

CAREERS



University of
Reading

2020

The Undergraduate Research Opportunities Programme presents

UNDERGRADUATE RESEARCH SHOWCASE

18 November 2020

Hello and thanks for your interest in the UROP Undergraduate Research Showcase 2020!

Throughout this digital booklet you will find details on the fantastic research that was carried out by our students over the summer. For each student you will find a brief written submission about their research and a link to their screencast so please make sure you follow this link to find out more and hear from the students themselves!

What is the research showcase? The research showcase is our annual event to celebrate the work of UROP students. Traditionally a physical poster exhibition we have had to make adjustments this year to run the event online. All of our students have taken their time to produce written submissions and screencasts so please do spend as much time as you are able to in order to view their work.

What is UROP? The Undergraduate Research Opportunities Programme or UROP for short, is a research internship scheme exclusively for University of Reading students. It matches up students with researchers at the university, with students gaining an insight to the world of research and the staff getting some support on their research projects. The UROP projects last for 6 weeks over the summer and we have seen over 700 students and researchers collaborate since 2006.

Want to take part? If you are a staff member interested in running your own project you can find out more at www.reading.ac.uk/urop. Applications open from October to December each year with projects to run the following summer.

Students wishing to take on a UROP project must be in their penultimate year and can apply to take part when projects are advertised between February and April.

If you have any questions about the showcase or the UROP scheme please contact me on the details below.

Tom McCann
UROP Manager
urop@reading.ac.uk

You will find each of the student submissions below. They are sorted in alphabetical order by the first name of the student and colour coded by the research theme that the project sits within.



Agriculture, Food & Health



Environment



Heritage & Creativity



Prosperity & Resilience

ADRIAN MAN

"How green is your food?": A semiotic investigation into the notion of sustainability on food packaging

Supervised by: Dr Sylvia Jaworska

Research theme: Heritage & Creativity

This project aims to uncover the discursive strategies used by food producers to convince consumers that their products are sustainable. In doing so, it hopes to contribute to our understanding of the current notion of sustainability. Examples of food packaging sold in British mainstream supermarkets that detail sustainability efforts have been collected and compiled into a database. Using a Multimodal Discourse Analysis, the project takes a close look at how the relationship between written language and visual elements on packaging create meaning

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through perceived associations of language, colour and symbols. Additionally, the social and cultural embeddings of sustainability are identified, having been influenced by ongoing socio-political affairs as well as advances in the ease of access to information. Greater expectations and responsibilities of both producers and consumers have impacted choices people make. Producers have adapted to these new social practices by designing their food packaging to appeal to these new attitudes.

ALEXANDER VEAL

Impact of biochar on soil pH: A meta-analysis

Supervised by: Dr Alfonso Rodriguez Vila
and Dr Tom Sizmur

Research theme: Environment

The goal of this project is to use data collected in different papers to calculate whether biochar impacts soil pH. The assumption is that it will, but the data will give an indication of to what degree this is true and if it increases or decreases. There are also other factors recorded throughout like the biochar feedstock material, the maximum pyrolysis temperature, and the most prominent soil texture. By looking at these you are able to see what factors create the biggest change in soil pH after biochar application. This information is important as it has

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real world benefits to both large and small-scale agricultural practices. Utilising biochar could help create better conditions for crops and provide an indication of how much to use and how much is too much. With the data set I collected from the papers it can be concluded that biochar increases soil pH. This project has made reading papers much easier, reading them quicker and finding the relevant information with ease. I also gained more experience using Excel and using Excel for calculations.

ALISHBAH KHAN

Citizen science: enlisting people to help us evaluate the real magnitude of medicinal waste and disposal practices

Supervised by: Professor Parastou Donyai,
Professor Rachel McCrindle, Professor Simon
Sherratt, Dr Terence Hui

Research theme: Agriculture, Food & Health

The aim of this project is to develop an app through which members of the public can upload photographic and textual submissions about medicinal waste as well as educating themselves about correct disposal techniques. The reason for this is because medicinal waste is causing a detrimental effect on the economy and the environment. Approximately £300 million worth of medicine is being wasted each year in the UK. Incorrect disposal of medicines such as in the bin or sink, is harming the environment by contaminating water, making it unsafe to drink. By conducting a

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short survey on disposal habits, it was found that many people do not dispose of their medicines correctly. Therefore, by raising awareness on this issue, members of the public are more likely to understand the intensity of this issue and be more willing to help. Whilst taking part in this project, I have not only realised that medicinal waste is a big problem that needs tackling but also that there are many people who are unaware of how to correctly dispose of medicine. I have also developed a greater appreciation for the area of research and have learnt what it takes to conduct a good research project.

AMBER FOSTER

The Representation of Males with Eating Disorders within the Newspaper Media

Supervised by: Dr Paul Jenkins

Research theme: Agriculture, Food & Health

There is an unfortunate misconception that eating disorders only impact young white women. Though some disorders are more commonly shown in women, the belief that men cannot suffer with an eating disorder is dangerously incorrect.

This project sought to evaluate reporting within newspapers of men with eating disorders, to decipher whether they were in line with scientific reports. This was done by looking at the volume of reports, as well as causation, age of onset and comorbid disorders. The results showed that despite an influx of awareness within science, there was no drastic increase in relevant newspaper

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articles over the 10-year period which the study looked at. General reporting, while not wholly inaccurate did show some flaws. Disorders such as Binge-eating Disorder did not receive as much attention as others, but the study did show that some improvements have been made in reporting quality since similar studies undertaken prior to this.

Conducting this study was fascinating for me to delve deeper into a subject which I find interesting and begin to understand it on a more technical level. The project helped me to develop research and recording skills and encouraged me to present findings in ways I hadn't considered before.

AMY ANNEAR

A review of land policies, property rights and institutions in Zambia

Supervised by: Dr Nugun Jellason

Research theme: Agriculture, Food & Health

This review of land policies in Zambia was undertaken to highlight the key trade-off's and contradictions within the policies over the last 30 years. This is important as it is difficult to ensure food security and economic growth whilst protecting biodiversity and smallholder farmers, this research may be used to influence decision making and Zambia's policies in the future. The key findings whilst undertaking this research was that the Zambian government seem to still have in practise old policies that favour commercial farming and damage the environment and local economy but increase the countries exports and employment rates. Deforestation is a massive problem in Zambia and many policies make detrimental contradictions

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about forestry – for example they have policies that seem to support local farmers and help conserve biodiversity but also support clearing land for agricultural use and do not formally recognise customary rights.

I found UROP and this research a very beneficial process. I am able to research much easier and use software I was unable to before. I now have a methodology for literature reviews I am able to apply to research I will be doing this year for my dissertation. I have a much broader knowledge on land policies, and this is an area of interest for me when applying for jobs in the future.

ANNA BROWN

Investigation of the impact of contract arrangements on the economic resilience of UK pig farms

Supervised by: Dr Simone Pfuderer

Research theme: Agriculture, Food & Health

The UK pig industry faces variations in prices and supply due to environmental and health shocks such as disease. There has previously been a lack of published literature surrounding the contract arrangements in the market. My project therefore collected primary and secondary data through literature readings, survey distribution and informal telephone conversations. The main findings of the research revolve around the fact that the majority of farmers use contracts when selling finished pigs, with the benefits including a guaranteed price and sale in a volatile market, meaning there is much less risk involved. The UK market is much less volatile

than in other countries, but the market still varies between 'good' and 'bad'.

This has been my first ever research role, a project outside of my degree discipline. I study Human and Physical Geography; and my UROP internship was an Agricultural project studying the pork industry, and in particular UK pig farms. I have found this very interesting and rewarding for my personal development and agricultural knowledge, such as the increase in confidence for my written and oral communication skills.

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ANNA INGLIS

Do abiotic properties of soil affect nest density of solitary bees?

Supervised by: Konstantinos Tsiolis and Professor Simon Potts

Research theme: Environment

My project involved gathering data to help aid my supervisor for his PhD research, "understanding where apple pollinating bees nest", the project involved working at NIAB EMR to collect soil sample data from man-made nesting bee plots, including soil moisture, hydraulic conductivity, root biomass and counting the number of bee plots present. The bees studied were solitary bees and are extremely valuable pollinators, not much information is known about their nesting habitats and how we can help benefit these different solitary species, the research conducted will help provide valuable information for the conservation of bees and how we can maximise pollination levels. Throughout my

project I learnt many different data collection methods, the importance of bees, the research, and skills to manage bee populations, how to collect samples of not only soils but bees and how to pin and preserve specimens. Working in a real research centre allowed me to practice many valuable skills to enable future opportunities after university, it also opened my eyes to how important insect species are and how humans are impacting them, working with a knowledgeable supervisor has given me guidance, information and helped influence my work ethic and given me many opportunities for future research.

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ARIANA TARRADO RIBES

The impact of replacing dairy for plant based alternatives on children aged 1.5 to 3 years

Supervised by: Dr Sokratis Stergiadis,

Dr Miriam Clegg and Dr Kirsty Kliem

Research theme: Agriculture, Food & Health

There has been a substantial increase in popularity of plant-based alternative products in the last years. This has created a new market of plant-based dairy alternatives aiming to replicate their dairy counterparts' functionality, however their ability to replicate dairy products nutritionally has yet to be assessed. The aim of this study is to compare the nutritional content of plant-based milk, yoghurt and cheese alternatives with their dairy equivalents and the impact on nutritional intake in children aged 1.5 and 3 years. The analysis showed that plant-based dairy alternatives contained less protein, vitamins

and minerals compared to dairy products. Plant-based milk alternatives made of legumes were the only to contain similar protein content to milk and the results showed that some plant-based alternatives significantly impacted the nutritional intake of children aged of 1.5 and 3 years. The fortification of these alternative products varies greatly, which creates confusion and could lead to severe nutritional deficiencies in children. Further work is required to ensure plant-based alternatives can be a reasonable substitute for dairy products.

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AYESHA ALI

ENRICH

Supervised by: Professor Carol Fuller and

Dr Anne Thies

Research theme: Prosperity & Resilience

In 2010, women accounted for 47% of all incidents of self-harm in prisons despite only representing 4.1% of the total prison population.

The reason why women can be seen as suffering more in prison is because their needs are typically overlooked by the system which focuses heavily on understanding and responding to the behaviour of male offenders. The government and the courts have recognised the inherent gender bias within the system and have introduced initiatives to overcome this. An initiative is to introduce female-only support programmes like Enrich which creates a safe space

where women can meet to gain advice and to build meaningful relationships.

