened new strategies for pharmacological interventions. Methods: Due to a new isolation technique from a native and local Australian plant by UTAS Chemists, we have unlimited and exclusive access to a unique metabolite typically extracted from Eucommia ulmoides Oliver leaves named Asperuloside (ASP). Results: Our in vivo study (mouse) has shown very promising anti-obesity properties through a direct reduction of food intake supporting preliminary results (Fujikawa et al.). Chronic ASP administration-controlled body weight gain, white adipose tissue and liver weight gain in mice exposed to the high-fat diet. Conclusions: Our investigations indicate also changes in the dopaminergic and melanocortinergic circuitry suggesting a key role of ASP in the reward mechanisms of food intake. Further studies are now needed to elucidate the safety and mechanism of action of the compound under chronic administration for the effective and safe treatment of obesity.

Supervisors

V. Caruso, R. Eri, M. Iglesias

Ishikawa, Tetsuya - College of Science and Engineering

PHYSIOLOGICAL AND MOLECULAR MECHANISMS CONTROLLING XYLEM ION LOADING IN RICE

Abiotic stress including salinity, waterlogging and drought significantly impact on food production. Rice is the second most popular cereal crop in the world which is highly salinity sensitive. Plants have diverse strategies to adapt unfavourable environment, and control of xylem ion loading is one of them. My Master’s research found that salinity tolerant barley quickly increased xylem Na+ loading in response to salinity for osmotic adjustment, then reduced Na+ transport to the shoot, while salinity sensitive rice prevented the entry of Na+ into xylem at the beginning but failed later that caused severe salt toxicity. My PhD project is focusing on discovering the details of this process by using cutting edge microelectrode technique, so called MIFE technique. This method can show ion flux in response to abiotic stresses that enables us to analyse what transporters or channels are involved in ion transport. Previously, the trait of xylem ion loading is ignored in breeding programs, and a lot of breeders failed to produce salinity tolerant rice. Findings from my research can be the start point of the future breeding program focusing on this new trait to produce stress tolerant rice, and therefore contribute to the future food security.

Supervisors

S. Shabala, L. Shabala, M. Zhou
ABSTRACTS OF POSTER PRESENTER

Islam, Raisul - Tasmanian School of Business and Economics

SYSTEMIC RISK: VISUALIZING VULNERABILITY

This paper develops a means of visualizing the vulnerability of complex systems of financial interactions around the globe using ANN techniques to show how time-varying spillover indices can be translated into two dimensional crisis maps. The crisis maps have the advantage of showing the changing paths of vulnerability, including the direction and extent of the effect between source and affected markets. We demonstrate these crisis maps using equity market data for 31 global markets over 1998-2017. These tools help portfolio managers and policy makers to distinguish which of the available tools for crisis management will be most appropriate for the form of vulnerability in play.

Supervisors

M. Dungey, V. Volkov, M. Raghavan

James, Ivan - College of Arts, Law and Education

REFUGEE SETTLEMENT: UNDERSTANDING THE IMPLICATIONS OF CHANGES IN GOVERNMENT POLICY

Immigration policy is a highly-contested political and social issue in the Western world and it has cast a shadow over Australian politics since 2001. My Honours research investigated the front-line settlement services in Launceston and my findings demonstrated the complexity of the system and exposed the apparent lack of coordination between 30 government-funded settlement programs. My PhD project investigates Australia’s refugee settlement policy and practices and examines the implications for the social and economic integration of refugees in Tasmania. The timing of this investigation is significant because all the government settlement programs were redesigned and privatised in late 2017 and this study will be the first to examine the impact of those far-reaching changes on the lives of new settlers and their host communities. This investigation aims to use qualitative methods to examine the genesis of the current settlement policies and procedures and to engage with participants from all five levels of settlement: policy-makers, contracted service providers, street-level bureaucrats, refugee entrants, and the host communities. It will also use quantitative methods to conduct an attitude survey of a representative sample from within the host communities in Launceston and Hobart and to analyse the data.

Supervisors

R. Julian, P. Cook
Ji, Ruixuan - College of Arts, Law and Education

INVESTIGATION OF STUDENTS' EPISTEMIC BELIEFS CHANGING DURING SECONDARY-TERTIARY TRANSITION

Much research has addressed the importance of learning mathematics. There has been a growing interest in transitions in mathematics learning. Students’ conceptions of the nature of mathematics and their attitudes towards mathematics influence their higher education chances and future decision. The problems shown in transition are complex, so identifying problems in transition during the process of mathematics learning is of great significance.

Supervisors
K. Beswick, G. Oates

Johnson, Kate - College of Science and Engineering

CAN WOODY PLANTS REPAIR DROUGHT-INDUCED DAMAGE TO THE PLANT WATER TRANSPORT SYSTEM?

Drought events have been linked to tree mortality in forests across the world. As more intense and prolonged droughts are predicted into the future, it is critical to understand the mechanisms which lead to plant death in drought conditions. Failure of the plant water transport system (xylem) has been identified as a casual factor in plant death in due to drought. New techniques now make it possible to accurately measure this damage to the xylem to determine how vulnerable plants are to death in drought events. However, to understand and predict how woody plants respond to drought, it must first be determined whether the damage to the plant water transport system caused by drought can be repaired. Here I will use four plant species, Oak (Quercus robur) an Australian conifer (Callitris rhomboidea) Olive (Olea europaea) and a Eucalyptus species (Eucalyptus pulchella) to determine whether woody species can restore function to xylem after drought-induced damage.

Supervisors
T. Brodribb, G. Jordan
Jones, Imogen - College of Health and Medicine

NEW METHOD FOR CALCULATING RELATIVE RISK IN EPIDEMIOLOGY

The risk ratio (relative risk) is the ratio measure of choice in Epidemiological studies when using data with a binomial outcome. However, fitting a log binomial regression model has previously resulted in failure of model fit due to numerical difficulties. Therefore, odds ratios are instead presented, which is considered an inferior measure. However, in 2010, Petersen and Deddens published an article demonstrating a method to solve the mathematical issues of fitting a log binomial regression model to binomial data. This method has now been coded in two software packages by staff and students at The Menzies Institute of Medical Research. The method will be briefly described here with examples demonstrating its use.

Supervisors
L. Blizzard, K. Wills, J. Stankovich, D. Hosmer

Jones, Laurel - College of Science and Engineering

A 1H NMR SPECTROSCOPY STUDY OF THE PKA OF UREA IN NON-AQUEOUS SOLVENTS

The measurement of pKa values is extremely important. Not only is knowledge of acid-base characteristics imperative for drug development, but also for ligand characteristics and the alteration of physico-chemical features. Urea is the simplest diamine and is of significant importance due to its critical function in processes such as protein denaturation and in its role as a source of nitrogen. Although extensively studied, there is little research published on the pKa of urea in any solvent other than water. It is well known that acid-base properties can be altered through use of non-aqueous solvents. Proton binding, and therefore pKa, is strongly influenced by the surrounding environment, therefore shifts in pKa can be observed for the same molecule in different solvent systems. NMR has been shown in the literature to be a useful tool in the determination of pKa values in aqueous media. 17O NMR has been successfully used previously to study the protonation of urea in water. Here, the pKa values of urea in a variety of non-aqueous solvents have been measured using 1H NMR and methanesulfonic acid. This study presents a novel approach for the determination of pKa in non-aqueous solvents.

Supervisors
M. Breadmore, M. Zhang
Joseph Dass, Sabrina - College of Health and Medicine

PRECLINICAL DEVELOPMENT OF NEUROPEPTIDE Y (NPY) FOR THE TREATMENT OF MOTOR NEURONE DISEASE (MND)

Any activity or movement that is completed is due to the use of motor neurons. This includes movement, speech, breathing and swallowing. Motor neurone disease (MND) is the name given to a group of diseases in which these neurones fail to work normally. With no nerves to activate them, muscles gradually weaken and waste. There are many subtypes of motor neurone diseases, but Amyotrophic Lateral Sclerosis (ALS) is one of particular interest as it typically affects motor neurones in the brain, brainstem and the spinal cord, causing progressive degeneration and atrophy of voluntary skeletal muscles ultimately resulting in paralysis (1) and limits survival to 2-5 years after disease onset. One of the approved drugs for the treatment of ALS, Riluzole, prolongs lifespan by mere months (2). The aim of this project therefore, is to target the neocortex excitotoxicity pathway to gain a better understanding of disease pathogenesis, through the restoration of inhibitory and excitatory balance in the cortex and/ or spinal cord and to ultimately develop a treatment for ALS.

Supervisors

T. Dickson, C. Blizzard, R. Clark

Khaleel, Israa - College of Health and Medicine

INFORMATION OVERLOAD IN CONSUMERS OF HEALTH-RELATED INFORMATION: A SCOPING REVIEW

Objective: To examine and map the breadth of evidence on information overload in lay adult and adolescent consumers of health-related information. Methods: Six electronic databases including PubMed, CINAHL, ERIC, PsycINFO, Embase, and Scopus, hand-searching, limited grey literature (advance Google search, WorldCat) were searched for evidence published in English without any limit on the date of publication. Total records (n=12115) were identified; from which, 56 records were included. Results: The included records (n=56) were organised into four groups; studies that measured information overload in consumers (n=15), studies that mentioned information overload (n=26), expert opinion articles (n=14), and literature review (n=1). The majority of the studies that measured information overload focused on cancer information overload (n=8). Health information overload was measured by variant approaches. Predictors and correlates of health information overload were identified. Interventions in the studies that measured information overload did not introduce significant changes in health information overload. Conclusions: There is a lack of robust studies that explore health or health-related information overload in consumers. Our scoping review is trying to shed light on the growing need for studies that aim to develop a comprehensive and clear understanding of health or health-related information overload, and its potential consequences and solutions.

Supervisors

G. Peterson, B. Wimmer, K. Lee, T. Zaidi
Khan, Mohammad - College of Arts, Law and Education

EXPLORING DEVELOPMENTALLY APPROPRIATE PRACTICES IN THE CONTEXT OF AUSTRALIA FOR CREATING AN EARLY CHILDHOOD EDUCATION (ECE) FRAMEWORK FOR PAKISTAN  DR JENNIFER MASTER DR ELSPETH STEPHENSON

This study investigates contemporary pedagogical approaches for children’s holistic development in the context of Australia for creating a culturally responsive ECE framework for Pakistan. Currently, the education system in Pakistan largely follows a didactic approach to teaching and learning which encourages rote memorization rather than developing conceptual understanding and children’s holistic development. Evidence from research suggest that ECE programmes supportive to the needs of the children can create a robust base for success in life. The current study will seek advice from Australian educators in early learning settings where the education programme is based on sound principles of developmentally appropriate practices and successful multicultural approaches. The study will follow a design-based research paradigm within interpretive enquiry. The research process will include document analysis, in-depth semi-structured interviews with principals and focus groups with educators. The framework design will be an iterative process throughout the study, consistently informed by the data collected during the research. The outcome of this study will be a detailed, culturally responsive and developmentally appropriate ECE framework for Pakistan. This document will be provided to early childhood educators in Pakistan to enable them to develop effective and culturally sensitive curriculum programs for the children that they teach.

Supervisors

J. Masters, E. Stephenson

Kohl, Amelia - College of Health and Medicine

EXPLORING THE THEORETICAL BASIS OF CONFIDENCE IN RECOGNITION - A PSYCHOPHYSICAL APPROACH VS. AN INFERENTIAL APPROACH TO ECPHORIC CONFIDENCE RATINGS

We are investigating whether ecphoric confidence ratings (e.g. a rating of a participants confidence as to whether a stimuli had been seen before, made in the absence of a binary yes/no recognition judgement) are best accounted for by psychophysical or inferential models of metacognition. In the first experiment, 60 participants undertook a facial recognition task. Participants saw a mix of full and partial faces, and provided ecphoric confidence ratings for each face at test. Inferential models of metacognition propose that additional information at test, regardless of its diagnosticity, increases confidence. Therefore, we would expect confidence to be higher in trials where participants viewed a partial face at study (TS) followed by the corresponding full face at test (FT), than when they viewed a partial face followed by the corresponding partial face (TT). Psychophysical models propose that confidence indexes discriminability, and should be unaffected by additional non-diagnostic information (TS/FT = TS/TT). The doubt-scaling model argues that non-diagnostic information should decrease confidence (TS/TT > TT/FT). Linear mixed effects models supported the doubt-scaling account. The second experiment aims to look at whether these results truly support the doubt-scaling model by replicating the study, but this time using images of houses/landscapes instead of faces.

Supervisors

J. Sauer, M. Palmer, A. Heathcote
Kok, Zhen - Australian Maritime College

NUMERICAL INVESTIGATION OF CONTAINER SHIP SQUAT AT HIGH SPEEDS

Ship squat is a common phenomena where a ship experiences additional trim and sinkage due to the hydrodynamic forces and moments experienced by the ship when the ship is travelling forwards. Ship squat presents a port safety issue as it is escalated by how fast the ship is travelling and how confined the channel is. In extreme cases, grounding of the ship can and has occurred before. Hence, ship squat has been investigated by various researchers for many decades where the ultimate goal is to be able to predict the sinkage of a ship for a given operation condition and therefore prevent grounding. Most prediction methods available today are based on model-scale experiments where the effect of scale is questionable. Furthermore, currently available prediction methods for high speed conditions have been found to be inaccurate according to industry experts. Thus, the aim of this research is to develop an improved empirical prediction technique using computational fluid dynamics (CFD) based investigation focusing on high speed container ships.

Supervisors
J. Duffy, S. Chai

Krisanski, Sean - College of Science and Engineering

BELOW CANOPY UAS PHOTOGRAMMETRY FOR STEM MEASUREMENT IN A RADIATA PINE PLANTATION

Unmanned Aerial Systems (UAS) are a cost-effective means of collecting forest data which are conventionally operated above the forest canopy. Where forest canopies are dense, limited information about stem structures can be extracted directly due to obscuration by foliage. In these circumstances, complementary ground-based methods including manual measurement and terrestrial laser scanning can be deployed, however these techniques are often limited in scope and scale of data collected by factors including time, field cost and site accessibility. This poster describes the application of below-canopy UAS photogrammetry as an efficient and effective approach for stem measurement in areas where the canopy is difficult to penetrate. The study sites were scanned with a helicopter-mounted VUX-1LR LiDAR as part of this campaign, and the resulting point clouds were used as a comparison dataset. The measurements extracted from these point-clouds were compared with ground-based measurements of diameter at breast height and relative positions. Below-canopy UAS photogrammetry was found to achieve useful accuracy, achieving a root-mean-squared error of diameter measurements of 4.1cm. Future research will look at applications in forest structure research and autonomous flight within the forest.

Supervisors
P. Turner, M. Taskhiri
Kucina, Talira - College of Health and Medicine

METACOGNITION FOR DETECTION-ONLY DECISION MAKING

Countless decisions are made daily, many of which are under conditions of uncertainty, where people may utilise metacognitive judgments to guide their subsequent actions. Metacognition refers to one’s capacity to understand, monitor, and control their cognitive processes and is relevant to many types of decisions. This project focuses on metacognition in different types of decisions that involve scanning a visual array or scene. For example, different types of decisions can be involved when radiographers scan x-ray images. Sometimes the decision involves specifying what type of abnormality is present and where it is located (a compound decision involving the detection and identification of an abnormality). Sometimes the radiographer simply makes a triage yes-no decision about whether or not further examination is required (a detection-only decision). An important consideration is the extent to which people can accurately predict future decision making performance and evaluate past decision making performance. There is a distinct lack of literature pertaining to the metacognitive assessment of detection decisions in relation to the accuracy and timing of these choices and how this affects behaviour. A series of studies aim to evaluate and improve how people make detection-only decisions; both in terms of performance and, most crucially, metacognitive accuracy.

Supervisors

M. Palmer, J. Sauer, A. Heathcote

Latour, Pauline - Institute for Marine and Antarctic Studies

MARINE H2O2 DISTRIBUTION TO THE SOUTH EAST OF AUSTRALIA AND ITS EFFECT ON PHYTOPLANKTON CARBON UPTAKE. DOES MANGANESE HELP THESE COMMUNITIES AGAINST ROS STRESS?

Hydrogen peroxide (H2O2) is a reactive oxygen species (ROS) which can cause damage in phytoplankton. Mainly produced by photochemical reactions in the marine environment, it can also be produced by a step in the metabolic respiratory chain. Hydrogen peroxide is a strong oxidant, but can also be a reductant in seawater and its distribution is controlled by several parameters, such as irradiance, precipitation, temperature, particles, organic material, mixing and biological processes. Uncharged, H2O2 can diffuse across biological membranes and be detrimental to DNA or alter carbon fixation. To defend themselves against this ROS, organisms can produce enzymes, such as peroxidase. Manganese has been shown to be essential for another similar enzyme, the superoxide dismutase. Therefore, relieving manganese limitation could help relieve ROS stress. This hypothesis will be investigated during the IN2018-V04 voyage which aims to study iron inputs in the East Australian Current. I will study the distribution of H2O2 in the waters south of Tasmania and south east of Australia, where currently no data exists for H2O2 distributions. I will also test, through onboard phytoplankton incubations, if the addition of H2O2 decreases C uptake and stresses communities, and if adding manganese can relieve this stress.

Supervisors

A. Bowie, M. East, P. Van Der Merwe, K. Wuttig
Law, Geoffrey - College of Science and Engineering

THE MAKING OF THE TASMANIAN WILDERNESS WORLD HERITAGE AREA

In 1982, the Tasmanian Wilderness was inscribed on UNESCO’s World Heritage List. Constitutional history was made in 1983 when Australia’s High Court ruled that a large hydroelectric dam in the Tasmanian Wilderness could not proceed. The Court upheld the power of the Australian Government to make laws under its foreign affairs power to implement the provisions of the World Heritage Convention, thereby enabling Australia’s national government to intervene in affairs previously regarded as the preserve of the states. Consequently, efforts by conservation groups to protect large tracts of the natural environment in Australia, such as Kakadu, the Great Barrier Reef and the Queensland Wet Tropics, have relied heavily on the World Heritage Convention. My research seeks to identify and describe the special qualities of the Tasmanian Wilderness itself as well as the circumstances that led to the successful use of the World Heritage Convention in Tasmania in the early 1980s. I have found that the World Heritage qualities of the Tasmanian Wilderness extend outside its current boundaries into unprotected areas, thereby driving current conservation campaigns in Tasmania, but that many of the political conditions that led to World Heritage Listing of the Tasmanian Wilderness in 1982 no longer apply today.

