

UNIVERSITY OF
BIRMINGHAM



IMAGES OF RESEARCH

2019/2020

Guidelines for voting

Can you tell the story of your research project in a single image? The University Graduate School presented this challenge to our postgraduate researchers and the images you see here represent the exciting research projects our postgraduate researchers are working on at the University of Birmingham.

Help us choose this year's winners by voting for your favourite entries that have captured your imagination and made you think a little differently about research.

Please vote for your **top 5** favourite entries. As a guide, a winning entry should be:

- 1. Visually appealing**
- 2. Original and creative**
- 3. The accompanying abstract should be clear and make you want to know more about the research study**

After you view the catalogue, please [vote online](#).

Voting will close on **11 January 2020** and the winners will be announced online.

We hope you enjoy the Images of Research catalogue and please feel free to share the catalogue with your colleagues, friends and family.



Images of Research 2019/20

Can you tell the story of your research in a single image?

The University Graduate School presented this challenge to our postgraduate researchers and this booklet includes contributions from 62 postgraduate researchers across a variety of departments from all five Colleges (Arts and Law, Engineering and Physical Sciences, Medical and Dental Sciences, Social Sciences and Life and Environmental Sciences). The images and abstracts in this booklet highlight the cutting-edge research conducted by our postgraduate researchers at the University of Birmingham and we hope you will enjoy learning more about these exciting research projects.

Special thanks to our postgraduate researchers for taking part in Images of Research 2019/20.

Ahmed Saad
Alice Jasper
Andrea Preziosi
Aneela Khan
Antonio Gervasoni
Arooj Khan
Augustine Farinola
Caroline Russell
Catherine Blair
Charles Goode
Charlotte Bird
Chloe Bamboulis
Chris Byaruhanga
Citta Widagdo
David Pettifer
David Evans-Powell
David Bray
Dega Sian Rutherford
Eleni Papadatou Soulou
Elizabeth Thomson
Emily Vincent
Erik Thoomes
Francisco Figueiredo de Souza
Gheorghe Williams
Hadeel Al-Dawsari
Holly Brown
Ian Jenkins
Jane Fletcher
Jeannette Rodgers
Jennifer Furlong
Jenny Knight

Laverne Smith
Lucy Prior
Marcelo Carvalho-Loureiro
Marie Rowley-Brooke
Meryl Faiers
Moumita Deb
Mukile Kasongo
Natasha Nicholls
Panagiota Mantouvalou
Rebekah Andrew
Rhys James Jenkins
Riccardo Buscicchio
Richard Bainbridge
Rob Greene
Rowan Mackenzie
Ruby Persaud
Ryan Turnbull
Sagir Muhammad Yusuf
Samantha Pendleton
Samara Dantas Palmeira Guimaraes
Sarah Chung
Shaun Thein
Sonja Bloch
Sue Quick
Thomas Wood
Tim Podlogar
Tom Goodman
Una Lodge
William Burton
William Horncastle
Zakareya Nashwan

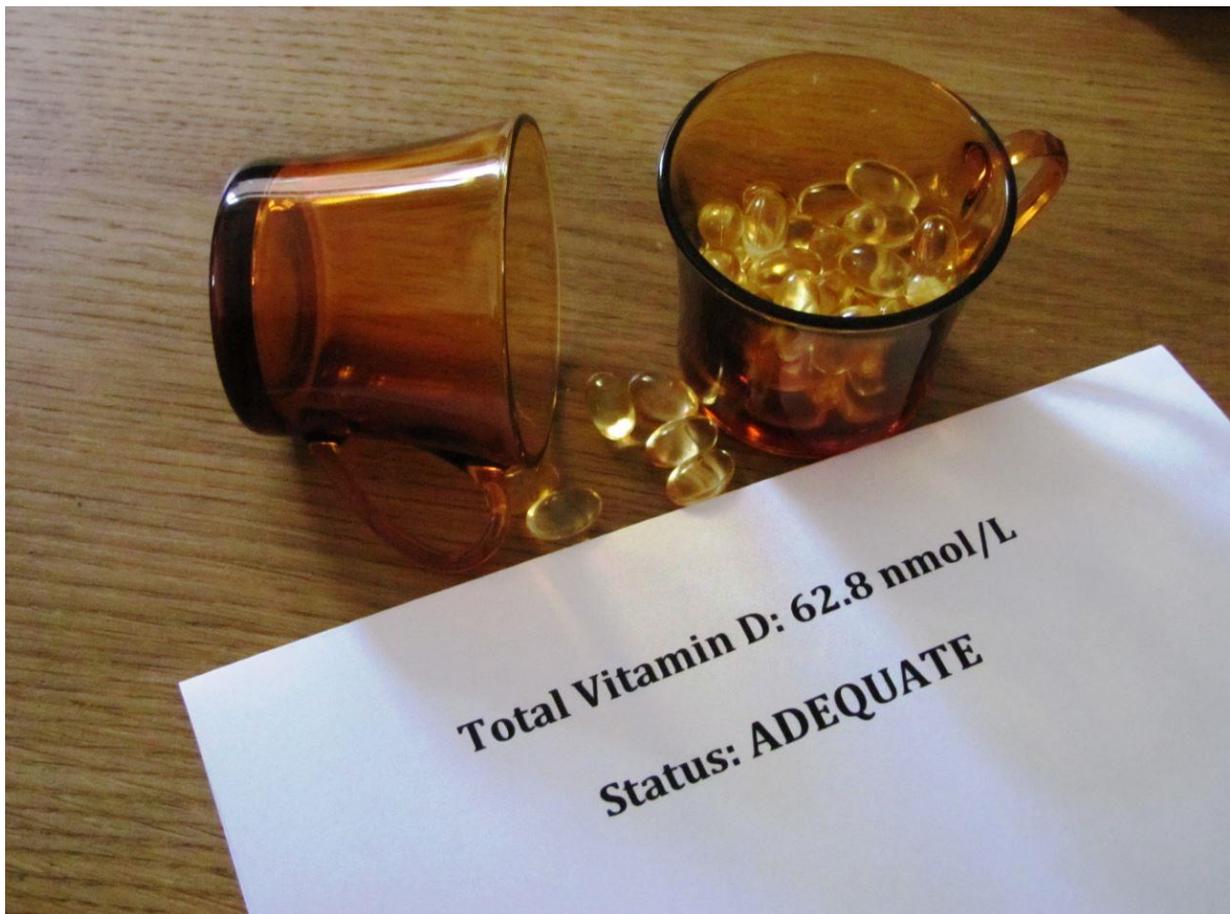


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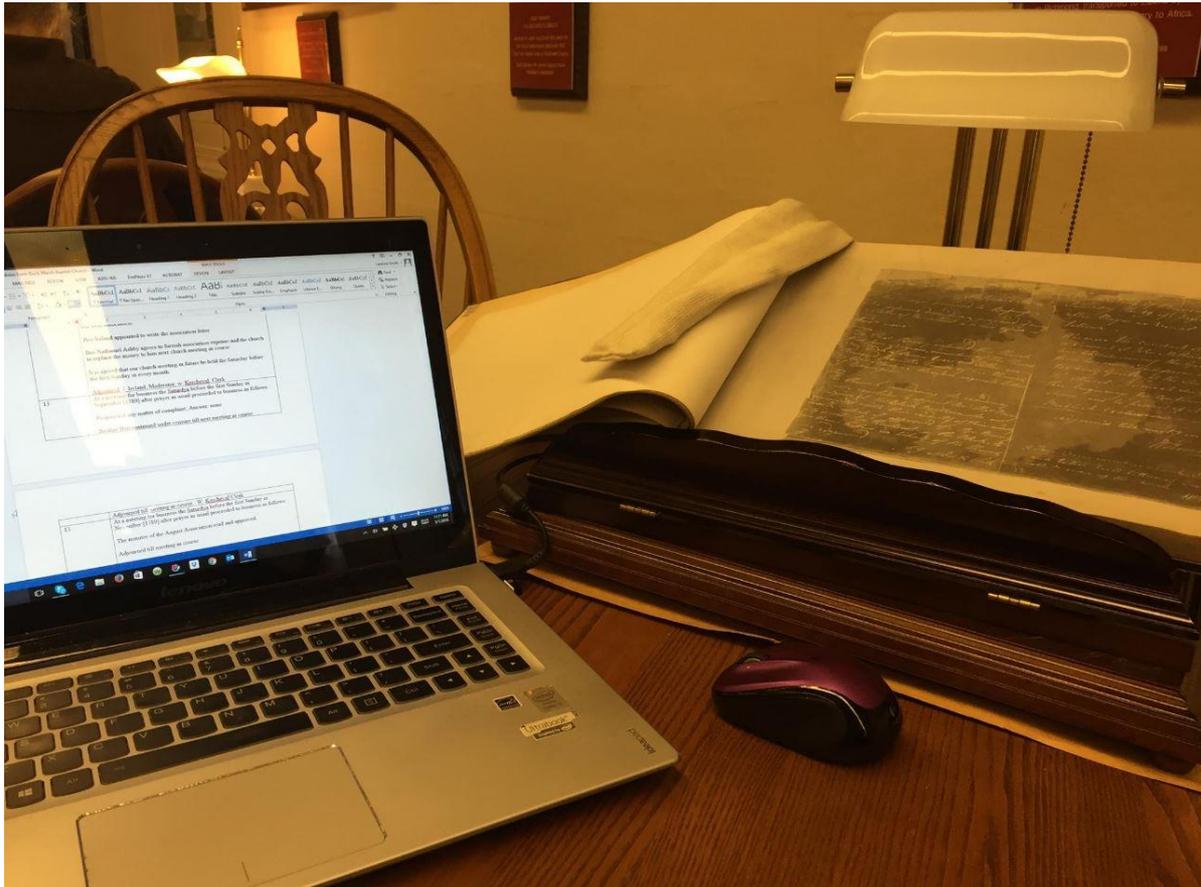


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Status: Adequate

Jane Fletcher, College of Medical and Dental Sciences

Crohn's Disease is a chronic, debilitating condition causing severe inflammation throughout the gut. Vitamin D plays an important role in ameliorating inflammation, yet vitamin D deficiency is common in Crohn's sufferers. In my study I am measuring vitamin D levels in people with Crohn's Disease using a dried blood spot test. People with proven deficiency will then be randomly allocated to one of two groups to receive a daily vitamin D supplement treatment. My aim is to see if treating their vitamin D deficiency improves the inflammatory symptoms of their disease. The photograph shows my own vitamin D result using the same test. My status is, apparently, adequate.





Research Past and Present

Laverne Smith, College of Arts and Law

This image was taken at the Virginia Baptist Historical Society and Center for Baptist Heritage in Richmond, Virginia, and contains two elements. The item on the right is a bound photostat copy of eighteenth-century church records. The computer next to the bound volume is useful for transcribing the information from the document and makes the information searchable for research purposes. The photostat copies make the information accessible while protecting the original documents from handling, thus preserving them. I am grateful to the historical archives and their staff who provide access to materials for researchers who need to explore the past in the present.





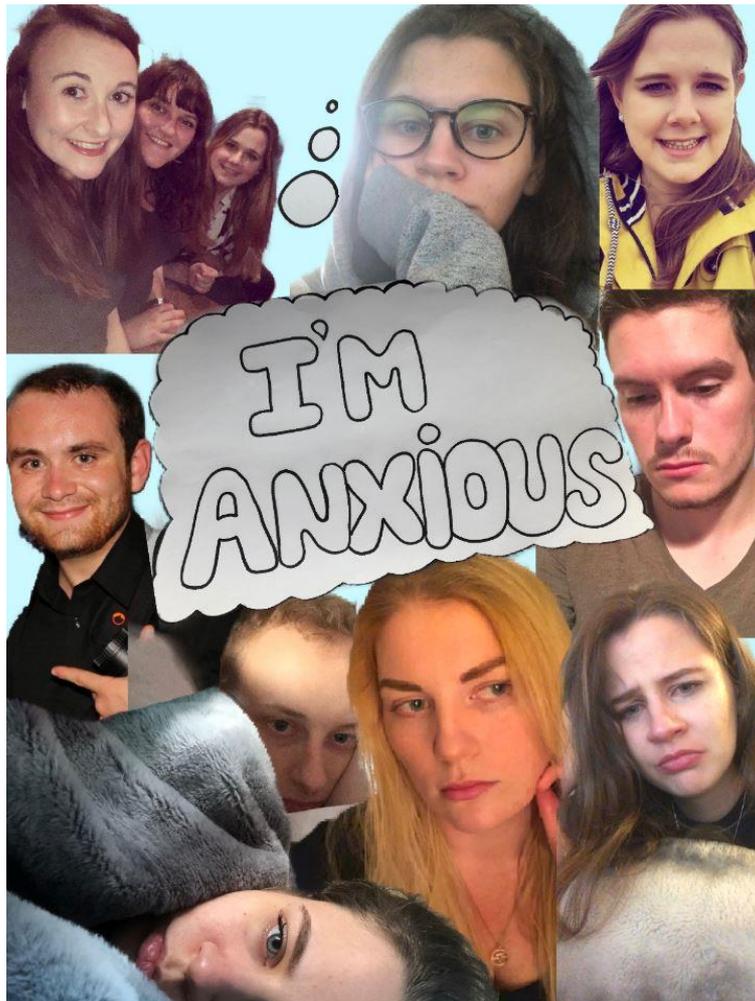
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Dark heritage and the earthy unearthly: Characterising folk horror in British cinema and television

David Evans-Powell, College of Arts and Law

We all know folk horror when we see it, even if we're not familiar with the term. This photo, taken at Babbacombe Model Village, features several of the quintessential folk horror motifs: the beautiful yet unsettling countryside, the disquieting relics of our pagan past like stone circles and chalk figures. Folk horror draws together our semi-legendary history and our half-forgotten mythic landscapes. However defining the genre, beyond identifying individual motifs, has proved elusive. My research will build on this relatively new area of enquiry by examining in depth the relationship between the history and topography of the British rural landscape on screen.





The Youth Anxiety Epidemic

Lucy Prior, College of Arts and Law

My research aims to explain rising anxiety rates in UK young people, aged 16-24. A fundamental step in doing this is examining current philosophical and psychological conceptions of anxiety, determining what we really mean when we say, "I'm anxious". We can use it to mean that we are worried about something, or that we are in the throes of a panic attack. My collage shows images of youth experiencing these distinct instances of 'anxiety', and that we can be anxious even when we might be looking confident on the outside. I aim to demonstrate anxiety has no distinct outwardly presentation and can affect anyone.



Seiner

for a Fisherwoman

Commercially fishing summers off the Kenai coastline
her golden back set East seining through Alaska's Gulf—good form from
launch to dock—she teaches
today's man to earn his keep, while keeping me patiently angling,
never crossing the lines,
never out of line, and
the new crew who ask
how much they can earn
in a given summer are met
with the same answer—
that depends.



Seiner

Rob Greene, College of Arts and Law

The concrete love poem "Seiner" was created out of respect for women, work and experience. Maritime images include a rudder, a seine net, a cabin cruiser and others. My research weighs the unifying factor of empathy through the shared experiences of addiction, war, loss, recovery, love, work, parenting, caretaking and fear that we all share either directly or indirectly regardless of any of the demographics that are used to separate us such as race, nationality, immigration status, socio-economic status, etcetera.





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Shakespeare Unbarr'd - behind the prison walls

Rowan Mackenzie, College of Arts and Law

The Gallowfield Players is the first UK prisoner-owned theatre company and I have the pleasure of being the artistic director. For the last two years we have worked together to edit, rehearse and perform Shakespeare plays and along the way have transformed the lives of those involved who are serving life sentences. My research into Creating Space for Shakespeare in non-traditional settings has led me to this amazing opportunity to be involved in life-changing experiences with incarcerated people, people with mental health issues and people with learning disabilities. Space is altered by the activities within it and this photograph shows not a prison but a theatre.