Programmes like Enrich are effective because they aim to break the cycle of offending and help women make better decisions and receive support that was not available to them within the general, mainstream services. This research project has demonstrated that although active steps have been taken to reduce the gender bias within the Criminal Justice System, there is still more that can be done in terms of providing support, resources and funding for these initiatives.

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AYSHA HALES-HENAO

Mitigating climate change: Carbon sequestration in restored heathlands and acid grasslands

Supervised by: Professor Mark Tibbett and Sarah Duddigan

Research theme: Agriculture, Food & Health

Climate change is the driving force of biological disruption in the 21st century, the importance of mitigation techniques has never been more essential. This project aims to investigate and emphasise the utilisation of soil as a carbon sink and the importance of restoring heathlands and acid grasslands for action against climate change. Researchers applied elemental sulphur and ferrous sulphate to disrupted heathland soil on the Isle of Purbeck, Dorset. These treatments aimed to restore the soil back to the pH and mineral content of the native heathland, which had almost double the amount of soil carbon. Researchers identified

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that whilst the whole soil carbon samples did not indicate any difference, there was a significant difference in one of the analysed soil fractions; Macroaggregate Particulate Organic Matter. This result indicates a significant low stability carbon capture technique, relying on future protection to ensure successful climate change mitigation. There is a high degree of research still to be conducted with an emphasis on conservation and enhanced carbon sequestration mechanisms. The frontline research experience I gained from the internship is highly applicable to my future biological career and I am keen to implement my new academic skills.

BARATI KESHINE SRIDHARAN

Providing medication services to people with dementia during COVID-19: the experiences of the community pharmacy team

Supervised by: Dr Rosemary Lim

Research theme: Agriculture, Food & Health

Our study aims to explore the experiences of community pharmacy teams in supporting people with dementia and their family carers during the COVID-19 pandemic, specifically in providing medication services. As more than 90% of people with dementia have comorbidities, they are at a higher risk of COVID-19 and were required to self-isolate. Due to cognitive decline, people with dementia require the support of carers not only in performing activities of daily living, but also in managing their complex medication regime. Community pharmacy, as a primary care service, is often the first point of contact for people with

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dementia, but it is unclear whether any changes were made to the provision of medications to continue supporting this vulnerable group of people during the pandemic. In this presentation, I will discuss about thematic analysis, a method used to analyse the interviews that were conducted with participants from community pharmacies across England. This study will give you an insight on the challenges faced by community pharmacy teams such as communication issues due to social distancing but also the efforts made to continue providing medication services such as government funding to increase deliveries.

BELLA BOERSMA

Cook Clever: Investigating food sustainability behaviours in 18–25 year olds

Supervised by: Dr Natalie Masento

Research theme: Agriculture, Food & Health

Did you know that over 1/3 of all food ends up wasted? Plus, a shocking 53% of this waste comes domestically from consumer's homes! With food waste and climate change becoming a more concerning issue each day, now is the time to research into ways we as a society can become more sustainable consumers. This UROP project focused on 'Generation Z', specifically 18–25 year olds, as the future generation who can lead the world into a more sustainable future. This specific project investigated the barriers, issues and knowledge towards food waste that young people face every day. My role was to lead a mini qualitative data study into the reasoning, implications and

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intentions behind food changes occurring from movements between university and home. I used in-depth interviews as a data collection method to interview 8 university students on their food habits at university and at home, and these interviews were analysed using thematic coding to generate themes, results and findings. The UROP scheme was an excellent opportunity for me to discover the world of research, to learn valuable skills, useful both to my degree and life in general. It's helped to give me the idea for my dissertation, and it has also pointed me in the direction of market research as a possible future career path. I would recommend the UROP scheme to everyone!

BIBI MUTTUR

Investigating the effect of single and multiple viewpoints on unfamiliar face recognition

Supervised by: Dr Katie Gray

Research theme: Agriculture, Food & Health

The underlying mechanisms of unfamiliar face recognition has long been debated. Some authors suggest it uses structural codes (e.g. facial features) and other suggest that recognition uses pictorial code (e.g. face viewpoints). It is also unclear the extent to which individuals can recognize views outside the view that they have previously seen and if there is an advantage on the three-quarter view on face recognition accuracy. Thus this study aimed at investigating pictorial codes for different viewpoints (Right Profile, Full Face, Three-Quarter) of the face and their relative contribution to recognition at other views. Specifically asking does learning a single view of a three-quarter image

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confer an advantage to recognition either of the two other views.

Findings revealed that indeed there seems to be a three-quarter view advantage on face recognition accuracy however it is not clear if this is due to pictorial codes or structural thus further research with using multiple viewpoints at learning phase could shed light onto this theoretical question.

During this experience I have gained an interest in a field of researching psychology that was novel to me before. In addition this experience has aided me in gaining practical skills that I can implement in my final year project.

BRYONY BANHAM

University study and mental health: what are the experiences of University of Reading students with mental health conditions?

Supervised by: Dr Alana James

Research theme: Agriculture, Food & Health

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This project explored the experiences of students at the University of Reading with Mental Health Conditions (MHCs), to help inform and improve University support services and policies. It is important for Universities to offer sufficient mental health support as ~75% of MHCs develop by the age of 25, overlapping with the time at which many individuals are studying at University. Universities are required to offer 'reasonable adjustments' (e.g. flexible attendance, extra time in exams, deadline extensions) to students with a disability, which includes those with MHCs. Although the University offers a range of adjustments, not all those entitled

to the support request it. We found this reflected delayed diagnosis, fear of disclosure, failure to perceive MHCs being classed as a disability, long waiting lists and/or lack of awareness of the support available. Taking on this research project enabled me to hear directly from students about their experiences, and to develop my interview techniques. We felt that students were more honest about their experiences as they were being interviewed by other students rather than university staff. I gained skills in conducting a mixed methods research project and the different methods for data analysis.

CATHERINE HEWITT

Responding to the needs of "vulnerable" children during the coronavirus outbreak

Supervised by: Dr Anna Tsakalaki

Research theme: Prosperity & Resilience

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My project was based around exploring the impact school closures and social distancing measures have had on the provision of children and youth defined as "vulnerable". The term "vulnerable" was used throughout this study to refer to pupils who may have Special Educational Needs, children who are in need/ protection plans, looked after children, refugees, come from a disadvantaged background or otherwise assessed as vulnerable. To collect data, we used questionnaires to collect the views of professionals as well as families/ careers of these children. Out sample consisted of 63 practitioners and 76 families/carers. From these questionnaires we were able to draw conclusions

and identify recurring themes. All of our data was posted onto our website. Going forward we aim to run interviews investigating how the transition back into 'normal' schooling is working for these pupils and how they have been affected. This study enabled me to expand my research and IT skills through analysing data and creating a professional website. As an educator, my knowledge of support for these "vulnerable" pupils was improved through investigating charities and online resources to add onto our website. It was great working on a relevant project; knowing that we were positively helping the community and families by signposting support services.

CHARIS WINTER

Exploring the Experiences of Autistic Students at the University of Reading

Supervised by: Dr Fiona Knott

Research theme: Agriculture, Food & Health

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Evidence suggests that autistic students face barriers at university, leading to lower enrolment and completion rates compared to typical peers, or peers with other disabilities. We therefore felt it was necessary to investigate the experiences of autistic students at Reading University, with the aim to promote inclusivity for these students. For this project, students with autism completed an online survey and participated in semi-structured interviews. Key findings showed that autistic students experienced social challenges including a lack of peer awareness of autism, a high proportion experienced mental health and/or specific learning difficulties, students also reported difficulties

disclosing their condition to the University as well as challenges associated with accessibility of campus spaces. Implications of this research focus on promoting equal opportunities for autistic students at Reading University. From this experience, I have developed my communication skills. Conducting semi-structured interviews required me to listen to the perspectives of students and further question relevant areas, whilst also considering the sensitive nature of the topics of discussion. This project has also increased my own awareness of the private struggles' students with autism face, and the importance of speaking openly with peers at university.

DAMIEN PATRICK MC ALINDEN

Off Limits: The Neglected History of Fences, Walls and Hedges

Supervised by: Dr Jeremy Burchardt

Research theme: Heritage & Creativity

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The topic is one of real contemporary political relevance, be it border disputes between India and China or Donald Trump's Mexican border wall. Despite the profound importance of fences throughout history they have received little attention from historians. There has been some studies charting the decline of hedges but this is where these studies end, they do not explore and cover the rise of wire fencing that induced hedge decline. Nor do these studies grapple with the factors driving such change. In our study we sought to do that, and also examine temporal and regional variation in English field boundaries. Ultimately, due to time restraints and challenges imposed by

Covid-19, this study acts as a signal to historians for further research. Some key findings include re-assessing the role road widenings played in fencing evolution, which were previously thought not to be as important, and also uncovering the strong cultural forces resisting fencing change, namely the English value accredited to the aesthetic hedge landscape. Overall, the study aimed to shine light on a dimly lit area of historical research. For me it was an immensely useful experience, both equipping me with new skills and confirming researching is something I would consider for a career. This is reinforced by the fact I wish to do a masters upon finishing undergraduate.

DAN BARTHAUX

Impacts of Anthropogenic Emissions on Changes in Rainfall over The Sahel

Supervised by: Dr Paul-Arthur Monerie and Dr Jon Robson

Research theme: Environment

In the 20th century the Sahel region of Africa experienced distinct changes in precipitation over several decades; notably a severe drought between the late 1960s and 1980s, to a slight restoration from the 1980s onwards. The cause of the drought is attributed to prolonged climate cycles like the Atlantic Multidecadal Variability, as well as external radiative forcing from the emission of greenhouse gasses and anthropogenic aerosols. Using the CESM1 climate model, simulations with constant emission rates of aerosol and greenhouse gases were compared to a historical simulation with changing emission rates using approximate known

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values. The model points to aerosols during the drought period as the main driver of reduction in the land-sea temperature difference necessary for the West African Monsoon system, and as the primary agitator of the North-South Atlantic temperature gradient. The restoration of precipitation is attributed to anthropogenic aerosols and the enhancement of greenhouse gas impacts. Signal-to-noise ratio analysis located likely areas with noticeable signals that were most affected by external forcing. Having come from a country where rain can be scarce, this project helped me appreciate the complexities in the creation of a drought.

