Three Minute Thesis (3MT®) is an academic competition developed by The University of Queensland (UQ), Australia
New Thinking

We held our first Postgraduate Research Conference (PGRC) in 2012, with the aim of creating a space for postgraduate researchers to share their work in a friendly, relaxed environment. We also wanted to give them the chance to meet fellow researchers and engage with questions from beyond their own field.

The conference is now six years old, and we’re pleased to say it’s gone from strength to strength. This year we received more paper submissions and more posters than ever before, and even had to extend the programme to fit in as many papers as time and space would allow. We’re also delighted that colleagues from the University of Cumbria continue to support the conference and attend in good numbers, demonstrating the value of collaboration and shared connections.

If you attended the PGRC this year, we hope you had a wonderful time, and were just as inspired as we were by the sheer breadth and diversity of research on display. We also hope you enjoyed the guest lectures and workshops and that you came away from the conference inspired by what you’d seen, with new connections, new friends, and maybe even an idea or two that might influence your future research. If you’ve not attended the PGRC before, then we warmly invite you to attend next year’s event, and browse this booklet to see the great impact our conference has made – both at Lancaster and Cumbria, and also in the wider community.

If you have any questions or feedback, please do contact us at the Graduate College and we will be more than happy to help. We are always looking for guest speakers, presenters and volunteers to help on the day, so if you have time to spare and want to get involved, do let us know.

All that remains now is for us to thank our many guest speakers, workshop leads, stalls and the members of our various judging panels. We are also particularly grateful to the postgraduate students who have contributed to the programme, as without you we would not have a conference! Please take a moment to look at the back page for acknowledgements.

On behalf of the organising team and everyone at Graduate College, we wish you all the very best, and look forward to seeing you at PGRC 2019!

Claire Povah and Dr Paul Dolby
Principal and Vice Principal, Graduate College
PGRC 2018

On Saturday 12th May, delegates from Lancaster University and the University of Cumbria came together for a day of presentations, workshops and networking at the Postgraduate Research Conference (PGRC) 2018.

The day was opened by Graduate College Principal Claire Povah, who welcomed delegates and set out the programme for the day. She also welcomed those watching online, via the live video stream for distance learners and those unable to make it on the day.

Morning session
To start off the presentations, Claire introduced the day’s first speaker, Professor Chris May from Lancaster’s Department of Politics, Philosophy & Religion. In a lively and engaging opening lecture, Chris shared insights from his life in academia, from his work in faculty management to his time as a professor of political economy.

Chris’s talk was then followed by the Three Minute Thesis (3MT®) competition, in which PhD researchers were given just three minutes to explain their entire thesis to a non-expert audience. The 3MT competition is always a highlight of the PGRC programme, and this year was no exception, with eight speakers presenting research from youth work and radiotherapy to news reporting and DNA repair.
Following on from 3MT, delegates enjoyed a coffee break before a guest lecture from Professor Robert Young, Director of Lancaster’s Quantum Technology Centre. Robert spoke passionately about his career in research and the many people who had helped him along the way. Relationships are important in an academic career, and it’s important to bear in mind that help can often come from unforeseen places.

Robert’s talk was followed by workshops for delegates on ‘Planning your academic career’ and ‘Surviving the PhD’, which were both really well attended and gave delegates plenty to think about for the following lunch and poster session.

**Afternoon session**
The afternoon kicked off with a guest lecture from Dr Yvonne Battle-Felton of North West Literary Arts. In her talk, Yvonne described her life as an American writer living in the UK, and how she learnt from her setbacks to establish a successful literary arts salon in Lancaster.

Yvonne’s talk was then followed by the day’s ‘long presentations’, chaired by Dr Ewa Bednarz, a Senior Research Associate from LEC. In this session, nine speakers took to the stage to give 10-minute papers on subjects from health and hygiene to deception, sustainability and classroom simulators.