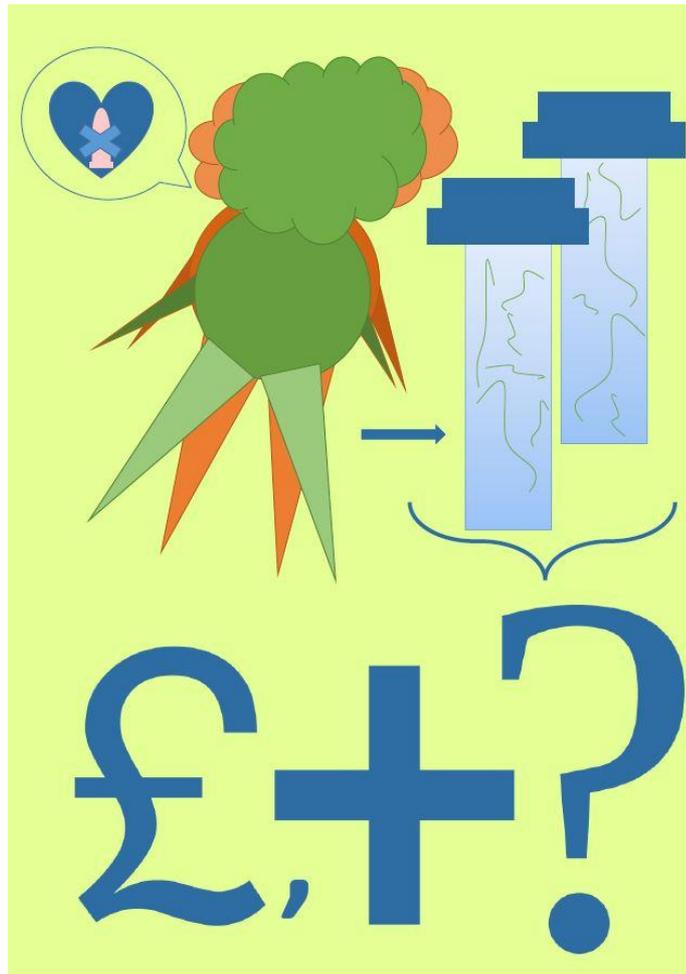
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Green Belts and Green Growth: Where Should New Housing Development Be Located?

Charles Goode, College of Life and Environmental Sciences

Most people agree there is a housing crisis and that new homes need to be built but there is much more contention about where these homes should be located. This is the key question that we as planners are grappling with and forms a central part of my research. Historically, the Green Belt- a large tract of countryside surrounding settlements- has restricted the outward expansion of England's largest cities and housing growth occurred beyond the Green Belt in places like Eastbourne in the photo. However, would it be more sustainable for Green Belt to be relaxed and for development take place closer to cities? This is my central but controversial research question!





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The costs and benefits of screening programmes for sexually transmitted infections

Sonja Bloch, College of Medical and Dental Sciences

Sexually transmitted infections are on the rise in England. Therefore, it is important to test and screen the population to control the incidence and prevalence of the infections. However, from an economic point of view, it is difficult to evaluate the costs and benefits of such control programmes. In addition, this evaluation should also be meaningful to local decision-makers who commission these programmes. This is why this research image tries to illustrate the overall research question of my project: How to measure costs and benefits of control programmes for sexually transmitted infections to generate meaningful evidence for local decision-makers in England?

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So many tabs, so little time...

Rebekah Andrew, College of Arts and Law

In this image each coloured tab represents a reference to the Bible, many of which have been previously unacknowledged by critics and unnoticed by modern readers. The books pictured are 'Tom Jones', 'Shamela', and 'Joseph Andrews' by Henry Fielding; and 'Clarissa', and two versions of 'Pamela, or Virtue Rewarded' and 'Pamela in her Exalted Condition' by Samuel Richardson, all published during the 1740s. My research asks the complicated question 'how are biblical references used in these novels?' and challenges the opinion that the eighteenth-century novel is a secular genre of fiction.





THE FREE SCHOOLS GAME

Free Schools
—have created more than—
400,000 places
—and done so 29% cheaper—
than the previous school building programme

Secondary Free Schools are:
Achieving above average GCSE results
Top performing type of school at GCSE as measured by the official 'Progress 8' measure

Revealed: Cost to taxpayer of free schools that never opened

'Seckford Foundation Free Schools Trust celebrates all 3 schools in top 10'

CONFIDENTIAL

DfE report praised damned free school

'£22.8m cost of new Cobham Free School site 'profligate use of taxpayers money'

So what is a Free School?

- A 'free school' is the DfE's term for any new provision academy.
- 'Academy' is the legal term for state-funded schools that are independent of local authority control and receive their funding directly from the government.

"Excessive" use of restraint, growing violence and "serious" behaviour problems have been uncovered in a damning Ofsted report of a special primary school in Darlington.

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Keeping our perspective

David Bray, College of Social Sciences

Free schools were introduced by the 2010 coalition government, they are state funded 'independent' schools. Given that all schools were also encouraged to become academies and state schools have experienced high levels of marketisation since the Thatcher governments it is not immediately clear what distinctive characteristics a free school might have, other than being new. Discourse provides contested views, framing them as variously different, desirable, or anti-democratic. My research considers some of the ways this type of school organisation can be seen as a field (Bourdieu) and the way participants (agents) understand their part in the rules of the game.

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Modernity: Is it all a load of rubbish?

Ahmed Saad, College of Arts and Law

This photo is of a skip full of rubbish from a refurbishment process of a bathroom. My research focuses on traditionalist Muslim response to the challenge of modernity. Studies of Muslim responses either neglect this response or misidentify it. They focus on responses that assimilate or dismiss modernity altogether. Traditionalist response does not see modernity as something to assimilate to or neglect; it avoids a binary way of thinking and looks beyond the dictates of leave it or bin it. Engaging this response can change our evaluation of tradition and ability to explore recycling some of its components.



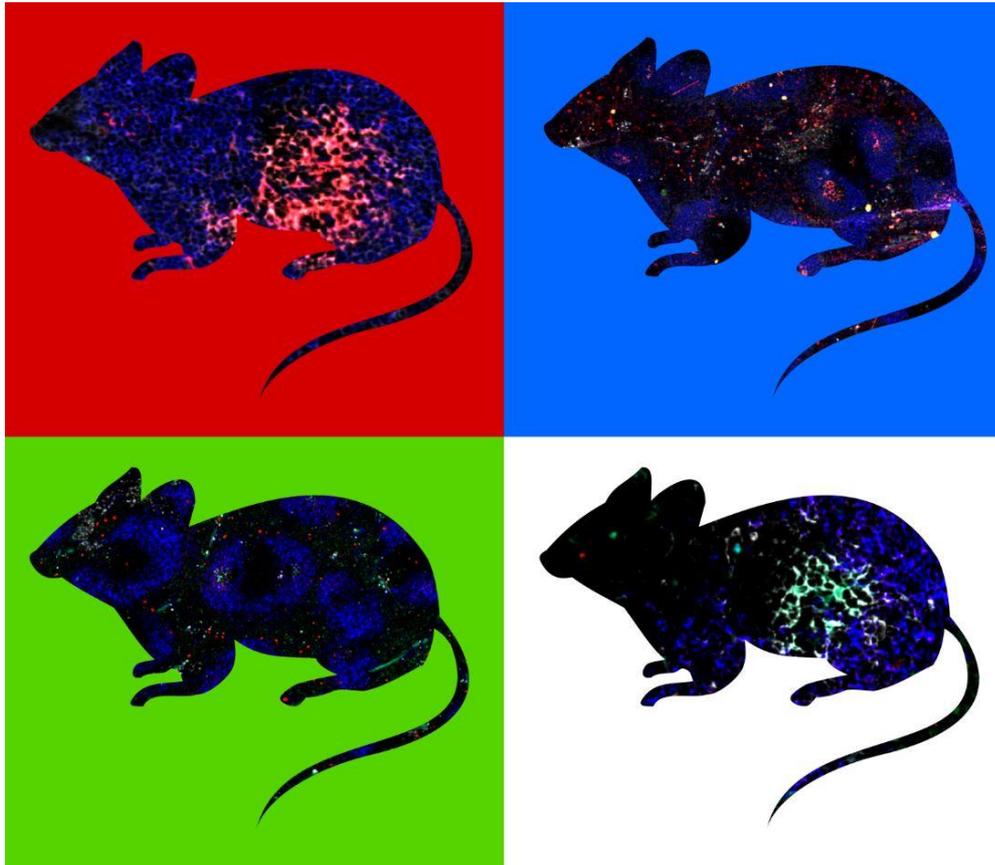


The Grey Man of the Forest

David Pettifer, College of Life and Environmental Sciences

Lanjo is a strong, healthy, grey haired eastern chimpanzee in the prime of his life. Despite his colouration, he is only 21 years old, and expected to live another 10 years on average. But what about those individuals who survive beyond this, reaching the upper limits of their lifespan? Does a chimpanzee at the age of 50 experience the same suite of old-age complaints as a human might? My research focusses on changes in mobility and joint health as chimpanzees age in the wild and captivity. I aim to understand how environment and activity may affect the health of these individuals, particularly as they move forward into their twilight years.





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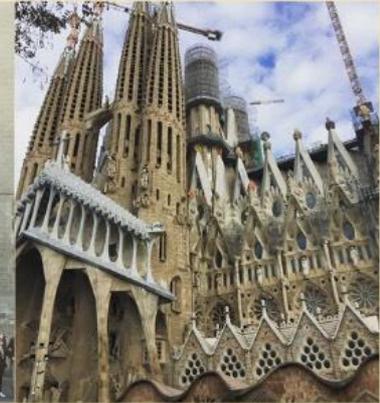
Gatekeepers to research

Ruby Persaud, College of Medical and Dental Sciences

Animals have played an integral role in providing breakthrough treatments and medication. What most fail to understand about this research is the humility and respect it takes to work with them. My PhD research uses mice to investigate the immune system, and how vaccines protect against invasive Salmonella infection, a leading cause of morbidity and mortality worldwide. Without mice, we would not be able to achieve the research required for making effective vaccines that protect current and future generations. This piece is in dedication to the animals that make my work possible. The images you see are from imaging experiments that show individual cells in immune organs.

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*I go to Prepare a
Place for you*

(JOHN 14:3)



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"I go to prepare a place for you"

Ryan Turnbull, College of Arts and Law

The displacement of Christ's body is the promise that all bodies will be radically placed. Farm and cityscapes present the illusion of 'mapping' places from privilege. Cathedrals are constructed and eclipsed by the image of pilgrimage, an embodied practice that arrives at and transgresses place. A monastery is juxtaposed by the cliffs of Cape Breton; traditions of utopia and wilderness entertaining the radical possibility of emergent place. Finally, a woman is obscured against a landscape, symbolic of displaced bodies; again juxtaposed by a man and dog, encouraging contemplation of whether our account of place includes displaced and non-human bodies.



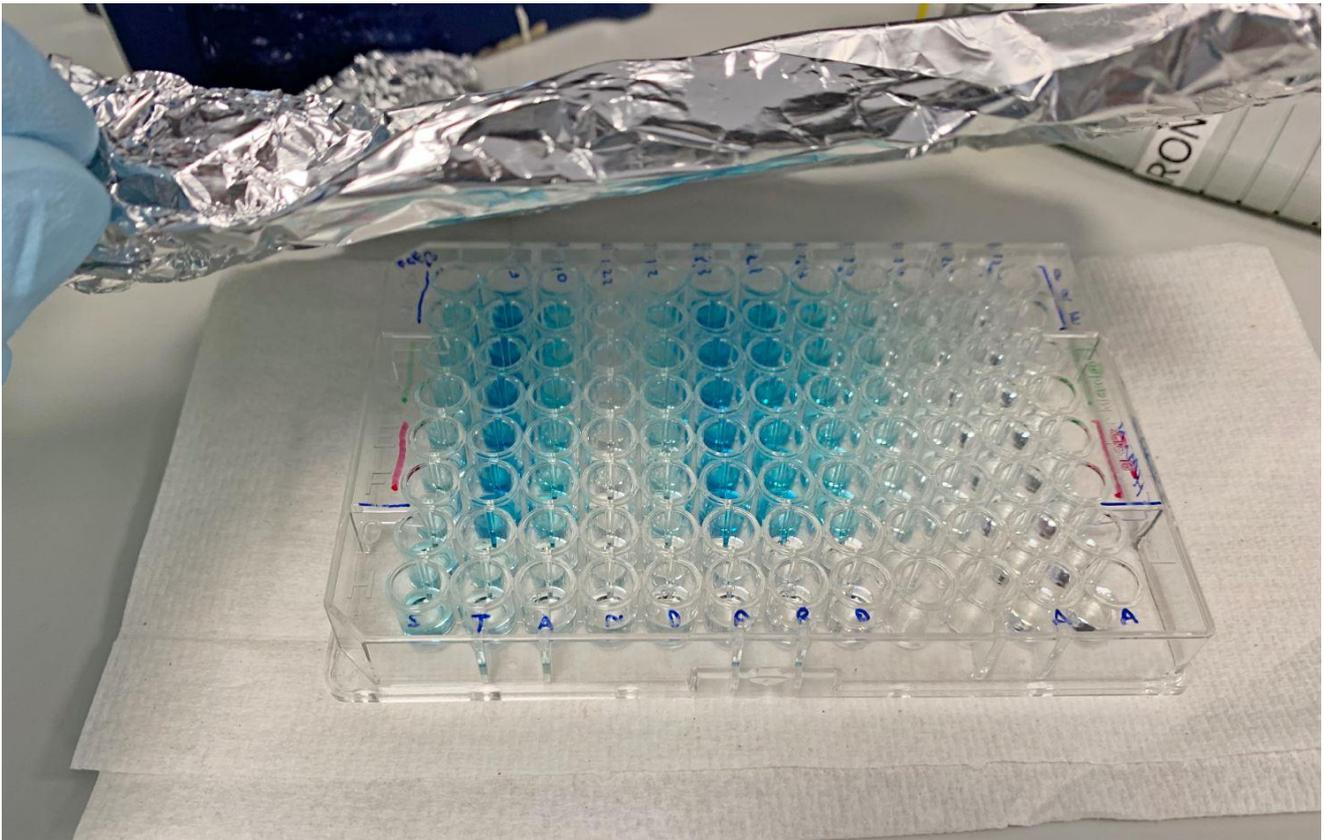


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"I'd scrub this place out. I never want to go there again"

Arooj Khan, College of Life and Environmental Sciences

This image is a co-created map of safe and unsafe spaces for black and brown bodies in Grays, Essex. It is the product of a collaborative mapping exercise with BAME students at South East Essex College. This pilot activity served as a precursor for a piece of research examining the parallels between regeneration and British colonialism, by observing the impact of regeneration on children and young people of colour who have recently moved to Tilbury Town from London boroughs. By observing the non-representational through a postcolonial lens, this research aims to deliberately disrupt the processes of regeneration by reclaiming and redesigning local spaces.





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A peek under the foil

Shaun Thein, College of Medical and Dental Sciences

ELISAs (Enzyme Linked Immunosorbant Assays) are core to my research. We are exploring the role of fibroblast growth factor 23 (FGF23) beyond the homeostasis of vitamin D in critical illness. FGF23 is not regularly measured, and there is sparse literature on what levels are in the healthy population let alone in a population with illness. This image shows a peek during a light sensitive stage of the ELISA experiment to see if it's working. Although the colour is changing, there are reactions which are darker the reference range which means needing to dilute and repeat some of this experiment.



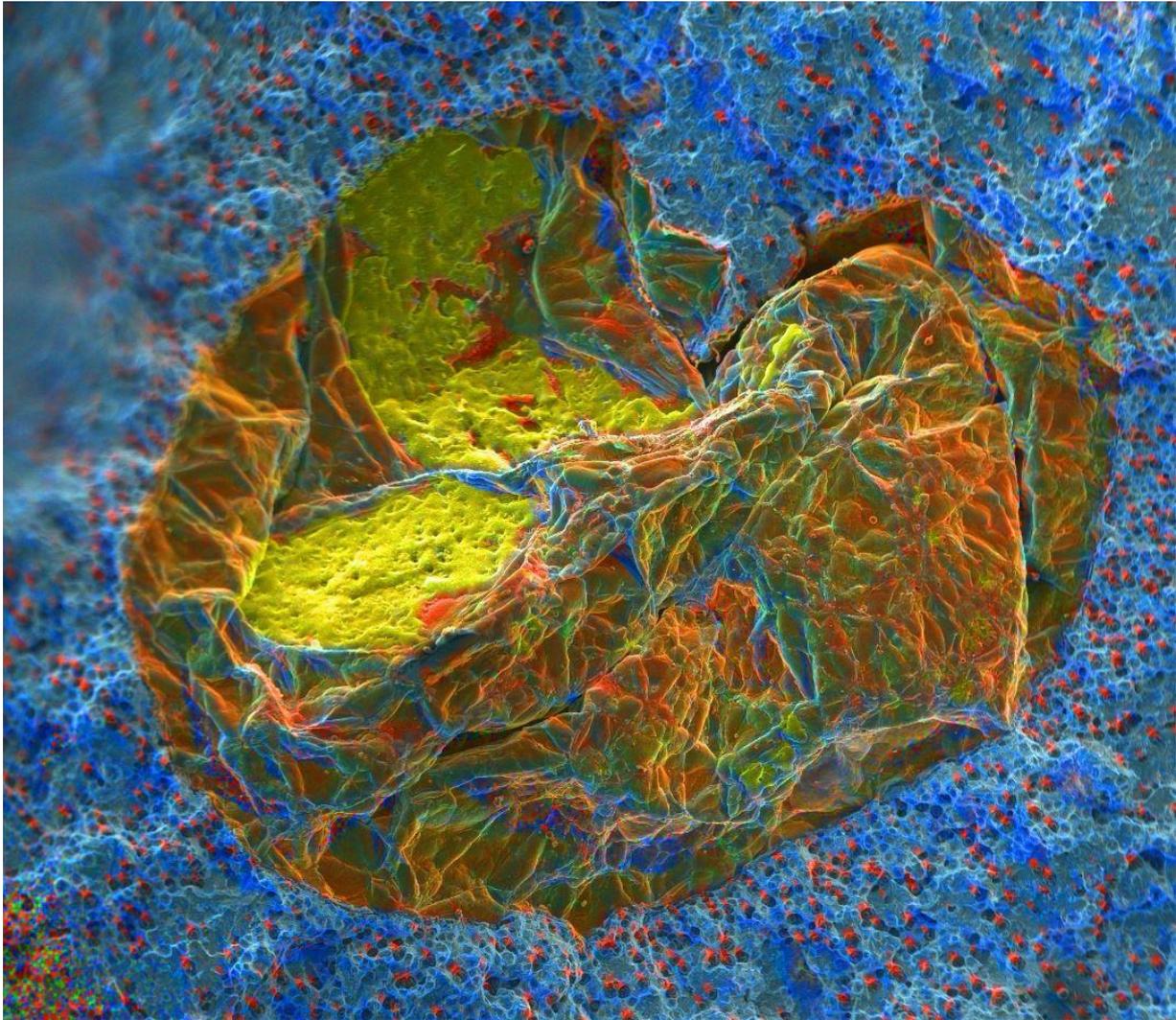


● ● ● Psychosis and Injustice

Aneela Khan, College of Life and Environmental Sciences

Psychosis is typically understood as an episodic change in one's state of mind, usually characterised as a loss of contact with reality. For example, individuals with positive symptoms of psychosis tend to lose their grasp on what is real and may experience hallucinations and delusions. My thesis will explore how individuals with psychosis make sense of their experiences, and more specifically, how the medical model and medical terminology can validate or invalidate their understanding of what they are experiencing. The image displays how an individual may feel frustrated and confused with the leading medical approach adopted when diagnosing and treating psychosis.