DANIEL PEARNS

A Public Health and Climate Change 'Countdown' for Reading Town: Health, Heat and Political Discussion

Supervised by: Professor Elizabeth Robinson

Research theme: Environment

The project was based on the global Lancet Countdown – looking at the impacts of climate change on public health worldwide. The aim was to apply the indicators present in said report to Reading town – making it the first “town-level” project of its type. I focused on applying the global countdown domains of Climate Change Impacts, Exposures and Vulnerabilities and Public and Political involvement. Another undergraduate student focused on Mitigation Actions and Health Co-benefits. The research undertaken will hopefully have the following effects: inform the public and academics of links between climate and health at a Reading-level, push local and national legislators

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into taking mitigating and adaptive action within the area, and inspire future reports focused on the areas of public health and climate change within Reading and in other towns, cities, regions and countries. These sections of the report establish a new indicator for tracking political engagement amongst local Berkshire political representatives (with a clear 2019 spike in engagement), track health susceptibility to climate impacts (concluding there is increased age-risk and diabetes risk, but decreased risk from smoking) and establishes that average temperatures in Reading have demonstrated a clear upwards trend, while the numbers of heatwave events have dramatically increased.

DELORICE MURUDZWA

Protocol development for the novel use of a crystallisation robot tailored to suit early stage drug discovery

Supervised by: Dr Elena Kabova

Research theme: Agriculture, Food & Health

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This project explored the novel use of a crystallisation robot, the Oryx 8, for early stage drug discovery. Conventional crystallisation experiments can be conducted using such robots however, these are designed to handle large proteins. Therefore, my role was to see if the Oryx 8 could be adapted to handle small drug-like molecules instead. This was done by exploring different plate designs and their robustness against various named solvents and crystallisation conditions. During the literature search, I discovered that the materials used to make most crystallisation plates currently available are at

large very robust and resistant to the main solvents methanol, ethanol and acetone. Unexpectedly, the main barrier during this was not the material but the cost of the products available.

Due to the coronavirus pandemic, this project was unable to go ahead as planned in the laboratory and I had to work from home. This meant that I had to adapt very quickly and manage my own time effectively. Overall, I improved my ability to carry out extensive literature research which I had not yet previously done and this has provided me with a lot more confidence going into my fourth year.

DOMINIC DAVIES

Inflation Hedging and Monetary Policy in US Housing Markets

Supervised by: Dr Pin-Te Lin and

Dr Jorn Van de Wetering

Research theme: Prosperity & Resilience

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This paper examines the inflation hedging ability of US housing markets (how well it maintains its value against inflation), over time. Considering how many households are homeowners (around two thirds), and how much a house makes up of a household wealth portfolio (around 40%), this is a very important topic for both policymakers and homeowners.

The findings are that inflation hedging varies across individual states. Further, hedging ability decreases in periods of high and persistent inflation, and tends to be particularly concentrated in coastal states.

The UROP programme has allowed me to develop a range of skills that allow one to write a cohesive and useful piece of research. Examining available literature, I created a literature review and research motivation, to identify how our research paper adds to the subject area. Using complex regression software packages to perform data analysis I was able to formulate a discussion on empirical results, with a clear understanding of the technicalities. I am very grateful for UROP for giving me a challenging but highly enjoyable experience. I hope to utilise these new skills in further studies, as well as in my career.

ELENI HADJICOSTAS

Tracking and mapping Sooty Tern in the Seychelles using GIS

Supervised by: Dr Jess Neumann, Dr Chris Foster and Chris Feare

Research theme: Environment

Sooty Terns are the world's most abundant avian species in tropic oceans (Neumann et al, 2017), yet their population size reduced has significantly due to human activity, particularly land use changes and over egg-harvesting (Feare et al, 1997). Another factor affecting Sooty Tern populations and their breeding success are food shortages. This research project focuses on displaying tracked GPS data of Sooty Terns in the Seychelles using GIS. This project builds upon Neumann et al's (2017) research findings, where an abrupt food shortage was suggested by the increased distances Sooty Terns travelled to forage. Research utilising spatial analysis to understand the changes in ocean activity and

foraging behaviour is important as it demonstrates the impacts climate change has had upon the breeding success and foraging behaviour of the avian species. Additionally, it could inform where to designate Marine Protected Areas in the Seychelles. As the spatial analysis was incomplete by the end of the project, no conclusive results were found. However, this experience developed my ArcGIS and Excel skills, making me more employable in the GIS-field. I also learned that not everything occurs as planned during academic research, however that does not make one's experience and learning less valuable.

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ELINA KUZNECOVA

Development of neural network for analysis of platelet activation

Supervised by: Dr Alice Pollitt

Research theme: Agriculture, Food & Health

This summer I had a wonderful opportunity to participate in one of the UROP projects that looked at platelet functioning. The aim of our project was to develop an accurate and low-cost method based on machine learning to accurately analyse platelet activation. Platelets are small anucleate cells that play a critical role in haemostasis and thrombosis. Inappropriate activation of platelets can be causative to stroke and heart attack, which are the leading causes of mortality worldwide. Research is therefore vital to understand platelet activation to advance current treatments. Upon activation, platelets change shape and form protrusions from

the surface called filipodia and lamellipodia. The current analysis of these changes in platelet shape includes the manual annotation of platelets which is a labour intensive and time-consuming process and can also lead to analysis bias.

Although due to coronavirus the nature of the project slightly changed, it was still an amazing opportunity which allowed me to develop wide variety of transferable skills. Moreover, I believe that this project will become a significant contribution to a platelet field in the future.

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ELITSA DOBREVA

Understanding the underrepresentation of BAME groups in professorial and senior leadership roles

Supervised by: Dr Karen Jones

Research theme: Prosperity & Resilience

The project centres around uncovering the barriers to progression into leadership faced by BAME academics at the University of Reading to give an insight into how representation of BAME staff can be increased in senior and leadership roles. The topic of underrepresentation of BAME academics is hugely important, especially in today's climate where we are all realising the importance of representing minority voices within large institutions and has been a topic which has encouraged the media, government and policy makers to question why BAME academics are so hugely underrepresented within higher education institutes. The results showed that many BAME academics within the university felt that

racism and discrimination was a key problem to their progression and felt that they were often unable to speak out about racial discrimination due to fear of potential repercussions. Another key finding was that BAME staff felt their work was undervalued or questioned much more than that of their White non BAME colleagues which they felt negatively impacted their career progression. BAME women especially felt that due to their intersectionality they had to work twice as hard for being a woman and BAME in comparison to White colleagues. I feel that I have learnt a huge amount from doing this research in particular in regard to barriers faced by BAME staff colleagues.

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ELLIE ROSE EDWARDS

Phylogenetic analysis of the Nuclear Hormone receptors of C. elegans

Supervised by: Dr Nandini Vasudevan and

Dr Eva Kevei

Research theme: Agriculture, Food & Health

The vast family of nuclear hormone receptors (NHR's) in *C. elegans*, arising from successive rounds of duplication and an unusually high rate of evolution, are largely unknown in function and only hypotheses exist towards the driving force for their extensive proliferation. In our research, we aimed to take a step towards assigning potential function by analysing the evolutionary pattern of divergence of the *C. elegans* NHR's, in comparison with our own human receptors and ancestral receptor sequences, to attain an accurate phylogeny. This area of research is particularly exciting because of the potential applications, once assignment

of function is possible with a degree of certainty. NHR's are already utilised for suppression of immune response and replacement therapies, and this diverse family in *C. elegans* could offer not only insight towards a better understanding of our own human receptors but provide new potential drug leads. This bioinformatics-based project opened my eyes to the power of in silico research and has been my most enjoyable and rewarding experience in my academic career so far. I am now looking forward to pursuing a bioinformatics focused MSc after completing my BSc and pursuing a career in computational biological research.

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EMILY DYSON

A review of land policies, property rights and institutions in Ethiopia

Supervised by: Dr Nugun Jellason

Research theme: Agriculture, Food & Health

Current land tenure issues in Ethiopia undermine the potential for economic development, food security and sustainable resource management. Ethiopia is rich in biodiversity, yet conservation efforts and attempts at sustainable use of natural resources have been insufficient. Access to land in Ethiopia is extremely important for a country reliant on agricultural production for subsistence and income. There is a need for stronger resource governance as these issues have led to inconsistencies within food production, biodiversity conservation and sustainable development. The aim of this review was to identify the changes in land policies,

property rights and institutions since the 1950's, to better understand the trade-offs that Ethiopia is experiencing. I have analysed existing policies on forest management, land acquisitions, biodiversity conservation and agricultural development from national policy documents and reports. This research is part of the Sentinel Project (Social and Environmental trade-offs in African Agriculture) and will help governments, policy-makers and the private sector to make better informed decisions about land use, agricultural practices and investment to strive towards food security, social equality and biodiversity conservation.

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EVIE HARRINGTON

Researching emotion perception of music stimuli: A validation study

Supervised by: Dr Fang Liu and

Florence Leung

Research theme: Agriculture, Food & Health

This research involves the first round of validation for a future study that will investigate the way individuals with and without autism recognise emotions in speech, vocal and instrumental music in distracting environments. This validation study is important for the main study as it will ensure the stimuli that is presented to participants is standardised and the emotions the stimuli convey will be perceivable.

The outcome of this study meant that there is now enough stimuli for the emotions sadness and happiness, however the participants could not agree

on anger, fear and surprise, therefore another round of validation will be needed to ensure there are at least 24 music segments for each emotion to be used in the main study.

Taking part in this research has made me more confident in using programmes such as Gorilla, Excel and SPSS which will be extremely valuable for my final year project. Additionally, this research has made me realise just how interested I am in music psychology and this is something I would like to investigate further for my final year project.

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FRISKY FERNANDES

Interventions for successful ageing at work – A systematic review of the literature

Supervised by: Dr Tatiana Rowson and
Dr Chris Woodrow

Research theme: Prosperity & Resilience

The project involved consolidating previous research on interventions for successfully ageing at work. Over the past two decades the topic of ageing at work has become increasingly popular and continues to grow. As we head towards an ageing population with individuals remaining in employment for longer, the topic of ageing at work has become a growing concern for employers. The purpose of this literature review is to consolidate previous research to assist employers, guide further research and identify areas of research from a managerial perspective. Databases used to gather data were Web of Science, PsycINFO, EBSCOhost and Google Scholar. Key findings identify common

themes in previous research on interventions for successfully ageing at work: increasing physical activity, maintaining/improving mental health and physical health. Results of the interventions displayed improvements in workability, which is key in successfully ageing at work. Through this research project I gained exposure to and experience working in academia, which has assisted me in gaining a clear view of the academic options I wish to explore. From the project I have also personally learned the importance of self-discipline, organisation and time-management, the diverse experiences I gained on the project have contributed to my personal development.