The day was closed by College Principal Claire Povah, who gave out prizes to the winner of the 3MT competition, the best long presentation and the best academic poster. She then thanked members of the organising committee including Vice Principal Paul Dolby, without whom the event couldn’t have taken place, as well as Jane Hulland and Saadia Shah.
Guest Speakers

Professor Chris May
Chair of Political Economy, Lancaster University

Christopher May holds the Chair of Political Economy at Lancaster University and has published widely on the interactions between the law and political economy (ranging from intellectual property rights to the rule of law and the corporate form). Having spent nine years in faculty management, he is now back in the Department of Politics Philosophy & Religion enjoying life as a normal professor. He co-convenes the first year introduction to Politics & International Relations, is the Director of Postgraduate Research and teaches a popular 2nd year undergraduate course, Economics for the Real World. Currently he is also studying for a MA in Art History with the Open University and occasionally DJ’s at the Stonewall Tap in Lancaster.

Professor Robert Young
Royal Society Research Fellow, Physics, Lancaster University.
Co-Founder and Chief Scientist at Quantum Base

Rob is the Director of Lancaster’s Quantum Technology Centre and the co-founder of a spin-out company, Quantum Base Ltd, which is commercialising results from his research group in the Department of Physics.

Rob is an experimental physicist with a passion for developing practical applications of quantum technologies. The last decade saw the beginning of a new generation of technology, one that is underpinned by the quantum nature of devices. This technology will have a huge impact on our lives in many ways; the first being to enable truly secure communications. Rob’s contribution in this exciting new field was seeded by a Master’s degree in physics from Oxford University (2002), before moving to Cambridge to complete a PhD in experimental quantum information processing.

Dr Yvonne Battle-Felton
North West Literary Arts c.i.c

Yvonne is a creative producer, writer, and is co-founder and Director of North West Literary Arts c.i.c. Yvonne is an American writer living in Lancaster, UK. A writer of fiction and Creative Nonfiction, her writing has been published in riverSedge, Assisi, Not Somewhere Else But Here: A Contemporary Anthology of Women and Place, Welter, Slices, and The Chesapeake Reader Literary Journal and is forthcoming in an anthology.

Winner of a Northern Writers Award in fiction (2017), her debut novel, Remembered (forthcoming 2019), is the story of an emancipated slave haunted by both the past and the present as she struggles to lead her dying son home.
Workshops

Workshop 1
Planning your academic career: the secrets of success

Lead: Elaine Davies, Careers Consultant, Lancaster University

Workshop 2
Surviving the PhD

Lead: Dr Simon Vaukins, Faculty Graduate School Manager, Faculty of Science and Technology, Lancaster University
Academic Posters
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<td>Barathi Bakthavatsalu, FHM, Lancaster University</td>
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<td>Can Social Housing survive in an age of austerity and competition?</td>
<td>Simon Taylor, Arts, Business, Teaching &amp; Policing, University of Cumbria</td>
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<td>What Makes a ‘Space’ a ‘Healing Place’? An Examination of Settings for Counselling and Psychotherapy Within the United Kingdom</td>
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<td>Walnuts, Bill Bailey, the hunchback of Notre dame and a little bit about Radiotherapy treatment planning</td>
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An Interactive Classroom Lesson Simulation
Fred Ingram, Management Science, Lancaster University

This is an interim report on a project to develop a computer simulation of interactions between students and their teacher during classroom lessons. The aim is to develop a visual, animated, decision-support tool that would enable school teachers and other educators to study the consequences of common classroom scenarios, such as the effect on productivity of introducing a teaching assistant, or rearranging student seating, or altering a lesson plan to include more group work.

A case study was conducted at a UK Secondary school, during which a lesson event recording tool was developed and used to capture many different activities of 67 students and 7 teachers during 40 lessons. This provided empirical data needed for constructing models.

Also, using these data, a lesson can be ‘played back’ using a visualization program that has been coded in NetLogo, a popular simulation development tool. A visualization and simulation can be viewed side-by-side and their outputs compared in various ways. Different metrics have been identified or constructed to characterise lessons, classes, students and teachers in order that simulation outputs may be compared, to each other and to the empirical data.

The main remaining technical challenges for the research are: the formulation of a complete set of rules that encapsulate student and teacher behaviour; deciding which metrics to use to compare lessons, students, etc.; and determining exactly how to validate a simulation, in order to assign some level of confidence in the plausibility of the results.