Supervisors
J. Kirkpatrick, J. Aryal, P. McQuillan

Le, Duy - College of Science and Engineering

RISK PREDICTION USING NATURAL LANGUAGE PROCESSING OF ELECTRONIC MENTAL HEALTH RECORDS IN AN INPATIENT FORENSIC PSYCHIATRY SETTING

Instruments rating risk of harm to self and others are widely used in inpatient forensic psychiatry settings. A potential alternate or supplementary means of risk prediction is from the automated analysis of case notes in Electronic Health Records (EHRs) using Natural Language Processing (NLP). The Wilfred Lopes Centre (WLC) in Risdon is a Forensic Mental Health unit linked to the Risdon Prison. Most of the patients are prison inmates from the prison and lengthy text-based records of patient activities and their health are recorded by staff. The centre, much like the prison, has a strong focus on risk management in relation to the patients’ behaviour. The risk factors of most concern are those that relate to self-harm or harm to others. This project will use Natural Language Processing (NLP) and Machine Learning in conjunction with these historical narratives and other records of harm events which have occurred, in an attempt to predict events that may occur in the future. The predictive tools that result may then be used to raise warnings before incidents occur, allowing suitable intervention by staff.

Supervisors
J. Scanlan, J. Montgomery, K. Kirkby
Lizarraga, David - College of Science and Engineering

REVIEWING THE EFFECTS OF CHLAMYDIAL IMMUNIZATIONS ON THE HOST IMMUNE SYSTEM

Multiple host species can be targets of infection from bacterial species belonging to the Chlamydiaceae family, leading to devastating diseases such as conjunctivitis, pneumonia, and pelvic inflammatory disease. Controlling the spread of chlamydial infection with antibiotics is a financially expensive undertaking that may not be practical for certain populations (e.g. underdeveloped countries or infected wildlife). Thus, developing a functional vaccine has been a major focus of chlamydial research over the last six decades. Using the database Web of Science, we searched the literature for studies containing chlamydial immunizations and measurements of host parameters (e.g. cytokine and antibody abundance). The resulting studies were filtered and immune parameter measurements from immunized and control groups were extracted and used to calculate an effect size. There exists an increase in the number of published chlamydial immunization studies, particularly in the last 20 years. After averaging the effect sizes of immune parameters, we found decreased chlamydial loads and increased immunoglobulin G (IgG) antibodies after immunization, while the average effect sizes of interferon gamma, IgA, IgG1, and IgG2a abundance were equivocal after immunization. The results of our meta-analysis identify trends in chlamydial immunization research that will guide future studies toward a functional chlamydial vaccine.

Supervisors
S. Carver, P. Timms

Lo, Lara Marie - Menzies Institute for Medical Research

THE PREVALENCE OF COMORBIDITIES BEFORE AND AFTER THE ONSET OF MULTIPLE SCLEROSIS COMPARED TO THE GENERAL POPULATION

Few studies have examined the prevalence of comorbidities of people with MS before MS symptom onset and at the current age with the aim to assess changes over time. 1,519 participants of the Australian Multiple Sclerosis Longitudinal Study were asked whether the a comorbidity was present prior to the age of MS onset and at current age and compared to the general population using the 2014-15 National Health Survey data from the Australian Bureau of Statistics. Prevalence ratios (PRs) were calculated. Compared to the general population and after age and sex adjustment, people with MS were significantly more likely to have depression, anxiety, high cholesterol, psoriasis, cancer, migraine and anaemia before MS symptom onset. At the current age, the PR increased for most of the comorbidities. No increased PR was observed for heart diseases and type 1 diabetes, and no significant differences were seen by MS onset type. We found that prior to MS symptom onset, many comorbidities were already more prevalent and at the current age this number increased and the magnitude of effect was strengthened. These findings highlight the vital need for the prevention and optimal management of comorbidities.

Supervisors
I. van der Mei, B. Taylor, A. Palmer
Lubuulwa, Kizito - College of Arts, Law and Education

EMPOWERING LOCAL POLITICAL & COMMUNITY LEADERS: THE THEORY OF CHANGE AND PARTICIPATORY ACTION RESEARCH, FOR SERVICE DELIVERY AND LOCAL ECONOMIC DEVELOPMENT

Decentralisation policy in Uganda is within the context of representative democracy. It is conceptually associated with representative governments: as a system in which people elect their representatives, accountable to them for their activities within government. Political leaders at the local level must represent the interests of the broader masses in each government jurisdiction and be held accountable. Through the theory of change, which proposes that if local politicians are empowered to carry out their stipulated roles, they positively influence other actors to improve service delivery and local development. On one hand politicians influence citizens through harnessing their participation, while on the other they influence the technocrats to provide services that are responsive to the needs of the citizens. Preliminary and anecdotal evidence indicate that administrators' commitment to this policy to empower the local leaders and community is inadequate resulting in ongoing poverty and social injustices in Uganda. Through Participatory Action Research approach, which pursues collaborative and practical solutions to social problems by bringing together action and reflection, theory and practice in participation with the communities, I will analyse how decentralisation is implemented in Uganda to achieve Local Economic Development (LED) and to make evidence-based policy recommendations that further empower local communities.

Supervisors
F. Gale, J. Vince

Ma, Canchen - Menzies Institute for Medical Research

DISTAL RADIUS BONE MICROARCHITECTURE: WHAT HAPPENS BETWEEN AGE 25 AND OLD AGE?

Purpose: The aim of this study was to describe differences in bone geometry, volumetric bone mineral density (vBMD) and microarchitecture parameters at the distal radius between older and young adults.

Methods: Bone geometry, trabecular and cortical parameters and vBMD at distal radius were collected using high-resolution peripheral computed tomography (HRpQCT) in 201 participants from the prospective Tasmanian Older Adult Cohort study (mean age 72.2 years, range 61.9-89.4 years, female 47%) and 196 participants from the T-bone study (mean age 25.5 years, range 24.1-27.6 years, female 38%). Results: Older adults had a larger cross-sectional area of the transitional zone (outer 30.96mm2 vs. 28.38mm2, inner 36.34mm2 vs. 32.93mm2) compared to young adults. In addition, the prevalence of cortical porosity (54% vs. 49%) was higher in older adults than in young adults. Cortical and trabecular vBMD (734.51 mg HA/cm3 vs. 801.04 mg HA/cm3, 144.19 mg HA/cm3 vs. 178.02 mg HA/cm3) were all significantly lower in older adults. There were no significant differences between older and young adults in cortical and trabecular cross-sectional area. Conclusion: Compared to young adults, older adults have an increase in transitional zone bone size, decreased vBMD measures and increased prevalence of porosity.

Supervisors
G. Jones, T. Winzenberg, L. Laslett, F. Pan
ABSTRACTS OF POSTER PRESENTER

Macdonald, Cameron - College of Science and Engineering

GOTTA GO FAST: MECHANISTIC CONTROL OF GROWTH RATES

Organisms grow at different speeds based on a number of factors: Temperature, nutrient levels, salinity, pH, and many more. But what is it that limits a rate of growth? Why is it that organisms can't just grow faster and faster? By examining diverse groups of microorganisms that share living conditions, such as the cold-temperature adapted psychrophiles, we can begin to build an understanding of the similarities that these organisms have. This will allow us to delve deeper into how they control the rates at which they grow, and what stops them from growing faster. Additionally, by examining the opposite, a group of organisms that are highly similar genetically, but have very different living conditions, we can examine how small differences in genes can cause large changes in how organisms live. By combining these two approaches, we can begin to truly understand the mechanics of how organisms grow, and what we can do to use this to help people.

Supervisors

R. Corkrey, T. Ross, J. Bowman, R. Wilson

Makomere, Reuben - College of Arts, Law and Education

GOVERNING OCEAN ACIDIFICATION: TOWARDS MULTI-SCALE REGULATION OF 'GEO-ENGINEERING PLUS' RESPONSE STRATEGIES

Ocean acidification is a complex environmental and developmental problem primarily caused by elevated concentrations of atmospheric carbon dioxide. However, there are other small scale stressors that also drive changes in sea water chemistry. These changes occur at different rates across different ocean basins and affect marine organisms across different trophic levels. Apart from reducing elevated atmospheric carbon dioxide concentrations, there are other strategies that could be useful in responding to ocean acidification. These include: geo-engineering, protection of biodiversity, reducing of local land-based stressors and adapting human activities to ocean acidification. This study terms these as 'geo-engineering plus' strategies. These strategies will also require an integrated approach to implementation. However, regulation of these strategies has not yet matched the scale of implementation required to respond to ocean acidification. The research will focus on these strategies and examine the extent to which governance frameworks can facilitate implementation of 'geo-engineering plus' strategies to ocean acidification. It will also examine theory driven explanations for challenges in coordinating the governance architecture of ocean acidification. The research will apply a mixed methods approach and aims to contribute to the understanding of whether and the circumstances in which 'geo-engineering plus' strategies can be effectively regulated and implemented.

Supervisors

J. McDonald, J. McGee, K. Brent
ABSTRACTS OF POSTER PRESENTER

Mardon, Gabrielle - College of Arts, Law and Education

SHARING A COMMON PRESENT: A FEMINIST APPROACH TO THE PHENOMENOLOGY OF TIME AND TEMPORALITY

The sheer speed at which our social and cultural processes run according to late capitalism’s demands for productivity, efficiency, and instantaneity, born of a linear narrative of progress and production, results in an alienated experience of the present in which we struggle to locate ourselves: a collective experience of belatedness which is in tension with the demand to keep up with the new. What is our phenomenological and existential experience of this compressed, belated present like? Feminist phenomenologist Sara Heinämaa writes, “the constituting subject is intentionally tied to other constituting subjects, and together, in communicative interaction, these subjects establish the sense of the world” (2014, p.84). If it is the case that we engage in the constitution of the world interactively, what happens if we do not share a common present – if we cannot meet in the present in order to engage in world-building? The thesis will deploy the methodologies of feminist phenomenology to explore our current experience of time and temporality, and will consider the political and ethical dimensions of the question of whether it is necessary to share a common present in order to project meaningfully into the future.

Supervisors

L. Tatman, I. Farin

Marhamati, Arman - Australian Maritime College

FOOD COLD CHAIN: AN INVESTIGATION OF THE IMPACT OF CURRENT CHALLENGES ON COLD CHAIN PERFORMANCE

The term cold chain (CC) is used to describe a specific supply chain whose activities and processes certify the temperature control for the perishable products. Food cold chain (FCC) is a particular type of CC to keep the foodstuff in the proper condition. Therefore, food cold chain management (FCCM) consists of a set of SC practices aimed to preserve appropriate atmosphere for the perishable food products and defy microbial spoilage. Food Cold Chain’s barriers and problems regarding infrastructure, cost, technology, and expertise potentially pull down the firms’ efforts and performance, especially, in the developing economies. Consequently, effective planning, integration and information sharing are becoming critical success factors in moderation of the global food competition risk. There are many technical, logistical and investment challenges as well as economic opportunities related to the use of the cold chain which needs to be investigated and evaluated.

Supervisors

P. Chen, S. Cahoon
Mason, Claire - Institute for Marine and Antarctic Studies

THE EFFECT OF CLIMATE VARIABILITY ON SHY ALBATROSS POPULATIONS AND CONSERVATION UNDER CLIMATE CHANGE

Shy albatross are endemic to three Tasmanian islands. In recent years, the population has gradually declined and modelling suggests climate plays a key role in driving population dynamics. Our knowledge of this climate-biology relationship is limited, and potential conservation efforts, such as climate change adaptation interventions, require in-depth ecological understanding. Using long-term monitoring, demography and telemetry datasets, I will study the influence of climate variability and change, the most pervasive threat for shy albatross, on population dynamics. I will then use this information to guide future management and conservation of the species.

Supervisors
M. Lea, R. Alderman, A. Hobday

Meijer, Jan Jaap - Institute for Marine and Antarctic Studies

AN OBSERVATIONAL PERSPECTIVE TO THE STRUCTURE OF A STANDING MEANDER IN THE ANTARCTIC CIRCUMPOLAR CURRENT

In the last two decades, the melting rate of the Antarctic Ice Sheet has accelerated, and it is now one of the biggest contributors to global sea level rise. Therefore, it is becoming increasingly important to understand the warming of the southern waters. The Antarctic Circumpolar Current (ACC) that encircles Antarctica, acts for most of its path as a barrier between north-south transfer of heat, but in a few places where the current interacts with changes in topography, meanders and energetic eddies form and strong poleward heat flow is observed. In this poster the structure of a standing meander in the ACC southwest of Tasmania from in-situ observations is described.

Supervisors
H. Phillips, N. Bindoff, S. Rintoul
ABSTRACTS OF POSTER PRESENTER

Mekonnen, Geberew Tulu - College of Arts, Law and Education

GOVERNANCE AND GOVERNMENTALITY: THE EXPANSION OF ETHIOPIAN HIGHER EDUCATION SYSTEMS

The purpose of this study is to investigate the Ethiopian public universities’ governance systems in the context of the Bologna Process. In the past two decades, Ethiopia expanded its higher education institutions from one public university to more than thirty public universities. With this tremendous expansion, the higher education system is becoming complex and there is a prevailing chorus of complaint among stakeholders (instructors, students, instructors, leaders etc.) about public university governance systems in Ethiopia (Mehari, 2010). The Ethiopian government has acknowledged the stakeholders’ dissatisfaction with governance (Ministry of Education, 2015) and has put governance as one of the agenda items for the coming five years of the Growth Transformational Plan-II (GTP-II) of 2016-2020 (The Federal Democratic Republic of Ethiopia, 2016). It has been also reported that little has been published about higher education governance in Africa (Bano & Taylor, 2014; Kigotho, 2015; Roberts & Ajai-Ajagbe, 2013; Vandemoortele, 2012). Therefore, it is timely and worth to explore the governance system of the Ethiopian public universities by using a pragmatic mixed methods design (quantitative followed by qualitative). The concept of governance and governmentality will also be utilised as a conceptual framework to explain the public universities governance systems in Ethiopia.

Supervisors

S. Kilpatrick, D. Kember, J. Kenny

Melvin, Jessica - Institute for Marine and Antarctic Studies

EFFECT OF OCEAN ACIDIFICATION ON PHYSIOLOGY AND GROWTH OF ANTARCTIC KRILL

Antarctic krill are recognised as one of the keystone species in the Southern Ocean, linking the lower and higher trophic levels of the food web. They are also the target of the largest fishery, by tonnage, in the Southern Ocean. The world’s oceans have absorbed approximately one-third of anthropogenic carbon dioxide (CO2) emissions since the industrial revolution, driving various changes in the ocean, including ocean acidification (OA). The ecosystems of the Southern Ocean are expected to be particularly vulnerable to OA as this ocean acts as a ‘sink’ for CO2 because its cooler temperatures facilitate the dissolution of more atmospheric CO2. Even though krill are one of the most studied crustaceans, there are only a handful of studies focusing on krill and OA. This study will address this issue by conducting long-term experiments, exposing krill to different levels of CO2 and monitoring their physiological responses. The project will contribute to established Southern Ocean ecosystem models that predict changes under various environmental scenarios. These models will aid policy makers in making management decisions about the status of krill stocks in the Southern Ocean in a changing environment.

Supervisors

K. Swadling, S. Kawaguchi
Mohammadalipourtofighi, Aylin - Institute for Marine and Antarctic Studies

EXAMINATION OF THE EXISTING TRANSBOUNDARY LEGISLATION IN THE CONTEXT OF MARINE GEOENGINEERING

Marine geoengineering methods such as ocean fertilization, artificial upwelling/downwelling, microalgal cultivation and alkalinity addition have been proposed to offset anthropogenic climate change through enhancement of carbon sequestration from the atmosphere. However, these technologies pose several risks including increasing ocean acidification which could influence food web dynamics, development of toxic algal blooms and exacerbating anoxic areas of the ocean. Hence, a comprehensive regulatory framework must be enacted to ensure that states adequately research, coordinate, and exercise mutual restraint before enacting geoengineering. To date, no specific international rules to regulate these activities have been completely developed. Nevertheless, the number of international treaties has limited geoengineering practice merely for scientific research purposes. Using legal doctrinal and legal policy analysis, this thesis examines the current international law in governing the marine geoengineering technologies and the extent they could be applied. Moreover, it probes whether decision-makers could build governance on existing international treaties and institutions, or new regimes have to be developed. Furthermore, it will improve our understanding regarding the legal approaches to geoengineering techniques and will help to set a guide for policy-makers to ensure that research into geoengineering and the future deployment of geoengineering techniques are properly governed at an international level.

**Supervisors**

P. Boyd, J. Jabour, J. McGee

---

Mohd Khalid, Mohd Khairul Nizam - Menzies Institute for Medical Research

GENOME-WIDE ANALYSIS OF GENE REGULATORY NETWORKS IN PRIMARY OPEN ANGLE GLAUCOMA

Glaucoma is the second leading cause of blindness worldwide with an estimated 80 million affected individuals in 2020. The disease is characterized by death of a specific type of retinal neurons known as retinal ganglion cells (RGCs). The most common subset of glaucoma is the primary open-angle glaucoma (POAG). The POAG disease burden is compounded by ineffective screening programs, while current treatments can only slow disease progression if administered early. Despite having strong genetic component, molecular mechanisms leading to RGC loss in POAG remain unknown. We aim to answer this question by studying the RGCs generated from patients with blinding POAG using RNA sequencing (RNA-seq). We hypothesize that by deriving RGCs from actual patients with extreme phenotype we will be able to recapitulate glaucomatous processes in vitro. RGCs generated will also be subjected to accelerated aging in vitro to examine the role of aging in POAG pathogenesis. RNA-seq will allow us to identify transcriptional and post-transcriptional genetic effects in RGCs and the associated molecular pathways that lead to POAG blindness. We hope the findings from this work will translate into improved care by enabling drug repurposing and the development of novel therapies for POAG.

**Supervisors**

A. Hewitt, A. Cook, G-S. Liu
Montalvo Mancheno, Cristian - College of Science and Engineering

SYSTEMATIC CONSERVATION OF AUSTRALIA'S TERRESTRIAL BIODIVERSITY IN THE ANTHROPOCENE

Biodiversity is in danger globally. Due to the scale of this crisis, bioregional schemes have been developed to prioritize conservation efforts at global and regional scales. In Australia, the Interim Biogeographic Regionalization for Australia (IBRA) framework was developed to conserve and manage Australia’s terrestrial biodiversity. For 23 years, the IBRA framework has been instrumental in the expansion of Australia’s Natural Reserve System, curbing its original bias towards areas of low productivity. However, its implementation has done little to deal with drivers of biodiversity loss (e.g. land clearance). Conservation scientists and practitioners are yet to think of IBRA as a minimal unit of analysis that provides the space through which the effect of past changes and the impact of future environmental change on biodiversity could be predicted with the purpose of improving the conservation planning process. To move towards this, I will seek to answer these two overarching questions: Are IBRA bioregions appropriate units of planning for biodiversity conservation? Can IBRA bioregions stand future change in environmental conditions caused by human activities?