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Ductile Cast Iron Rainbow Defect

Zakareya Nashwan, College of Engineering and Physical Sciences

Ductile cast irons are used in several critical components across many applications like automotive, railway, energy generation and aerospace. Failure during service of these components could be catastrophic. Double oxide biofilms are defects found hidden inside casted metal components that reduces mechanical properties significantly leading to premature failure. A scanning electron microscope image with a layered energy dispersive x-ray elements map is revealing the first observed double oxide bifilm on a fracture surface of ductile cast iron test bar. The image shows the complexity of the defect as each colour of the spectrum represents an element.



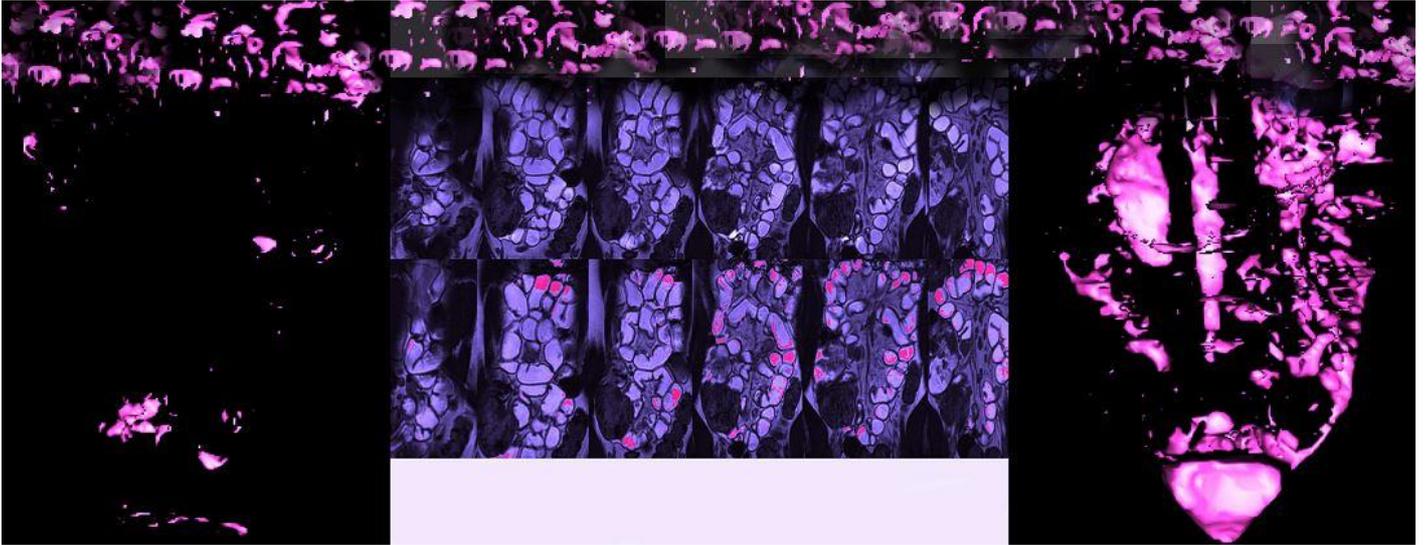


Shifting Land, Shifting Governance

Caroline Russell, College of Life and Environmental Sciences

This is a photo of a landslide near my PhD field site in Western Nepal. Rural Communities all over the mountainous regions of South Asia live with the risk to life, loss of land and livelihood, associated with exposure to landslides and flooding. These risks are increasing due to climate change, agricultural practices, and mismanaged development, contributing to low resilience levels in these communities. My work focuses on the emergence of collaborative governance approaches to Disaster Risk Reduction, which suggests a shift to an inclusive governance model away from top down government will increase resilience to hazards in mountain communities.





Exploring The Paediatric GI Physiology Via A Novel MRI Methodology

Eleni Papadatou Soulou, College of Medical and Dental Sciences

Exploring the paediatric GI tract via a novel MRI methodology has been challenging and time-consuming, requiring hours in front of a single MRI image to identify all the fluid pockets in the GI tract. As the small intestine is the main site where oral drug absorption takes place, its fluid content could have an impact on the drug absorption. It was an urgent need to unravel the complex paediatric GI physiology, as this will shape therapies for children by providing the most accurate dosage. Looking at this image, you can see much more than meets the eye, more than three years of my life. You can see what I was dreaming of when I was asleep at the end of the research day.





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Out of the Shadows: the case for the participation of children in transitional justice

Jeannette Rodgers, College of Social Sciences

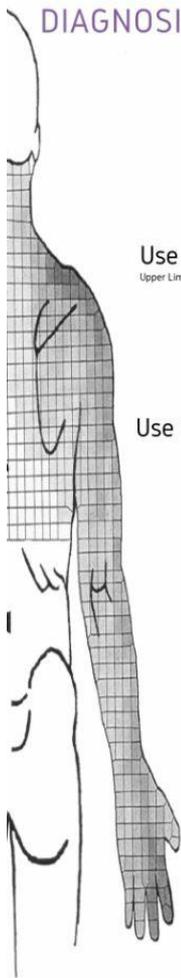
This image shows a young man at the Kigali Genocide Memorial in Rwanda, looking intently at exhibited photographs of the many victims of the genocide in 1994. I took this photograph whilst visiting Rwanda in April 2019 - a year marking 25 years since the genocide. Children under 18 in Rwanda are known as 'Generation 25,' and my research makes the case for how, and why, the participation of these children should be integral to the purpose of international, national and local justice. The project seeks to understand their perspectives on what the meaningful participation of children should look like, to inform a new framework of participation in law and development.

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DIAGNOSIS AND CLINICAL MANAGEMENT OF PATIENTS WITH CERVICAL RADICULOPATHY

Do you suspect your patient has a cervical radiculopathy? What to do next...



Use 4 ULNTs

Upper Limb Neural tests I-III-II-III



to Rule Out (Se 0.97 (95%CI: 0.83-1.00))

Use 4 tests



Spurling's test
Sp 0.92 (95%CI: 0.59-1.00)

Traction-Distraction test
Sp 0.97 (95%CI: 0.83-0.99)

Arm Squeeze test
Sp 0.97 (95%CI: 0.95-0.98)

Upper Limb Neural tests I-III-II-III
Sp 0.69 (95%CI: 0.41-0.88)

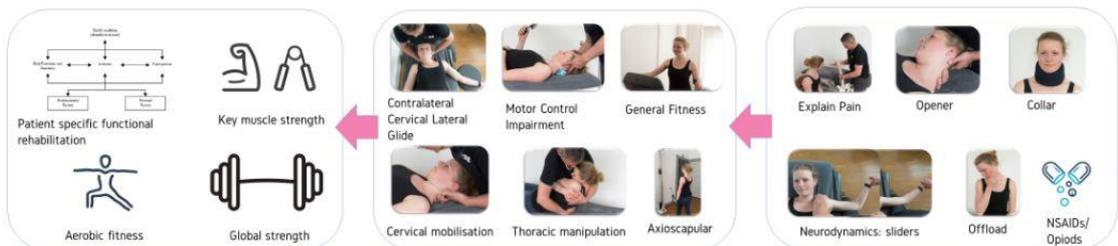
to Rule In

For a multi-modal management plan:

Longer term rehab

Mid term stage

Acute stage



- References:
- Thoomes E.J, van Geert S, van der Windt D, Falla D, Verhagen A, Koes B, Thoomes-de Graaf M, Kuisjer B, Scholten-Peeters G, Vleggeert-Larikamp C. Value of physical tests in diagnosing cervical radiculopathy: a systematic review. Spine J. 2018 Jan;18(1):179-189.
 - Thoomes E.J. Effectiveness of manual therapy for cervical radiculopathy: a review. Chiropr Man Therap. 2014 Dec; 9:24-45.
 - Thoomes E.J, Scholten-Peeters G, Koes B, Falla D, Verhagen A. The effectiveness of conservative treatment for patients with cervical radiculopathy: a systematic review. Clin J Pain. 2013 Dec;29(12):1073-86.
 - Thoomes E.J, Scholten-Peeters G, de Boer A, Oltshoorn R, Verkerk K, Lin C, Verhagen A. Lack of uniform diagnostic criteria for cervical radiculopathy in conservative intervention studies: a systematic review. Eur Spine J. 2012 Aug;21(8):1459-70.

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Adapted from Slipman et al., 1998

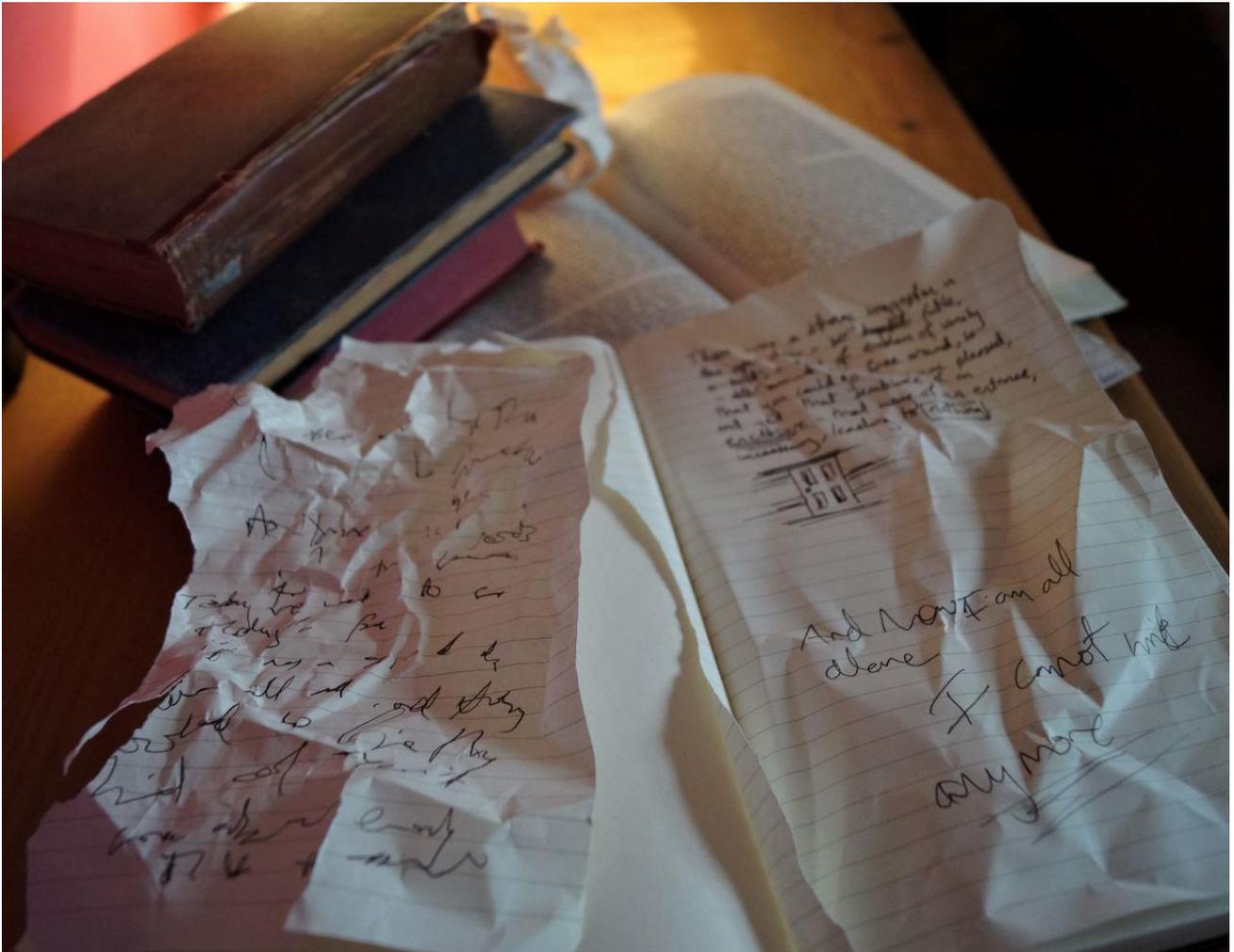


Diagnosis and treatment of cervical radiculopathy

Erik Thoomes, College of Life and Environmental Sciences

Radiating pain in the arm can be a result of benign everyday neck disorder, but also due to nerve root impingement. This is called 'cervical radiculopathy'. For clinicians it is of importance to differentiate between the two, as the management strategies differ substantially. My research focuses on the diagnostic accuracy of no/low cost clinical tests which can be used by clinicians all over the world, regardless of the setting they practice in. Additionally I am looking at the effectiveness of non-invasive management strategies in an effort to build a treatment framework for patients with cervical radiculopathy, which, again, can be implemented by clinicians all over.





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"I cannot write anymore"

Emily Vincent, College of Arts and Law

"And now I am all alone. I cannot write anymore". This was how prolific nineteenth-century author Margaret Oliphant tragically concluded her autobiography after facing eleven bereavements, six of whom were her own children. My image shows a scrawled diary and Oliphant's 1882 ghost story *The Open Door*. Through my research, I argue that Oliphant, and other late Victorian women writers, wrote and read supernatural fiction as an abstract means of publicly confronting the loss of their children. The crumpled pages and hurried writing represent the emotional turmoil of the life-writing process for women in an era fraught with gendered expectations of maternal mourning.