[The visualization/simulation software will be demonstrated.]
Gender-based violence is a form of discrimination that seriously inhibits women’s ability to enjoy rights and freedoms on a basis of equality with men. In a social setup like India, violence against women is systematic and occurs in both public and private spheres. Institutional responses also continue to identify only some abuses and violent acts like, rape, domestic violence and dowry related deaths. Gender based violence is still not contextualized in its local-cultural setting, as a result, a number of violent practices against women that have been customarily conceived and which justify patriarchal norms go unnoticed and unpunished. A social practice like, ‘honour killing’ despite being prevalent in India, neither finds place in any literature nor is considered a real issue of importance by the State, civil society and media. Honour killings are usually perpetrated by family members, often with the complicity of community leaders. Reasons range from a woman’s refusal to be forced into marriage and retaliation for marrying the man of her choice, to refusal to follow prescribed and expected dress codes etc. Because certain practices like, honour killings are ‘socially-tolerated’ they are often kept outside the purview of laws on violence against women which raises a question on the whole understanding of violence against women itself.

In this backdrop, the presentation attempts to highlight some of the key issues surrounding honour killings in India. These are as follows:

- What are honour killings?
- What role does ‘honour’ play in such crimes and whose honour is at stake?
- Who is responsible for the killings and to what extent are such killings prevalent in India?
- What is the judicial response to Honour Killings?
Kendal Mountain Festival as an Arena for Learning and Transition Towards Sustainability
Seonaid Lafferty, Department of Science, Natural Resources and Outdoor Studies, University of Cumbria

Mountain festival culture explores physical and mental limits, which are also the foundation of sustainability (Raworth, 2012). To embed a Circular Economy (CE) is to challenge linear, one-way flow of resources (Winston, 2014) and embed an approach that incorporates planning, communication and feedback loops. This paper is part of a PhD project with Kendal Mountain Festival (KMF), that’s purpose is to explore the organisational values of KMF in a way that harnesses its status as a leading event and explores its potential to deliver a strong message on sustainability. KMF is a unique environment which provides a playground for stakeholders to build new ways of thinking and test innovative approaches for a growing industry (European Outdoor Group, 2017). Furthermore, acts as a platform to analyse production and consumption patterns across stakeholder groups and at different scales; a principle that is at the heart of CE (Gardner, 2013).

Establishing CE within the outdoor industry challenges paternalistic notions of saving the planet and becomes about developing a symbiotic relationship within planetary limits (Winston, 2014). The pursuit of biophysical sustainability non-negotiable and preconditioned (Porritt, 2005). Transitioning to CE invites us to reconsider our behaviour, to discover, areas for development and agree a route forward collectively, which is a slow process (Cummings and Worley, 2015). A festival presents an ideal environment for change that crosses boundaries between disciplines, industries and stakeholder groups, at a range of special and temporal scales.

The research takes place in-action. It will cross disciplines and involve qualitative and quantitate analysis to make it relative and meaningful at different scales. The methodology will respond and adapt throughout the PhD to create a practical toolkit. Emphasis is placed on taking steps to continually monitor and evaluate behaviour patterns, systems operations and ecological impacts in an innovative way (Bocken and Short, 2016).

[References available on request]
Have Humans Become Too Hygienic?
Chiedozie Nwafor, Biomedical and Life Sciences (MSc Biomedicine), Lancaster University