Supervisors
B. Brook, J. Buettel, S. Ondei

Moore, Myles - Menzies Institute for Medical Research

EXERCISE PHYSIOLOGY IN THE IDENTIFICATION AND CONTROL OF HIGH BLOOD PRESSURE: THE EPIC-BP STUDY

Background: Elevated blood pressure (BP) responses to exercise reveal high BP not detected at rest. Accredited exercise physiologists measure exercise BP during routine clinical services. The EPIC-BP study aims to develop and test a clinical pathway to identify and control high BP using exercise BP. This study will determine whether exercise BP measured upon referral to an exercise physiologist identifies high BP, and whether exercise physiologist designed interventions improve BP based on exercise BP. Methods: 200 patients referred for exercise physiology services at three Tasmanian clinics will be recruited. Participants will have exercise BP measured at an initial and final visit to the clinic. Participants will complete 24-hour ambulatory BP monitoring to determine BP. Exercise BP and 24-hour ambulatory BP will be compared to calculate the: 1) prevalence of high BP detected by exercise BP, 2) optimal exercise BP threshold for determining high BP, and 3) effectiveness of exercise physiologist interventions to improve BP. Outcomes and significance: We expect this study to demonstrate exercise BP measured during exercise physiology services to improve the identification and control of high BP not detected at rest. This will ultimately help to reduce the burden of high BP and preventable cardiovascular disease.

Supervisors
M. Schultz, J. Sharman
ABSTRACTS OF POSTER PRESENTER

Moran, Frieda - College of Arts, Law and Education

IMAGINED FOOD SAFETIES: AN AUSTRALIAN CULTURAL HISTORY

Food Safety is a perennial issue in human societies: it costs lives, health and money. It is a source of much anxiety. This study importantly moves beyond the sources of illness: how people fear getting sick from food is often very different to scientific knowledge, and such fears importantly inform decision making. A cultural history will show that understandings of food safety are not fixed or natural. Rather, they are contextual, shifting, and contested. My thesis will illustrate that food safety manifests in ways much broader than previously understood. I am interested in how people have negotiated fears of getting sick; that is, how food safety has manifested materially, in discourses, and in practises; and how these have changed over time. This study will explore the relationship between individuals, private organisations, communities, and governments in shaping understandings of food safeties, and how international ideas impact the local. Finally, I am interested in what this can tell us about Australian culture more broadly. Through a cultural history of food safety, I will explore and demonstrate the inextricable entanglement of the everyday with important historical themes such as empire, race, class and identity.

Supervisors
N. Tarulevicz, P. Edmonds

Morgan, Emily - College of Arts, Law and Education

A GENRE-BASED APPROACH TO TEACHING ENGLISH AS A FOREIGN LANGUAGE IN A JAPANESE UNIVERSITY CONTEXT

Genre-based teaching frameworks for English were developed from the 1980s in Australia from Systemic Functional Linguistics (SFL) theory. These frameworks for teaching writing and reading to students of English as a Foreign Language (EFL) have received little attention in Japan. Studies from other EFL classrooms around the world and in Australia suggest genre-based pedagogies improve learning outcomes for students with regard to English writing ability. This action research will involve a ten-week intervention program of genre-based English writing lessons to students at a Japanese university’s English Extension program. Using qualitative and quantitative methods, this research will seek to determine if improved English writing outcomes from genre-based English teaching apply to Japanese university students, and what details can be discovered regarding optimum teaching methodologies of the genre-based approach across cultures, age groups and pre-intervention skill levels.

Supervisors
V. To, A. Thomas
Mostafavi, Seyed Mojtaba - College of Science and Engineering

THE ROLE OF DETERGENTS ON CHROMATOGRAPHY SEPARATION

Detergents are widely used for the separation and solubilization of peptides in proteomics. They are so strong and due to their organic and inorganic parts of structures, the joint detergent-peptide as a double, triple or micelle can be easily solved at the organic or aqueous media. Sodium Dodecyl Sulphate (SDS) is an important detergent that is used for denaturation of different structures of peptides. In the initial samples in the low concentration of SDS (<0.01%), there is no significant change in intensity or retention of peaks either in chromatographic peaks or MS peaks. However, at the higher concentration of SDS, not only intensity decreased, but also peptides dramatically eluted at the higher retention time. The significant decrease in peak intensity has different reasons in MS and LC. At the MS, decreasing of intensity can be happened because of a peak suppression in the ESI process. At the ESI process, DS- dominates over peptide peaks and can create ion suppression MS peaks. Detergent removal is an important treatment that must be done before injection of samples especially biologic samples such as proteins or other macromolecules into Mass spectroscopy.

Supervisors

J. Quirino, M. Macka

Mudwari, Nabaraj - College of Arts, Law and Education

TOWARDS INCLUSIVE EDUCATION FOR REFUGEE CHILDREN: EXPLORING EDUCATIONAL EXPERIENCES OF BHUTANESE STUDENTS IN TASMANIAN SCHOOLS

Over the last few decades, the “inclusive education” has become very important to address the increasing issues of diversity of students within school communities, including the cultural and linguistic diversity (CALD). The issue has been even more important in Australian schools because of increasing number of students with diverse immigration backgrounds including the students with refugee backgrounds. Students with refugee backgrounds are facing various barriers in schooling in host countries due to their prior limited and/or disrupted schooling and traumatic experiences in their countries of asylum. Schools can play a critical role to ensure inclusive education for such children. However, the main issue is how schools can successfully support these vulnerable students. While evidence is available on other group of refugee children from the educators and administrators’ perspectives, the experiences of Bhutanese refugee students and their parents are yet to be explored. By drawing Bourdieu’s theory of field, habitus, and hysteresis (1977), this research project will be expected to contribute towards fulfilling this research gap in the literature.

Supervisors

M. Cuskelley, C. Murphy
Murray, Sandra - College of Health and Medicine

INVESTIGATING THE PREVALENCE, PREDICTORS AND CONSEQUENCES OF FOOD INSECURITY AMONG UNIVERSITY OF TASMANIA STUDENTS

As awareness about the prevalence of food insecure households has increased there are growing concerns being raised about the food security (FI) of university students. Evidence suggests that university students could be experiencing an even higher level of FI than has been reported for the general adult Australian population. This study will investigate prevalence, predictors and consequences of FI on academic achievement and overall health among University of Tasmania (UTas) students’; the impact on educational outcomes and policy solutions required to address FI. Methods will include a validated on-line survey to investigate prevalence and semi-structured interviews and focus groups to examine predictors and consequences. A socio-ecological approach will be used to investigate program solutions that could support student food security from an individual, campus, community and policy perspective. Whilst there is a scarcity of Australia studies, researchers in the US suggest FI is a major public health problem among university students and therefore it is conceivable that UTas students are also at significant risk. If the finding of this research are consistent with existing studies, this will indicate a need for action if UTas students are to achieve their potential.

Supervisors
S. Elmer, D. Adams

Nair, Manoj - College of Science and Engineering

CREATION OF A PREDICTIVE DIGITAL MODEL TO IMPROVE EDUCATIONAL OUTCOMES

The aim of this research is to figure out ways to reduce/minimise the gap (also called the TASki gap) between the Year 12 attainment rates amongst Secondary students here in Tasmania versus the other states. The main hypothesis is that this gap can be tackled effectively through a predictive digital model that can act as a Teacher Assistant and can help overcome the main causative factors of this gap viz distance to nearest school, attitude towards learning environment/material and socio-economic background. The key research questions we are seeking answers to are: 1. How can we enable teachers to track and manage the individual knowledge gaps and learning outcomes of their students in real-time? 2. How can we help teachers to source quality ‘peer-reviewed, scored and ranked’ learning resources in real-time on a particular study topic? 3. How can we help teachers to present personalised learning recommendations to students in real-time? The methodology used here is an AGILE one to create the digital model / software using a design centered approach i.e. building a prototype quickly and testing it with teachers across the state and getting them to co-create this along with us. During this process, we will seek answers to our research questions.

Supervisors
S. Garg, L. Ellis
Nampak, Haleh - College of Science and Engineering

ATTRIBUTION OF LIGHTNING AS AN IGNITION SOURCE OF WILDFIRE IN TASMANIA, AUSTRALIA

In Tasmania, lightning is often dismissed as an ignition source of wildfire given rain often follows lightning events. Recent large wildfires including the 2016 event in the North-West of Tasmania challenges this highlighting much is to be understood about lightning as a potential source of ignition. Here, we present initial work undertaken to investigate lighting strike data and their relationship to bushfire ignition in North-West and Western Tasmania, Australia. We use the global GPATS lightning database in addition to the fire history dataset obtained from the Department of Primary Industries, Parks, Water and Environment (DPIPWE) to investigate fire ignition over a 10 year period. We focus our analysis on spatial and temporal variability in lightning strikes, ranging in frequency over diurnal to seasonal time scales. We conclude this presentation with a discussion highlight how these analyses will be used in ongoing research into fire occurrence modelling in Tasmania.

Supervisors
J. Aryal, C. Watson

Nascimento, Sibele - College of Science and Engineering

DETERMINING THE LONG-TERM IMPACT OF HISTORIC MINING ON WATER QUALITY: A CASE STUDY ON MT LYELL, WESTERN TASMANIA, AUSTRALIA

This study documents the environmental impacts by the Queenstown Mount Lyell Mining and Railway Company in western Tasmania, Australia. For the past 100 years, inadequate management of mine waste at Mt. Lyell has affected the water quality and associated ecology of the Queen River, King River and Macquarie Harbour. Over the past decade, the water quality of the Queen and King rivers from the mine site to Macquarie Harbour has been measured annually to investigate the hydrochemical impact of the historical mine wastes. Baseline data show that the pH should be approx. 5.5. However, at the confluence of Haulage Creek (seepage from the historical waste at Mt. Lyell), the ph is consistently below 3.5 and remains below 4 to Macquarie Harbour. Elevated concentrations of Al, Cu, and Zn have also been measured and unless they are attenuated, or in the case of Cu metallurgically recovered, the Queen-King system will continue to be severely impacted.

Supervisors
A. Parbhakar-Fox, M. Cracknell, D. Cooke
Nath, Shruti - College of Science and Engineering

HEALTHY BUILT FABRIC SYSTEMS FOR ZERO ENERGY RESIDENTIAL BUILDINGS

The National Construction Code has been regularly enhanced since 2002 with an effort to reduce greenhouse gas emissions. Many aging and very young Australians spend most of their time within their homes. Coincidently, in Australia, asthma is the leading cause of disease in children aged 0 – 14 years, accounting for 17.9% of the total burden in boys and 18.6% in girls. Many researchers have supported a connection between damp housing and sensitivity to dust mites and other childhood respiratory symptoms. Within Australia’s temperate and cool temperate climates, the brevity of the regulations may have inadvertently created ideal interior environments that promote mould growth. If the built environment is promoting mould growth, leading to sick building syndrome, it is a matter of serious concern that could be resulting from design or technical flaws in the building fabric. This concern, which has been raised by medical scientists, requires the action of architectural scientists to provide guidance on methods to passively, or actively, manage air-borne moisture within homes and workplaces. This paper attempts to bridge the gap between architectural perspective and medical science perspective in this area of study. Key words: National Construction Code; greenhouse gas emissions; sick building syndrome; respiratory symptoms.

Supervisors
K. Orr, M. Dewsbury

Nayak, Minakshi - Menzies Institute for Medical Research

DESCRIPTIVE EPIDEMIOLOGY OF SEDENTARY BEHAVIOUR OVER TIME IN TWO YOUNG ADULT COHORT STUDIES

Background Sedentary behaviour (SB) is defined as any waking behaviour which includes sitting, reclining or lying down where the energy expenditure is \( \leq 1.5 \) metabolic equivalent (METs). SB is recognized as an important public health issue. The aims of this study were to 1) describe the pattern of different SB over time, 2) to understand how sociodemographic factors are associated with SB; and 3) to identify baseline predictors of SB patterns over time. Methodology Longitudinal analysis in READI (Resilience for Eating Activity Despite Inequality) and CDAH (Childhood Determinants of Adult health) studies. Data were survey questionnaire on SB at three time points. For READI study (women age 18-45 years) I, II and III number of participants were 4349, 1913 and 1560 respectively. For CDAH study (adults age 26-34 years) I and II number of participants were 3999 and 3049 respectively where as for CDAH-III participants are to be determined. Descriptive statistics were used to characterise SB patterns over time. Mann-Whitney U-test and Kruskall-Wallis test were used to understand any difference in SB at each time point across socio-demographic variables. Linear mixed model were used to identify the baseline predictors of SB over time.

Supervisors
V. Cleland, K. Wills, M. Teychenne
Nguyen, Thi Da Thao - College of Science and Engineering

THE IMPACTS OF WOMEN'S KNOWLEDGE OF HOUSEHOLD LIVELIHOODS ON DECISION-MAKING IN SMALLHOLDER CATTLE PRODUCTION SYSTEMS IN VIETNAM

In many rural areas of Vietnam, women are actively involved in smallholder beef cattle production activities. However, their role in such production systems has not been well understood. Moreover, the participation of women in decision-making for practice change is not known. There may also be differences between Kinh and ethnic minorities regarding the role and influence of women in cattle production. Therefore, it is of importance to conduct a comprehensive study on the role and participation of rural women in cattle production systems. This research studies the role of women in cattle production in smallholder farming systems in Dien Bien and Dak Lak provinces, Vietnam. The aim of the research is to address how women’s knowledge of household livelihoods opportunities and constraints impacts on decision-making for cattle production. Data from semi-structured interviews and focus group discussions will be collected using both quantitative and qualitative research methods. Understanding the role distribution in cattle producing households and impacts of gaining new knowledge about cattle production on the role and influence of women in smallholder farming systems provide useful information for realizing efficient and sustainable smallholder cattle production in Vietnam’s rural areas. Key Words: women, knowledge, decision-making, cattle production, Vietnam.

Supervisors
L. Bonney, S. Ives

Njoku, Chidiamara - College of Health and Medicine

HOSPITAL READMISSION OF PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD): RISK FACTORS, CONSEQUENCES AND PREVENTABILITY

Introduction: COPD is a progressive, preventable and treatable chronic condition, mainly characterised by obstruction of airflow in the lungs that cannot be fully reversed. Smoking is the major cause. In 2016, one in 20 Australians aged >45 years had COPD, which is associated with frequent presentation to emergency departments and hospitalisation. Identification of risk factors for hospital readmission from COPD is vital to their prevention. Aim: To investigate the risk factors for, consequences of and possible solutions to, hospital readmissions in patients with COPD in Tasmania. Method: As background, a systematic literature review (based on the PRISMA protocol) will be conducted to identify previously reported risk factors and their consequences, both to patients and the healthcare system. Using an explanatory sequential mixed method approach, a large de-identified dataset of Tasmanian hospital admissions over 7 years for patients with COPD will then be examined for potential risk factors, that will be explored further qualitatively via interviews of patients. Analysis: The retrospective data analysis will be conducted using SPSS statistical software while content analysis of the interviews will be utilise QSR NVivo qualitative software. Conclusion: These projects will provide a foundation for understanding and addressing the increasing COPD-related hospital readmissions in Tasmania.

Supervisors
B. Bereznicki, B. Wimmer, G. Peterson, L. Kinsman
Nowruzi, Mohsen - Australian Maritime College

MEASURING THE VALUE AT RISK OF FREIGHT RATES WITH UTILIZING, COPULA FUNCTIONS

Freight rates are determined in the freight market where the sea transport is bought and sold, and during the last 28 years they have risen and declined sharply several times. As a result the risk for market participants has risen significantly, which has led them to employ a wide variety of financial methods to hedge their risk. In this study we will suggest a creative mathematical model for measuring Value at Risk (Var), determine the best Copula functions which can be used for VaR estimation, improve the accuracy of VaR measurement by measuring non-linear dependency and finally finde the optimum portfolio with lowest level of risk.

Supervisors

N. Nikolova, K. Tenekedjiev, O. Nguyen

Obi, Ifeoma - Australian Maritime College

BRINGING AN END TO THE PROBLEM OF FOREIGN MARITIME LIEN RECOGNITION AND ENFORCEMENT FROM A COMPARATIVE PRIVATE INTERNATIONAL LAW PERSPECTIVE

Maritime lien is a right arising due to services performed for a ship or damage done by a ship allowing the claimant to approach the court to arrest and sell the ship to create a fund upon which the claimant can be paid. Although internationally recognized and have existed for centuries, maritime nations are not in agreement on claims giving rise to maritime lien. This means some claimants are not able to enforce their foreign maritime lien in some countries. Three international conventions aimed at unifying the laws on maritime lien have been unsuccessful. The research will assess if the continued existence of the maritime lien is justified in modern maritime business; investigate the reasons for the failure of the conventions; identify the maritime business most affected to devise a workable sectoral response to the problem; apply lessons learnt from more successful international cooperation systems and; provide recommendation for reforms from three perspectives—private international law, public international law and at the maritime business level. The significance is that the research introduces a new approach to advance solutions to an old problem viz. applying a combination of quantitative methodology, comparative legal analysis and principles and ideas from other systems and disciplines.

Supervisors

P. Sooksripaisarnkit, P. Chen
Odeyemi, Olumide - Institute for Marine and Antarctic Studies

MICROBIAL COMMUNITY PROFILING OF MODIFIED ATMOSPHERE PACKAGED LIVE MUSSELS AT COLD STORAGE TEMPERATURE USING 16S RRNA AMPLICON SEQUENCING

There is little information on the microbial community associated modified atmosphere packaged (MAP) live mussels or how pre-packaging depuration modifies the microbial community and spoilage. Amplicon sequencing was used to describe spoilage microbial community succession in MAP live mussels during cold storage. Proteobacteria, Cyanobacteria and Firmicutes were the three major phyla observed in the mussel meat and pouch water of undepurated and depurated mussels. Among these phyla, Cyanobacteria was more predominant on day 0 in mussel meat of undepurated and depurated mussels while Proteobacteria was predominant in commercially-depurated mussels. Synechococcus was dominant on days 0 – 7 in the mussel meat of undepurated mussels and days 0 - 10 in depurated mussels. Shewanella was dominant on day 0 in commercially-depurated mussels. Acidaminococcus became dominant on day 10 in undepurated and day 15 in depurated mussels. Psychrobacter was observed to be dominant in commercially-depurated mussels on day 7 and further shift to Acinetobacter occurred by day 15. In the pouch water, Acinetobacter was dominant throughout the storage days in undepurated mussels while Psychrobacter was predominant in both depurated and commercially-depurated mussels. Commonly, Acinetobacter and Psychrobacter preceded Shewanella and Acidaminococcus as spoilage bacteria in live mussels.