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GABIJA MELIAUSKAITE

Monster Dance Project

Supervised by: Dr Lily FitzGibbon

Research theme: Agriculture, Food & Health

Curiosity as a concept has been studied for decades in order to understand its relationship with complexity (Berlyne, 1960). The 'Goldilocks effect' is an area of particular interest to us because it is thought that curiosity is greatest when stimuli are not too simple and not too complex. As this has not been empirically studied in children, we wanted to apply this theory to understand which properties of stimuli rouse curiosity and verify the role of complexity in this. Understanding this could be very beneficial for purposes of learning, as the most 'interesting' and not very predictable stimuli are speculated to be most learnable. Our pilot testing

used five monster stimuli that varied in complexity by using sequences that followed different patterns and so varied in predictability. We found that participants were good at distinguishing the different levels of complexity, especially in the lower complexity as it was easier to compute. We found a trend towards a positive linear relationship between reported interest and sequence complexity, and a significant negative relationship between interest and ratings of predictability. This experience has widened my understanding of the developmental field and empirical research as a whole, and has opened up many possibilities for me.

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GIBRIL GAYE

Face and emotion analysis on video streams: application to pain detection

Supervised by: Dr Luis Patino, Dr Katie Gray and Dr Tim Solomons

Research theme: Environment

This placement constitutes a pilot study and is part of the build-up of a research initiative looking into the use of camera-based systems to assess emotional states and mental health. Most modern camera systems can detect faces, this can be used in conjunction with advancement in Artificial intelligence to extract facial features and infer emotion state. The models we built showed that, out of the eight universal emotions, 'happy', 'disgust' and 'surprised' are the most easily distinguished emotions. However, there were several misclassifications involving 'neutral', 'sad' and 'angry'. This was surprising given that these emotions are very distinct to humans. Upon further investigation, we found that similar facial muscles

are involved in expressing sadness and anger. We trained three models in classifying the emotions two of which are more traditional from a statistical point of view. The third model was built using a neural network (computer models of the human brain) and achieved the best results. However, it took longer to train and as such, if fast prediction is required, the more traditional models will be better suited.

During the placement, I have gained experience working within a multidisciplinary team. Also, I was exposed to software engineering principles, like design, version control and maintaining well documented code. Finally, I now have a deeper appreciation of the iterative nature of model building and making inference from models.

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GWYN DONLAN

Learning from Rescued Historical Weather Observations

Supervised by: Professor Ed Hawkins

Research theme: Environment

There are millions of hand-written weather observations that could help improve our understanding of weather events that happened centuries ago. This project is all about digitising a specific set of observations from South Devon and the following analysis of the rescued data. This project will also aid future tests of the accuracy of future weather predictions. Firstly, there were a few interesting notes that were written down that describe some phenomena that had no previous

recognition. Secondly, there were some strange long-term trends and sudden jumps in the data compared to existing data in the time and location. One of the next steps for this project will be to investigate these jumps in the data as well as the strange, more long-term data. Although the project was completed virtually, from completing this project, I have gained invaluable experience working in the research sector as well as working with current researchers in their specialist fields.

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HAMISH GREENING

New Online Methods in Experimental Philosophy of Language

Supervised by: Dr Nathaniel Hansen

Research theme: Heritage & Creativity

Philosophy of Language has traditionally been an armchair process, in which one arrives at one's conclusion after a lot of beard stroking and provides extensive, logically precise arguments supporting that conclusion. A new branch of philosophy has arisen in response to criticisms that such methods distinguish Philosophy of Language unfavourably from related fields of social science and the humanities and their more empirical research methodology: that branch is Experimental Philosophy. X-Phi began to build research based upon traditional questionnaires, much like those used in psychology. With the world increasingly pivoting to an online world, these morphed into largely online questionnaires,

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but there are reasons to doubt the results obtained from such a method. Our project offered a radical new type of questionnaire: a "Socratic One". More recognisable as a form of 'interview', in that it is centred round a real time conversation between the subject and researcher, we developed a method for carrying these out online. This has multiple benefits for cost, ease, potential volume and is of course it remains a failsafe method throughout a global pandemic. Through the 'chats', we gained astounding insights into the way participants really interpret and respond to the questions fed to them in questionnaires and interviews, providing real food for thought for those designing such experiments in the future.

HENRY WELLS

Rescuing historical weather observations: The Heberden Diaries, 1782–1855

Supervised by: Professor Ed Hawkins

Research theme: Environment

To understand the changing climate of today, we must first understand the climate of the past. Reconstructions of past weather and climate rely on historical weather observations, of which weather diaries kept by early meteorologists are an important source – especially before the start of widespread observations to consistent national standards in the mid-19th century. But to be useful, these weather diaries must first be digitised, or "rescued". The Heberden Diaries contain daily temperature, pressure and notable weather observations kept by the Revd Thomas Heberden and Elizabeth Althea Heberden, his daughter, in the Exeter area between 1782–1855. I transcribed and

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processed over 70,000 individual readings from the diaries, and compared the resulting dataset with other historical observation records. The Heberden dataset represents the varying weather, and many aspects of the climate, of the region and time period well. However, there are significant average differences compared to other historical records. A lack of information about the exact locations of the observations, and the instruments used, makes accounting for the factors causing these average differences difficult. This project gave me useful experience in focused, detailed research ahead of my final year project, and greatly improved my coding skills.

IBRAHIM KHAN

Effects of decision pre-commitment on learning from experience

Supervised by: Dr Anastasia Christakou and Brendan Williams

Research theme: Agriculture, Food & Health

Within the field of psychology lies the study of decision making and how its effects can be affected by learning. Studies in the past have examined how our external environment, such as peers and reward, affect how rapidly we learn associations when making decisions. Yet, our internal belief systems about the world and how they affect our interpretation of situations and experiences are lesser known. Therefore, this project aimed to measure how interpreting a particular environment affects learning. In order to do this, a 'choice commitment' task was hypothesised, coded and constructed, and tested as a pilot study to

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gauge if the concept would be successful to target audiences through feedback from the pilot audience. Feedback gathered from participants was favourable in that instructions were clear; the stimuli were easy to discriminate between and that the code ran smoothly. Since much of the project involved coding and task construction, I learnt a new skill in coding a task which involves multiple variables and pathways. Similarly, as the research is ongoing, it is commendable to be part of a bigger project which I realise takes time and careful consideration to get right since the choice commitment task was modified several times.

IKRA ULLAH

Are Nuclear Hormone Receptors in C. elegans related to those present in other genera?

Supervised by: Dr Nandini Vasudevan and Dr Eva Kevei

Research theme: Agriculture, Food & Health

Nuclear hormone receptors (NHRs) are transcription factors regulated by ligands that are encoded for in the human genome. NHRs contain a ligand binding domain and a highly conserved DNA binding domain. However, not all follow this canonical structure. Collective signalling from these domains enable humans to fight diseases (as mutations in these have been linked to cancer) and regulate various metabolic processes. Humans and the simple model organism *Caenorhabditis elegans* (*C. elegans*) share many orthologs but differ drastically in complexity. Therefore, studies into NHRs in *C. elegans* can occur readily and be related back to humans. The aim of this bioinformatics-based

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project is to visualize the full protein sequences of NRs, as a dendrogram, in humans (48), *C. elegans* (271) and a few ancient species. The phylogenetic tree produced depicted the clustering of NHRs into their respective families (NR1–NR6 and NR0). Orthologs between humans and *C. elegans* were also shown to group together on the tree. This suggests that they diverged from a common ancestor and hence, could share conserved function. This would likely mean that they bind similar ligands; an area that could be explored further for therapeutic applications. This project has introduced me to a whole new spectrum of resources that make visualisation even easier.

JACOB L. TOMASZEWSKI

Eavesdropping on Eating

Supervised by: Professor William Harwin

Research theme: Agriculture, Food & Health

When a nutrition study is undertaken the participants must record the food they have eaten, which is usually done as a food diary; However, what happens if they forget to log their snacks? An unreported jelly baby here, and a sneaky chocolate button there and before you know it the accuracy of the study drops massively. This is the problem we were attempting to solve.

We attempted to create an algorithm that can listen to an audio file and identify whether something was eaten. We did this three ways: a matched filter, a linear regression algorithm and a deep neural

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network. The later two provided very promising results, however as this was an exploratory study further research is needed to be able to differentiate crunches of different food stuffs.

I have been able to really develop my signal processing and manipulation skills, an area I felt I was behind on during lectures. I now have a far greater insight at what I would like to do after I finish university, and it has also given me a peak behind the curtain on how research is conducted at academic institutes – albeit remotely!

JAMES BALDOCK

A Public Health and Climate Change "Countdown" for Reading Town

Supervised by: Professor Elizabeth Robinson

Research theme: Environment

The aim of this project was to take the Lancet Countdown which tracks over 40 indicators of climate change and its effects on public health and apply it to Reading thus establishing a Reading Countdown. This entailed ranking indicators from the Lancet Countdown before adapting indicators to be suitable for the scale of Reading as well as creating new indicators which are appropriate for Reading. Finally, finding the data, transforming it into a more visual format and finally creating a report.

In a time where climate change is at the forefront of people's minds and at a critical point in terms of

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action needed, this project is important to identify and educate to people the effects of climate change on their health. The threat of climate change can feel at times a distant and impersonal and this project was a great opportunity identify the local effect climate change is having.

Finally, more personally this project has developed my research skills, giving me an opportunity to understand and gain experience in the different stages of a research project, collecting and visualising data and finally, producing a report on an incredibly pertinent subject.

JAMES HODGSON

Information Visualisation of Massively Complex Data

Supervised by: Dr Varun Ojha

Research theme: Environment

My placement was extremely important this summer, I was analysing Covid-19 data to create graphs and prediction models for the future. Covid-19 has taken over the world this year so it is important to try and track how it is spreading and how quickly, so my job this summer was to analyse all of the data previously gathered and create a prediction model so that I could try to predict how many cases each region of England would have in

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the coming days. I felt like I gained a lot from this project, I was able to get experience working in a sector that is of interest to me and I have improved my employability by completing a project that links so closely with my degree. To anyone wondering if they should take part in the UROP scheme, I would say that it is definitely worth your time and you will gain so much from the experience.