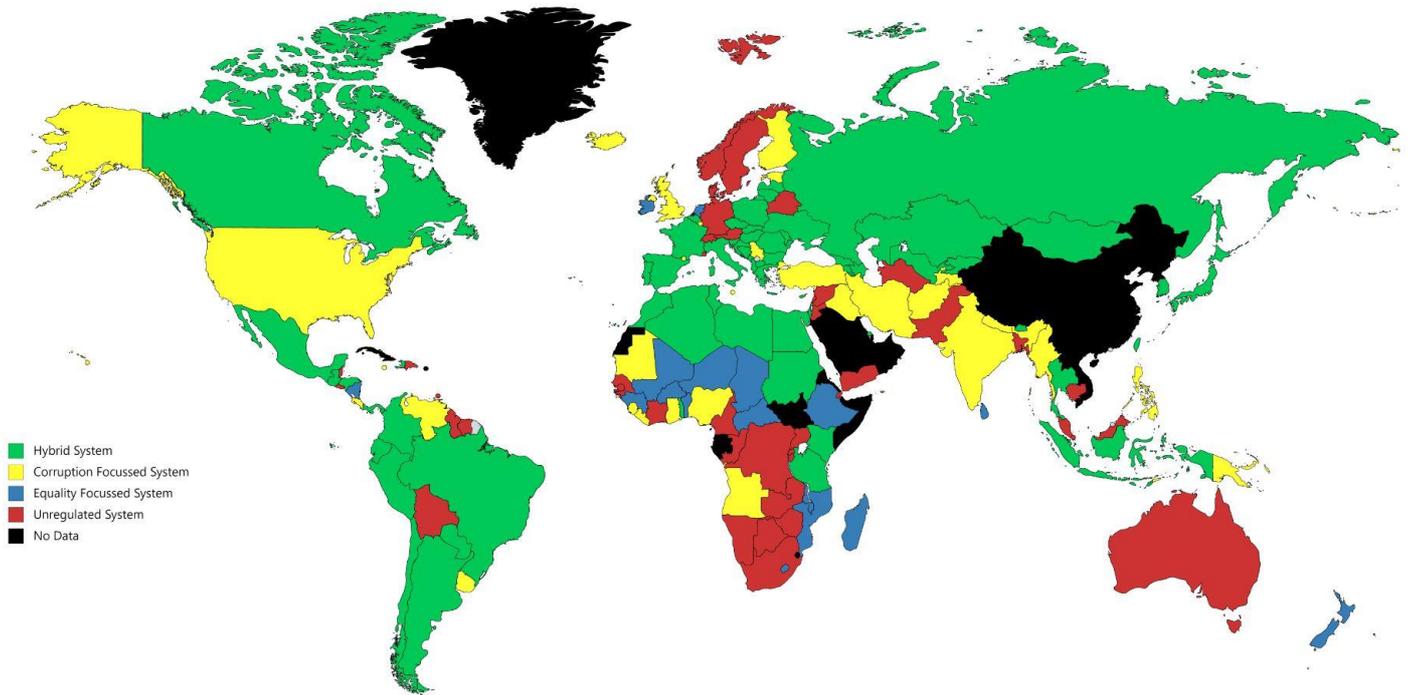


<seg type="WOMEN WRITERS" subtype="MEDIEVAL FEMINISTS">

Holly Brown, College of Arts and Law

Memorias by Leonor López de Córdoba, is the first autobiography in Castilian, Arboleda de los enfermos, by Teresa de Cartagena, the first reflection on deafness, and the Vita Christi, by Isabel de Villena, is the first print book in the kingdom by a woman. The image depicted is a transcription of their work into XML code. A taxonomy of labels identifies connected discourses and undercurrents of meaning in their words. This process amplifies the "signs" on the page to a more nuanced language demonstrating that these women were actively feminist and adding their voices to the legacy of writers opposing the suppression of female speech and limited gender roles.





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'Patterns of Political Finance': Developing a Categorisation Tool for Political Finance Regulations

William Horncastle, College of Social Sciences

Elections are a cornerstone of democracy. To run a successful campaign, parties must raise and spend large sums of money, but how do they do this? Do funds come from small volumes of large donations, or large volumes of small donations? Does tax revenue add to these costs? The thesis aims to identify patterns in political finance and, in doing so, finds a two-dimensional structure, with nations adopting varieties of regulations focussed on corruption reduction and equality enrichment. Four categories of system emerge; unregulated, which have few regulations in both areas; corruption focussed; equality focussed; and hybrid systems, which focus regulations in both areas.





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Quakers in Britain

Richard Bainbridge, College of Arts and Law

Why are people religious in a secular world? The badge draws attention to my research which is focused on the lives/spiritual journeys of contemporary Quakers [Religious Society of Friends]. 132 have participated since 2016 from various parts of Britain. In answer to the question as to how and why people became associated with Quakerism I discovered they come for a variety of reasons including seeing the Meeting House or even watching 'Fleabag' on television. For many it is a matter of 'coming home', feeling that they were always Quakers but only found it in later life. Participants differently exemplified 'believing' and 'belonging' with community as central.

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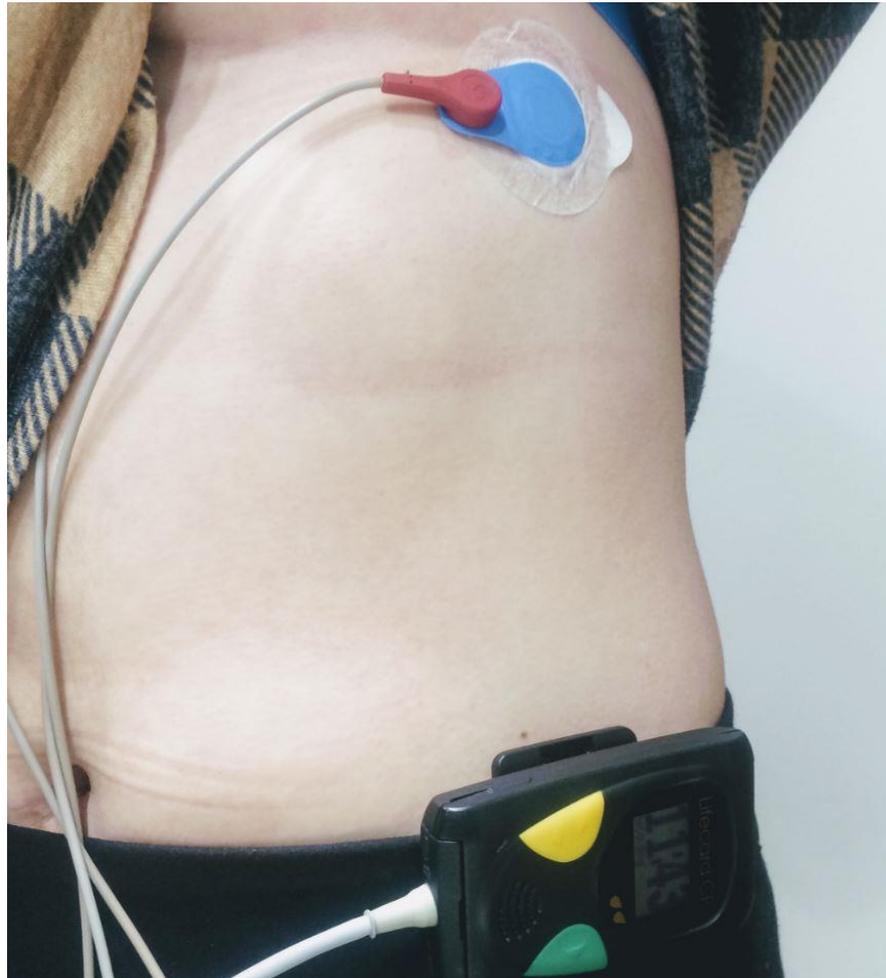
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'The burden of responsibility'

Sarah Chung, College of Social Sciences

School governors have existed for many years, although the nature and responsibilities of the role have changed greatly. Today, governors are part of a 'skills-based' model of governance that has a high level of accountability. The additional responsibilities placed upon governors has led to the professionalisation of governance, meaning that those with specific skills are highly desirable - but is this enough? My research examines whether specific governor training can support external professional skills by identifying the training available and whether this training is appropriate in both the content and mode of delivery.





My Electrocardiogram

Samantha Pendleton, College of Medical and Dental Sciences

Finding underlying patterns in cardiac research helps us understand heart-related conditions and improve medical care. I couldn't help but think it was a coincidence that my PhD research coincided with some random heart issues, for which I could not find the underlying pattern. Before, I had no idea the sort of heart conditions existed and was clueless about tests which patients undergo, such as Electrocardiogram (ECG). But now, a patient myself, I recently underwent a 24hr heart-monitored ECG; as seen in my piece of art: the sensor detecting my heart rhythm and activity while the device records. ECGs help us detect heart conditions via the smallest irregular heartbeats.





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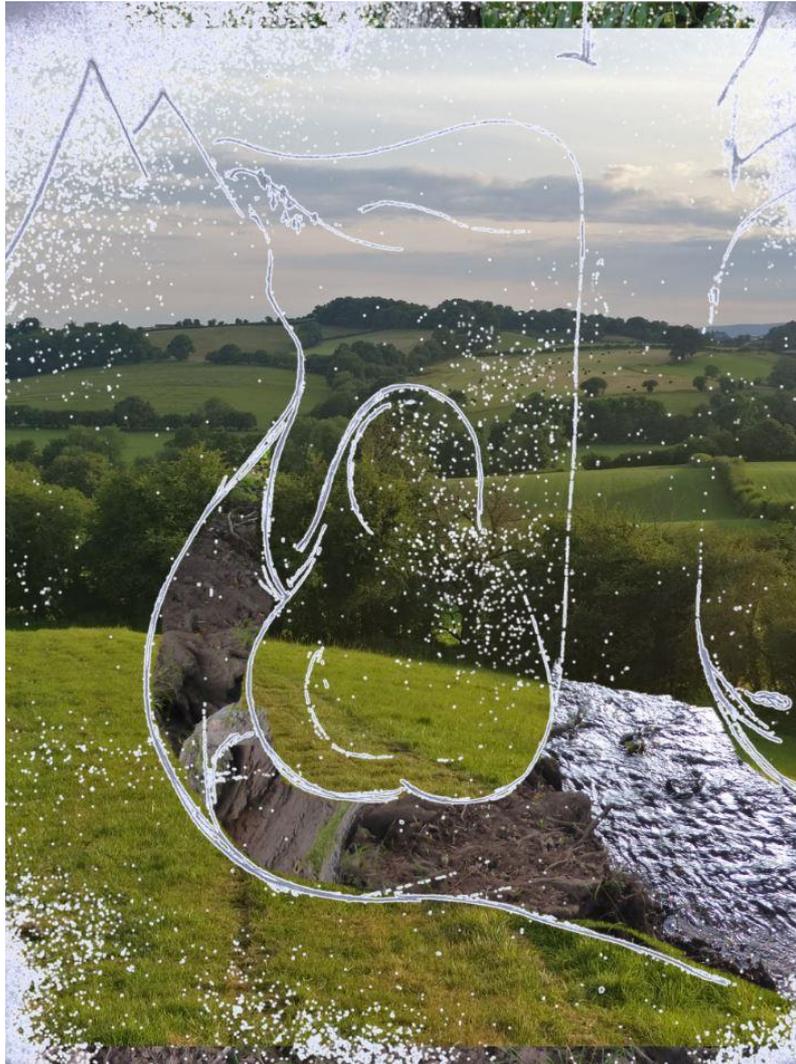
Ave Human or The extermination of tormentors | O extermínio dos algozes

Marcelo Carvalho-Loureiro, College of Arts and Law

Ave Human expresses the change of epistemological reality necessary so we can call oppression something from the past. The work is an illustration of the process of equality between humans, element that through my thesis 'Decolonising Nationality Law' I attempt to analyse from the perspective of citizenship law and coloniality. The 'inverted' 1643 map and its juxtaposition illustrates the inaccuracy of the colonial paradigm, one still difficult to overcome. The co-existence of wind-roses pointing to different directions and three different humans offering different peace-branches corroborates with the idea of freedom and extermination of oppressors/tormentors.

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Perceptions and preferences for landscape and trees for Natural Flood Management

Jenny Knight, College of Life and Environmental Sciences

Landscape change is often designed with 'physical science' as the focus. But landscapes are social, lived environments. Local knowledge shapes and forms landscapes, landscapes in their turn shape decisions, behaviours, people. In addition neglected expertise of local lived experience may mean an over-reliance on 'data lean' scientific models, creating policies that are neither reflective of or practical within complex landscapes. We have shown that tree planting for benefits including Natural Flood Management is possible (even on farms!) when the social is accounted for. The next stage is to explore how to integrate these findings with physical data and computer models.



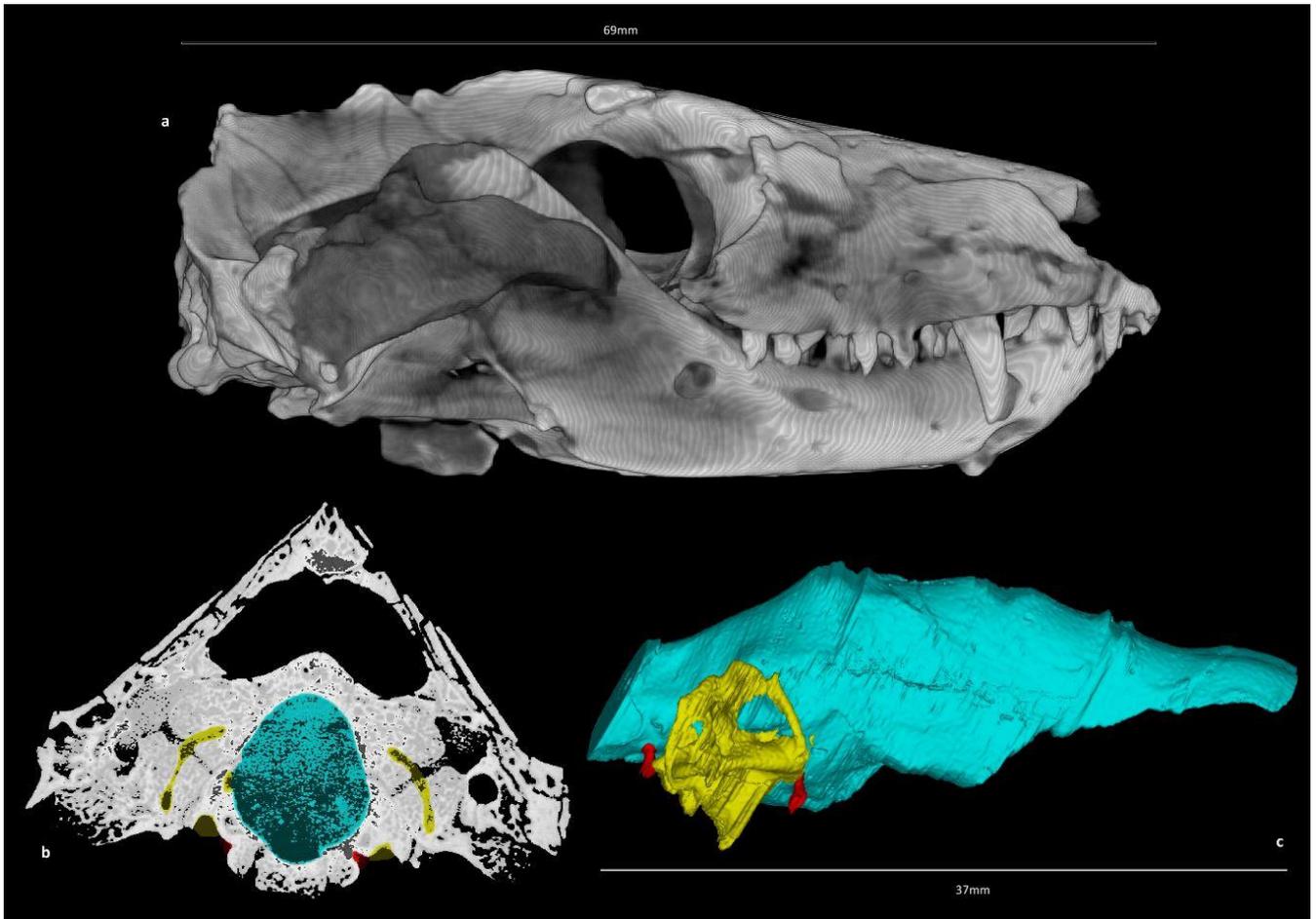


Wall to Wall: Showcasing Defiance in Urban Hong Kong

Dega Sian Rutherford, College of Arts and Law

A photograph taken on 12th August 2019 in Causeway Bay, Hong Kong. Almost 10 weeks after the beginning of the 2019 HK protest movement. It shows one of the territories many 'Lennon Walls' - areas of the city adorned with post-it-notes conveying messages of hope, support, anger and desperation. HK Lennon walls beautifully exemplify how everyday spaces can become politicised and transform into sites of defiance which champion freedom and showcase resistance. My PhD pioneers the concept 'displayification' to describe how ideology can be imagined and rendered visible through ornamental inscription, symbolic display and performance. 'Lennon Walls' are ornaments of protest.





Virtual Palaeontology: Peering inside the skull

Charlotte Bird, College of Life and Environmental Sciences

Virtual palaeontology is pioneering the non-destructive study of fossils. As a researcher, I use CT scans to peer inside the skulls of extinct organisms and digitally reconstruct their anatomical features. This skull belongs to a cynodont (a, UCMP 40466), part of the evolutionary lineage leading to mammals. Through masking cavities (b), 3D models of the brain, inner ear and neurovascular anatomy (c) allow brain evolution in cynodonts to be assessed, with calculations of sensory capabilities and intelligence levels indicating behavioural patterns. Importantly, I will also investigate the bias in digital reconstruction techniques, an issue of multidisciplinary importance.





The Linguistic Landscape of Welcome Activism - the Riace Model

Catherine Blair, College of Arts and Law

Since 1998, a crumbling town in Calabria, southern Italy, has invited refugees to resettle and rebuild their lives, providing a home and employment. This humanitarian project, known internationally as the "Riace Model", reversed depopulation caused by emigration and made the town and its mayor world famous. My research chronicles the linguistic landscapes and online activism that have grown up in support of the project. From street signs to street art commemorating the model of welcome, I look at how refugees are represented and by whom, and at the semiotic power of multilingual and artistic expression in the urban and virtual spaces.