Supervisors
C. Burke, C. Bolch, R. Stanley

Olaoye, Toba - College of Science and Engineering

THE EMPIRICAL EVALUATION OF VAPOUR PERMEABILITY OF BUILDING COMPONENT AND AS-BUILT IN AUSTRALIAN BUILDING CONSTRUCTION

The presence of moisture above the critical limit in building fabric can affect its service life and lead to significant building and human health implications. The moisture may affect the physical, mechanical, and chemical properties of individual building components but through the manifestation of various deterioration processes, may also significantly impact the durability and thermal performance of the envelope or structural system. These include mould, corrosion, rusting, freezing, swelling and other dimensional changes on building elements. Building material water vapour resistivity quantifies the capacity of a material to resist or support water vapour diffusion. Given that recent research identified that up to 50% of all homes constructed in the last 15 years in Australia have some form of condensation problem and it’s internationally recognised that it’s the building’s role to passively manage water vapour. understanding and quantifying of building materials vapour resistivity properties becomes imperative for Australian buildings to be able to passively manage water vapour so as to inform climatically appropriate design and construction systems for buildings. This research will discuss vapour resistivity data currently available in Australia and the methods being developed at the University of Tasmania to establish vapour resistivity/permeance values for Australian building materials.

Supervisors
K. Orr, M. Dewsbury
Ooi, Chun Kit - College of Science and Engineering

A STUDY OF THE RELATIONSHIP BETWEEN HEAVY METAL CONCENTRATIONS AND MUSCLE MELANISATION IN TASMANIAN SOUTHERN SAND FLATHEAD (PLATYCEPHALUS BASSENSIS)

The reported incidence of melanisation, apparent as dark spots in the normally white muscle, has recently increased in southern sand flathead from certain parts of Tasmania. The presence of melanisation is especially worrying because sand flathead has high recreational and commercial value and it leads to queries on whether they are safe for consumption. The cause of melanisation in flathead is not well understood and is currently the focus of this project. As sediments in some of these areas are contaminated by heavy metals and flathead is a benthic species that may accumulate pollutants from local sources, the presence of melanisation is hypothesised to be associated with heavy metals. Our preliminary study found that, among the many heavy metals analysed, zinc concentrations were significantly higher in melanised muscle compared to muscle in the same fish with no apparent melanisation. In this study, we will continue the analysis by digesting fish samples with microwave assisted acid digestion, followed by inductively coupled plasma mass spectrometry and flame atomic absorption spectrometry analysis of the digests. In addition, the practicality of utilizing laser ablation inductively coupled plasma mass spectrometry, for the first-time, to analyse fish muscle will also be investigated.

Supervisors

T. Lewis, B. Nowak, J. Lyle

Page, Simone - College of Health and Medicine

RECOMBINANT HUMAN PARAOXONASE-2 AS AN ANTI-PSEUDOMONAL THERAPY

Cystic Fibrosis (CF) is a genetic disease that affects multiple organs, although lung disease accounts for the majority of morbidity and mortality. In people with CF, airway mucus becomes thick and dehydrated and is prone to chronic infection by Pseudomonas aeruginosa. P. aeruginosa communicates using signalling molecules to coordinate the formation of antimicrobial resistant biofilms and to express virulence factors which cause damage to host cells. These bacterial signalling molecules also enter host cells and upregulate inflammatory pathways exacerbating lung damage. It is, therefore, clear that new therapeutic strategies are needed to treat these infections and prevent damage to the airways of people with CF. Paraoxonase-2 (PON2) is a human enzyme that inactivates the P. aeruginosa signalling molecule, however, PON2 is expressed intracellularly and is unable to inactivate the extracellular bacterial signalling molecules. Our lab has produced a recombinant form of PON2 that can be administered extracellularly and have shown that it inactivates the P. aeruginosa signalling molecule and reduces the formation of biofilms. This project aims to demonstrate that this therapy is also effective against P. aeruginosa during infection of human cells and that when used in combination with antimicrobials prevention and/or eradication of P. aeruginosa infection is possible.

Supervisors

L. Roddam, M. Ambrose
ABSTRACTS OF POSTER PRESENTER

Pan, Gongbu - College of Health and Medicine

THE ROLE OF ALZHEIMER'S DISEASE POLYGENIC RISK SCORES IN PREDICTING COGNITIVE DECLINE IN HEALTHY MIDDLE AND AGED ADULTS: A LONGITUDINAL COHORT STUDY

Background: Some studies show evidence that genetic variants and polygenic risk were associated with the Alzheimer’s disease (AD). But the relationship between AD polygenic risk scores (ADPRS) and cognitive decline was unclear due to the lack of longitudinal data. Methods: A longitudinal prospect study of 326 healthy people with genotyped data. ADPRS was evaluated as a predictor of cognitive decline. Mix model was used to test for predictor cognitive decline. Based on the cognitive reserve values and gene measurement data measured by 331 testers in the TBHP cohort study, the values of PRS and cognitive decline were calculated, then cox analysis was performed to calculate the risk ratio, and a regression equation was constructed. Results: higher PRSs were associated with a greater odds of having cognitive decline than being cognitively normal.

Supervisors

J. Vickers, A. King

Pandey, Pratikshya - College of Health and Medicine

NOVEL APPROACHES TO TREAT INFLUENZA-ASSOCIATED PNEUMONIA

Worldwide, nearly 1 billion people are infected with influenza virus with 3–5 million cases of severe illness and 300,000–650,000 deaths annually. Annual vaccination is a cornerstone for preventing the disease, however, is less effective in children, elderly and those with chronic disease conditions, such as asthma and chronic obstructive pulmonary disease. In addition, antiviral therapy, the current available treatment measure, is only effective when taken within 48 hours of onset of symptoms. Moreover, the overuse of antivirals poses significant threat to the development of drug resistance. The significant morbidity and mortality associated with influenza virus infection is due to serious complications, including primary influenza pneumonia, and exacerbation of chronic pulmonary diseases which is characterised by exaggerated inflammation and severe lung pathology. We hypothesise that uncontrolled inflammation reduces the effectiveness of antiviral drugs, particularly 48 hours post onset of symptoms. We further predict that dampening inflammation during influenza virus infection might augment the adaptive immune response and also reduce the dose and frequency of antiviral treatment, potentially minimising the generation of antiviral resistance. Therefore, we aim to determine whether anti-inflammatory treatment combined with an antiviral can effectively overcome lung pathology and reduce the viral load.

Supervisors

G. Karupiah, B. Lyons
ABSTRACTS OF POSTER PRESENTER

Park, Chanjoo - College of Science and Engineering

KUNZEA AMBIGUA DISTILLED OIL: A BIOACTIVE PRODUCT TO ADD TO THE AUSTRALIAN ESSENTIAL OIL PORTFOLIO

These days, essential oils have attracted industrial attention because of their biological activity and unique fragrance. With this point of view, kunzea ambigua oil may be a good candidate for the new essential oils. The kunzea oil is extracted from the leaves and twigs of kunzea ambigua. It is commercially produced by steam distillation of vegetative material from native stands by Essential Oils of Tasmania (EOT) and at a small scale plantation at Waterhouse in northeast Tasmania. The kunzea oil has a spicy pine-eucalyptus odour and the Therapeutic Goods Administration (TGA) approved the use of kunzea oil for aromatherapy and as a therapeutic product. Essential oil quality and productivity of crops are dependent on various factors, including climate, cultivar and management practices. However, there is no experimental data for the selection and cultivation of kunzea ambigua and kunzea oil. Therefore, to produce the kunzea oil as a commercial essential oil, research is needed to select for high yielding plants and to establish the conditions for optimal vigour and yield. In a concrete way, this project is for a systematic approach to screening native K. ambigua stands across Tasmania with aim to improve yield, chemical profile and biological activity.

Supervisors
S. Garland, D. Close, A. Gracie

Perez Suarez, Thalia - Menzies Institute for Medical Research

IDENTIFYING CRITICAL NEURONAL SIGNATURES OF EPIGENETIC MODIFICATIONS AND TELOMERE LENGTH ALTERATIONS IN ALZHEIMER’S DISEASE

The incidence of neurological disorders, including Alzheimer’s disease (AD), increases with aging as the cellular integrity and function declines. In healthy cells, gene expression is tightly regulated by epigenetic processes (DNA methylation/histone modifications) to allow learning and memory to occur. The epigenome changes during aging, but epigenetic dysregulation can lead to neurodegenerative pathologies. Additionally, telomeres are the protective end-caps of chromosomes, its length decreases with age and may contribute to age-related diseases such as AD. Because proper epigenetic and telomere length control must be maintained during aging, we hypothesize that epigenetic dysregulation and telomere length shortening play an important role in the onset and progression of AD. Our aim is to investigate whether proteins that regulate epigenetic processes behave abnormally in AD, and to determine whether telomere shortening is involved in AD. We will identify epigenetic signatures and provide quantitative data of telomere length in neurons of human sporadic AD cases by ChIP-sequencing and a multiplex quantitative PCR, respectively. Our findings will help to understand the role of epigenetic dysregulation and telomere length in AD, and as epigenetic defects are reversible, we could also identify new clinical targets to improve the treatment of this disease.

Supervisors
A. Woodhouse, P. Taberlay
Potts, Douglas - Australian Maritime College

EFFECT OF VIV EXCITATION ON SUBMARINE MAST HYDRODYNAMIC WAKE

This project investigates a cantilevered cylinder projecting down into the water column moving at high velocity through still water, as is applicable to submarine masts. Surface-piercing cylinders differ from fully submerged cylinders due to the generation of surface wakes and under increasing flow speeds the formation of a ventilated pocket in the lee of the cylinder, both of which grow with increasing velocity, with concomitant effects on the hydrodynamic loading. The relative length of submergence (L/D) and end conditions of the cylinder with respect to tip vortex drag effects may also impact the hydrodynamic loads and wake formation. Laboratory testing of surface-piercing cylinders to date has predominantly been confined to characterising the wakes shed from a rigid cylinder cantilevered down into the water from a towing tank carriage, which under certain test conditions will also exhibit significant Vortex-Induced-Vibration (VIV), though not adequately identified and accounted for in its magnification of drag and wake. This project will investigate the hydrodynamics of a moving surface-piercing cylinder across a range of velocities, using a range of cylinder diameters and submerged lengths, characterising wake formation, drag loading, effect of VIV, and then comparing against the body of literature, notably that of Hay (1947).

Supervisors
J. Binns, F. Hardjanto, H. Marcollo, A. Skvortsov

Ramirez, Mauricio - Tasmanian School of Business and Economics

THE ROLE OF PSYCHOLOGICAL CAPITAL ON EMPLOYEES MENTAL HEALTH: A COMPARATIVE EVALUATION OF INDUSTRIES AND THE MODERATING EFFECT OF UNION AND ORGANISATIONAL COMMITMENT

An estimated three in five Australian employees experience mental health issues, costing organisations $AUD 693 million-yearly in productivity-lost. Psychological capital (PsyCap) reflects an individual’s positive state of psychological development characterised by efficacy, optimism, hope, and resiliency. Research has demonstrated that PsyCap is positively related to job performance and negatively related to absenteeism. However, knowledge regarding the relationship between PsyCap and employee mental health is still in its infancy. Particularly, there is limited understanding regarding the potential influence of contextual factors, such as organisational and union commitment on the relationship between employee PsyCap and mental health. Therefore, this research will aim to investigate the relationship between employees’ mental health and PsyCap and the potential moderating effects of organisational and union commitment on this relationship. A sample comprising approximately 385 unionised employees across six Australian industries will be employed. Data will be collected via a 2-wave online-survey using validated measures. Data will be analysed using factor and regression analysis. It is anticipated that the results will demonstrate a positive relationship between PsyCap and mental health. Organisational and union commitment will positively moderate this relationship. The findings will help Australian trade unions and organisations in their future efforts to promote positive mental health.

Supervisors
S. Dawkins, R. Macklin, C. Adams
Ranasinghe, Ranmali - College of Health and Medicine

UNDERSTANDING THE CCR6-CCL20 AXIS IN THE GUT

Immune profiling in Inflammatory Bowel Disease (IBD) has not taken place in a comprehensive scale up to date. Therefore, we intend to screen a wide range of immune cell types in our study from a murine model of spontaneous IBD which interestingly, is gene deficient in the chemokine receptor 6. The importance of the chemokine receptor 6 (CCR6) and its ligand CCL20 is that they are immune modulatory chemokines which target chemotactic cell migration to inflammatory locations in the gut mucosa and play a significant role in T lymphocyte differentiation during immune induction of many inflammatory disorders. They are of paramount importance to maintain the TH17/Treg pathway in which an imbalance of this axis is considered as an immunological factor which causes IBD. Mouse models will consist of the normal healthy controls of C57/BL6, spontaneous colitic model, Winnie, CCR6-/- and CCR6-/- X Winnie. Immune profiling will be carried out on T and B lymphocyte subsets, macrophages and dendritic cells using flow cytometry, immunohistochemistry and confocal microscopy. Finally in this study, we aim to elucidate the immune cell behaviour in CCR6 deficient mice which could open up new vistas for the development of effective therapies to treat IBD in the future.

Supervisors
R. Eri, D. Geraghty

Randall, Nick - College of Arts, Law and Education

A SCULPTURAL EXPLORATION OF THE BOAT FORM AND ITS CONNECTION TO THE ELEMENTS OF WIND AND WATER

The theme of this project is to create forms inspired by the boat and the elements of wind and water. Boat building techniques will be combined with craft and digital technology. Humankind has had an intrinsic connection with the ocean from the beginning of civilization. Most vessels are built for purely practical purposes but exhibit aesthetic beauty. The importance of this project is how it highlights the significance of the boat to human civilization and our close connection with the maritime environment. I will demonstrate the benefits of a synthesis of craft practice and contemporary technology and its value. My investigation centers around the boat as an artefact and its intrinsic link to civilization. An archetypal form of the boat will be used to communicate this notion. For the theoretical research I have been researching sources of literature to understand the wider significance of the boat to human society, artists who have found inspiration from the boat and the notion of craftsmanship in the digital era. Boats have featured heavily in the cultures and religions of many parts of the world in symbolic, mythological and practical forms. The practical element of this research will involve making sculptural forms.

Supervisors
M. Keating, L. Negrin
Raza, Ali - College of Science and Engineering

CAPITALIZING KNOWLEDGE USING BLOCKCHAIN

Knowledge base systems (KBS) are typically constrained by their ability to acquire new knowledge without the intercession of a technical knowledge engineer. This introduces a fundamental disconnect between the system and domain experts, causing lengthy delays and cogitative disruption for the experts during the attempts to capture their knowledge. Ripple Down Rules (RDR) and Multiple Classification Ripple Down Rules (MCRDR) address this problem as they provide knowledge acquisition techniques where a domain expert can provide knowledge to classify data (known as a case) in the local context in which it occurs, where their justification for the classification is only required against cases previously seen by the system. Traditional MCRDR KBSs however are implemented in a monolithic fashion with the expectation there is only one domain expert to populate the system’s rule-base. Also, the rule-base and associated keystone cases that were used in rule formation are themselves stored in traditional databases and are subject to tampering which, apart from security concerns, is potentially a contradiction to the fundamental incremental refinement technique MCRDR provides. To address these shortcomings we will implement and evaluate MCRDR-based KBS that is underpinned by blockchain technology and policies.

Supervisors
B. Kang, E. Roehrer

Razmi, Komeil - Institute for Marine and Antarctic Studies

PGC DEVELOPMENT, THEIR GENETIC DETERMINANTS AND ROLE IN SEX DIFFERENTIATION IN G. HOLBROOKI: TOWARDS NOVEL SOLUTIONS FOR PEST FISH CONTROL

Invasive species have caused severe losses in economic productivity and local biodiversity. In the case of mosquitofish (Gambusia), the intentional introduction of this alien species for control of mosquito larvae had adverse effects. Gambusia is native to southern and eastern USA and was introduced by local councils to New South Wales in the 1930’s with the aim of controlling the mosquito population. However, several studies and field observation has shown Gambusia compete with native fishes and amphibians predating the eggs and larvae. In addition, the competitive advantages of Gambusia over endemic species jeopardize Australia’s biodiversity. Various biological, mechanical and chemical approaches have been established to control aquatic invasive species. Many of them, however, are not useful to control Gambusia or showed little success. Taking advantage of recent advances in genome editing technology, novel approaches for control of agricultural or animal pest have been already elaborated. However, there is a limited information on cellular and genetic pathways associated with primordial germ cell (PGC) development and sex differentiation in the species. To address this knowledge gap, this study will focus on understanding the early development of PGC and differentiation of gonads with a view to developing a genetic sex ratio manipulation strategy.

Supervisors
C. Carter, J. Purser, J. Patil
ABSTRACTS OF POSTER PRESENTER

Reading, Andrew - College of Health and Medicine

DEVELOPING APPROACHES TO INHIBIT NEUROPEPTIDE RELEASE USING LIGHT

Neuropeptides are key components of modulation across the central nervous system. These short peptides are released from neurons and non-neuronal cells and have powerful modulatory effect on neuronal activity leading to changes in sensory perception, movement output and complex behaviours. Currently there are no experimental tools that can manipulate the release of these neuromodulators with high precision. The main objective of this project is to develop light induced, optogenetic approaches to inhibit the release of neuropeptides without disrupting the release of non-peptide neurotransmitters. To achieve these goals, we will use light induced reactive oxygen-generating proteins and light induced protein dimerization to disrupt the release of secretory vesicles from C. elegans and cultured neurons. By targeting these proteins to vesicles containing neuropeptides, we will be able to achieve the selective disruption of the release of neuropeptides without affecting synaptic transmission. These tools can be used to selectively turn off the release of neuropeptides at a specific region, at a specific synaptic connection or onto specific cells with unprecedented speed. We expect these tools to drastically change the study of neuromodulation, allowing elucidation of circuits for human thoughts, feeling, and actions and its disruption in neurological disorders.

Supervisors

J. Lin, L. Foa, O. Marshall

Rehman, Sabah - Menzies Institute for Medical Research

SEX DIFFERENCES IN RISK FACTORS FOR ASAH: SYSTEMATIC REVIEW AND META-ANALYSIS

Background: We reviewed sex differences in the risk factors for aneurysmal subarachnoid haemorrhage (aSAH) to investigate causes of the higher incidence in women than men. Methods: Electronic databases were searched to November 2017 to identify case-control and cohort studies that reported risk factors for aSAH. We did meta-analysis if more than two studies were available for a risk factor. Results: We included 31 studies in the systematic review and 22 studies in the meta-analysis. The sex-stratified results showed that hypertension, smoking, family history, angiotensin-converting enzyme gene polymorphism, variation in protease gene and age were risk factors for aSAH in both sexes. Alcohol intake, high alanine aminotransferase levels and endothelial nitric oxide synthase gene variant increased the risk in males. Early menarche, late age of pregnancy, contraceptive pills use, nulligravidity, aSAH predilection area, being divorced, clotting factor XIII gene polymorphism and chromosome 9p21 variation increased the risk for aSAH in females. High aspartate aminotransferase levels decreased the risk in males while diabetes mellitus and parity reduced the risk in females. Conclusion: More risk factors were identified in women compared to men, but the magnitude of risk of aSAH associated with most common risk factors were similar for men and women.