JOHN PERRENS

Information Visualisation of Massively Complex Data

Supervised by: Saša Čaval

Research theme: Heritage & Creativity

During my placement I assisted in examining and developing digital documentation for archaeological research into a medieval funerary heritage (12th–16th C) in Bosnia and Herzegovina. I assisted my supervisor Saša Čaval in this task because it helped create the foundations for a digital database which can be accessed by everyone for free and will eventually be submitted to the National Institute for the heritage protection in Bosnia. This will allow future generations both foreign and local to be able to access these databases on the free Tropy app,

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where during my placement I assisted in uploading images and files from Google Drive to this app so that everyone across the globe will one day be able to view this important data for free and help strengthen our understanding behind medieval funerary heritage. Through this project I have learnt the importance of digital documentation and how it will someday allow everyone to gain a deeper understanding of the funerary practices that our ancestors conducted in Eastern Europe during the 12th–16th centuries.

JONATHAN CHEONG

Blockchain Technology for work relationships: A systematic review

Supervised by: Dr Lebene Soga

Research theme: Prosperity & Resilience

Over the past decade, blockchain technology has been gaining considerable attention among corporations, practitioners, and researchers. However, to date, blockchain technology research on its impact on workplace relationships has not been widely discussed. In this paper, we focus on literature explaining its potential work relationship applications and explore how blockchain technology can be used to improve work relationships.

We first systematically review blockchain technology literature and propose a model that explains four work relationship dynamics based on the use of blockchain technology, firm- client relation, workplace relation, firm-firm relation and firm-supplier relation respectively. We then compare and contrast the effectiveness

of blockchain technology in its use for work relationships and its potential implications.

This paper contributes to the blockchain discourse by providing a well-structured foundation for those who aim to apply social implications to blockchain technology. We strongly believe that significant opportunities exist to understand the links between the social impacts of blockchain technology in the field of work.

Personally, through this research programme I have learnt many things. The most notable ones would be the skill of carrying out proper research, skill of proper research writing and the amazing opportunity of working alongside with Dr. Lebene Soga.

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KATIE STEPHENS

The UK's law and policy framework for the promotion of gender equality in the world

Supervised by: Dr Anne Thies

Research theme: Prosperity & Resilience

Leaving the EU's legal framework, the UK establishes itself as global trade power, which remains bound by international and domestic legal obligations related to the protection and promotion of gender equality. What are the implications for the UK's Gender mainstreaming and the accommodation of gender equality considerations in trade policy? This project assesses how much, or little, gender equality international and domestic legal obligations, have begun to shape the UK's legal framework for external action, external policies and international treaty making, focusing on trade

policy after Brexit. I gained an understanding of the research process including how to uncover, collate and assess primary legal material (international treaties, domestic law) and policy documents. I also gained knowledge of an important area of UK foreign relations and equality law. This project led me to be more conscious of gender equality in the UK. It led me to be concerned that gender equality considerations are not written in to international treaties and therefore there is a very real possibility that gender equality may be compromised when the UK is negotiating trade agreements.

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KONSTANTINA NOUKA

The Rise of 'Twiplomacy' and the Making of International Law

Supervised by: Professor James Green

Research theme: Prosperity & Resilience

The project was aimed at examining whether legal claims made on Twitter by Heads of State, or ministers, can act as a source for the creation or amendment of binding customary international law (CIL). Researching this area is crucial since as the society adopts to the 'online world', examining whether the international legal system should do the same, and how will affect already complicated and ambiguous areas such as CIL, is necessary.

After researching, it was found that Twitter is a platform where legal claims potentially confirming existing CIL can be made. But the research also

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found a statement made by President Macron on ecocide as potential evidence that Twitter can be a platform where new CIL is created. Overall, the conclusion of the project was that at the moment Twitter is a platform mainly used to confirm existing law instead of creating new law. In the future though, as society moves even more into the online 'world', there is the clear potential for this to change.

Finally, in addition to all the knowledge that I gained on CIL, I further developed my research and organisation skills, but also, I gained knowledge of what is going on around our world!

KRUPALI VIJAY

How home and international students work and communicate together in group tasks

Supervised by: Dr Sarah Brewer

Research theme: Heritage & Creativity

How home and international students collaborate and communicate in group tasks is key to a more effective learning environment. The University of Reading currently has more than 5000 international students from over 140 countries. It is a rising population of diversity, cultures and backgrounds. There are a growing number of group work projects that are assigned to students, but the impact that these language and cultural differences have on student learning has not been fully considered. Have group work projects been built well enough to positively reinforce student learning? It is a question that we all want the answer to. This project gained

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participants through personal contacts, emails and phone calls to both Undergraduate and Postgraduate students at the International Study and Language Institute at Reading. 11 participants were then interviewed through Zoom to explore this further. Participant feedback was analysed through extensive reading to identify emerging common themes. Results show that international students have very diverse and strong opinions on this. They feel that the culture difference is the main barrier in group work while home students have instead embraced the opportunity of being able to work with people from different countries.

LAURA LINEHAN-HILL

Exploring the use of high resolution climate models to simulate European energy variables and their future projections

Supervised by: Dr Paula Gonzalez

Research theme: Environment

Climate models are often used by scientists to predict the future weather by running the model far into the future at a lower resolution. Climate change indicates that there is likely to be a large change in weather variables such as temperature and this would affect variations in electricity usage and weather driven renewable energy. We considered winter as this season showed the clearest patterns in the data.

The high-resolution model HadGEM3-GC31-HM was used to consider temperature, electricity demand, wind speed and wind power and how these variables change between the historical (1979–2014) and future (2015–2050) periods. This model was

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chosen as it compared favourably to the reanalysis dataset ERA5. The model indicated a greater increase in temperature towards the east of Europe compared to the west of Europe with the largest temperatures occurring in the Gulf of Bothnia. When wind power is considered, there appears to be a decrease in wind power in northern countries and an increase in wind power in southern countries.

I have gained experience in programming (with python) and data analysis. I have also gained experience of what a working relationship is like. This UROP project has helped me to develop a more resilient mindset.

LAURA TURPIN

The Impact of Distance-Learning (as a Result of the COVID-19 Pandemic) on 8–12 Year Olds Reading Motivation, Enjoyment and Strategies

Supervised by: Dr Anna Tsakalaki

Research theme: Prosperity & Resilience

As schools were forced to close in March 2020, due to the COVID-19 pandemic, this project chose to explore the impact that this may have on children's reading development. In particular, the measures used assessed reading motivation, enjoyment, activities and strategies. The investigation is still ongoing, although, preliminary results indicate that the majority of participants had a specified reading disorder, experienced difficulty reading at-home texts and had a low motivation to read. Going forward, this project aims to recruit more

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participants so that the impact of distance learning can be further interpreted and explored.

My overall experience with UROP was invaluable. I had the chance to work with a knowledgeable and very supportive supervisor who guided me throughout. As someone who wants to pursue a career in research, having the opportunity to apply research skills and learn new ones has given me a great foundation for future ventures.

LOUIS STEWART

Drawing a Pint; The histories of Henley-on-Thames and Brakspear Brewery

Supervised by: Henry Russel

Research theme: Prosperity & Resilience

My UROP project was on the histories of Henley-on-Thames, the Brakspear Brewery and the Brakspear Family. The aim was to see how the Brakspear Brewery was affected by the changes in Henley and its economy and vice versa. Learning about the heritage of towns and businesses is important as it offers insight into the growth of important trade centres and the adaptations of businesses in a constantly changing economy, and allows future businesses to spot patterns allowing for growth. The brewery adapted well with the changing economy of Henley-on-Thames. As brewing became important in the 19th century, the brewery thrived and merged

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with rivals, increasing the brewery's success. Due to this increased success, they were able to add lots of additions to the original site and further bought and developed pubs where the breweries product would be sold. By the late 20th century, the economy had shifted and brewing was dramatically less important to the economy that it previously was. Due to this, parts of the brewery were not used and repurposed either commercially or residentially. This project has allowed me to develop my research and archive skills and also developed my interest in planning and real estate.

LUCY HARWOOD

Higher Education Leadership gaps – understanding the underrepresentation of women and BAME groups in professorial and senior leadership roles

Supervised by: Dr Karen Jones

Research theme: Prosperity & Resilience

Diversity and inclusion are something that every institution should be evaluating and improving – especially in the wake of the current 'black lives matter' movement, which has highlighted that systemic racism still exists and action needs to be taken.

Although some participants in this survey commented on the improvements to the systems of promotion at the university, it was interesting to see that there are still recurring problems faced by women, BAME and disabled people. The data also highlighted the significance of intersectionality,

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especially for BAME women. Things may be better than they used to be, but the work is definitely not done.

As well as analysing the qualitative data from the survey and reviewing literature about visual/graphic research methods, I created my own graphic artworks to illustrate the key themes in the data. This project has given me experience of how art can be used to disseminate research and get a deeper understanding of the data – something I was not familiar with before, but now want to implement into my future art practise.

LUCY HEWITT

Remote learning and education during lockdown in Whitley, south Reading

Supervised by: Professor Michael Goodman

Research theme: Prosperity & Resilience

My UROP project researched the effects of remote learning and education during the coronavirus lockdown in Whitley. This project is especially important as many children experienced home schooling differently depending on their ability to access technology and personal family circumstance. Therefore, this effected the children's ability to learn effectively during lockdown; this is of significant concern because the education gap would widen as a result of this. Hence, the aim of

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this project investigated the challenges families in Whitley, the most deprived borough in Reading, have experienced through home schooling during the lockdown, as well as parent's concerns regarding the impact on their child's future learning. Through the understanding of the parent's point of view, support can be effectively emplaced to address the impact of remote learning in Whitley. For example, the introduction of extra tutoring for enhancement and one to one support for each pupil's specific needs.

LUCY SUTTON

The Thames as a liquid history: interactions between framers and the river 1866–1974

Supervised by: Professor Simon Mortimer

Research theme: Environment

I am researching this project as there is very limited data and studies surrounding the history of pollution events along the Thames. This project is important because researching such events can help to identify what type of pollution has most effected the river and how to avoid this in the future. Additionally, we can learn what types of pollution are the most common in the river, and where these events are occurring, in cities, towns or villages. I have found that the cause of pollution events has changed significantly over time, from people placing waste from their own homes into the river at the start of the century, to businesses causing oil spills in the 1970s.