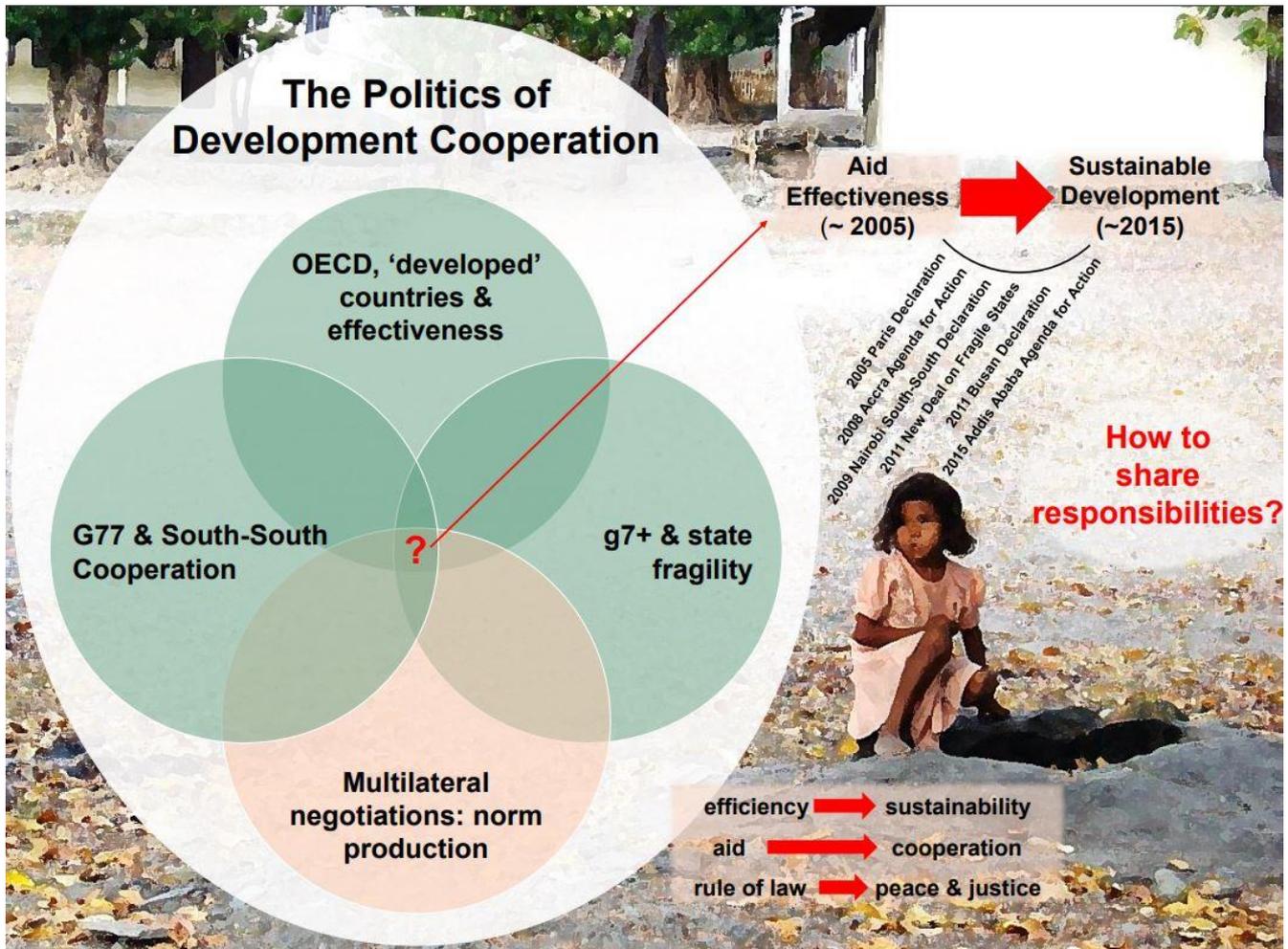
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When research require you to suffer on the bike

Tim Podlogar, College of Life and Environmental Sciences

One of main objectives of my PhD project is to find ways how to augment cyclists' performance. Working with real people requires a lot of pilot work, especially when testing the limits of human physiology. It could easily happen that an idea for research you have is too difficult for participants to complete. Hence, I spend numerous hours in the saddle on my own, testing (and suffering) so that I am able to design a study that is feasible to be conducted on participants. You can see me during one of numerous N=1 studies trying a potential study protocol on the bike. This one ended up being too hard.





The politics of development cooperation

Francisco Figueiredo de Souza, College of Social Sciences

I took this picture in Timor-Leste in 2004, on the road to a place where, 5 years earlier, approximately 200 East Timorese had been murdered during a massacre. Since then, this place entered the list of world's locations with the highest number of international cooperation projects being developed. In an interval that coincides with the time limits of my research, this girl also became a grown woman. Other than that, and the words we use in development, what else really changed? Blurred in the background of the thesis' diagram, her picture is an ironic reminder of the gap between what originally inspires research and our limited capabilities at the end of the day.





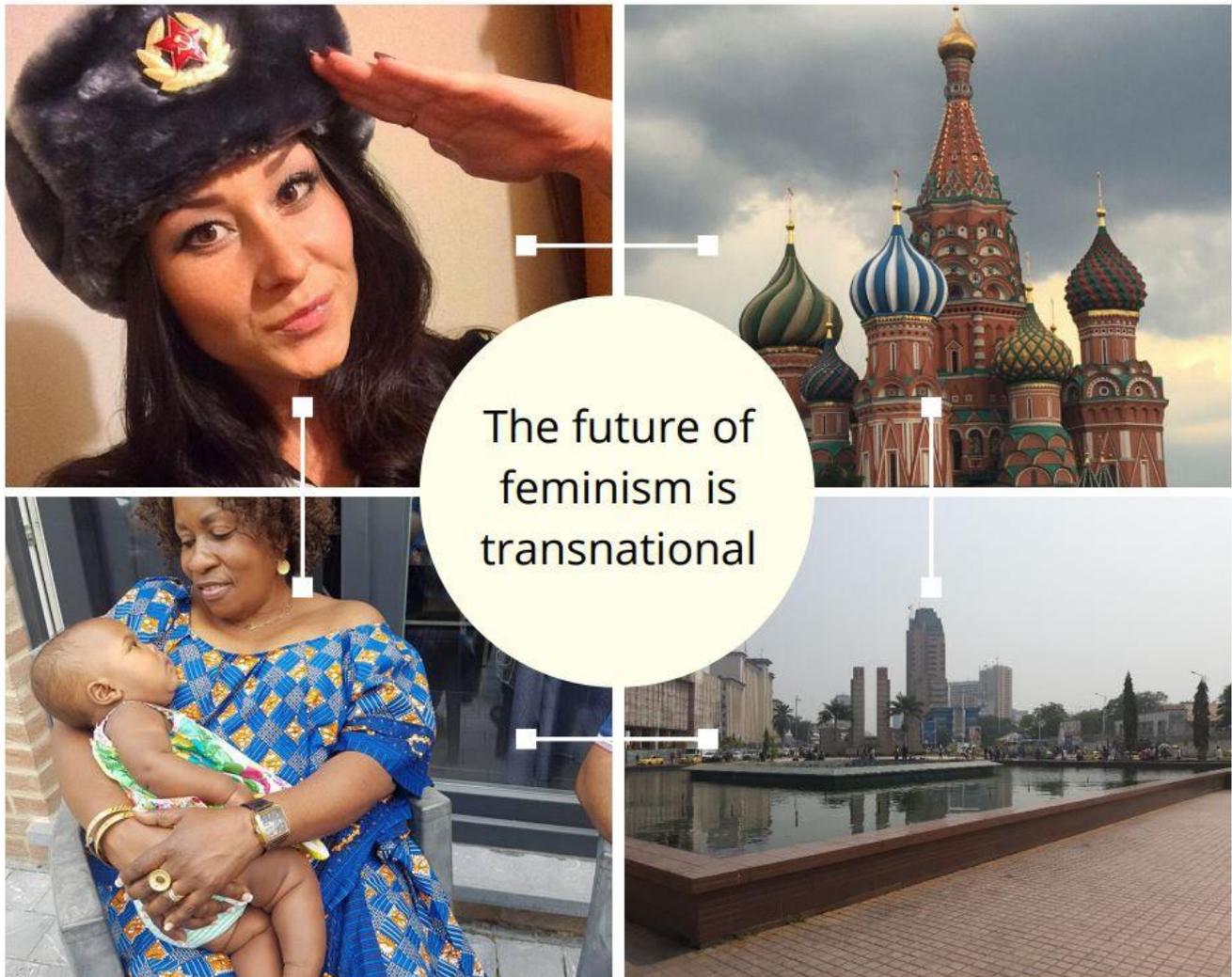
Image courtesy of NY Daily News and in public domain.

Reagan's Lost War on Terror

Ian Jenkins, College of Arts and Law

This image of a hijacker threatening the Captain of TW 847 in Beirut (June 1985) has come to represent the nadir of President Reagan's counter-terrorism policy in Middle East. Whilst maintaining a public position of not negotiating with terrorists, the incident resulted in 700 Israeli-held prisoners being released to secure aircraft's hostages. This incident followed two years after the Beirut Embassy/Marine Barracks bombings. My research will examine the emergence of USA Counter-Terrorism policy and will demonstrate how the nation's vulnerability became more acute through inconsistent policy making and inability to recognise the emergence transnational terrorism.





The future of feminism is transnational

Mukile Kasongo, College of Arts and Law

You may wonder how this African woman is connected to the Russian woman, both representing two different contexts. The circle symbolizes commonalities between these women such as sexism and motherism, which can be used in building future transnational alliances. The Committee for Soviet Women encouraged collaboration with African women and studying this intersection of African and Soviet feminisms is a focal point of my research. More specifically, I am researching the translation of African feminist novels into Russian in the late Soviet period. The main question is how Soviet (Russian) female translators have connected or juxtaposed the two contexts in their translations.



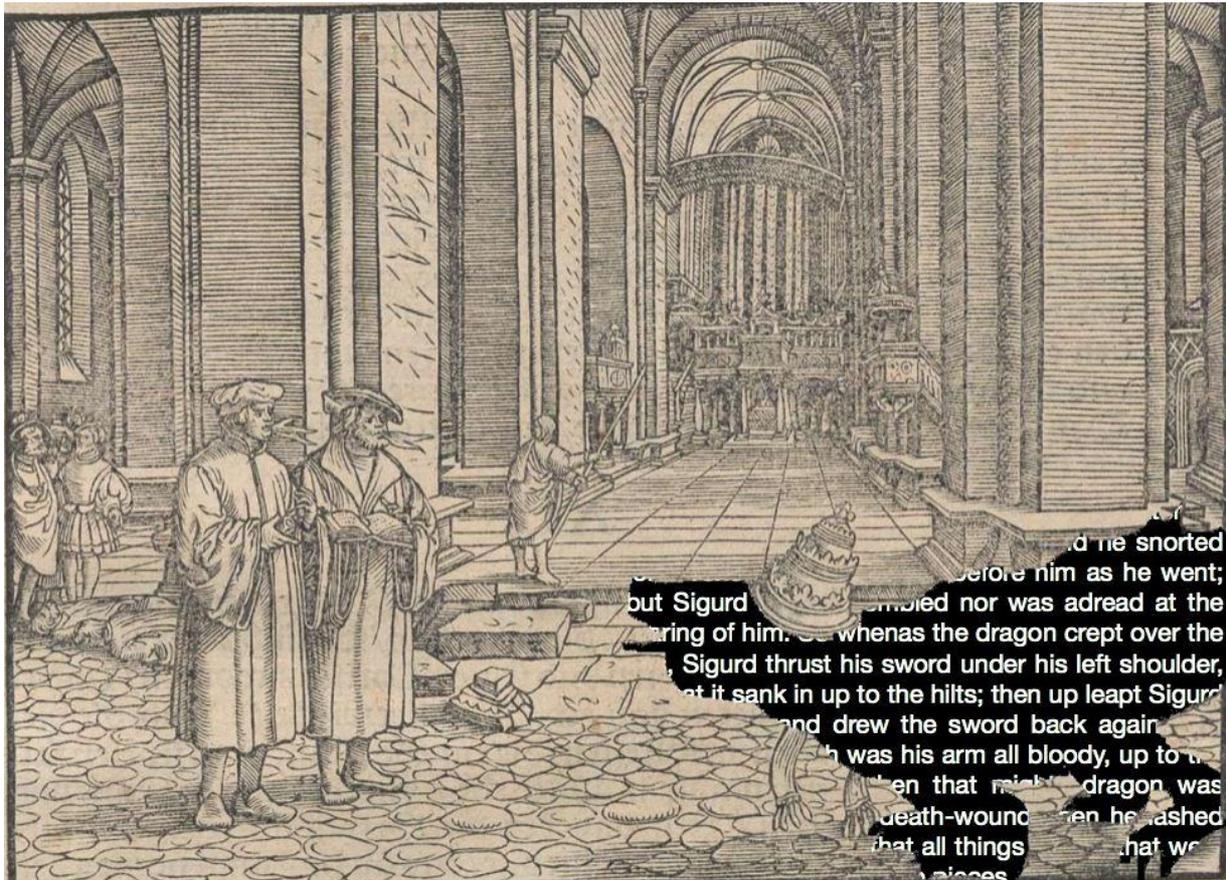


Trees, Soil and Water in a Future Temperate Forest

Sue Quick, College of Life and Environmental Sciences

Our Future-Forest experiment at Birmingham Institute of Forest Research, elevates carbon dioxide in the air of three forest patches by about 40%, to levels expected by 2050 at the latest. My image mimics panes of a greenhouse. My project measures how the tree-soil-water relations in this semi-natural mature oak forest respond to the experiment in both elevated and control patches. I measure soil moisture, sap flow in the oak tree stems and leaf transpiration, enabling me to evaluate how temperate forests might survive the stresses of climate change. You need to imagine what is happening below ground level where roots, nutrients and microbes are active.





and he snorted
before him as he went;
but Sigurd trembled nor was adread at the
sighting of him. So whenas the dragon crept over the
ground, Sigurd thrust his sword under his left shoulder,
and it sank in up to the hilts; then up leapt Sigurd
and drew the sword back again,
and his arm was all bloody, up to the
elbow. Then that mighty dragon was
slain with that death-wound, when he lashed
his wings, that all things
fell in pieces.

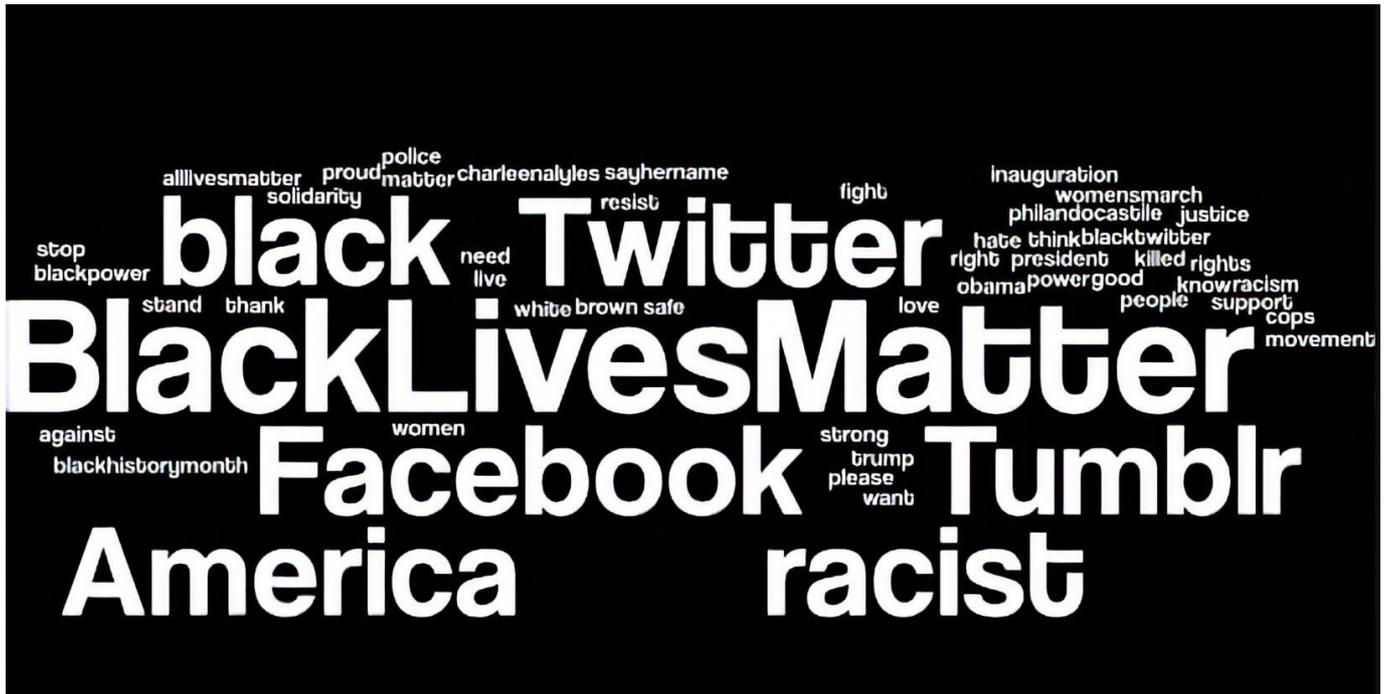
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Serpents and Dragons in early modern German religious culture

Thomas Wood, College of Arts and Law

My research explores the significance of serpents and dragons as cultural phenomenon in the changing religious landscape of sixteenth and seventeenth century Germany - with a particular interest in the interplay between religion and popular culture. My image shows a Protestant woodcut of an event in the book of Revelations where God's Two Witnesses are attacked and killed by 'The Beast' (which religious reformers chose to depict here as a dragon). I have removed the dragon and replaced it with text from the Völsunga saga to show that symbols such as these were shaped by how reformers understood and manipulated the shared ancestral folklore of the German people.