Supervisors

S. Gall, M. Callisaya, M. Breslin
Ridley, Jeff - College of Arts, Law and Education

THE RISE OF ECONOMIC LIBERALISM IN AUSTRALIA: THE CASE OF AUTOMOTIVE MANUFACTURING

In the last decades of the 20th century, both major Australian political parties embraced liberal approaches to industry policy although in 2007, the Rudd government briefly adopted a developmentalist stance in economic policy. By 2013, all Australian industries were exposed to this significant paradigm shift from protectionist policy to economic liberalism. However, unlike other industries, the car industry resisted this policy change until 2013. This research will be focusing on the latter period and asking what impact have changing Australian cultural ideas, identities, norms, beliefs and practices had on the changing policy approach to the Australian car manufacturing industry? This research will explain why support for the car industry only declined from 2000 onwards unlike other sectors of the manufacturing industry which faced the steady withdrawal of government assistance from the 1980s onwards.

Supervisors

H. Murphy-Gregory, A. Kellow, D. Adams

Rigby, Alex - College of Science and Engineering

DESIGNING CWS CODES USING A GENETIC ALGORITHM

Quantum states used in quantum computers and communication systems are subject to noise which can result in errors, this can be protected against using a quantum error correcting code. A large number of quantum coding schemes are based on stabiliser (additive) codes. However, nonadditive codes can potentially have more codewords for a given distance and number of qubits, making their design an area of research interest. Codeword stabilised (CWS) codes are defined by a classical code and a simple undirected graph. All additive codes and nearly all the best known nonadditive codes can be expressed within the CWS framework. However, the design of large CWS codes with good parameters is difficult. The number of possible graphs grows exponentially with the number of qubits and finding the optimal classical code for a given graph is NP-hard. I demonstrate that a genetic algorithm can be employed to find good CWS codes, including a 13 qubit code with better parameters than any published in literature. This genetic algorithm employs a novel crossover operation based on spectral bisection. It also mitigates the complexity of finding an optimal code for a given graph by employing an approximate fitness function.

Supervisors

J. Olivier, P. Jarvis
ABSTRACTS OF POSTER PRESENTER

Robertson, John - College of Science and Engineering

ORIGINAL APPROACHES FOR CONTROLLING EXTERNAL STIMULI IN ORGANIC SYNTHESIS

Pulsed irradiation involves the generation of an oscillating light output, which lends itself to many applications in analytical chemistry and synthetic chemistry. Intermittent illumination or pulsed irradiation has been used to study mechanisms of photochemical and photocatalyzed reactions for almost a century. In addition, it is used extensively for the characterisation for many photoactive compounds, including transient-absorption spectroscopy, along other analytical techniques. However, little has research has focused on investing the applications of pulsed irradiation in synthesis. It has been reported that pulsed irradiation can improve photosynthetic activity and phytochemical production in plants. Intrigued and inspired by these observations, we postulated that pulsed irradiation strategies may have broader implications in organic synthesis. To this end, we recently demonstrated that pulsed irradiation enhances both the rate and yield of a photocatalysed reaction for the first time. This represents a conceptual advance in the field.

Supervisors

J. Robertson, T. Nicholls, A.Bissemer

Robinson, Duncan - College of Arts, Law and Education

OTHERING WITHIN THE EDUCATION OF THE NORM

How are Indigenous People Othered and what steps do the dominant, normative culture need to take in understanding the lived experiences of those who they Other? This research will investigate how Othering is perpetuated within social work education spaces that contain the culture and history of Indigenous Australians. The education/training/facilitation that happens in regard to Indigenous issues can provide critical dialogue in how the Indigenous Other are placed as a provider of knowledge, and yet still face elements of racism. This research will foster relationships with practitioners in this field of social work in order to explore the complexities of the development of inclusion and diversity in Australian society. The cultural awareness training environment provides opportunity to explore the nuance of racism, the evolution into new racism, and how the dominant culture’s de-identification with racism continues to place Indigenous People as a cultural outsider.

Supervisors

J. Baltra-Ulloa, M. Walter
Rocha, Manuel - College of Science and Engineering

GENETIC CONTROL OF MICROFIBRIL ANGLE IN EUCALYPTUS NITENS

Eucalyptus nitens is the main plantation eucalypt in Tasmania with around 208,000 hectares, where it is grown for pulp, timber and other engineered wood products. In Tasmania, over the period 2015-19, it has been estimated that around 4% of hardwood log volume will come from plantations managed under solid-wood silvicultural regimes (i.e. thinned and pruned) and this is predicted to increase due to the need to replace the diminishing supply of logs from native forest resources. There is increasing interest in using and improving plantations for veneer and timber production and other traits apart from growth and wood density are of potential importance. Microfibril angle (MFA) is the underlying biological trait that largely explains (along with wood density) the behaviour of wood stiffness measured as the modulus of elasticity (MoE). While MFA is an important contributor to key solid wood selection traits, there have been few studies of the quantitative genetic control of this trait in eucalypts, including E. nitens. The objectives of this study are to determine: i) the genetic control of MFA, ii) its genetic correlation with selection traits such as MOE, AWV, growth and form and iii) extent of genetic by environment interaction in MFA across sites.

Supervisors
B. Potts, R. Vaillancourt

Ross, Angela - College of Arts, Law and Education

ENGAGEMENT OBSTACLES: EXAMINING THE RELATIONSHIP BETWEEN MEDIA USE AND DEMOCRATIC DISENGAGEMENT

Media provide the main means for democratic citizens to learn about common problems and participate in finding a common solution. Yet many factors inhibit the ability of citizens to use media to civically and politically engage and participate. The quality and diversity of mainstream news content has been reduced through media consolidation and concentration. Online, people are increasingly consuming misinformation and disinformation. There is evidence political polarisation has been encouraged by the personalisation of online content. Despite these trends there is a lack of knowledge about how citizens are critically assessing digital content, especially those with poor literacy skills. People suffering from educational, employment and technological disadvantage are more likely to struggle to use media to democratically engage yet the issue is rarely examined from the individual’s perspective. Media use must be studied in context because people rely on a mix of old and new media to inform themselves. This ethnographic study will examine how people living in an area suffering from educational, employment and technological disadvantage are able to use media to engage and participate in their democracy. It aims to identify ways to reverse citizen disengagement, a problem that is plaguing contemporary democracies.

Supervisors
E. Lester, D. Reid
Rubenach, Andy - College of Science and Engineering

EVALUATION OF LOTUS FOR PHOTOPERIOD AND CIRCADIAN CLOCK REGULATED FLOWERING TIME THROUGH FUNCTIONAL GENOMICS

Legumes, such as peas, beans and chickpeas are important crop plants and for researching photoperiod (length of day) flowering time responses and development. Early and late flowering mutants have been valuable resources for deciphering the molecular pathways regulating photoperiod flowering time through the circadian clock network. Appropriate mutants for research are generally limiting in many legumes. Lotus japonicus is a model legume for symbiotic nitrogen fixation but the circadian clock and photoperiod mechanism has received little attention. However, evidence suggests conservation of photoperiodic molecular pathways in legumes. With the availability of over 600,000 non-transgenic Lotus japonicus retrotransposon 1 (LORE1) mutants, my PhD project will determine if L. japonicus is a suitable model legume species for understanding the molecular details of the circadian clock network and photoperiodism by using functional genomics.

Supervisors
J. Weller, V. Hecht

Russell, Allanna - College of Health and Medicine

ONGOING DEVELOPMENT OF A NOVEL MODEL OF STROKE

Despite promising animal data, drug development for ischaemic stroke has failed repeatedly. We hypothesise that this failure is due to deficiencies in the current animal models that limit their translational utility. Existing models are confounded by unavoidable surgery and anaesthesia, and also do not sufficiently mimic the thromboembolic nature of human stroke. Our work focuses on the development of a novel, minimally invasive model of stroke which involves the magnetic binding of superparamagnetic iron oxide nanoparticles (SPIO) to the wall of the middle cerebral artery (MCA). These SPIO particles will have a coating that reacts with a thrombotic peptide, injected later, to trigger a local blood clot and stroke induction. This model, called magnetic nanoparticle stroke (MNP-stroke) will be free of the confounding effects of surgery and anaesthesia. This will allow us to determine the effects of these confounders on the underlying pathophysiology of stroke through controlled reintroduction. Because the MNP-stroke model will induce local thrombosis without surgical intervention that alters clotting biology, it will be more representative of human disease than any other current model. This will make it more clinically relevant and hopefully make drug development for stroke quicker, easier, and cheaper.

Supervisors
D. Howells, L. Landowski, B. Sutherland
Sajnani, Karishma - Menzies Institute for Medical Research

**NLRP3 INFLAMMASOME: IN COLITIS AND COLITIS-ASSOCIATED COLORECTAL CANCER (CAC)**

A low level of inflammation is an integral part of balance between the immune system & microbiota in the high antigen environment of the gastrointestinal tract & maintains homeostasis. A failure of this balance can lead to chronic intestinal inflammation and increase the chances to develop colorectal cancer significantly. Inflammasomes are molecule complexes that are assembled in response to vast danger signals & facilitate the production of bioactive proinflammatory cytokines. One inflammasome in particular, NLRP3, has been analysed extensively in its contribution to colitis and has been shown to be associated with the development of CAC. This investigation will be based on Winnie model of Colitis and NLRP3 knockout of Winnie. This project will detail the gross difference in the immune architecture between Winnie and NLRP3xWinnie immune cells & also look at modification done at the gene level of this immune cells like DNA methylation and alternate splicing and SNPS. Finally the data obtained from the mouse study will be compared with the data available on human NLRP3 in colitis and colitis associated cancer. This project will be first to outline the detail immunology behind transition of Colitis to CAC thus providing valuable insight in designing novel and specific therapeutic treatment against Colitis associated Colorectal cancer.

**Supervisors**

H. Korner, J. Dickinson, R. Eri

---

Salarpour, Simin - College of Science and Engineering

**QUANTIFYING THE EFFECTS OF QUASAR STRUCTURE IN NEXT-GENERATION GEODETIC VLBI OBSERVATIONS**

Very Long Baseline Interferometry (VLBI) is a powerful space-geodetic technique in radio astronomy. The VLBI technique uses radio signals from quasars to measure movements of the Earth’s crust and also the rotation and orientation of our planet that facilitate scientists to study all precise geo-referenced measurements on Earth such as sea level variations. The accuracy of geodetic VLBI has been restricted by instrumentation and some assumptions like that quasars are perfect point sources. Ignoring the nonpoint-like nature of quasars can result errors in position as measured by geodetic VLBI at the level of a few millimetres. This project is concerned with mitigation of quasar structure effects, using frequency-dependent models of quasars and an UTAS-developed quasar structure simulator to develop techniques for calculating and correcting the effects of quasar structure across the 2-14 GHz range.

**Supervisors**

S. Shabala, L. McCallum
Sardar, Abdullah - Australian Maritime College

ARTIFICIAL INTELLIGENCE IN MARINE ENGINEERING TEACHING

The objective of this research is to determine the External & Internal Human Errors to Increase The Reliability of Marine Engines. Through Ant Colony Optimization technique, it will significantly decrease the time and resources required to estimate human error probability whilst decision making for marine operations involving different environmental and operational conditions. My focus on study is to assess effective of teaching and learning through simulator. To analyze by using the Ant Colony Optimization technique, given a simulator training, assessment methods, means how much of lessons learned (skill developed) is used in real life. In other words how much will virtual simulation help in training (measured in terms of minimizing error).

Supervisors

F. Khan, V. Garaniya, R. Abbassi, A. Sardar

Scherelis, Constantin - Australian Maritime College

BIOPHYSICAL COUPLING OF HYDRODYNAMICS AND FISH DISTRIBUTION AT PROMISING TIDAL ENERGY CANDIDATE SITES

Australia’s coastline offers vast potential for tidal energy development. A project initiated by the Australian Renewable Energy Agency has identified the Banks Strait, located in the north-eastern corner of Tasmania, as a promising site for tidal energy extraction. Characterising the biophysical relationships that exist at high-flow tidal sites prior to turbine installation allows for potential risks to the marine environment to be identified and mitigated early in the development process. Environmental monitoring procedures capable of sampling at high temporal resolutions are necessary to describe these highly dynamic and variable sites effectively. Biological echosounders provide information about fish density and distribution, while simultaneous deployments of bottom-mounted Acoustic Doppler Current Profilers provide high-resolution hydrodynamic measurements of the study site. This permits us to investigate how physical drivers may influence biological activities observed, and how these may affect fish abundance, distribution, and behaviour. Given the strong relationship between hydrodynamic properties and biological activity, the possibility of generating a predictive model for biological activity from a site’s physical properties will be explored. With this study, we hope to gain a greater understanding of the biophysical relationships that exist at high-flow tidal sites and aim to develop new techniques for characterizing these relationships.

Supervisors

I. Penesis, J. Wright, M. Hemer, R. Cossu
Schofield, Lydia - College of Science and Engineering

WHAT ARE THE POLITICAL CAUSES AND CONSEQUENCES OF THE EMERGENCE OF INDIGENOUS PROTECTED AREAS IN AUSTRALIA?

In Australia, Indigenous Protected Areas (IPAs) were created as a new type of institutional environmental governance owing to the need to protect the full range of ecosystems in Australia and to progress Indigenous inclusion. Protected areas are the primary mechanisms for biodiversity conservation worldwide, previously the domain of government, there has been increasing opportunity for non-government actors to take responsibility. At the same time, there is a growing mandate for the inclusion of Indigenous peoples in conservation efforts, recognising land rights, Indigenous knowledge systems and rights to self-determination. IPAs offer opportunities for achieving employment and conservation outcomes, as well as ‘more than environmental’ benefits. Whilst a ‘new’ institution, IPAs build on more than 65,000 years of knowledge. Which raises the question, what is new about IPAs? This thesis considers socio-political changes such as neoliberalism, private property, the Anthropocene, the commons and emergency narratives, and how they have influenced IPA substance and process. Through multi-sited ethnography of IPAs in Australia, the project pays particular attention to the practices, identities, and values that emerge, exist, resist, co-exist. The entanglements of Indigeneity, modernity, Indigenous knowledge and science and the power relation therein. Asking how does the IPA programme distribute benefits and dis-benefits (harm)?

Supervisors

A. Davison, J. Kirkpatrick

Scomparin, Cyril - College of Science and Engineering

CONTROL OF INVASIVE PREY SPECIES TO PROTECT NATIVE WILDLIFE FROM PREDATION BY CATS

Invasive species are one of the most important threats to Australian and island native wildlife. They negatively impact native populations directly through predation and competition, and indirectly by disrupting habitat suitability. Consequently, reducing the impact of invaders is a major goal of conservation management, especially on islands, and usually focuses on reducing density of introduced predators. Because the conventional methods of controlling introduced predators have limited success, we will test an alternative approach: manipulating introduced prey to trigger a cascading effect on introduced predators to benefit native species. Although this method has been suggested and analysed by modelling, it has never been experimentally tested. Using Bruny Island as a case study, we will firstly investigate which factors drive the abundance of the eastern quoll (native predator) and feral cat (introduced predator). Then, we aim to experimentally test if control of rabbit and black rat population (introduced prey) affects the behaviour of feral cats and increases predation risk for native prey. Finally, by using the previous results we will forecast with population dynamics modelling the likely consequences of introduced predator control on the island.

Supervisors

M. Jones, C. Johnson, H. McGregor
Seneviratne, Inoka Upul - Australian Maritime College

IMPEDIMENTS TO THE MAINTENANCE AND IMPROVEMENT OF THE ISO 9001 QUALITY MANAGEMENT SYSTEM

Quality has become increasingly important for every business organisation due to the rapid growth of competition, globalisation, and customer demands. In this context, many businesses have begun to pay more attention to the quality of their products and services, as well as the implementation of quality management systems (QMS) to cope with the challenges. The ISO 9001 QMS has become the most prominent quality management practice today and its global diffusion has emerged throughout the past years. However, obtaining an ISO 9001 certificate does not reflect that the particular organisation has implemented a superior QMS or provided high-quality products or services. Organisations need to maintain and improve their QMS according to the requirements of the ISO 9001 standard in order to reap the benefits. This study investigates the impediments to the maintenance and improvement of the ISO 9001 QMS during the post-certification phase. The outcome of this study enriches the knowledge on maintenance and improvement of the ISO 9001 QMS and barriers associated with it in certified organisations. Moreover, the ISO 9001 maintenance and improvement framework developed by this study will assist both potential and certified organisations to understand the tactics needed to adopt an effective QMS maintenance and improvement.

Supervisors
S. Cahoon, P. Chen

Sengupta, Shruti - College of Science and Engineering

ADAPT AND EVOLVE: SNOW SKINK’S SHOCKING RESPONSE TO CHANGING CLIMATE

Climate change has proven to be one of the major drivers of modifications in a species’ ecology. Response to the shifts in temperature is governed by the thermal physiology of the animal. Ambient temperature has limiting effects on many biological functions. Organisms are only able to maintain optimal performance over a limited range of temperatures, and thermal fluctuations outside this optimal range can have negative consequences for individual fitness. In a predictable environment, during the course of the species’ life history, an animal can modify their responses to the regular variation through various mechanisms. One of the physiological responses to thermal fluctuations is Heat Shock Response (HSR). My project aims to understand this mechanism in the viviparous lizard Niveoscincus ocellatus. I will look into the gene expression profile of Heat Shock Proteins (HSPs), a key element of HSR in a high-temperature setting. As local adaptations lead to variations in a trait, in this project I will also look across populations in an altitudinal gradient to see the population-specific response. This work will attempt to build a bridge between behavioural and physiological thermoregulation of a temperate ectotherm in changing climate.

Supervisors
E. Wapstra, G. While
Serra Goncalves, Catarina - Institute for Marine and Antarctic Studies

IDENTIFYING COMMUNITY-BASED REDUCTION AND MITIGATION TOOLS FOR MARINE DEBRIS

Marine debris is considered one of the major threats for marine ecosystems. To address environmental issues that have an impact at an international scale, such as marine pollution, the required large scale and coordinated effort can likely only be achieved through collaboration with communities and scientists. Additionally, due to the diversity of sources responsible for plastic pollution in our environment, the development of mitigation strategies is extremely complex; there is not one simple and unique solution. Mitigation will differ according to the source and type of debris, the location, and the stakeholders involved. Globally, few data are available in relation to the challenges associated with the implementation of marine debris mitigation strategies, such as policy considerations and costs. Most importantly, the effectiveness of individual strategies with a measurable outcome to reduce marine pollution has never been assessed rigorously. We aim to measure the effectiveness of quantifiable programs with pre- and post-implementation data to identify common aspects, challenges, and most importantly, keys to success in order to recommend and implement the best (i.e., most effective) marine debris reduction strategies in the future, and clearly identify the role of the community in the solution.