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The amount of individual events occurring does decrease over time, but this may be due to lack of reporting in the 40s, due to the war, etc. However, the events which did occur during the 50s, 60s and 70s were often worse and would have caused more damage than those happening earlier in the century.

I learnt how research can often be frustrating and tedious. However, it is also rewarding when you have found out something interesting at the end, and contributed to that area of science. I gained insight into the world of research and now appreciate the entire process of a study.

MAISIE BRUCE

Is heathland restoration a viable carbon sequestration strategy to help mitigate climate change?

Supervised by: Professor Mark Tibbett and Dr Sarah Duddigan

Research theme: Agriculture, Food & Health

Native heathland soils store over double the amount of soil carbon below-ground than agricultural. After WW11 many UK heathlands were converted to agriculture for food production but technological improvements mean this can be reduced. Heathland reversion is an important input to climate change mitigation for DEFRA. A project on the Isle of Purbeck was commenced to restore areas of agricultural land back to heathland. After 2 decades the restoration has not shown any significant increase in below-ground carbon storage. The project was to identify and review published literature on carbon storage stocks and dynamics and also conversion and measurement

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techniques in UK and N.Europe lowland heathland systems and gather data. To examine other researchers' findings to ascertain if any results are similar or different to the Isle of Purbeck study. The research showed, historical native lowland heathland soil which has been used for agriculture and then restored to heathland contains less carbon stored and organic matter than untouched native heaths. This is the same regardless of restoration and measurement techniques. As well as the scientific and environmental learnings, this project provided an intensive training course in literature review techniques, interpretation and amalgamating diverse data.

MICHELLE JAMES

Exploring the student experience of student with Specific Learning Difficulties

Supervised by: Dr Allan Laville

Research theme: Agriculture, Food & Health

Our study explored the experiences of students at the University of Reading with specific learning difficulties via surveys and interviews. Previous research has identified that teaching in HE does not always meet the needs of neurodiverse learners and that the additional support students receive is generic rather than tailored. Our research reflected the literature and identified that there is still a great lack of understanding of the needs of students with SpLD and what SpLD friendly learning looks like. There are also still numerous barriers that stop students from disclosing their SpLD to the University. The key recommendations

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for improving teaching, learning and support are: There needs to be a greater awareness of SpLDs and their impact among academic staff; Services need to ensure that the provision they offer is well-advertised and understood by students. Support needs to be tailored to the student and their individual needs; Services should develop 'feedback loops' wherein student voice drives changes and improvements to services. This project was great preparation for my upcoming dissertation, in regard to ethics, building a survey and conducting interviews. I have also gained a greater understanding of SpLDs and the extent of their impact.

NICHOLAS MITCHELL

An Exploration into Potential Renewable Energy Generation in Africa

Supervised by: Dr Hannah Bloomfield and Dr Caroline Wainwright

Research theme: Environment

This study focuses on regions in Africa that have seen little exploration and investment but have high potential. This could set the foundation for investment in the region, and help countries lower any dependency on fossil fuels. Furthermore, in these regions there could be an increase in electricity being shared between countries.

Areas which showed the best potential were Senegal (strong wind speeds), Lake Victoria (consistent solar radiation), and Southern Africa (consistent winds and high solar radiation). Using a conversion to capacity factors (CF), which measure how well a generator (wind turbine or solar panel) can convert solar radiation and wind speed to

electricity. It is often found that there is an anti-correlation during the diurnal cycle between solar CFs and wind CFs, so investment in both energy sources would see solid output throughout the day. Due to how cheap solar panels are, solar power provides more energy per £. However, due to high electricity usage in evenings and overnight solar might not be the best investment everywhere until better electricity storage is invented.

I learnt how to manage my time through this project, how to interact with experts in their field, and investigate and explore my own ideas within a given framework.

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NOOR NOEMAN

Market Assessment of Mucoadhesive Drug Delivery Systems

Supervised by: Professor Vitaliy Khutoryanskiy

Research theme: Agriculture, Food & Health

My project was to conduct an assessment on the current drugs on the market that are mucoadhesive in nature. This was for 2 main reasons; to establish what has been already successful in reaching the market from clinical trials and any common trends between these drugs, as well as if there are any gaps in the current market. These gaps could be the mucoadhesive agents used, the formulation of the drug itself or the route of administration.

It was found that the oral and GI routes had the largest number of mucoadhesive drugs, however, the buccal route had the largest variety

of formulations. The sublingual and rectal routes had the smallest number of drugs on the market together with the smallest range in formulations. Throughout the research it was also noted that intravesical route had no drugs currently on the market. Therefore, these three routes could be of interest for future novel mucoadhesive drug development.

This project allowed me to develop better critical analysis skills when searching review papers to gain information and data. Moreover, it gave me a deeper understanding of research outside of a lab setting.

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OLIVIA BLACKBURN

Bees in the Collections: Political, Social, and Colonial Meanings of Bees

Supervised by: Dr Helen Parish and

Dr Rohan Deb Roy

Research theme: Heritage & Creativity

This UROP project is a comparative study of the representation of bees from the Early Modern period through to the Modern period in Britain and abroad. Understanding the social and political perceptions and connotations of bees is vital to understanding how best to tailor conservation efforts today. Overall, I discovered that there were two key factors which dictated the representation of beehives in societies. Firstly, the construction of the hive. Natural i.e. bee-made hives were often exalted as ideal, ordered societies. On the other hand, as man-made hives were developed they came to represent the exploitation of working

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men and working bees alike. Secondly, geography played a key role. In colonial India, natural beehives were condemned as savage and uncivilised, while European hives were celebrated for their efficiency and order. This completely reversed the assumptions about hives made in Britain. I have learnt an immense deal from this project. I have learnt about the importance of understanding social and political perceptions of nature, as these inform current attitudes to the world around us today. I have also gained a profound insight into research-based work and has confirmed to me that I would like to take this further as a career.

OLIVIA PETERSON

Covid-19, Multilingualism and Migration

Supervised by: Dr Tony Capstick

Research theme: Heritage & Creativity

The Covid-19, Multilingualism and Migration Project seeks to find what languages and literacies refugees use to teach, learn and share information during the pandemic. A virtual ethnographic approach is used, and the Internet is the substructure upon which research is conducted. The projects Partners traverse 4 continents, and work to pilot 'participatory research methodologies for refugee researchers in Ghana, Jordan, Syria, Turkey, Venezuela and the United Kingdom'. This research is important as Covid-19 has accentuated disparities between languages and linguistic social groups globally, which will continue to affect future sociolinguistics research, and the global outlook on language barriers to adequate access

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to vital information. Findings and analysis are not yet finalised as this is an ongoing project to 2021, howbeit our researchers had an increased dependency on social media applications and online messaging services due to maintaining crucial contact with relatives who are still residing in war-torn or politically unstable countries. Additionally, Community Researchers had expressed that they had played a significant role in disseminating crucial information: necessary health and safety practices; Covid-19 statistics; and the current status of the virus as this information was unbeknownst to many within the country's mainland. I have gained broadened and enhanced insight into refugee affairs beyond the news headlines and political debate.

OLU TO FARATI OGUNGBAYI

Designing a questionnaire to assess the financial capabilities of university students

Supervised by: Dr Vivien Burrows

Research theme: Prosperity & Resilience

The purpose of this project is to create a starting point to address the issue of the lack of financial knowledge and positive financial behaviours among UK university students. The aim of the questionnaire is to discover the areas of financial literacy where university students struggle. Recent studies show that there is a low level of financial literacy among young people and in the research conducted it was discovered that there is a real need of financial education for young people in preparation for the wider economy. As the 2007/08 crash showed us, the economy is a lot more intricate and complicated than perceived. The consequences of low levels

of financial capabilities and literacy today are dire; therefore, we need to be able to educate and equip university students with useful financial skills. It was interesting that although some students had significant financial knowledge their attitudes and behaviours had a noteworthy impact on their financial position. This project has taught me how to discern useful information as well as developing skills using Stata to analyse data. I recommend that the pilot data should advise financial education to not just aim at increasing knowledge but develop positive attitudes and behaviours.

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ORE IJINIGBA

Intergenerational play as commoning: tracing the elusive urban imprints of Paidia and Ludus

Supervised by: Dr Penelope Plaza

Research theme: Heritage & Creativity

Context: C20th Play was separated from everyday life, creating enduring division between 'useful' work and 'useless' play. We find this so normal it seems difficult to imagine we are missing out on ideal work-PLAY balance. Penelope Plaza's research and practice focuses on proposing ways to mix generations by creating play-full urban interventions. She would like to translate her activist work in Venezuela engaging adult, public play. From my participation in a table tennis club in Lower Earley, I saw how intergenerational mixing can be encouraged by play. **Aims:** Finding traditional and contemporary forms of 'analogue' play bridging cultures, generations and abilities; Explore how

'analogue' can encourage urban play for adults and between generations. **Findings:** Pre-19th century, urban spaces were not created specifically for play. It would need to have been regarded as 'socially acceptable'. Play was intertwined with ordinary life to disrupt routine activities e.g. in streets; Unstructured play-forms have less concrete, written evidence of their history compared to structured play (games) due to lack of structure in the form of written rules and components. **Lessons learnt:** Archival historical, visual research; Interpretation of findings from visual data; Terms of open access and creative commons. **Theory:** play, playfulness and intergenerational relationships

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RACHEL FORSTER

Can a high flavonoid diet improve mother's mental health in the immediate postnatal period?

Supervised by: Dr Katie Barfoot

Research theme: Agriculture, Food & Health

Postnatal depression (PND) is a type of depression that is commonly experienced after childbirth, affecting approximately 1/10 new parents. Research has found that mothers with PND have more cognitive, behavioural and interpersonal issues, and lower mood and energy than mothers without PND. Thus, it is essential to examine preventative treatments for PND, for the mother's wellbeing. Current treatments for PND include psychological therapy, antidepressants and self-help methods. However, it is also essential to examine natural alternatives because pharmaceutical medication may enter the child's bloodstream through breastmilk. This includes preventative measures and treatments, such as following a healthy diet.