The prevalence of inflammatory diseases have increased almost exponentially in recent times and this might not be unconnected with globalization, rapid changes in our environment, affluence and extended lifespans. While technological advancements have led to more hygienic environments and a near absence of infectious diseases (at least in Europe and America), medical science is struggling to grapple with an emerging rise in occurrence of lifestyle diseases such as type-2 diabetes, cardiovascular diseases, allergies, obesity, and cancer, all linked to inflammation. Some of us believe it is time to revisit the Hygiene Hypothesis postulated in 1988 by British physician David Baker but later disregarded and dismissed by contemporary biomedical scientists. It is established knowledge that humans co-evolved with microorganisms in our environment, and these interactions help in the development of system functions necessary for healthy living, such as innate immunity, nutrient digestion, tissue formation, etc. The small intestine depicts this diverse ecosystem made up of mucosal tissues, bacteria, immune cells, flora and fauna. In this small intestinal, the lumen is separated from underlying sterile tissues by a layer of epithelial cells that control the passage of fluids from the gastrointestinal tract to the walls of the gut. Studies have shown that a disruption in the balance and diversity of intestinal biota, either due to the absence of commensal microorganisms, or due to the presence of invasive parasites may result in the loss of barrier integrity of the gut walls, leading to inflammatory immune diseases. Thus, there is a link between the rising incidence of autoimmune, inflammatory diseases and the depletion of intestinal microbiota, because of improved hygiene, late or no exposure to infectious microorganisms, improved household water supplies etc. This research is investigating the effects of reintroducing a microorganism specie Hymenolepis diminuta (rat tapeworm) into the human small intestine as a means to restoring the diversity of the intestinal biota, hence providing a therapeutic solution to inflammatory diseases.
The study of wellbeing is fast becoming a key consideration for policy makers as it can provide a system to measure social progress. Wellbeing is generally understood as a positive state and a high level of satisfaction with one’s life. Key factors include health, education, environment, personal relationships and mobility.

According to NEF (2015), average national wellbeing scores are rising. However, so is inequality of wellbeing. “If these improvements were the result of public resources, […] are we improving the wellbeing of those most in need?” (NEF, 2015)

The pattern of disparities in wellbeing reveals an unequal geography where prominent spaces of inequality have formed. Spatial injustice is defined as the intentional effort to organize physical space in ways that maintain or reinforce that inequality.

“Living in a deprived area adversely affects individuals’ life chances over and above what would be predicted by their personal circumstances and characteristics” (ODPM, 2005:6). Health, education, social inclusion and mobility – both social and occupational – are some quality-of-life outcomes that can be distressed by occupying a disadvantaged spatiality (Galster, 2014).

Current literature advocates a strong link between reduced life chances, low wellbeing and spatial inequality. Neighbourhoods can have self-regulating social controls, such as peer influence and social cohesion that facilitate the creation of poverty traps (Jencks & Meyer, 1990; Galster, 2012). Research also shows that the quality of social relationships is a fundamental aspect of wellbeing (Ryff, 1995; Seligman, 2011; Keyes, 2002, 2009; Diener, 2012) Current literature demonstrates how social processes and measures of wellbeing are intrinsically related. However, what it does not fully articulate is how the spatial structure of those social processes affect wellbeing. This presentation will propose a new way of thinking about wellbeing and inequality, through the spatial lens of urban design.
Molecular machines are perhaps the smallest devices capable of controlled mechanical motion. One type of molecule of considerable interest for making molecular machines are rotaxanes. Rotaxanes consist of a ‘thread’ like component called the axle, threaded through a ring like component called the macrocycle. Bulky groups are placed on the ends of the axle to prevent the macrocycle from falling off (fig. 1). An analogy would be a washer trapped on a bolt by a nut or a needle and thread. As the macrocycle and the axle in rotaxanes are not attached to each other the macrocycle can be made to rotate around or shuttle along the axle. These motions have already been exploited by chemists to develop functional molecular machines, having already been used to move liquid up hill and in molecular computing.[1,2] However, rotaxanes are notoriously difficult to synthesise, more so in large quantities and are often difficult to store. At Lancaster we are demonstrating “New Thinking” by developing a series of robust rotaxanes using a new motif. These rotaxanes are relatively straightforward to synthesise in a scalable way and are bench stable, synthesised using a hydrogen bond templated methodology. These rotaxanes have then been put to work as molecular machines, using change of pH and addition of metal cations as a trigger (fig. 1).

Footnotes

Research from the field of psychology has shown that there are significant differences between the behaviours of a truth teller and a liar; investigating these differences in more detail may point towards cues to deception. These cues can be divided into three categories: physiological cues (such as heart rate and sweat); behavioural cues (such as body language and eye movement); and verbal cues (such as speech rhythm or grammatical differences).