Supervisors
J. Lavers, A. Bond, H. Taylor

Serrano, Ana - College of Arts, Law and Education

BUILDING PERFORMANCE: CHOREOARCHITECTURE AS SPATIAL SCORING OF THE SKIN WITHIN

Building performance refers to the efficiency of the function of buildings and its impact on natural environments and their users, achieved through architectural practice with a set of standardized common measurements protocols which often leave out qualitative registers and embodied knowledge. I will argue that as a result, architectural drawings are often purely contractual and only register quantifiable measurements of place. This research focuses on spatial notation (scoring) and performativity through practice-led research as means to explore the intersection of bodily engagement and building interiors that are unregistered in the current architectural protocols of building performance. Scoring, used as a time-based method of movement documentation, representation and proposition in which the work embodies the slippages and tensions of such an encounter, can become a performativa material incision into the skin within the human body (the first skin) and the body of architecture (the third skin). Choreoarchitecture, in this context, will be a newly formed liminal site of critical enquiry that combines the theories and practices of contemporary choreography (movement writing), chorography (place writing) and architecture (as the third skin), with the overarching ambition of redefining and expanding on the contemporary concept of building performance.

Supervisors
M. Keating, D. Hannah, S. Loo
Shafiq, Asma - College of Arts, Law and Education

REALISING HUMAN RIGHTS FOR MARGINALISED AND VULNERABLE GROUPS IN SOUTH ASIA: THE LIVES AND WORKS OF PUSHPA KAPILA HINGORANI, ASMA JAHANGIR AND SALMA SOBHAN

This thesis will investigate how the lives and works of Pushpa Kapila Hingorani, Asma Jahangir and Salma Sobhan the three human rights activists from India, Pakistan and Bangladesh respectively can be effectively engaged with the protection of the human rights of vulnerable groups, particularly of those living in Third World states. Although the three human rights lawyers played significant role towards the protection of women, children, under trial prisoners, victims of police torture, religious minorities and many other disadvantaged groups, very few literature focus on them. This thesis will attempt to fill this gap in existing literature by responding to few research questions: why the lives and works of Hingorani, Jahangir and Sobhan are worthy of investigation, how they contributed towards the protection of the human rights of vulnerable groups, what were the circumstances of their individual states, how did those help and hinder their works. It will be based on both primary and secondary sources. The former will consist of data collected through interviews; reported cases defended by Hingorani, Jahangir and Sobhan; relevant laws and policies of their respective countries and international human rights instruments. The secondary sources will cover books, journal articles, newspaper articles, reports, and court records.

Supervisors
M. Otlowski, S. Bartie, A. Hilkemeijer

Shah, Anuj - College of Health and Medicine

NATURAL HISTORY OF VERTEBRAL DEFORMITIES AMONG TASMANIAN OLDER ADULTS AGED BETWEEN 50 AND 80 YEARS

Vertebral fractures are not commonly clinically diagnosed and hence, they are termed as 'vertebral deformities'. Vertebral fractures are responsible for considerable morbidity and are a major cause of debilitating back pain and reduced quality of life. The incidence and natural progression of these deformities over a long duration can provide significant information regarding the prevention and management of such deformities. We will be studying the progression of these vertebral deformities over 10 years and the effects of various factors such as medication use and multi-site joint pain in predicting vertebral deformities. We will be using Dual Energy X-Ray Absorptiometry scans to calculate vertebral heights and identify deformities.

Supervisors
L. Laslett, L. Toh, F. Wu, G. Jones
Shahzad, Babar - College of Science and Engineering

UNDERSTANDING THE MECHANISMS CONFERRING SALT STRESS TOLERANCE IN CULTIVATED AND WILD RICE SPECIES

Among different mechanisms of salt stress tolerance, regulation of ion distribution among various tissues is of great importance. Moreover, multiple physiological mechanisms contributing to plant salinity tolerance, reducing Na+ loading into the xylem is often named as one of the most crucial features. A plant’s capacity to tolerate salinity depends on exclusion of Na+ from the shoot. This can be achieved either by minimizing entry of Na+ to the xylem from the root symplast, maximizing Na+ retrieval from the xylem, or exporting Na+ from the leaf into the phloem. Some species use Na+ as a cheap osmoticum to maintain cell turgor (and, ultimately, tissue growth), assuming it can be efficiently sequestered to the cell vacuoles by the tonoplast Na+/H+ exchanger, NHX. Thus the extent to which restriction of Na+ loading into the xylem contributes to salinity tolerance in rice and the extent to which control of xylem K+ loading also contributes to the differential tolerance between contrasting rice varieties and/or species remains to be shown.

Supervisors
S. Shabala, L. Shabala, M. Zhou

Shakourloo, Ali - Australian Maritime College

ADOPTION OF TECHNOLOGY AND IMPROVING SUPPLY CHAIN MANAGEMENT TO OVERCOME CURRENT AND FUTURE CHALLENGES

The business world is becoming more complex and dynamic, where organisations are, implementing efficient and effective SCM practices to achieve competitive advantage over its competitors (Jharkharia and Shankar, 2005). Also, firm’s resources can only be as source of competitive advantage when they enable a firm to conceive or implement those strategies that enhance effectiveness and efficiency (Barney, 1991). Aligning technology with SCM’s strategies to deal with its future challenges can help to gain more competitive advantage, therefore; knowing about future challenges, and areas of SCM that technology may empower them, are the main motivations of conducting this research.

Supervisors
S. Cahoon, P. Chen
Shastri, Sonia - College of Health and Medicine

INVESTIGATING THE EFFICACY OF NOVEL ANTIOXIDANT DRUGS IN AMELIORATING INTESTINAL INFLAMMATION USING MOUSE MODELS OF ULCERATIVE COLITIS

Ulcerative Colitis (UC) is a chronic, relapsing inflammation of large intestine. Imbalance in the oxidative/antioxidative enzymes is proposed to be an important factor for the progression of UC. In order to investigate the potential protective role of antioxidant drugs, we hypothesised that drugs will work through LIN28A pathway. Lin28A, a protein enhances the tissue repair and regeneration in some adult tissues. Oral administration of 200mg/kg of body weight of two antioxidant drugs A and B for 7 days along with DSS administration and for 21 days (without DSS), significantly improved the body weight loss, colon length and disease activity index in DSS-induced mouse model of colitis and in Winnie mouse model of spontaneous colitis, respectively. Also, western blot analysis revealed the higher expression of LIN28A protein in drug treated groups. However, further analysis such as qPCR, histology, immunohistochemistry and biochemical assays will unveil the efficacy of antioxidant drugs A and B in amelioration of ulcerative colitis.

Supervisors
R. Eri, N. Guven

Shepherd, John - College of Arts, Law and Education

THE ILLITERATE CONVICT? RECOVERING THE LOST TASMANIAN CONVICT VOICE

According to UNESCO, 26% of the world’s adult population today are illiterate. Illiteracy rates in United States prisons are as high as 75%. Historians have assumed that Tasmania’s 78,000 convicts transported between 1803 and 1853 were illiterate criminals. Their “voice” has been written out of history. This thesis will use digital e-tools to analyse the records of Tasmania’s 78,000 convicts and recreate the convict perspective. Specifically, I propose to: (1) create a database of previously unpublished convict letters; (2) using Corpus Linguistic software to undertake a content analysis; (3) determine the extent of literacy and illiteracy in Tasmania’s convicts using the digital resources of the UTAS Founders and Survivors project; (4) analyse the database with Sentiment Analysis software; (5) use e-tools to determine if convicts increased their literacy when under sentence; (6) analyse the petitioning process to understand if literacy aided freedom; (7) analyse the convict experience in a longitudinal way and ask if literacy was an advantage to convicts during their sentence? and their later lives? did convict illiteracy have inter-generational effects? The findings of this research has implications for the literacy and health of Tasmania’s population today.

Supervisors
H. Maxwell-Stewart, S. Petrow, P. Turnbull
Skrastins, Elga - College of Arts, Law and Education

FREUD, FOUCAULT & FEMININE SIN. A HISTORY OF THE PRESENT

Tasmanian history reveals a series of policies and legislative acts designed to regulate and control sexuality in young single girls. This study aims to track the historical process and the intended and unintended consequences of these policies through archival documents where voices of the young women will be sought to construct a possible ‘History of the present’. Reviews of the relevant literature and data indicate that contemporary opinions and attitudes about prostitution, masturbation, promiscuity and obscenity owe a great deal to the fears, obsessions and legislation from the era of the Contagious Diseases Acts. This starting point will be used to trace and analyse the aims of the legislation, the effects on the girls and enduring contemporary legacies. Texts, policy documents, statutes and archival material will be used to locate the underpinnings for the actions taken. Foucauldian Discourse Analysis of material from medical, political and social stakeholders will seek a rationale for the historical and ongoing focus on aspects of female sexuality. The categorisations and outcomes relating to “Feminine Sin”, may have implications for contemporary concerns and policy reforms.

Supervisors

R. Julian, S. Stanford, R. Frey

Slinger, Joel - Institute for Marine and Antarctic Studies

UNDERSTANDING HOW THE MICROBIOME OF HOST AND PATHOGEN AFFECTS AMOEBOIC GILL DISEASE PATHOGENESIS

This project will examine and describe the relationship between microbial communities and the pathogenesis of amoebic gill disease (AGD) in Atlantic salmon (Salmo salar). It will specifically address the relationship which exists between the microbiome of both the teleost fish gill and marine amphizoic parasite, Neoparamoeba perurans. Building from previous research in this area, a greater knowledge and understanding may be sought on how the presence/absence of microbiota communities or specific bacterial taxa may influence the onset and severity of amoebic gill disease in Atlantic salmon. The role of bacteria on AGD pathogenicity has not been examined in a situation where the microbiota of both fish gill and amoebae have been modulated or manipulated. To this end, the project will examine the relationship between microbial communities and AGD pathogenicity using a combination of metagenomics, bacteriology and molecular biology approaches.

Supervisors

M. Adams, J. Wynne
Smith, Abigail - Institute for Marine and Antarctic Studies

INFLUENCE OF WHALE FAECAL MATERIAL ON THE SOUTHERN OCEAN

The Southern Ocean is classed as a region of high nutrient levels yet low algal productivity, due to a lack of iron as an available micronutrient. Iron is vital to cellular processes in both bacteria and single-celled algae known as phytoplankton. Summer phytoplankton blooms are primarily limited by iron, yet bacterial productivity is limited by both iron and dissolved organic carbon (DOC). Baleen whales receive a significant amount of iron from their krill-based diet and release a slurry of DOC and iron-rich excrement when they defaecate. Additions of DOC and iron have been shown to fuel the microbial loop within regions of the Southern Ocean, stimulating bacterial and phytoplankton activity while transferring carbon to higher trophic levels. As a result, whale faecal material may act as an important iron and carbon source to bacterial and phytoplankton communities in nutrient-limited surface waters. This novel research will directly investigate the in situ bio-availability of iron and DOC released in whale faecal material to the microbial loop in Southern Ocean ecosystems.

Supervisors
D. Lannuzel, S. Nicol, A. Townsend

Smyk, Emily - College of Science and Engineering

GEOCHEMISTRY AND GEOCHRONOLOGY OF THE INTRUSIVE ROCKS OF THE CENTRAL WASATCH MOUNTAINS IGNEOUS BELT, UTAH, USA: IMPLICATIONS FOR PORPHYRY MINERALIZATION

The central Wasatch Mountains located in northeast Utah, USA, include the White Pine Fork and Park Premier porphyry deposits, hosted by the central Wasatch Mountain igneous belt (CWMIB). The CWMIB comprises the Little Cottonwood and associated White Pine intrusion; (ca. 29-30 Ma), Alta (ca. 33 Ma), Clayton Peak (ca. 35 Ma), Flagstaff, Valeo, Pine Creek, Mayflower and Park Premier stocks (all ca. 35-36 Ma). Earlier work shows a change in the emplacement depth of the CWMIB from 11 km in the west to less than 1 km in the east. Petrographic and geochemical evidence reveals a magmatic evolution from the most primitive, eastern stocks to the youngest, most felsic western stocks. The εNd compositions of the intrusions also decrease from the eastern stocks to the western, younger stocks of the Little Cottonwood and White Pine intrusions, which have the lowest εNd values. This study of the geochemical evolution of the intrusions of the CWMIB associated with porphyry-related mineralization shows that the magma evolved over a ~7 million year period prior to mineralization. The relatively small size of the CWMIB porphyry systems may be attributed to a prolonged melt evolution in the western stocks coupled with increased crustal contamination.

Supervisors
D. Cooke
Sutton, Laura - Menzies Institute for Medical Research

UNLOCKING THE POTENTIAL OF A NOVEL SETTING TO PROMOTE PHYSICAL ACTIVITY AMONG KNEE OSTEOARTHRITIS PATIENTS

Participating in physical activity reduces pain and improves function in knee osteoarthritis (OA) patients. Despite this, only 13% of people with knee OA meet the current physical activity guidelines, far lower than the national average. Identifying effective, low-cost, accessible, scalable and sustainable strategies to promote physical activity in knee OA patients is crucial. ‘parkrun’ is a free weekly mass community event that represents a novel setting with substantial untapped potential for physical activity promotion. The aim of this study is to assess the feasibility, acceptability and safety of parkrun for patients with knee OA. Participants will be asked to participate in four consecutive Saturday parkruns and complete quantitative surveys and qualitative interviews about their experience. Participants will be followed-up after 6 months to assess longer-term impacts and adherence. The findings of this study will inform the development of a large RCT aiming to examine parkrun as a strategy to promote physical activity for KOA and study its effectiveness compared to usual care.

Supervisors
D. Aitken, T. Winzenberg, A. Lahham

Swann, Olivia - Menzies Institute for Medical Research

IMPACT OF DIETARY FIBRE INTAKE ON INFLAMMATORY MARKERS IN ADOLESCENTS

An increased intake of dietary fibre may be beneficial for reducing or preventing chronic inflammation, with reduction in inflammatory markers and improvements in inflammatory conditions linked to high dietary fibre intake. Raised hs-CRP is often seen in inflammatory diseases, and high dietary fibre intake previously associated with lower hs-CRP. Leptin is an inflammatory cytokine, and adiponectin anti-inflammatory. The effect of dietary fibre intake on hs-CRP, leptin and adiponectin in Raine Study adolescents was examined with tobit and linear regression, along with lifestyle and biological factors. A higher dietary fibre intake was associated with lower concentrations of hs-CRP, leptin and adiponectin before adjustment for energy intake. Female sex and oral contraceptive usage were associated with higher hs-CRP, leptin and adiponectin. Increased BMI was associated with higher hs-CRP and leptin, and lower adiponectin, with the opposite effect seen for high energy intake. The attenuation of associations between dietary fibre and hs-CRP, leptin and adiponectin by adjustment for energy intake suggests that alternate factors associated with energy intake may be behind the observed association. These results indicate that lifestyle factors play a greater role, with larger correlations between lifestyle and hs-CRP, leptin and adiponectin than with dietary factors and BMI.

Supervisors
W. Oddy, M. Breslin, M. Kilpatrick
Sward, Darryn - Institute for Marine and Antarctic Studies

DEPTH DISTRIBUTION SURVEYS OF FISH BIODIVERSITY ON ROCKY REEFS ACROSS THE TASMAN PENINSULA USING A REMOTELY OPERATED VEHICLE

Many marine protected areas often cover large expanses of deepwater habitat that are beyond depths that are practical by SCUBA diver-based techniques (~<35 m). Remotely operated vehicles (ROVs) offer a robust, non-intrusive, video-based survey approach to accessing these inherently difficult to survey environments. However, ROVs are still in the early stages of development, requiring proper evaluation and standardization before it can be reliably used for biological monitoring. This project intends to assess the effectiveness of ROVs for describing, to a specified power, the distribution and habitat associations of key fish assemblages across typical shelf habitats along the Tasman Peninsula in Tasmania. This study will also explore a pressing management concern, the decline in Bastard Trumpeter (Latridopsis forsteri), and whether mesophotic habitats as a refuge for this species. Results from this study will contribute towards developing ROVs as a platform for robust video-based surveys of biodiversity in deepwater habitats across temperate Australia.

Supervisors
N. Barrett, J. Monk

Swarts, Kevin - Tasmanian School of Business and Economics

RELATIONSHIP MARKETING: CO-CREATION OF VALUE IN COMPLEX CUSTOMER RELATIONSHIPS

Relationship marketing is a well-developed marketing theory that seeks to improve organisational performance through building valuable relationships with customers. A key outcome of effective relationship marketing is increased customer loyalty through improving customer satisfaction (Berry 1983; Grönroos 1994). While relationship marketing is effective in many industry contexts, the theory is not readily applied to industries with complex customer relationships, such as those found in the construction industry. This research seeks to answer the question, to what extent does relationship marketing theory transfer to an industry with complex customer relationships? An explanatory sequential mixed methods design will be used. This will involve collecting quantitative data first and then explaining the quantitative results with in-depth qualitative data. In the first, quantitative phase of the study, survey data will be collected from construction firms within Australia to examine the extent relationship marketing transfers to an industry with complex customer relationships. The second, qualitative phase will be conducted as a follow up to the quantitative results to further explain the results. Phase three will integrate the quantitative and qualitative data to answer the research question.

Supervisors
G. Lewis, K. Lehman, M. Wickham
Tan, Bi Zheng - College of Science and Engineering

OPTIMISING NUTRIENT MANAGEMENT FOR IMPROVED PRODUCTIVITY AND FRUIT QUALITY IN APPLES

The Australian apple industry needs to produce consistently high-quality apple fruit to remain profitable and competitive in the export market. The industry has focused on the efficient nutrient use to improve yield per ha via precision fertigation through drip irrigation systems. However, guidelines for an optimal supply of nutrients to meet tree demand are limited. This research aims to better understand nitrogen use efficiency (NUE) matched to demand and its influence on fruit yield and quality in a commercial orchard over a three-year period. To distinguish the fertilizer N from the native N, we proposed to use 15N, a stable isotope of N to examine how application timing affects NUE, partitioning and remobilisation. We will excavate whole tree at dormancy of the first season and commercial harvest of the second season, separate different organs and conduct a nutrient analysis. A combination of 15N and litter bag technique will be used to study the dynamics of apple litter decomposition and quantify plant available N over time. This research will enable us to better understand the physiology of apple tree nutrient utilization, the contribution of apple litters to total nutrient supply, and generate data to inform growers of better nutrient management decisions.

Supervisors
N. Swarts, D. Close

Tanweer, Mariam - Australian Maritime College

DEVELOPMENT OF NEW GLOBAL TALENT ARCHITECTURE FOR NON-STANDARD WORK ARRANGEMENTS

The talent management (TM) agenda is gaining the attention of researchers and practitioners to deal with complex issues of human resources (HR) in the global arena. Managing talent is believed to be important specifically to cope with the scarcity of the right HR and to strategically link them with the organisation to get a sustainable competitive advantage. TM has been investigated in traditional organisational settings that have standard employment arrangements. However, organisations are now developing new structures that require the adoption of alternative employment arrangements. For example, self-employed and agency mediated contractors, on-call employees, temporary employees, and short-term employees coordinated through a mobile app are new additions to the employment systems. In this thesis, the changing nature of work and the resulting new modes of organising will be explored. This will provide a more holistic understanding of systems, processes and practices needed to manage talent in organisations using non-traditional employment settings at the global level. This thesis will develop a new TM architecture for non-standard/traditional employees that better align them with the strategy of the organisation.