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For example, the regular consumption of flavonoids supports overall well-being by reducing the risk of depression and positively impacting mood. However, little research has examined the relationship between flavonoid consumption and maternal mental health. Therefore, this study aims to address the gap in previous literature by examining whether following a high flavonoid diet will positively affect maternal mental health. If significant findings are found, this pilot study will be converted into a full-scale research project. I have gained experience, which includes recruiting participants, using software programmes and being trained to score outcome measures from mental health questionnaires.

REEM SHALHOUB

The experiences of the community pharmacy team in supporting people with dementia and family carers with medication management during the COVID-19 pandemic

Supervised by: Dr Rosemary Lim

Research theme: Agriculture, Food & Health

People with Dementia (PwD) are a growing group of people and their care is becoming more complex as prevalence of comorbidities in PwD is increasing. The community pharmacy team plays a big role in providing services and supporting PwD, now more than ever during this devastating COVID-19 pandemic. In order to explore their experiences in doing so, we conducted one-to-one telephone semi-structured interviews, transcribed them and analysed the results to produce themes. Overall, participants were all eager to help PwD and utilising

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all resources available to them to provide the best care they can. The project was a great opportunity that taught me endless skills and insights. Like leading interviews required confidence, strong communication skills and rapid thinking on the spot. Developing an effective interview guide was also challenging; pilot-testing helped as it allowed you to see where your approach can improve and hence shines light on good and bad parts of your plan. Overall, the project allowed me to dive deep into the hectic world of the community pharmacy team.

RÉMI LUCAS

The Modification of Local microclimate by clusters of trees

Supervised by: Dr Christos Halios and Professor Li Shao

Research theme: Environment

Whilst there is a wide range of existing research investigating the cooling effect of urban vegetation, very little of it focuses on urban vegetation on a small scale relevant to urban design. This project aims to find out how changing the arrangement of trees, from a linear pattern to a circular pattern, can alter the local microclimate.

The project involves the analysis of a field experiment carried out in 2019, and the application of a model to then simulate these field experiments to then draw direct comparisons.

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From this project, I have gained a valuable insight into research and have been able to apply skills learnt from my degree to real world datasets, from use of Excel & Matlab... to first time usage of Teams. Due to COVID I was unable to meet my supervisors in person, but I was still able to create a relationship with Christos through constant Teams meetings, which was very enjoyable to me.

I have since decided to pursue a master's in data science since enjoying the data analysis part of my project.

ROWAN WATSON

The International Development Time-Machine

Supervised by: Dr Alex Arnall and Caroline Knowles

Research theme: Prosperity & Resilience

International Development at the University of Reading has a rich and varied history that has been little documented to date. This screencast will lead participants through the subject's interdisciplinary roots and to unexpected and interesting places, such as selective breeding of cocoa beans, 50 year old links with the University of Mauritius and the secret service file of a past professor.

Through online research, database analysis and interviews, this project has been able to map the key changes to the agriculture faculty over 90 years, as well as numerous links with external institutions in that time. Colonialism, globalisation,

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feminism and climate change have all impacted the discipline significantly, and this project traces the reflection of these trends in Reading's teaching and demographic changes.

The challenges of lockdown restrictions fostered creativity and patience in searching for non-archival source material, meaning this project relied more on alumni office statistics and personal testimony from past staff members than past studies. Through oral testimony, this project codified years of institutional knowledge that would have been absent from current documents.

RUAN RENSHAW

Developing an app for music-assisted language interventions in autism

Supervised by: Dr Fang Liu

Research theme: Agriculture, Food & Health

Some children on the autistic spectrum have difficulties developing functional speech. This means it is important to try to have the best language interventions available to them. A music assisted language intervention has been designed to help such children acquire key words. This project's aim was to develop an app which would enable carers to carry out this intervention with their children at home. The app plays 11 specially-developed songs on the carer's phone while displaying images of the target words at the points

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they occur in the song. The app also records data on how the app is used, such as when the parents start and stop listening to a song, which will be analysed by the research speech and language therapists.

I enjoyed working on this project. I gained valuable experience with working and communicating with people from other disciplines and I got to practice my programming and design skills. It has also made me consider app development as a career choice.

RUTH FEATHERSTONE

Creating an online exhibition on 'Music and Materiality in Ancient Greece' for the Ure Museum of Greek Archaeology

Supervised by: Professor Amy Smith and Dr James Lloyd

Research theme: Heritage & Creativity

I was researching the field of music in Ancient Greece in order to put together an online exhibition for the Ure Museum's website. This was to be based on the 'Music and Materiality' in Ancient Greece exhibition that was held in 2018, but focused on a smaller, more specific aspect of it. I ended up looking at music education in Ancient Greece; in the process of researching this I discovered that it was an integral part of their childhood, because music was used throughout society, meaning that to fully participate and be respected music skills were a necessity, which could only be achieved by

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extensive education. I also got the chance to look at incredible artefacts, many of which are included in the exhibition. I really enjoyed this research project, and it was very valuable; I developed important skills, including independent working, time management, communication and teamwork. Museum curation is also a career I am interested in, so this project was very useful as it enabled me to experience first-hand the type of work that this would entail. I am really proud of the exhibition created, and very grateful that this research project gave me the opportunity to do this.

RYAN HOUGHTON

Medical and Pharmaceutical Obituaries: The role of death and illness in constructing scientific expertise

Supervised by: Professor Andrew Mangham

Research theme: Agriculture, Food & Health

By analysing hundreds of obituaries from the Pharmaceutical Journal and Transactions records, we have helped construct a clearer image of the Victorian pharmacist that is largely unexplored in 19th century fictional literature. The archives span over 28 years of pharmaceutical study, with over 400 obituaries in total, while many of the pharmacists are given succinct obituaries, there are a number of revered chemists whom they dedicate a significant amount of remorse and appreciation. While often macabre and bleak, the obituaries

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depict the sheer dedication of the pharmacists who are responsible for the incredible advancement of pharmaceutical practices of the modern age, many of which worked tirelessly till their deaths, yet are forgotten in Victorian literature. This project has been an extremely fascinating and entirely new experience for me, an invaluable experience that has taught me patience and acuity towards research, I wholeheartedly recommend undertaking a project to anyone who is willing to.

RYAN ING

Sting jets in high resolution climate simulations

Supervised by: Dr Oscar Martinez-Alvarado and Dr Reinhard Schiemann

Research theme: Environment

Sting jets are regions of distinct wind maxima found equatorward of the centre of low pressure in some rapidly developing extratropical cyclones. They are responsible for some of the most damaging winds in cyclones, including notably the Great Storm of 1987.

In this project, we have used data from the HadGEM3-GC3.1 climate model, for the first time, to identify and investigate the climatology of sting jets and determine how accurately they are represented. The project identified promising results which showed that sting jets are being accurately represented in the limited dataset we used.

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What remains to be done is a more systematic comparison throughout a larger storm dataset. Furthermore, it is important to perform trajectory analysis in the future, with this method being the only way to prove the existence of a sting jet in an extratropical cyclone.

During this project, I have gained a tremendous amount of new knowledge and skills in coding, academic writing and atmospheric physics. It has also provided me with the confidence and motivation to pursue research further, with plans to apply for a PhD.

RYAN SWALES

Developing Pharmacological Resources

Supervised by: Professor Gary Stephens and Dr Mark Dallas

Research theme: Agriculture, Food & Health

With the introduction of the new BSc pharmacology program, it is important to ensure new students have access to revision material to supplement their learning styles. While considering the VAK (Visual, Auditory, and Kinaesthetic) bases of learning, we have developed three resources: pre-reading practical material, an interactive quiz, and a practical experiment based around the planarian worm to aid in understanding the fundamentals of pharmacology.

A pre-reading Microsoft Sway document has been designed to give students an introduction into the physiology and morphology of the planarian worms,

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with a focus on neurotransmitters and their relation to worm motility. To link theory and practice, we have developed a protocol to demonstrate the effects of drugs through receptor modulation, by analysing planarian worm motility in the presence of an agonist (dopamine) and antagonist (haloperidol) to give students the opportunity to visualise drug effects.

We have also looked at the use of an interactive quiz as both a revision tool and a resource for lecturers to understand students' area of weakness based on the guinea pig ileum bioassay practical.

SAKINA KARIMJEE

Mapping son preference for policy evaluation in India

Supervised by: Dr Sylvie Dubuc

Research theme: Prosperity & Resilience

Son preference, in India, is deeply connected to patriarchy, and religious and cultural beliefs, resulting in historic gender discrimination, excessive girl mortality and since the 1980s, prenatal sex selection against females. Due to my Indian ethnic background, I am highly acquainted with the Indian context, its beliefs and all the issues that come with son preference. The demographic data (including sex-ratio at birth, sex-selection propensity and total fertility indicators) collected were used to calculate the novel indicator of son preference. This database was then evaluated and displayed as excel graphs and a GIS map, focusing on this indicator of son preference.

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The key finding was that in India, from pre-2010 to post-2010, is that son preference has reduced significantly. This may be due to the several state schemes that, mostly were put in place around the 2010s or a few years earlier, so they haven't been implemented until post 2010 or changed the social problem they are trying to solve. I did learn a lot about the various policy schemes that the government are putting in place, locally and on a state and national scale. The policies, clearly, are working to some extent to have reduced son preference in most states in India.

SARA HAJ MOHAMED

Protocol development for the novel use of a protein crystallisation robot tailored to small organic molecules

Supervised by: Dr Elena Kabova

Research theme: Agriculture, Food & Health

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This research aimed to establish the optimal crystallization techniques to allow the adaptation of the protein crystallisation robot Oryx 8 to be utilized for crystallization experiments of small organic molecules. This is a vital area to research as obtaining the crystal structure information is critical in all stages of drug discovery, as it allows us to identify the different physico-chemical properties of the molecules. Examples include melting point, solubility and dissolution rate. These properties are vital as they have a direct influence on the drug stability and its absorption in the body. Crystallising small organic molecules is

currently difficult as we do not know the conditions required to make the crystals. Many of the drugs are small organic molecules, thus understanding the optimal conditions for small organic molecules crystallisation would greatly ease the manufacturing of drug molecules. Slow evaporation, vapour diffusion and crystallising under oil were identified as suitable crystallisation methods for protocol development. It was decided that all crystallisation experiments can be performed in sequence to identify the best method to yield single crystals. This project provided a great insight into the knowledge regarding crystallization techniques.