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Talking Around Black Lives Matter

Jennifer Furlong, College of Arts and Law

The study focuses on Black Lives Matter (BLM) as a significant activist movement, as shown through the social media interactions that took place in three social media contexts (Facebook, Tumblr, and Twitter) during the first six months of 2017. The BLM movement began with the hashtag, #BlackLivesMatter, and has since become an internationally recognized symbol in the fight for racial and social equality. This image represents the keywords present in the data collected. Keywords help to understand types of discourses and rhetorical techniques used within a text and reveals who and what is being talked about. They reflect cultural values and reveal people's realities.





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An Athenian Philosopher's House

Panagiota Mantouvalou, College of Arts and Law

This image shows part of an excavated late antique house located on the Areopagus Hill in Athens, Greece. The floor mosaic initially represented a pagan scene, possibly Dionysus riding his panther, but was replaced by a cross design, by the later Christian occupants. The residence presents an example of the city's transition from paganism to Christianity. My research examines the importance of pagan monuments within the city and under what circumstances they obtained a Christian character as well as how they adopted the new elements of the Christian faith.





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Welcome

Natasha Nicholls, College of Social Sciences

The UK Community Sponsorship Scheme empowers volunteer groups to resettle and support a refugee family into their local community. They provide a warm welcome to a family in need, meeting them at the airport and providing financial, practical and emotional support as the family adjusts to their new life. Tea is a universal symbol of welcome; sharing a cup of tea is informal and offers comfort. It is likely to have been shared between the volunteers during the planning stages, as well as being offered to the family once they have arrived in the community. My research focuses on the motivations of the volunteers, why do they get involved?





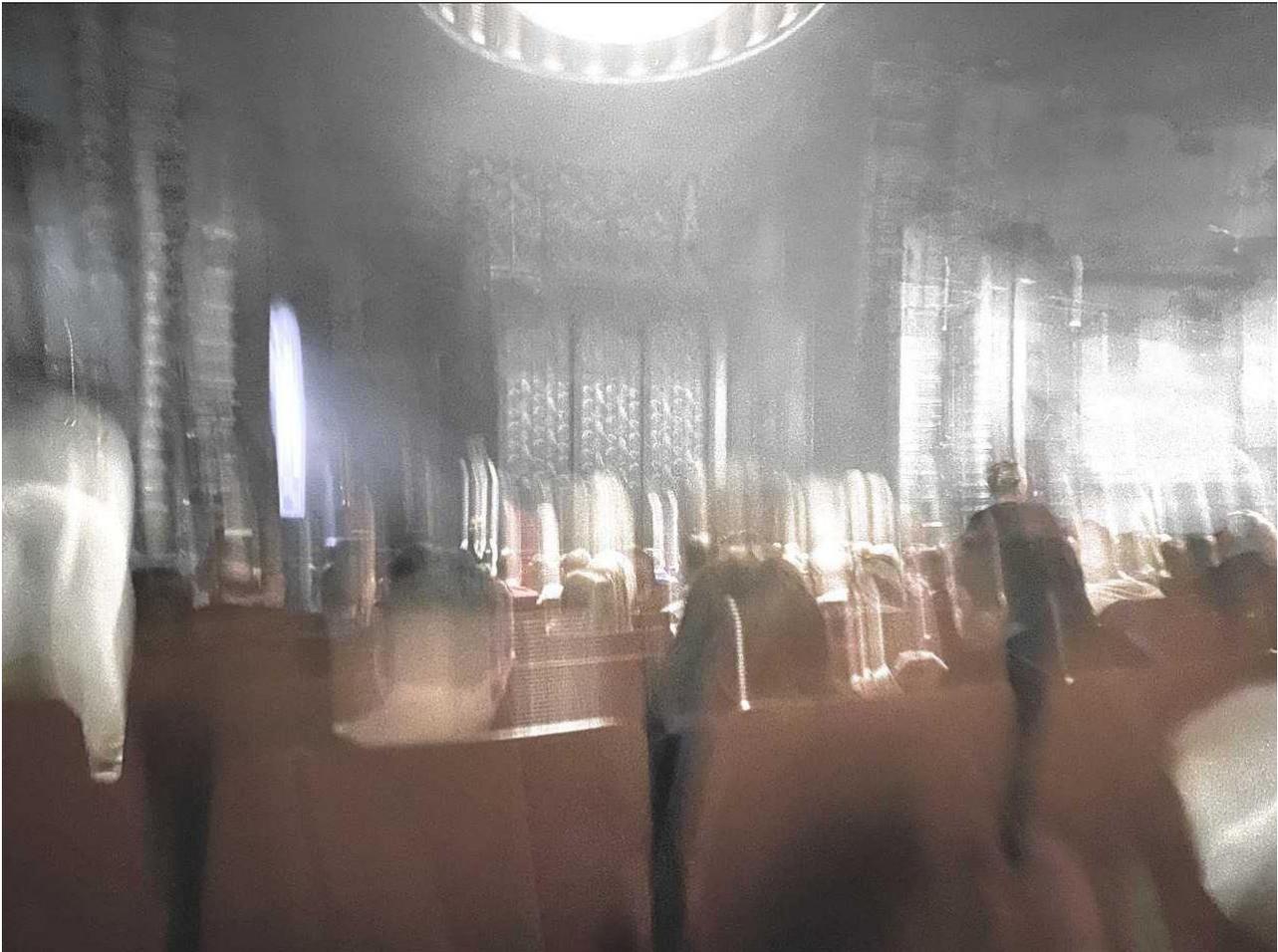
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Utopia

Elizabeth Thomson, College of Arts and Law

The Utopia brick, by the Aldridge Brick and Tile Company is one of millions of bricks manufactured in the Black Country between the late 18th century to the 1960s. The humble brick has been part of our built landscape for centuries yet how often do we think about how the brick was made and by whom? Women played a huge part in the brickmaking process yet we know nothing about their lives and experience of making up to 2000 bricks a day. My research will explore the lives of female brickmakers who turned a piece of clay into a commodity used in buildings and structures across the globe.





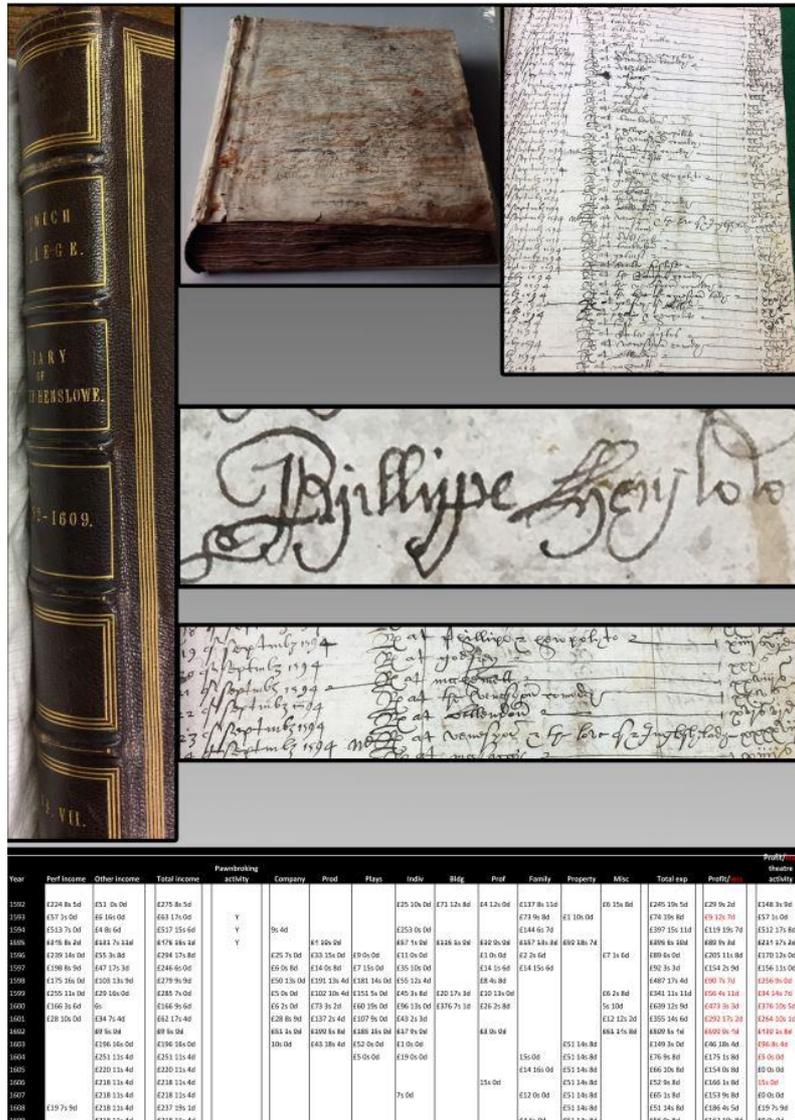
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Gothic Theatre Audiences

Gheorghe Williams, College of Arts and Law

This photograph was taken shortly before a recent production of *The Exorcist* at the Alexandra Theatre in Birmingham. My broader research concerns how Gothic theatre has interacted (and continues to interact) with Britain's current cultural, national, and political moment. Part of my research is examining how current cultural and political discourses—particularly ones of a divisive and controversial nature—have affected our habits of engagement with Gothic media in live performance contexts: What place does Gothic theatre hold in the public imagination? How is engagement with the Gothic affected by stigma, prejudice, and perceptions of ethical responsibility?





Year	Prof Income	Other income	Total income	Pawnbroking activity										Total exp	Profit/loss	Profit/loss activity
				Company	Prod	Plays	Indiv	Blfg	Prof	Family	Property	Misc				
1592	£224 8s 5d	£53 0s 0d	£275 8s 5d				£25 20s 0d	£71 12s 0d	£4 12s 0d	£137 8s 10d	£6 15s 0d	£29 0s 3d	£248 3s 9d		£248 3s 9d	
1593	£37 3s 0d	£6 16s 0d	£43 4s 0d	Y					£78 9s 0d	£1 10s 0d	£10 0s 0d	£9 12s 7d	£157 1s 0d		£157 1s 0d	
1594	£513 7s 0d	£4 8s 6d	£517 15s 6d	Y	9s 6d		£253 0s 0d		£144 6s 7d	£397 15s 11d	£7 3s 6d	£18 15s 7d	£132 17s 8d		£132 17s 8d	
1595	£470 8s 2d	£482 7s 11d	£952 15s 3d			£1 10s 0d	£87 1s 0d	£126 6s 0d	£107 0s 0d	£187 18s 8d	£100 18s 7d	£400 8s 20d	£821 17s 2d		£821 17s 2d	
1596	£290 18s 0d	£25 3s 8d	£315 1s 8d			£25 7s 0d	£10 0s 0d	£11 0s 0d	£1 0s 0d	£27 2s 6d		£205 11s 8d	£170 12s 0d		£170 12s 0d	
1597	£280 8s 0d	£47 17s 3d	£328 0s 0d			£6 0s 0d	£14 0s 6d	£7 15s 0d	£55 12s 0d	£14 1s 6d	£14 15s 6d	£92 3s 3d	£154 2s 9d		£154 2s 9d	
1598	£175 16s 0d	£20 12s 9d	£195 9s 9d			£50 13s 0d	£101 13s 4d	£181 14s 0d	£55 12s 4d	£6 4s 8d		£487 17s 4d	£190 7s 7d		£190 7s 7d	
1599	£250 11s 0d	£20 16s 0d	£270 7s 0d			£5 0s 0d	£102 10s 4d	£151 5s 0d	£45 3s 8d	£20 17s 3d	£20 12s 0d	£6 2s 8d	£345 11s 11d		£345 11s 11d	
1600	£160 3s 6d	£6	£166 3s 6d			£5 2s 0d	£73 3s 2d	£60 19s 0d	£96 13s 0d	£137 7s 1d	£26 2s 8d	5s 10d	£629 12s 9d		£629 12s 9d	
1601	£28 10s 0d	£14 7s 4d	£42 17s 4d			£28 8s 0d	£37 2s 4d	£107 7s 0d	£43 2s 3d			£12 12s 2d	£155 16s 6d		£155 16s 6d	
1602	£9 8s 0d	£9 8s 0d	£19 6s 0d			£1 1s 0d	£100 8s 8d	£180 24s 0d	£17 9s 0d	£4 0s 0d		£65 27s 8d	£100 0s 7d		£100 0s 7d	
1603	£196 16s 0d	£196 16s 0d	£392 32s 0d			10s 0d	£43 18s 4d	£52 0s 0d	£1 0s 0d	£149 3s 0d	£96 18s 6d	£96 18s 6d	£392 32s 0d		£392 32s 0d	
1604	£251 11s 4d	£251 11s 4d	£502 22s 8d					£5 0s 0d	£19 0s 0d	£5 0s 0d	£5 0s 0d	£76 9s 8d	£175 11s 8d		£175 11s 8d	
1605	£220 11s 4d	£220 11s 4d	£440 22s 8d							£14 16s 0d	£15 14s 8d	£46 10s 8d	£154 0s 0d		£154 0s 0d	
1606	£228 11s 4d	£228 11s 4d	£456 22s 8d							£25 0s 0d	£15 14s 8d	£150 8s 8d	£160 1s 8d		£160 1s 8d	
1607	£228 11s 4d	£228 11s 4d	£456 22s 8d					7s 0d		£12 0s 0d	£15 14s 8d	£65 1s 8d	£153 9s 8d		£153 9s 8d	
1608	£19 7s 9d	£228 11s 4d	£247 9s 3d							£1 14s 8d	£15 14s 8d	£51 24s 8d	£186 4s 8d		£186 4s 8d	
1609	£228 11s 4d	£228 11s 4d	£456 22s 8d							£1 14s 8d	£15 14s 8d	£88 9s 8d	£162 10s 8d		£162 10s 8d	

Henslowe's "Diary": reading between the lines

Meryl Faiers, College of Arts and Law

My research looks at the commercial infrastructure which created stability in an emergent theatre profession in the late 16th century; this in turn enabled the explosion of playwriting at the time. My primary source is the Diary or day book of Philip Henslowe, entrepreneur and theatre owner. This image reconstructs my journey through the volume from the 19th century binding; via the naked book during conservation; extracts of theatre income entries; and Henslowe's signature. From the financial information scattered through the volume I have reconstructed a partial profit and loss account of his business activities from 1592 to 1609, shown as the end point of my journey.





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The Annunciation - an unplanned pregnancy' (with apologies to Michael Angelo's 'Creation of Adam')

Marie Rowley-Brooke, College of Arts and Law

The visit by the Angel Gabriel to inform Mary that she would bear a child who would be the Messiah begins the Christian story. It's traditionally interpreted as part of a divinely ordained plan from 'on high'. My research explores what might be discovered if we view this story from a bottom-up, rather than a top-down approach? Not a planned, but a random event? In our post-human culture we see humans as evolving from a chaotic centre, full of potential and plenitude. I utilise the cyborg as a metaphor for my exploration, containing as it does the features of mutual entanglement, porosity, fusion and con-fusion, boundary transgression and relationality.