Supervisors
S. Cahoon, P. Chen
Tesch, Leigh - College of Arts, Law and Education

CAN THE CREATIVE ARTS BENEFIT PEOPLE WITH CHRONIC KIDNEY DISEASE RECEIVING DIALYSIS? A REVIEW OF THE LITERATURE

Arts and health is a growing area of interdisciplinary practice and research. The arts are known for supporting recovery in hospital environments by reducing pain, anxiety and stress, and supporting community engagement and social connectedness, through giving people the opportunity for self-expression and a collective voice. This poster will present current literature about the use of the arts to benefit people with chronic kidney disease (CKD). This condition has a significant impact on a person’s lifestyle, and people are more likely to experience anxiety, depression and social isolation. The poster will review studies that have examined the role of music, writing, craft, painting, drawing, poetry, theatre, film and story with this population. Studies have investigated the effectiveness of the arts, particularly for people receiving treatment in dialysis units, to improve mood, reduce anxiety, to enhance quality of life factors and to ease discomfort while undergoing treatment. Arts-based methods have also been used to understand the lived experience of patients and communicate this to the broader community. The poster will consider implications about the contribution that arts programs and arts-based methods may make to improve wellbeing for people with CKD and increase community understanding about this condition.

 Supervisors

A. Forbes, M. Jose, J. Ayton

Thanabalasingam, Dharushana - College of Science and Engineering

SIGNIFICANCE OF INOCULUM SOURCES FOR SYSTEMIC DOWNY MILDEW OUTBREAKS IN OPIUM POPPY

Systemic downy mildew (SDM), caused by Peronospora somniferi, has emerged as the most destructive disease of opium poppy (Papaver somniferum) in Tasmania since its outbreak in 2014. Tasmanian poppy industry has faced a wide yield loss since then. Unlike localized downy mildew present since 1996, SDM affected poppy plants show systemic infection symptoms. Symptoms of SDM include stunted and deformed plants with prolific sporulation on lower leaf surfaces. The wide spread occurrence of SDM has become a challenge to researchers and poppy growers. This research study aims to identify the critical inoculum sources that facilitate disease spread. Microsatellite markers will be developed to measure the relative contribution of seed-, soil- and air-borne inoculum sources under commercial cropping. Initially, greenhouse trials will be carried out to measure the relative inoculum contribution under controlled conditions and to identify potential temperature interactions. Based on those results, field trials will be conducted to validate greenhouse observations. In addition, seed infection mechanism(s) and the optimal environmental conditions for pathogen transmission from seed- and soil-borne inoculum to seedlings will be identified. In conclusion, identifying the most important contributing inoculum source(s) will aid development of suitable and reliable management strategies for SDM.

 Supervisors

J. Scott, C. Wilson, S. Jones
Thapa, Deependra Kaji - College of Health and Medicine

IMPACT OF ADULT CHILDREN’S MIGRATION ON QUALITY OF LIFE AND MENTAL HEALTH OF ‘LEFT BEHIND’ PARENTS: A STUDY PROTOCOL

Out-migration of young adults from the household has resulted in children, spouse and older family members being ‘left behind’. Migration literature has largely ignored the impact of out-migration of adult children on older parents left behind. This poster presents the study protocol developed to assess the impact of adult children’s migration on quality of life (QoL) and the mental health of older parents left behind in Nepal. Cross-sectional community based survey will be employed to a representative sample (n=626) of older parents aged 60 years or above living in rural Nepal. QoL will be measured by WHOQOL-BREF questionnaire and Depression Anxiety Stress Scales (DASS-21) will measure mental health. Other data to be collected for adjusting the confounding effect includes socio-demographic information, physical health, functional ability, participation in social activities, social support, stressful life events and physical exercise. Data will be analysed by multiple linear regression and logistic regression using STATA version 15. This study will be the first of its kind in Nepal to assess the impact of adult children’s migration on mental health of left behind parents. Findings will contribute to international research on left behind parents by providing an in-depth analysis of data from Nepal, a low-income country.

Supervisors

M. Cleary, D. Visentin, R. Kornhuber

Thoars, Cassandra - College of Arts, Law and Education

THAT’LL TEACH THEM: THE LIVED EXPERIENCE OF YOUTH OFFENDER EDUCATION AND TRANSITION FROM YOUTH OFFENDER DETENTION

Individuals who initially engage in delinquent behaviour and are formally introduced to the justice system as youths, experience an increased risk of recidivism compared to individuals who begin to engage in crimes as adults (Carcach, 1999). Incarceration of the youth offender involves multiple agencies in Australia, including education providers; however, there is no research that explores the role of youth offender engagement in education, and how this impacted on their transition from incarceration. As such, this small-scale research project explores the role engagement in education may play in youth offenders’ transition from incarceration. The research proposes to employ a phenomenological approach to develop participants’ narratives and gain insight into their lived experiences of educational engagement and will seek individuals who transitioned from Tasmania’s Ashley Youth Detention Centre and have since been incarcerated at Risdon Prison. The Archambault, Janosz, Fallu and Pagani (2009) engagement in education framework will then be used as a theoretical lens through which to analyse the narratives to reveal the extent to which engagement in education plays a role in their transition from incarceration. Understanding how youth offenders’ experience education engagement may inform approaches to policies, procedures and practices related to the education of incarcerated youths.

Supervisors

D. Moltow, I. Bartkowiak-Theron
ABSTRACTS OF POSTER PRESENTER

Thomas, Katy - College of Arts, Law and Education

THE DAD GAP: EXPLORING THE ROLE OF FATHERS IN PROVIDING SEXUALITY EDUCATION FOR THEIR YOUNG CHILDREN

The zeitgeist of the current era within the context of sexuality and gender identity makes today a particularly interesting time to conduct research in the sexuality education field. Although the benefits of sexuality education are widely acknowledged, and actions to improve sexual health and sexuality related outcomes currently occur within a multi-sectoral framework, there are considerable obstacles that limit its reach in home and school environments. Although parents wish to be the primary sexuality educators of their children there is a gap between their intentions and their actions due to a sense of inadequacy and embarrassment, a misguided assumption that school ‘has it covered’, and a fear of getting it wrong. This is particularly the case for fathers who tend to shy away from participating in sexuality education research, and from fulfilling their role as sexuality educators of their own children. Using mixed methods design, this research aims to address a significant gap in the literature by exploring the intentions, experiences, hopes and actions of fathers regarding their role in providing sexuality education for their young children. This will inform possible solutions aimed at reducing the gap between intentions and actions, thus improving the reach and efficacy of sexuality education.

Supervisors

K. Swabey, R. Nash, K. Patterson

Tierney, Caylee - College of Arts, Law and Education

MORE THAN JUST BOOKS: USING "CONVENTIONS" TO ADDRESS CONTEMPORARY CHILDREN’S FANTASY SERIES

All literature relies on what Howard Becker calls “conventions,” or a set of knowledge and processes that function to standardise texts and their production. Popular genres foreground their conventionality, as they define themselves through rigorous narrative conventions. This poster argues that examining the narrative and professional conventions that produce contemporary children's fantasy series enables a more detailed understanding of these series than analysis through traditional text-based methods of literary studies. Literary criticism typically relies on close textual analysis to determine the meaning and worth of literature. However, close reading fails to account for the industrial concerns implicit in popular fiction or the scope of serialised fiction, both of which are dominant forces in trade publishing. To date, scholars have struggled to combine accounts of popular fiction’s industrial identity with examination of its textual identity. Research that grounds genres in their conventions (in multiple senses) will draw these strands together by understanding genre as not only a group of thematically connected texts, but also as part of the publishing industry and a social structure. My PhD project employs analysis of this nature to reveal how conventions enable authors and publishers to create fantasy texts and influence the kinds of texts produced.

Supervisors

L. Fletcher, D. Wood
Toettenborg, Alberte - Tasmanian School of Business and Economics

LAYERED DESTINATION BRANDS OF TASMANIA

The main challenge in the area of Place Branding is politics, namely stakeholder complexity and power structures. Examining the powerful cohorts who inform society, and thus inform identity of place, will contribute to understanding the politics of place brand. Using Tasmania as a case study, neo-tribal theory will be applied for examination of cohorts. Breaking masses into smaller groups of heterogeneous members based on lifestyle, taste and passion rather than the structural features of class, gender and ethnicity, neo-tribalism regard the social links of cultural consumption as basis for construction of identity. Although neo-tribalism has gained popularity in marketing and sociology, it is not until recently that the theory has been applied to tourism studies. The empirical part of this study is based in Instagram, which is a relatively under-examined platform in terms of identifying neo-tribal groupings. Mining destination hashtags will contribute to the understanding of emerging neo-tribes in Tasmania, and in-depth interviews and observations will further explore sense of belonging, ritualised behaviour, fluidity and relationship with place within these groupings. The study will contribute in shedding light on conflicts of place branding, and acceptance and resistance of the place brand among stakeholders in Tasmania.

Supervisors

A. Hardy, C. Ooi, A. Dunn

Udy, Danielle - Institute for Marine and Antarctic Studies

CLIMATE DYNAMICS BETWEEN AUSTRALIA AND ANTARCTICA - UTILISING ICE CORES TO IMPROVE OUR UNDERSTANDING OF LONG TERM CLIMATE VARIABILITY AND UNDERPIN EFFICIENT WATER RESOURCE MANAGEMENT

Across Australia, the lack of suitable long term climatic records to assess decadal and multidecadal variability is a key limitation in hydroclimate risk assessments. Paleoclimate records indicate that the Australian instrumental record does not capture the full range of hydroclimate variability, misrepresenting the frequency/magnitude of droughts and floods. Antarctic ice cores, sensitive to the regional climate patterns, provide an opportunity to extend and broaden our understanding of Australian climate in the past and into the future. Recent studies have found statistically significant correlations between the Law Dome ice core record and Australian rainfall, particularly in Southwest and Eastern Australia. While possible mechanisms have been suggested, a detailed analysis of the mechanisms driving the Law Dome to Australian rainfall connection has not been undertaken. This study will further investigate the possible mechanisms by utilising additional data from the Law Dome record and a new ice core from Mt Brown South. Improved understanding of climate dynamics captured in the ice cores, gives us more confidence in extrapolating the climate proxy and applying to teleconnection interactions. Understanding variability in the Southern Indo-Pacific is crucial for understanding how Australian climate will respond to climate change, since most weather systems originate in this region.

Supervisors

T. Vance, N. Holbrook, A. Kiem, M. Curran
Ullah, Sami - College of Science and Engineering

EXPLORING PRODUCT DESIGN OPPORTUNITIES FOR LOW-GRADE PLANTATION EUCALYPTUS

Value of appearance wood products in current market is influenced by aesthetic grading. Timber with minimum features is graded 'select' whereas timber with rustic appearance is graded 'feature'. Designers/manufacturers choose 'select' timber to exhibit value and to meet customer expectations. This is due to perception that timber features are unaesthetical. This perception is responsible for limiting price and varied utilization of feature grade timber since majority of Tasmanian plantation eucalyptus is sold at low-price for pulpwood. More recently, it is debated that timber characteristics are desirable, for example knots/burls, expressing an element of beauty/drama. These characteristics can be incorporated as stylistic features and distinct elements into products. This project will explore product opportunities for low-grade plantation eucalyptus and its potential as high-value stock. This research aims to evaluate potential of joinery modularity and digital technologies on plantation eucalyptus and assess product options for resource. The study is classified into three areas. First is identification of flexible and fit-for-purpose connection sub-system called modules/units for plantation eucalyptus. Second is exploring digital technologies to define/express timber features as focal aesthetical elements. Last stage of research is to utilize developed joinery modules and methodized digital processes to trial plantation eucalyptus in various product areas.

Supervisors
N. Kotlarewski, J. Power

Vandorou, Aikaterini - College of Science and Engineering

EXOPLANET SEARCH AND CHARACTERISATION USING THE GREENHILL OBSERVATORY

Planets that exist outside of our solar system are termed exoplanets, and they can fall under the category of gas giants or terrestrial planets. Detecting exoplanets can be challenging as they do not emit any of their own light. Smaller, cooler planets that are of a similar size to Earth, are even more difficult to observe. However, they can be detected using gravitational microlensing. Since gas giants are easier to detect, they are better represented in data. This has resulted in statistical inferences being skewed towards larger planets. Detecting more terrestrial planets would lift this bias and help us better understand planet formation. This research aims to detect new exoplanets using the University’s telescope via gravitational microlensing. Planets will then be characterized, and their properties studied. Follow-up surveys will also be conducted on systems that are already known to have planets. These surveys will improve our knowledge of the system as a whole, as well as individual properties of the host star. Finally, this research aims to detect exoplanets and conduct follow up surveys on known planetary systems. This will improve our knowledge regarding planet distribution within our galaxy, planet formation, and specifically the formation of the solar system.

Supervisors
A. Cole, J. Beaulieu
Vijaya Kumar, Induni - College of Science and Engineering

PRODUCTION AND QUALITY OF INDUSTRIAL CANNABIS (CANNABIS SATIVA L.) IN RESPONSE TO WATER REGIMES

Development of an Australian cannabis industry is vital due to an increasing demand globally for seed and chemical based products. Improved understanding of crop water relation for cannabis is essential to increase crop production under field and controlled conditions, yet there is a knowledge gap in cannabis plant-water relations. The project objectives are to evaluate the growth, development and agronomy of cannabis to water regimes. This data will be used to develop irrigation recommendations and refine the cannabis crop simulation model, which can be used to improve available predictive growth models to support farmer decision making regarding water management. Preliminary results from a glasshouse experiment with the industrial cannabis cultivar, Ferimon 12, have shown decreasing water application from 2 day to 10 day intervals increases time to flower initiation and flowering, but reduces leaves, stem and total aboveground dry biomass and plant height at flowering. Future experiments will examine the range of quantitative (e.g., above ground dry matter, leaf area and plant height), qualitative (e.g., chemical constituent of flower head and seeds) and physiological crop responses (e.g., CO2 assimilation rate, plant transpiration rate and chlorophyll fluorescence) be conducted with improvements from the preliminary experiment.

Supervisors
T. Acuna, S. Lisson

Vlcek, Samantha - College of Arts, Law and Education

TECHNOLOGICAL COLLABORATION: TEACHERS, PARENTS, AND ALLIED HEALTH PROFESSIONALS SUPPORTING STUDENTS WITH AUTISM SPECTRUM DISORDER THROUGH INFORMATION COMMUNICATION TECHNOLOGY

The diverse traits and behaviours of students with Autism Spectrum Disorder (ASD) necessitate the support of a range of personnel to ensure each student receives inclusive and equitable educational opportunities. Teams supporting students with ASD typically consist of teachers, parents, and allied health professionals; however, collaboration between team members is often limited by constraints on available time, funding, and resources. The aim of the present study is to determine whether an information communication technology (ICT) platform reduces barriers to effective collaboration between these key stakeholders and increases the effectiveness of supports across environments. Team clusters will be recruited using social media across primary and secondary year levels from both mainstream and specialist schools throughout Australia. Through the action research project, the implementation of an ICT platform enabling regular communication and collaboration will be evaluated to observe the benefits, limitations, and challenges of using a program to coordinate supports. The study intends to develop a range of suggestions for improving the quality of education students with ASD receive, and anticipates that the outcomes may be generalised more broadly to students with other disability and additional educational needs enrolled in Australian schools.

Supervisors
C. Rayner, M. Cuskelley, M. Somerton
Wadah, Jochabed - College of Arts, Law and Education

INVESTIGATING COMMUNICATIVE LANGUAGE TEACHING (CLT) IN MANUS SECONDARY SCHOOLS, PAPUA NEW GUINEA

The communicative language teaching (CLT) approach employed in English language teaching (ELT) in Papua New Guinea (PNG) is a complex interplay between culture, government bureaucracy and teacher perceptions. This study aims to explore and better understand how CLT is understood and implemented by non-native speakers of English in English language classrooms on Manus Island. It also seeks to ascertain CLT’s appropriateness and relevance in a non-Western context.

Supervisors

M. Short, G. Ashman

---

Walker, Bernard - College of Science and Engineering

MECHANISMS OF DISEASE SUPPRESSION AND SOIL HEALTH PROMOTION BY GREEN MANURING IN VEGETABLE CROPPING

Declining soil health is a serious problem in intensive agriculture, and causes yield loss, reduced input efficiency, increased disease, and environmental problems from run off. Green manuring (incorporation of a cover crop) can be used to improve the health of agricultural soils and help to ameliorate these problems. Much of the agronomic benefits from green manuring are well understood, and due to organic matter input and breakdown. However, disease suppression is also commonly observed to result from both biofumigant and non-biofumigant green manuring, but understanding of the mechanisms behind this effect is patchy at best. This doctorate will examine how and why disease can be reduced by biofumigation and generic green manuring on vegetable cropping soils, with a particular focus on characterising how the soil microbial community, as affected by the green manures, influences disease suppression.

Supervisors

C. Wilson, S. Powell, R. Tegg, R. Doyle
Wan, Fuzhen - Menzies Institute for Medical Research

VALIDATION OF FATTY LIVER INDEX FOR ULTRASOUND-DETECTED FATTY LIVER DISEASE IN A PROSPECTIVE COHORT STUDY IN ADOLESCENTS AND YOUNG ADULT POPULATION

Background and Aims The fatty liver index (FLI) is an algorithm involving the waist circumference, body mass index, and serum levels of triglyceride and gamma-glutamyl transferase to identify fatty liver. Although some studies have attempted to validate the FLI, there is no studies have been conducted for external validation among Australian adolescents and young adult. Methods We will use clinical measures data to calculate FLI from the 14, 17, 20 and 22y follow-ups from the Raine Study which is one of few prospective pregnancy cohorts in the world. Liver ultrasounds were conducted at 17y and fibroscan was conducted at 20y, the results of FLI were estimated from the area under the receiver operating characteristic curve (AUROC) to evaluate whether this method is suitable for observational study of liver outcomes in adolescents and young adult population. Results Among the 1170 adolescents (51% male) assessed by ultrasound subjects in this study, fatty liver was diagnosed in 15.6% (182/1170). FLI had ability to identify patients with ultrasonographic fatty liver (AUROC:0.740, 95% confidence interval, 0.6905 0.7884; Male, AUROC:0.835, 95% confidence interval, 0.7712 0.8988; Female, AUROC:0.700, 95% confidence interval, 0.6359 0.7647). Conclusions FLI could accuracy identify ultrasonographic fatty liver in a adolescents and young adult population especially in male.