This work-in-progress talk will focus purely on verbal cues, outlining how I am using corpus linguistic methods to investigate the language of deception. Drawing upon previous research and methods from psychology, I will outline my experiment which was designed to extract truthful and deceptive language in a range of scenarios, and from a range of participants from different social backgrounds (i.e. differences in region, gender, age, and socioeconomic status). The focus of this talk will be on how corpus linguistic methods can be used to analyse this language.

The bulk of this talk will comment on the relatively uncharted territory which lies between corpus linguistics and forensic psychology. Research from the field of psychology in automated deception detection has so far only been carried out using LIWC (Pennebaker et al, 2001). However, in more recent years, Archer and Lansley (2015) and McQuaid et al (2015) have applied corpus linguistic methods to the field, using Wmatrix to investigate part-of-speech and semantic differences between truthful and deceptive corpora. It is clear to corpus and forensic linguists that we have a lot more to offer psychology and the field of deception detection than we have done already, and these methods have the potential to uncover deceptive cues that have so far remained unfound.

[References available on request]
Dramatic Loss of Agricultural Land Due to Urban Expansion Threatens Environmental Sustainability and Food Security in the Nile Delta, Egypt
Taher Radwan, LEC, Lancaster University

Egypt has one of the largest and fastest growing populations in the world. However, nearly 96% of the total land area is desert and uninhabited. More than 95% of the population is concentrated around the River Nile valley. This unbalanced distribution and dramatically rising population have caused severe socio-economic problems. In this research, twenty-four land cover maps from 1992 to 2015 were used to monitor land use/land cover (LULC) changes in the Nile Delta and quantify the rates and types of LULC transitions. The results showed that 2.3% of fertile agricultural land in the Nile Delta has been lost to urbanisation over the 24 year period at a rate of 38 km$^2$ year$^{-1}$, whilst 5.14% of bare (desert) areas have been converted into agricultural land at a rate of 86 km$^2$ year$^{-1}$. This paper evaluates alternatives to the current land use strategy in Egypt which could generate more beneficial outcomes for the environment and help promote greater food security. The CA-Markov integrated model was used to simulate likely future scenarios of land use/cover changes (up to 2025) in the Nile Delta. The results showed that the LC changes experienced in the Nile Delta in the past few decades are likely to continue. About 553 km$^2$ of land are going to convert to built-up areas at the expense of agricultural land from 2015 to 2025, which poses a threat to environmental sustainability and food security in Egypt. Above-mentioned findings in the broader context of possible future impact on designing drugs for the treatment of diseases caused by pathogenic protists.
Prize Winners

Three Minute Thesis (3MT®)

Emma Stubington, STOR-i, Lancaster University – ‘Walnuts, Bill Bailey, the Hunchback of Notre Dame and a Little Bit About Radiotherapy Treatment Planning’

Long Presentation

Charles Gell, Chemistry, Lancaster University – ‘Making the Tiniest Machines’

Academic Poster

Victoria Reay, Lancaster Medical School, Lancaster University – ‘Electronic Patient Records EPR’ (Winner of both the Judges’ Award and the Delegates’ Vote)
Like research? Want to meet like-minded people? If so, then come to New Cafe!

Every month, the Graduate College hosts an informal research event where two PhD researchers present their work to a friendly, non-specialist audience. It’s a great chance to share your work and practice speaking in public. You can also network with fellow researchers, and enjoy free food and drink afterwards.

For more details see social media:

• www.facebook.com/thenewcafe
• www.twitter.com/LUGradNewCafe
We are grateful to the following people/organisations that have contributed to this conference:

Claire Povah – Principal, Graduate College  
Dr Paul Dolby – Vice Principal, Graduate College  
Jane Hulland – Manager, Graduate College  
Saadia Shah – Administrative Assistant, Graduate College  
Mike Ryder – Assistant Dean, Graduate College  
Lancaster University ISS  
Lancaster University Management School  
Lancaster University Careers Service  

Lancaster University and Graduate College have also contributed funds to this event.

We would also like to thank our guest speakers, workshop leads and presentation/poster judges.

Finally we would like to thank all our delegates and those who have contributed to the programme, without whom the conference would not have happened.

#lupgrc