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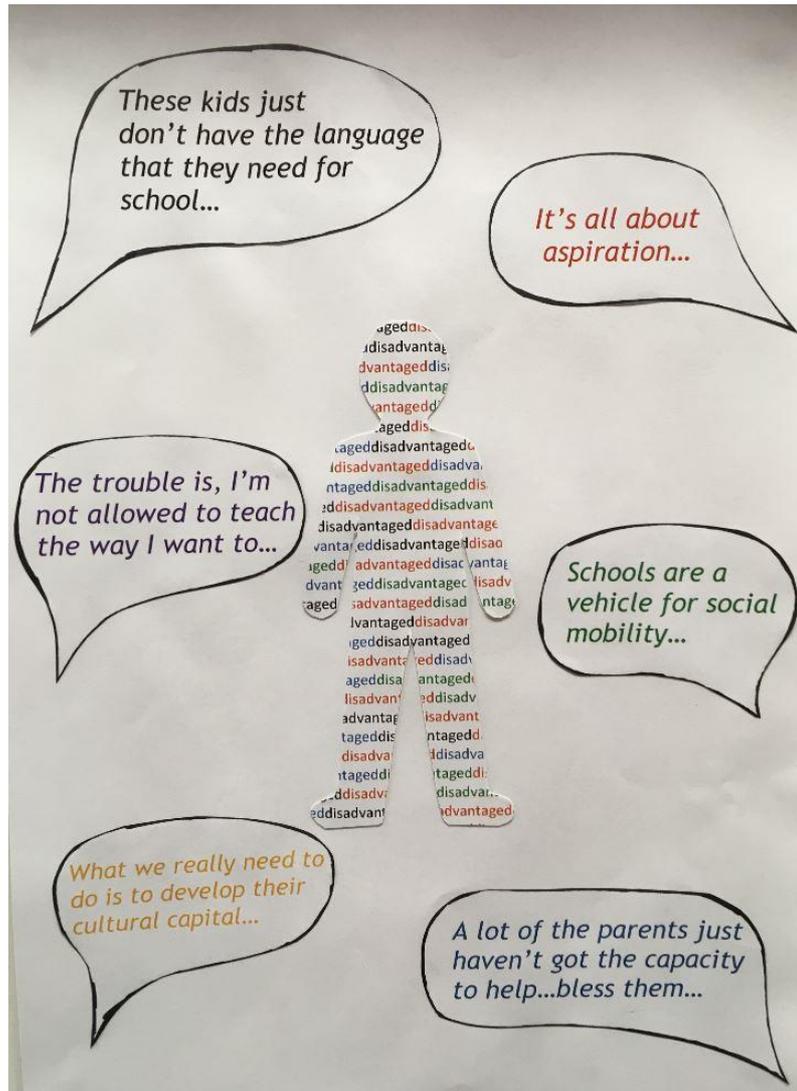
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Revealing gendered hierarchies in traditional justice systems in post-conflict Mozambique

Samara Dantas Palmeira Guimaraes, College of Social Sciences

This is a picture of a female healer I interviewed in Mozambique in 2016. This picture links to my research as my PhD looks at the role of healers in the building of the Mozambican state, and this healer had a key role in reintroducing former soldiers to their communities in the past. Now she resolves everyday conflicts. The spiritual realm is a constituent part of conflict resolution in Mozambican justice systems, and healers are part of traditional courts. Although this healer was very renowned in her community, she was not part of these courts. Respondents said that only male healers were invited to traditional courts, revealing gendered hierarchies in the country.



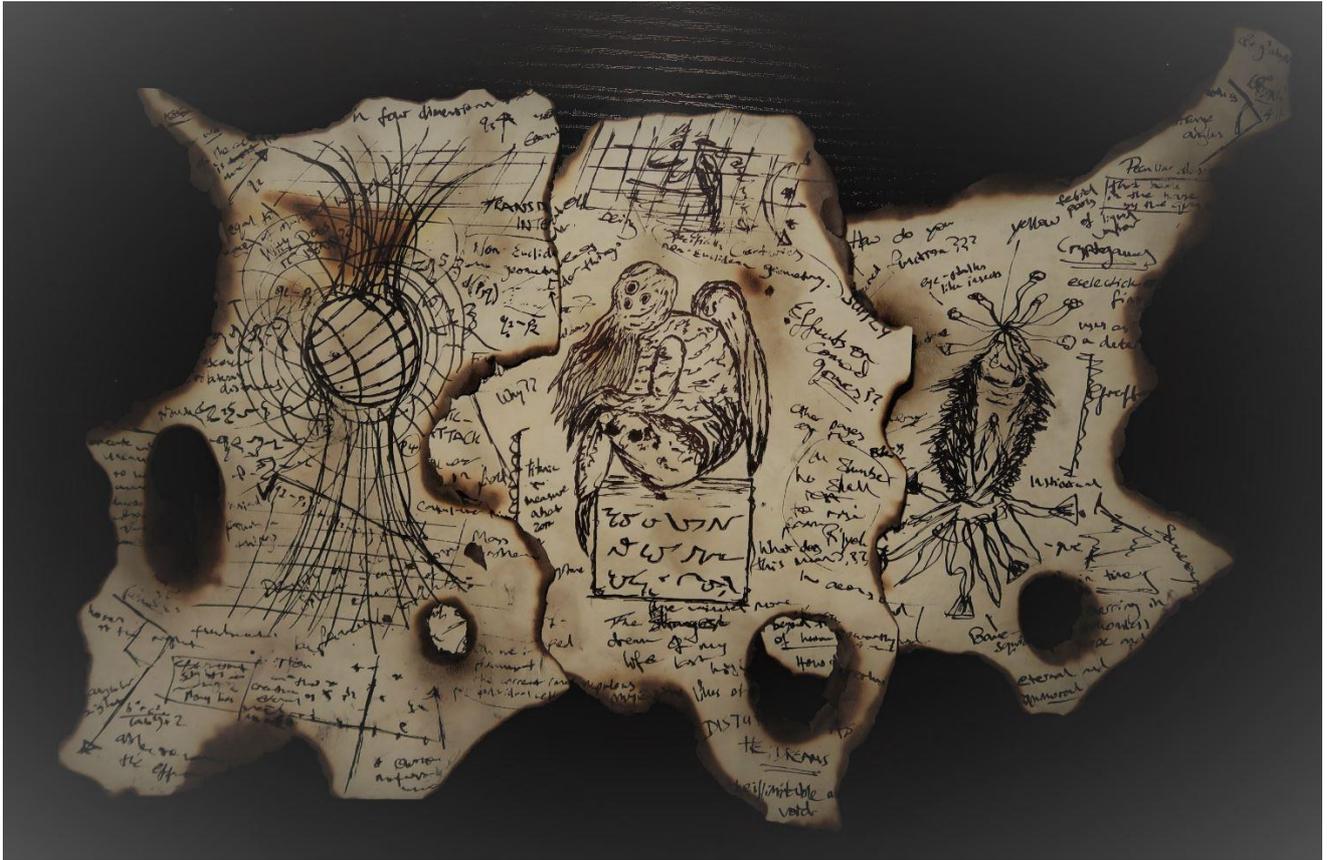


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The discourse of 'disadvantage'

Una Lodge, College of Social Sciences

Over the last decade, there have been considerable efforts made within British schools to reduce the significant gap in educational attainment between those classed as 'disadvantaged' (i.e. those eligible for free school meals on the grounds of low family income) and their peers. Much existing research has focused on the causes of 'disadvantage' or the effectiveness of specific interventions. In my research, however, I aim to analyse the language of secondary school staff, and of educational policy, in order to understand how the language used about 'disadvantage' may help to perpetuate or mitigate the 'attainment gap'.





Eldritch Angles: H.P. Lovecraft's Reception of the Classical World

Rhys James Jenkins, College of Arts and Law

Weird fiction author H.P. Lovecraft rarely illustrated his own stories, but would occasionally include sketches of Eldritch horrors in letters to contemporaries. One such sketch of the Great Old One Cthulhu poised on an engraved plinth inspired me to create a series of three illustrations on parchment. He once described his writing process as akin to forgery, as he would incorporate references to the Classical world in his fictional narratives as a means of immersing the reader, whilst lending speculative credence to the traumatic accounts of his unreliable protagonists. Here, I attempt to capture the spirit of this artifice in three mysteriously burned documents.





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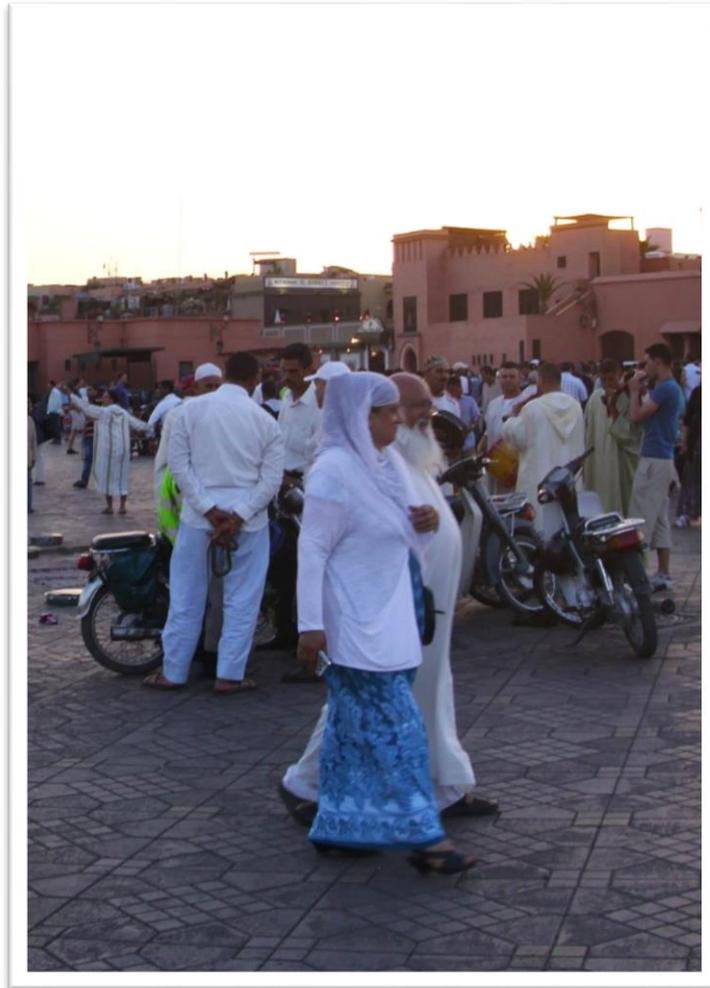
Tipping the scale: the security of human rights

Andrea Preziosi, College of Arts and Law

My research investigates the possibility of defining 'security' in law, aiming at clarifying the interactions between security and rights. We live in a historical period where appeals for security are often rhetorically employed to undermine rights, rather than to protect them. Against this background, it is often claimed that security and rights must be balanced against each other to find an acceptable arrangement. The image depicts the main argument of my thesis that seeks to challenge this logic. The scale tipping to the side of rights symbolises the opposite idea that rights should 'weigh heavier' than security, since security is best achieved by upholding rights.

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Islamic Society

William Burton, College of Arts and Law

Often academic work will cite that governments and political parties operate under the auspice of Islamic values. What are these values and where do they come from? My research has Tunisia as its case study. The image was taken by myself. For me it tells a narrative of Islamic society, North Africa, today, in the public sphere. *There is only one women, she is accompanied, holding a mobile phone and wearing a hijab. *The men are socializing, clothing is a mix of traditional/Western, mode of transport is the moped and the demographic is young. What do you see?





Dyslexics Are Different

Hadeel Al-Dawsari, College of Engineering and Physical Sciences

Dyslexia is a universal reading difficulty that can be found everywhere. But, as we know that each individual is different, dyslexic individuals have different reading problems too. Some of them may not understand what is written, while others may mix up letters while reading a word. Also, their teachers are humans who differ in their teaching and expertise leading them to success or failure in improving the dyslexic's reading. So, we need to offer each dyslexic individual the appropriate learning in a computerized form to improve their reading. This might improve other difficulties such as spelling, and overcome the human factor that might affect teaching.





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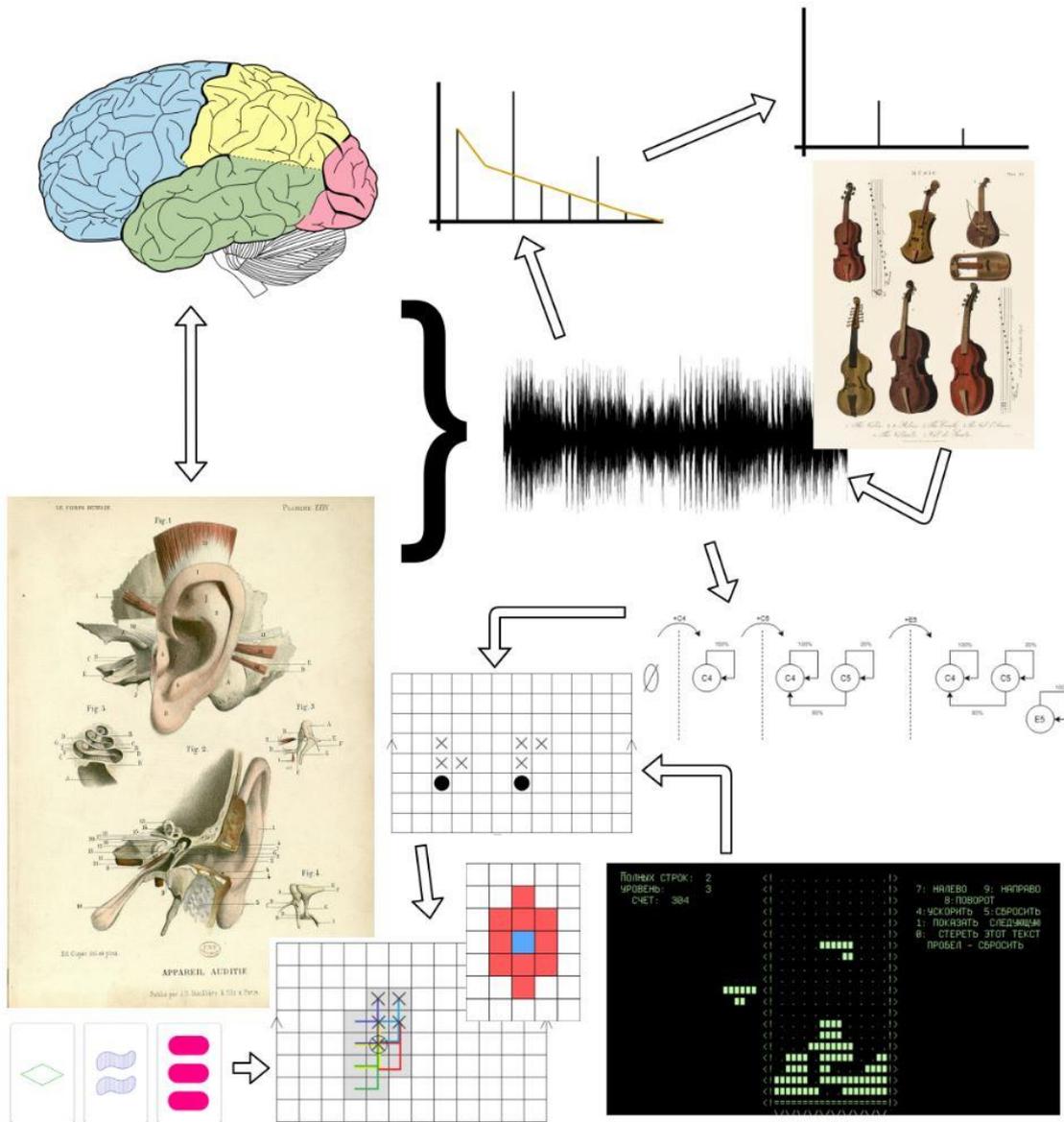
In Southeast Asia, Fast Food is Changing Habits and Expanding Waistlines

Citta Widagdo, College of Arts and Law

Southeast Asia is sitting on a volcano of obesity and cardiovascular diseases. This photo of a busy crossroads in Jakarta, Indonesia indicates the expansion of fast food restaurants across the region. Their growing popularity underscores how fast food is shaping palates, changing habits, and expanding waistlines. As countries develop, Western-style food represents a higher “social status”; often preferred for its food sanitation, restaurant cleanliness, and easy drive-thru at prime locations. They also attract younger customers through toys, party packages, and youth event sponsorships. My research seeks how global health law and regulations can effectively protect public health from the power and politics of Big Food, especially in poorer areas.