Supervisors
W. Oddy, F. Pan

Wang, Jiadong - Australian Maritime College

WING-IN-GROUND EFFECT OSCILLATING FOIL PROPULSOR

Observations and researches on the cetaceans give engineers a hint that the oscillating foil propulsor may be one of the most promising thrust systems. The feasibility of oscillating foil as the propulsor of ocean vehicles was explored during the past decades, and several advantages including high efficiency, low influence on surrounding environment and even loading distribution have been verified. Unlike most of oscillating foil studies which mainly focus on the single-foil frame, a dual-foil oscillating foil propulsor that can produce the beneficial wing-in-ground effect will be investigated in current project. The main aim in this research is to establish a numerical model based on computational fluid dynamics (CFD) and simulate the dual-foil oscillating foil propulsor. A set of numerical simulations with comprehensive parameters on this dual-foil oscillating foil experiencing both the prescribed heave and auto-pitch motion will be conducted to find the optimal propulsive performance. The investigation into hydrodynamic and flow characteristics are also scheduled, while these complex but important phenomena were usually ignored in past works. Overall, current study will provide an effective alternative for the propulsor of ocean vehicles, as well as valuable references for the design and construction of dual-foil oscillating system.

Supervisors
P. Liu, C. Chin, G. He
ABSTRACTS OF POSTER PRESENTER

Westwater, Jason - College of Health and Medicine

A WHOLE OF FAMILY QUALITATIVE EVALUATION OF YOUTH GENDER VARIANCE: IMPLICATIONS FOR UNDERSTANDING AND TREATMENT

The incidence of gender variance/dysphoria in young people has increased exponentially and the rate of mental health difficulties in this population is concerning. This study aims to add to the growing body of evidence and understanding of child and youth gender variance, to highlight the important issues affecting these young people and their families, based on the question: What are individual family member's experiences of youth gender variance? The more specific and unique aim of this study is to understand the relational experiences of individual family members (parents, siblings and young people), particularly siblings, within a whole of family context, by using circular (non-linear) questioning. The study will evaluate how specialist youth gender services in Australia currently assess families, and will then ask all family members their individual experiences, using circular questioning. Qualitative Data will be analysed using thematic analysis. The ultimate aim of this study is to better inform clinical assessment, support and offer evidence based interventions for young people and family members, thereby improving outcomes.

Supervisors

K. Walsh, K. Ford

Williams, Natasha - College of Arts, Law and Education

ENRICHING VOCABULARY IN YOUNG CHILDREN FROM LOW SES AREAS THROUGH ENGAGEMENT WITH STEM EXPERIENCES

The effect on vocabulary and oral language and the need for intervention for children raised in Low Socio-Economic Status (SES) areas has been well researched and documented in recent years. How best to provide these interventions, so they are appropriate for young children, are engaging for the children and target the necessary vocabulary are issues requiring further exploration. The subject specific vocabulary from Science, Technology, Engineering and Mathematics (STEM) has been identified as an essential component for students to access the curriculum and achieve future school success. Recent studies into the use of STEM in early childhood have provided positive insights that these experiences are an engaging way of learning for children. These experiences appeal to young children’s natural curiosity, sense of wonder and have shown to provide the additional benefit of enriching vocabulary in an authentic manner. The intention of this research is to add to the knowledge base of how to engage children in enriching their vocabulary through the provision of STEM experiences.

Supervisors

B. Reynolds, V. To, G. Oates
ABSTRACTS OF POSTER PRESENTER

Williams, Sarah - College of Health and Medicine

COGNITIVE CONTROL AND AUTOMATIC BIASES IN HEAVY DRINKERS: NEURAL MECHANISMS AND COGNITIVE TRAINING INTERVENTIONS

Individuals with substance use disorders often experience high motivation to quit due to the devastating consequences of their addiction, but report feeling a loss of control over their substance use. Dual-process models suggest that addictive behaviours are maintained by dysfunction in two competing cognitive systems. The implicit system, involving automatic, rapid and impulsive processes, is amplified in response to substance-related cues in the environment. In addition, the explicit system, involving deliberate, slow and thoughtful processes, is disrupted. This results in an increase in urge-related responding to substance cues, and a decrease in the ability to control this responding. Current interventions are typically aimed at remediating metacognitive processes, a subdivision of the explicit system. However, research suggests that other explicit processes, and earlier, more automatic implicit processes could undermine these interventions, and contribute to high rates of relapse. Recent research suggests that cognitive training interventions may show promise in remediating cognitive dysfunction in individuals with substance use disorders. The current research aims to investigate the efficacy of cognitive training interventions, and to develop a novel holistic cognitive training intervention, aimed at targeting multiple interrelated implicit and explicit processes simultaneously, hypothesised to produce a synergistic effect, reducing cognitive dysfunction and addictive behaviour.

Supervisors

A. Matthews, R. Bruno, J. Canales

Wilson, Erin - College of Arts, Law and Education

FACILITATING COMMUNITY SELF-REPRESENTATION BY ACTIVATING THE HISTORIC ROBINSON PHOTOGRAPHIC COLLECTION

In regional communities across Australia, small cultural institutions have possession of extensive archives of artefacts that represent the history of these cities and towns. Through the natural desire to ensure the preservation of these artefacts, curators are often utilised as caretakers to preserve the physicality of collections, and to undertake research leading to the dissemination and display of the contents of these archives. However, this arrangement has often been critiqued as leading to the communication of a local history and community narrative from the perspective of this institutional gate-keeper, the curator, which can result in the privileging of institutionalised master-narratives at the expense of broader, more diverse and more participatory perspectives. This study investigates the challenges facing curators of such collections to establish and adopt new strategies for access, research, dissemination and display. These strategies find their basis in a collaborative approach; engaging community members as keepers of knowledge, and co-producers of historical and cultural narratives, in order to democratisate the archives which have too often become muted. The case study for this research is The Robinson Collection; a historic collection of over 100,000 photographic negatives, owned by the Devonport City Council, and managed by the Devonport Regional Gallery, Tasmania.

Supervisors

B. Ozolins, M. Kunda, P. Edmonds
Wong, Lincoln - Institute for Marine and Antarctic Studies

THE ECOLOGICAL SIGNIFICANCE AND HABITAT RESTORATION EFFECTIVENESS OF ELASTIC ENVIRONMENTALLY SENSITIVE (ES) MOORING

With the steady increase in commercial and recreational boating activities, there is a parallel increase in demand for boat storage facilities. One of the common on-site storage methods included the use of moorings within a sheltered area. Traditional mooring design, while effective in anchoring vessels, have notable ecological concerns, including repeated mechanical disturbances to the benthic system due to chain movements. The notable impact from moorings have driven the development of environmentally sensitive (ES) mooring designs, yet currently, there is a limited number of ES mooring adaptations and comprehensive studies on their ecological effects. This study aimed to deploy ES moorings within 3 regions of South-East Tasmania to document the changes of the benthic communities over an 18 months period. This experiment will compare the demersal fish community and macroinvertebrate assemblages between mooring types. In addition, a social-economic survey will be conducted to collect data on the mooring owner’s perception and decision-making factors regarding mooring technologies. Through a multi-disciplinary approach, this study aimed to provide input for ecosystem management, including to establish if ES moorings are effective for the conservation of the spotted handfish population.

Supervisors

R. Stuart-Smith, J. Ross, T. Lynch

Woods, Briannyn - Institute for Marine and Antarctic Studies

UNDERSTANDING ENERGY PATHWAYS THROUGH SOUTHERN OCEAN MESOPELAGIC COMMUNITIES

Mesopelagic fish and squid, in addition to krill, dominate mid-trophic levels in Southern Ocean ecosystems, comprising an important link for the transfer of energy from primary producers to higher predators, such as whales, seals, seabirds and commercially valuable finfish. The energy pathways mediated by krill are well studied and reasonably well represented in ecosystem models. However, energy pathways mediated by mesopelagic fish and squid represent a key area of uncertainty in current ecosystem models. This project aims to address key areas of uncertainty: (i) whether mesopelagic communities constitute a single or multiple distinct energy pathways to higher trophic levels; (ii) the environmental factors that drive variation and differentiation of mesopelagic energy pathways; and (iii) more broadly, the factors that drive the abundance and biomass of key mesopelagic groups. Addressing these knowledge gaps will be essential to the development of models that are able to robustly predict ecosystem responses to change, which are important for setting conservation and management priorities in the Southern Ocean.

Supervisors

R. Trebilco, A. Walters, M. Hindell
Xia, Qing - Menzies Institute for Medical Research

HEALTH ECONOMIC EVALUATION OF BARIATRIC SURGERY AS A TREATMENT FOR OBESITY - AN UPDATED SYSTEMATIC REVIEW AND COMPREHENSIVE META-ANALYSIS

Objective: In an update and extension of a previous systematic review, this review aims to provide comprehensive qualitative and quantitative analyses of studies that report health economics outcomes for bariatric surgery (BS). Methods: bio-medical and economic databases were searched for pertinent studies to summarize the economic evaluation approaches for BS since September 2015. Additionally, a meta-analysis of cost changes before and after BS procedures was conducted. Furthermore, meta-regression analysis was also employed to identify major drivers of the cost changes. Result: 24 (/61) papers were included in updated systematic review (/meta-analysis). Out-of-pocket costs and indirect costs were still ignored, while costs due to re-operations/complications were included in half of studies. Delayed provision of BS led to a reduction in healthcare benefits. BS was generally cost-effective and even cost saving for specific group such as diabetes patients. Based on 25 non-modelling studies, the weighted average mean proportion of cost changes was -14.1%. For modelling studies (n=42), the proportion of cost changes was -2.9%. Meta-regression found initial BMI could explain the cost changes, with higher initial BMI save more healthcare costs (β=-0.035, P=0.036). Conclusion: BS generally reduces healthcare costs, especially for obese patients with higher initial BMI, resulting in significant cost savings.

Supervisors
A. Palmer, J. Campbell, B. de Graaff, L. Si

Xu, Yiyi - Australian Maritime College

DESIGN AND IMPLEMENTATION OF A COPC CLOUD FOR NUMERICAL HYDRODYNAMICS

CPU time has been a long remaining problem for computational hydrodynamics. Numerical hydrodynamics codes mainly consist of two categories and hence corresponding problems, one needs substantially long CPU time for a single data point/condition, and the other needs a relatively short single execution time but requires large amount of data points/conditions for building database for engineering design and optimization. While the former has been addressed substantially in terms of parallel computing technologies, the latter has rarely been dealt with so does it exist in the literature. The objective of this project is to address it to achieve the following goals: a CPU time reduction of 5 times; an availability of user accessibility via web services; and reliable data security. A new technology CoPC (cooperative PC could) will be developed to achieve the above goals. This new development, based on could computing technology, utilizes both high performance servers and inexpensive end nodes within an Intranet as an Advance Research Service (ARS), which can be widely used for any codes in the latter category. Some of the outcomes and contribution to literature of the project include several conference papers and journal articles.

Supervisors
P. Liu, L. Penesis, G. He
Yahaghi, Javad - College of Science and Engineering

THE EFFECT OF FREEZE-THAW CYCLES ON ROCK

In cold regions, soils and rocks frequently experience frost action. The effect of freeze and thaw cycles on rocks, soils and construction materials in cold regions and the geological disaster consequences from them are still uncharted. Therefore, it is vital to investigate the effects of these cycles on the properties of rocks, soil and construction material. In recent decades, many infrastructures such as airports, highways, tunnels and gas tanks have been constructed in the surrounding frozen rocks and would be constructed in the cold region such as Antarctica in the future. The rock masses which undergo the cycles of freeze-thaw are subjected to displacement and volume change along with thermal stress. Nevertheless, the response to this engineering problem is worthy to study. Most of existing literature focused on how and how much water freezes into ice in the pores/fracture, and its influence on freeze and thaw pressure with less attention paid to the other factors that affect the frost heave pressure such as the strength parameters of the rock and ice. This paper will show the deficiencies of these methods and highlight potential developments that will lead to future robust methods.

Supervisors
H. Liu, A. Chan

Yang, Wenli - College of Science and Engineering

BLOCKCHAIN-BASED INTERNET ARCHITECTURE: FROM "INFORMATIVE INTERNET" TO "TRUSTWORTHY INTERNET"

Co-existent with internet protocol suites and packet-switching technologies emerging in the late 1960s and early 1970s is an endless stream of research concerns for security, privacy, scalability and reliability of layered internet application architectures. Existing application architectures have dramatically changed societies and people’s daily lives through high speed information transmission and sharing. However, the fundamental security and stability issues inherent in these systems are concerning topics that we need to address, especially for large-scale networks; mass private information disclosures seem to be a daily occurrence. Blockchain has shown its potential for solving and enhancing the traditional internet with its key features: autonomous and distributed decentralised processing, smart contractual enforcement of goals and verifiable, trackable trustworthiness in tamper-proof transactions. We conduct a comprehensive study on how to deploy blockchain technology into secure internet layered service architectures, then present a new blockchain-based internet service architecture from different aspects.

Supervisors
B. Kang, W. Chinthammit, S. Garg
Zhang, Qinhan - College of Arts, Law and Education

PARENTS AND GRANDPARENTS' INVOLVEMENT IN, AND EXPECTATIONS FOR, THEIR CHILDREN'S EDUCATION IN RURAL AND URBAN CHINA

The primary purpose of this research is to investigate the differences between rural and urban parental-grandparental educational expectations for their children and grandchildren and the involvement in their children’s and grandchildren’s schooling under the dual social and economic structure in modern China. Numerous studies have shown parental involvement and expectation in their children's schooling as pivotal factors influencing students’ academic achievement (Fan & Wolters, 2014; Froiland, Peterson & Davison, 2013; Murphey, 1992). Within the cultural context in China, grandparents share a part of the parenting role, because Chinese people tend to believe that the accountability of raising children does not only belong to the nuclear family, but also to members of the extended family (Knapp, 2005). In China, rural populations have suffered from low quality levels of education, compared to their urban counterparts. These reduced outcomes have been considered as a consequence of socio-economic disparities between rural and urban areas caused by the implementation of Household Registration (Hukou) institution and other discriminatory policies against rural areas. The Hukou system and these disparities not only create difference in terms of accessing education and quality of schooling, but may also influence rural and urban parental-grandparental educational expectations and involvement.

Supervisors
M. Short, G. Ashman, R. Callington

Zhao, Ting - Menzies Institute for Medical Research

THE SYSTEMATIC REVIEW OF HEALTH ECONOMIC MODELS FOR THE TREATMENT OR PREVENTION OF OSTEOARTHRITIS

Osteoarthritis (OA) is one of the most common chronic joint diseases that mostly affects knees, hips and small joints of the hands which negatively impact individuals’ health-related quality of life (HRQoL) with pain, stiffness, joint swelling, loss of function and disability. Health economic disease simulation models are typically used to compare the cost effectiveness of treatment options to help decision makers choose the interventions that provide the greatest value for money. This systematic review study aims to explore the evolution of health economic models for OA interventions, with a focus on modelling techniques, data sources, model health states and model events. The systematic review will be carried out following the pre-published protocol. Electronic searches within biomedical databases and health economic/economic databases is carried out using a pre-defined search strategy. Inclusion and exclusion criteria is defined to select the related studies. Two independent researchers will extract data including country, treatments, comparators, type of model, time horizon, costs, effectiveness etc. separately. Microsoft Excel spreadsheets will be used to organise and store the collected information/data. This study will adopt a narrative, descriptive synthesis approach to outline the way health economic models of OA interventions have evolved over time in various aspects.

Supervisors
A. Palmer, B. Graaff, T. Winzenberg, D. Aitken
Zhao, Duran - Menzies Institute for Medical Research

GENETICS OF PAEDIATRIC CATARACT: DETERMINING THE ROLE OF HTR1F AND MODIFIER GENES

Paediatric cataract is defined as the opacification of the crystalline lens that is generated at birth (congenital) or develops during childhood. The prevalence of paediatric cataract is calculated to be 2.2 per 10,000 live births in Australia. Among the paediatric cataract, 8–25 % are inherited. A novel mutation in the HTR1F gene was identified in a South Australia family presented with autosomal dominant paediatric cataract. In addition, we also identified rare potentially pathogenic variants in both HSF4 and BFSP1 in this family, but neither segregated with disease. This family showed variable severity and the two most severe patients both carry all three rare coding variants. We assume that HTR1F is the primary cataract causative gene in this family but the phenotype is modified by the additional variants in HSF4 and BFSP1 which cannot lead to cataract formation independently. We aim to use a morpholino to knock down HTR1F thus reduce the gene’s expression in animal models (zebrafish) to see if that causes a cataract in the fish. Then, we will use CRISPR/Cas9 to introduce specific mutation seen in HTR1F and other two modifier gene into zebrafish and determine the relative severity of cataract.

Supervisors
K. Burdon, P. Taberlay, J. Charlesworth, L. Foa

Zhou, Jingen - Australian Maritime College

RISK MANAGEMENT IN CRUISE SHIP SUPPLY CHAIN

In the context of global competition and uncertain business environment, the cruise industry has been experiencing a variety of risks including natural disasters and man-made crises, which should be appropriately managed. This research explores the potential risks faced by the cruise industry from the perspective of a cruise ship supply chain, aiming to develop a conceptual framework for risk identification and risk assessment. First, using an extensive literature review, the potential risks identified in previous studies are summarised and classified into different types. Second, the Delphi method is undertaken to supplement the above risks from a practical perspective. Third, a survey is conducted to collect key stakeholders’ (e.g. cruise ship companies and cruise port authorities) views of risks faced by the cruise industry. Fourth, with the help of the fuzzy analytic hierarchy process technique, the identified risks are evaluated and prioritised for key stakeholders. Finally, based on this research, some appropriate risk management and risk mitigation strategies will be proposed to improve the performance of the cruise ship supply chain. This research not only advances the understanding of risks in the cruise ship supply chain but also provides strategies for key stakeholders to manage risks from a chain perspective.

Supervisors
P. Chen, W. Shi
Zhou, Boye - College of Science and Engineering

EXTENDING THE REACH OF GNSS INTO THE OPEN OCEAN

The urge to understand ocean-induced climate variability at smaller scales continues to grow rapidly. At the same time, satellite altimetry and marine based technologies are evolving to offer more content-rich data. New measurement technologies such as the as yet untested interferometric mode of Surface Water and Ocean Topography (SWOT) mission offer significant potential for improved understanding of ocean processes, yet present great challenges. One of them is calibration and validation (cal/val) of these new space-borne observation types against ground based in situ data. Using the Integrated Marine Observing System (IMOS) altimetry validation facility located in Bass Strait, and new Global Navigation Satellite System (GNSS) equipped buoys, the stage has been set for advancing GNSS application in the open ocean. Here, the proposed research aims to explore the integration of GNSS and Inertial Navigation System (INS) instrumentation to yield more accurate measurements of sea surface height and slope, wave state and troposphere water vapour content using a swarm-based deployment concept. The anticipated outcome will be the extension of well-established techniques into the marine domain for cal/val of new altimetry missions, leading to improved interpretation of ocean variability.

Supervisors

C. Watson, M. King