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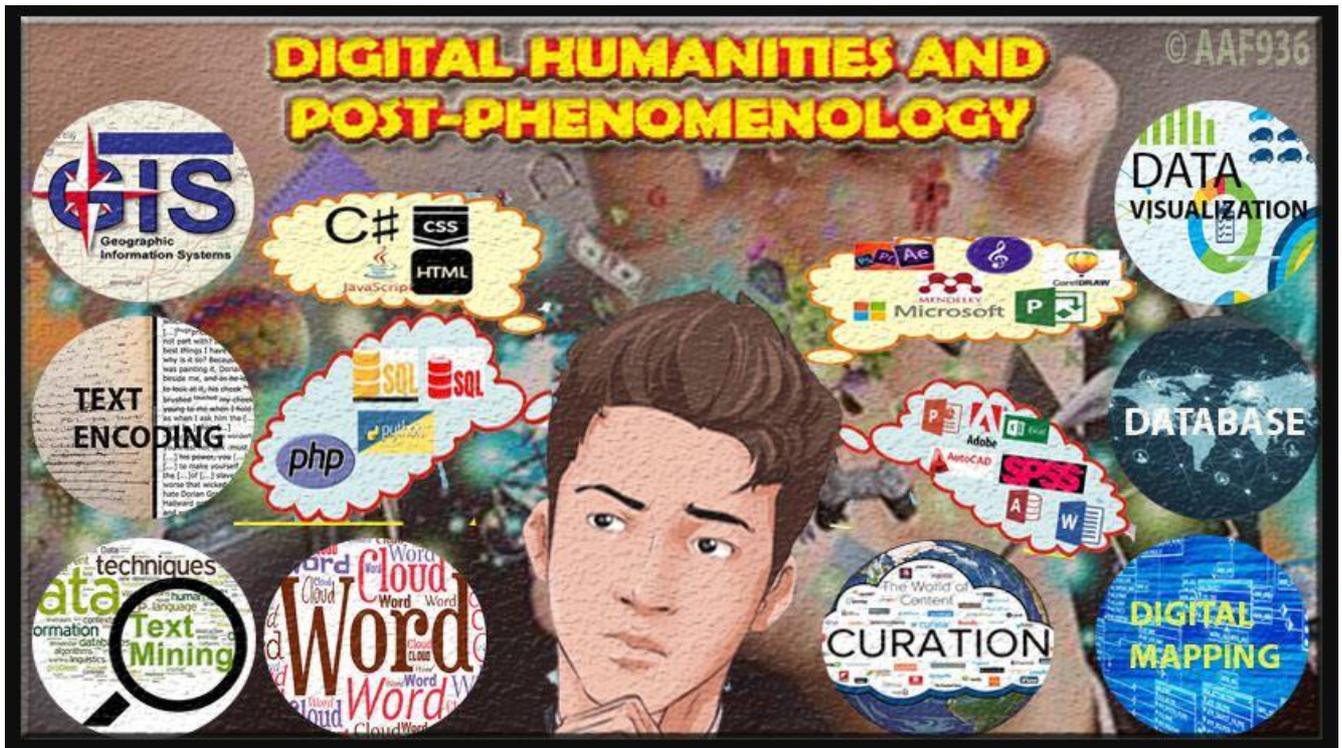


Pitch Detection: Maths, Music, and... Tetris?

Tom Goodman, College of Engineering and Physical Sciences

What brings together computer science, music, maths, a popular children's game, and physiology? Pitch detection of course! The problem of taking a piece of music and determining what notes are being played at a given time may seem trivial to the musically gifted, but for a computer it remains a real challenge. Why? Well the infinitely many combinations of notes, instruments, timbres, and other properties mean that it's like trying to separate a bucket full of different-coloured sand back into the individual colours... all whilst blindfolded!



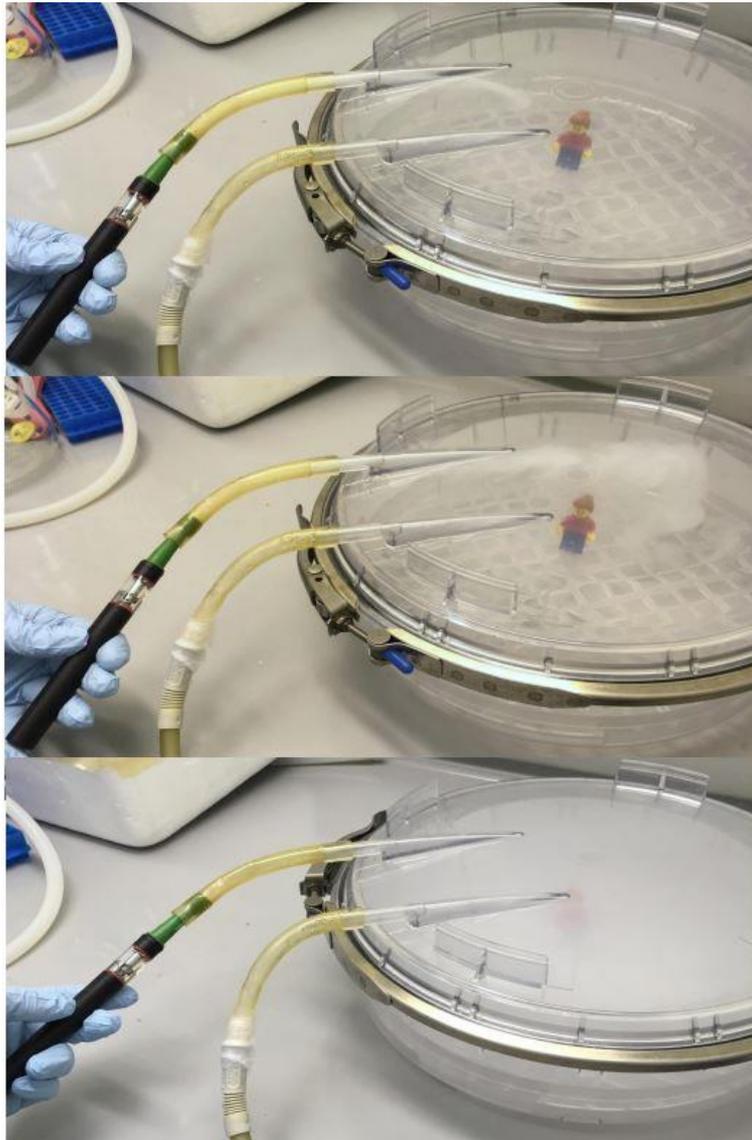


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Digital Humanities and Post-phenomenology

Augustine Farinola, College of Arts and Law

The image shows a scholar in the humanities in the presence of digital technologies used for text mining, analysis, mapping, visualization, and encoding. These methods, as deployed under the term 'Digital Humanities', have led to the production of digital repositories, databases, corpora, archives and AI tools on the web. My research, as a post-phenomenological investigation, is an attempt to show forms of embodiments and non-neutrality of the interaction that exists between the digital humanists and their objects of study (physical or digital representations). It provides a practical and theoretical framework for developers and users' experience of digital technologies.



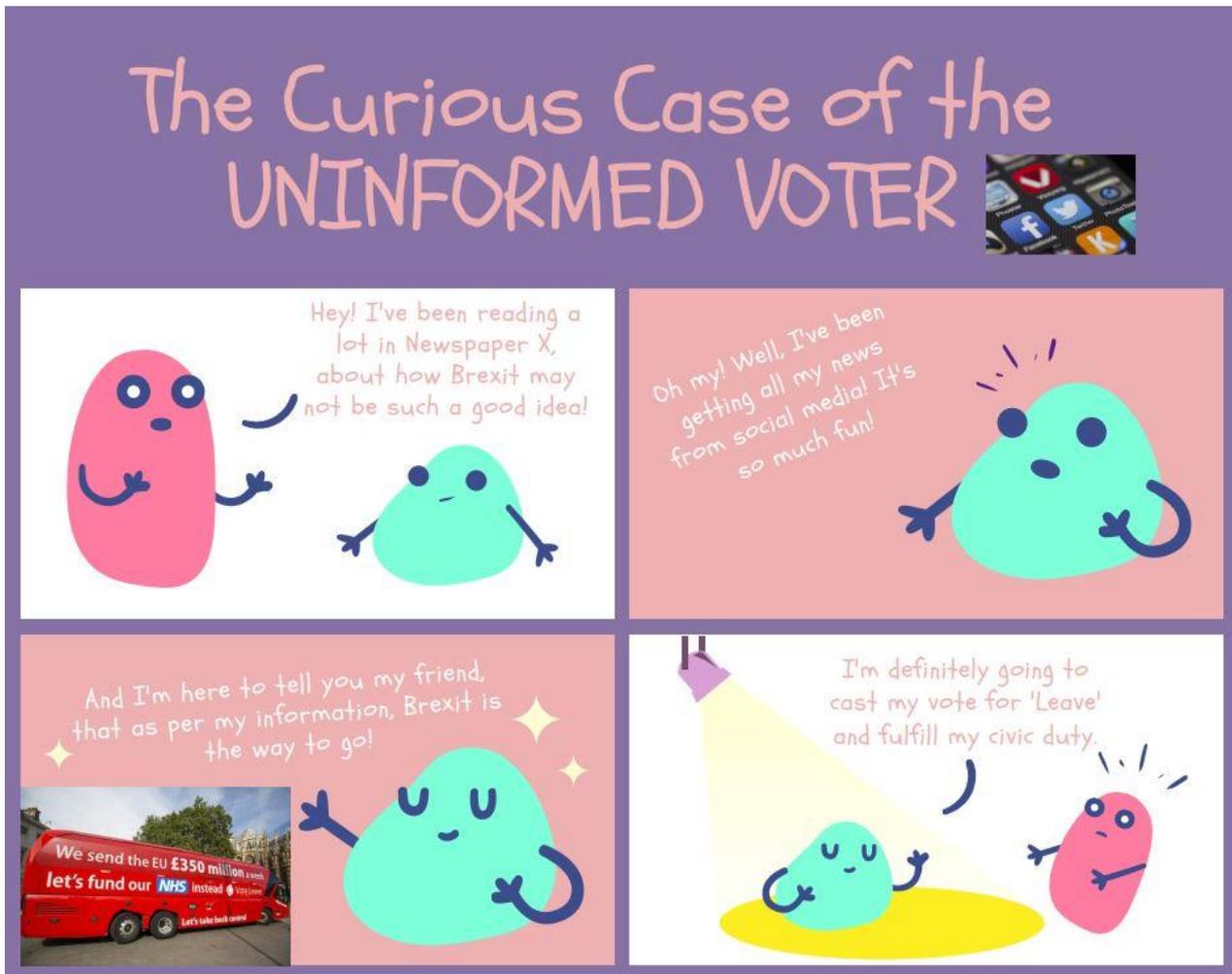


E-cigarette safety: no smoke without fire?

Alice Jasper, College of Medical and Dental Sciences

E-cigarettes were introduced in 2003 as a smoking cessation tool designed to deliver nicotine via inhalation of vapour rather than smoke. Since their invention, use among smokers and never smokers alike has rapidly increased despite a lack of evidence supporting their long-term safety. We have developed a chamber (pictured), which allows human immune cells to be subjected to e cigarette vapour. By mimicking vaping practices, we are able to assess the response of immune cells to e-cigarette vapour and detect changes predictive of long-term health implications of vaping to inform policymakers, healthcare professionals and the public on the safety of e-cigarettes.





Political Conversations

Moumita Deb, College of Social Sciences

In an increasingly polarised world, individuals select information sources that may be of a lower informational value, if they come with an added entertainment, as is seen commonly on many social media platforms, as compared to the more credible traditional media news sources. In order to understand how individuals make these trade-offs, we will strip away context, by testing these interactions in a laboratory experiment. In doing so, we will explore the tension between private consumption benefits that arise from the consumption of low quality or fake news versus the public costs that may arise if decision-makers base their political or economic decisions on such news.





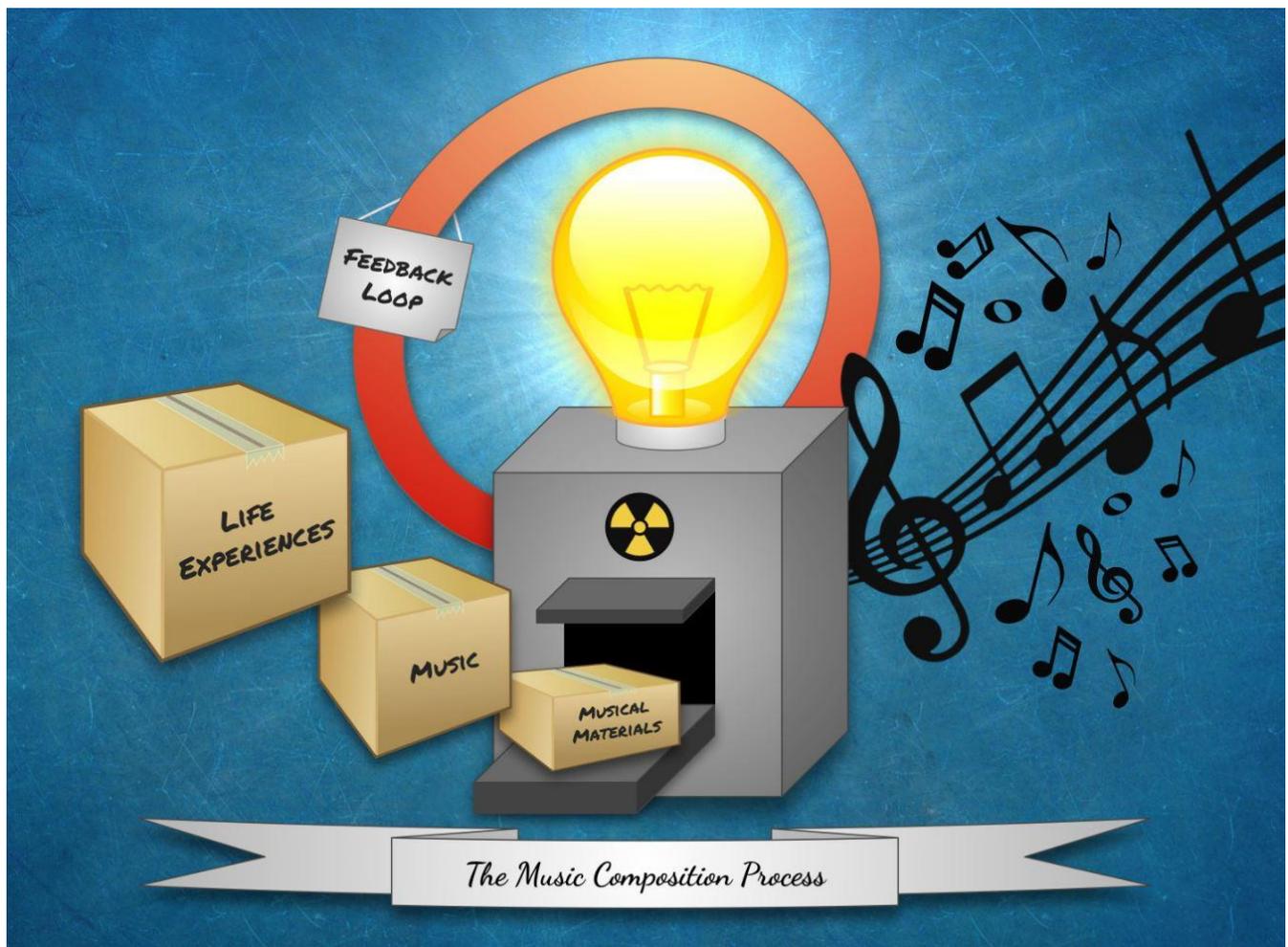
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Integrating road safety with road investment appraisal for developing countries

Chris Byaruhanga, College of Engineering and Physical Sciences

This photograph shows a road accident in Uganda along Kampala-Gulu Highway. Road accidents cost developing countries 1-5% of their Gross Domestic Product (GDP) every year. Infrastructure safety investment as part of the whole life cycle of a road from planning to operation is critical to reduce these accidents. In most situations, there are financial constraints thus requiring cost effective assessment in order to determine the priority and the best safety benefit for the cost of these different road safety counter measures. This research will focus on calculation of the costs and benefits of road safety countermeasures to maximize benefits to users and stake holders.





The Music Composition Process

Antonio Gervasoni, College of Arts and Law

The musical composition process can be imagined as a virtual machine in which different techniques of transformation and organization of musical material are found. An initial idea starts the process and is transformed into a more extensive musical fragment which is not only the output of the process but also a new input. More ideas can be incorporated into the process or it can continue to be based on a single idea until its transformation potential is completely exhausted. My research explores the vast possibilities of this process through the composition of several works whose purpose is to develop Peruvian culture in musical terms for the 21st century.





Gazing in space and time, searching gravitational waves

Riccardo Buscicchio, College of Engineering and Physical Sciences

The image is part of an ongoing development of visualization tools for astronomical data, especially targeting non-expert audience. Part of my research consists in inferring the properties of astrophysical sources (specifically, gravitational waves), using observational data provided by the LIGO scientific community. The white surface encloses the most likely locations of the event (labelled conventionally S190630ag) in the Universe. For reference, the crystal sphere encloses a distance of 6 million light years from us, the Solar system being a tiny dot at the center of it. Being an event far away in space and time, I've enclosed the surface in a crystal-gazer sphere.





Reasoning in Heterogeneous Multi-robot Coordination

Sagir Muhammad Yusuf, College of Engineering and Physical Sciences

A team of heterogeneous robots comprises different types of unmanned (autonomous) robots, for example, ground robots, aerial robots, etc., with different capacities, sensor profiles tasked together to accomplish a task. An issue arises in coordinating who does what task, conflict resolution due to sensor variation, data fusion, and collaborative behaviours enhancement. My research focuses attention on creating algorithms to help a team of heterogeneous agents in overcoming such issues cognitively by saving resources (energy, time, communication bandwidth, etc.).



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