SIMEON GURR

The Evolution of the River Thames and its Impact on Prehistoric Landscapes and Human Societies

Supervised by: Dr Dan Young

Research theme: Heritage & Creativity

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The study of past climates and their effect on human societies has been the focus of significant research in recent years. The analysis of the change in river characteristics and their deposits over time has played an important part in reconstructing past environments. QUEST (or quaternary scientific) are an archaeological and environmental science service that are part of SAGES at the university, and have begun to develop a deposit model (a model that displays the spatial distribution and/or thickness of geological deposits) for the Lower Thames Valley. This project looked to expand this model upstream from Battersea (the current limit of the model) with the aim to further identify areas

of topographical extremes within the gravel surface and outline areas of high palaeoenvironmental and archaeological potential. The analysis of over 4,500 borehole records from the BGS archives has helped to produce a set of high-resolution deposit models for the Middle and Lower Thames. These models have helped to identify multiple features such as palaeochannels, eyots (gravel islands that are deposited within braided river systems) and terraces within the gravel surface. Areas of palaeoenvironmental and archaeological importance have also been highlighted which may represent areas for future work to be undertaken.

SOL SANDERS-FARMER

How Well can Boundary Stability Be Estimated From Sunrise and Sunset Times?

Supervised by: Dr Natalie Harvey and

Dr Helen Dacre

Research theme: Environment

Manninen et al. (2018) propose an atmospheric boundary layer (ABL) classification technique that uses sunrise and sunset times to estimate the stability of the ABL, in the absence of surface flux data. To evaluate the effectiveness of this method, the ABL classification technique presented by Harvey et al. (2013) is applied to five years of Doppler lidar and sonic anemometer data from the Chilbolton Observatory in Southern England. The classification technique is first applied using sonic anemometer data to calculate the surface heat flux, from which ABL stability is estimated, and then is applied assuming stability during the night

and instability during the day. When using sunrise and sunset times to calculate stability, unstable ABL types are diagnosed 15.8% more of the time. On average, the ABL becomes unstable two hours earlier in the morning and becomes stable two hours later in the evening. No significant difference in morning or afternoon crossover timing was found when considering only clear days. The results of this study highlight the importance of including sonic anemometer data when using ABL classification schemes, particularly in identifying the morning and afternoon transitions.

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SOPHIE CHARLWOOD

Designing a 3D Real-Time Visualisation of Kinematic Data From Smart Clothing

Supervised by: Dr Soma Chakraborty

Research theme: Agriculture, Food & Health

The UROP project was conducted using a previously produced smart garment which contained 11 inertial measurement unit (IMU) sensors positioned at key positions of the body in order to capture the animation. The data collected from these sensors was used to create a 3D animation in an open source 3D graphics software called Blender to then be used in a web app front end interface.

I was researching this area for an external company called KYMIRA, which is linked to the Biomedical Engineering department at the University of Reading. The key motivation for the project was to

see whether it was possible to create an animation from these sensors which could potentially be used in smart clothes produced by the company in the future.

This project has allowed me to learn about animation which was a completely new area for me, it was really interesting learning about animation and graphics and having the opportunity to learn and work with a new software. The project has also allowed me to work on my Python programming skills as this was heavily used throughout the UROP.

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TINA MARGRET D MELLO

Language production in healthy bilingual vs neurologically impaired bilingual individuals

Supervised by: Dr Arpita Bose

Research theme: Agriculture, Food & Health

In this project, we analysed the English language characteristics from connected speech samples collected from healthy bilinguals and bilinguals diagnosed with Alzheimer's Disease. This will then be compared with the Bengali language analysis and the data will help characterise language production in healthy and neurologically impaired English-Bengali bilingual individuals, as part of a larger ongoing investigation. Results from the larger study will help add to the growing literature studying the effects of bilingualism on neurological impairments. This could further inform speech and language therapy and intervention plans for bilingual patients.

A significant finding, from a short literature search conducted during this project, was the lack of

studies conducted with individuals speaking in South Asian/Indian languages.

Some of my own personal take-aways from this research project include learning how to conduct a literature search, expanding my knowledge on Aphasia and communication impairments associated with neurological diseases, learning how to perform linguistic analysis, and developing a keen sense of criticality and wider thinking. Moreover, this UROP project has been my gateway into the field of research and has encouraged me to pursue further research opportunities, and possibly even a career in research in my area of interest.

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TOBY BARLOW

Re-Imagining the Highstreet – Oxford Road

Supervised by: Professor Lorraine Farrelly

Research theme: Environment

Throughout my six weeks I was working on a scoping study of Oxford Road, Reading. In order to secure funding for a community regeneration project. By analysing the history and function of this vibrant Highstreet and combining this with studying successful case studies of previous community projects. I came up with my own set of proposals that outlined my first considerations of implementing a community project on to Oxford Road. I visualised these ideas and used this to engage with potential stakeholders. From these

conversations I found that a bottom up approach would be the most successful way of conducting this project, working with communities to see how they would like Oxford Road to be improved. It was amazing to work on a live project and I was able to develop my communication and research skills throughout this time, giving me confidence to do this in the future. I am looking forward to finding out the outcome of whether or not the funding has been secured.

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TOM QUINLAN

Mapping the foodscape & food access of Whitley and its surrounding area

Supervised by: Professor Mike Goodman
and Dr Sally Lloyd-Evans

Research theme: Agriculture, Food & Health

I researched Whitley and its surrounding area and looked specifically at food access. Whitley is a very deprived area and some of it falls into the 20% most deprived areas in the UK. This means that food poverty and access to healthy food options can be a problem therefore in mapping the different places to buy food as well as how people are able to get to these places it started to show how they were restricted and why they may be struggling, especially now with COVID 19. One observation that stood out was the lack of shops, restaurants

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and takeaways that are actually in the area that is the 20% most deprived in the UK. This is significant as it means it is harder for those living in this area to access any types food without a significant journey, thus restricting them from pulling them out of deprivation. Personally, I have gained a lot of new knowledge about the area of Whitley as well as further knowledge on the geographies of food. I am now looking to continue this research in the area and have therefore decided to build on these findings as part of my dissertation.

URVI PILLAI

Developing pharmacological resources on effects of agonists and antagonists

Supervised by: Professor Gary Stephens,
Dr Mark Dallas and Professor Vitaliy
Khutoryanski

Research theme: Agriculture, Food & Health

The main aim of this project was to generate engaging and informative learning resources about the action of agonists and antagonists. We used planarian worms as a model system to study these effects. We investigated the mechanism of action of dopamine receptor agonist and the antagonist, haloperidol, and measured the effect these compounds had on the movement of planarian worms. The resources and protocols were designed to be used as a part of undergraduate teaching of the new BSc Pharmacology programme. This project encourages students to review important material before attending the practical sessions to help consolidate their learning. This will have a positive impact on their learning.

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While doing the experiments to generate a set of model class data, the results suggested that planarian movement increased when exposed to 100 μ M dopamine. Whereas, planaria movement decreased when exposed to 20 μ M haloperidol. This difference in behaviour is likely due to the pharmacological effect the agonist and an antagonist used have on dopamine receptors in the planaria nervous system.

By completing this project, I have gained valuable hands-on experience of research work and working collaboratively. I have also had the opportunity to develop a scientific protocol which will be used as a part of future undergraduate teaching.

WILL HINTON

Investigating the Representation of 3D Scenes in Moving Observers

Supervised by: Professor Andrew Glennerster and Dr Marialena Stefanou

Research theme: Agriculture, Food & Health

One possible explanation of the way in which humans represent 3D scenes is that they construct a 3D map whereas an alternative explanation avoids the construction of a 3D map, based on recent neural network modelling. The present research uses an immersive virtual reality 'hom-ing' task where participants return to a location they have seen before. What is novel about this task is that participants' view is restricted so that they cannot match their current view with the original one to complete the task. We compare the ability

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of two models to predict these data. The results will be used by the University of Oxford and Google DeepMind to help distinguish between 3D reconstruction and neural network alternatives as models of human behaviour. Personally, this project has introduced me to many skills, including research, data analysis and coding among many more. Using these skills in an area of psychology that I am new to has made me more confident as a researcher, which is a career I am looking forward to pursuing.

WILLIAM HUDSON

The Impact of Football Clubs in Their Local Area

Supervised by: Professor James Reade

Research theme: Prosperity & Resilience

Football clubs have an enormous impact on their local areas, they are incredibly important in supporting local jobs and the local economy, albeit that massive matchday crowds also bring with them negative externalities at times. The aim of this project was to see how fans and residents of areas with football clubs assess the impact, and whether they would be willing to ensure they remain there.

We made some interesting findings: The average pub-going fan spends £21.70 each matchday; Of the 31 responses we received, 13 would be willing to pay to prevent the departure of a club from its local area to the tune of £291.67; And that games

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being televised doesn't dramatically reduce the willingness to attend games.

The main disadvantage to this project was the disappointing number of responses that we received to our survey – something we hope to learn from in future research.

Personally, I have learnt a great deal, particularly when it comes to researching past academic literature and the ways in which research can be carried out, along with different ways of framing questions. This has helped particularly with my understanding of behavioural economics.

YIZHOU TU

Measuring international flows of waste electrical and electronic equipment

Supervised by: Dr Stefania Lovo and
Dr Sam Rawling

Research theme: Prosperity & Resilience

In this programme, we focused on the e-waste exported from European Union countries to those less economically developed countries in African. As the time period 1996 to 2005 considered as the starting point when consumption such electric and electronic equipment start showing rapid increase, we collect the trade data of three categories of e-waste, including fridges, laptops, and telephones for analysis.

Generally, telephone showed the largest increase among all the countries due to the popularization of such products and the relatively fast replacement. Laptop has relatively gentle increase in all countries

compare to telephone. It shows more dramatic changes in the countries with better economy. In contrast, fridges showed the flattest trend in three categories among all countries as it might contained more component defined as waste instead of e-waste.

By participating in this programme, my research skills have largely improved, and I learned more techniques in conducting data analysis. I also studied and applied more useful commands with the software Stata as well as how to interpret the result generated from the perspectives of a econometrician.

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YUQI WANG

Women in Football

Supervised by: Professor James Reade and
Professor Marina Dell Giusta

Research theme: Prosperity & Resilience

Women in Football project specifically focus on the football field. We study women managers in a male-dominated field, football. By focusing on their perceptions to discuss the leadership they adopted in the workplace and the difficulties they face. This project conduct survey within China and the UK, collecting female coaches and managers perspective about their working condition and their understanding of the norms. The result shows that women football coaches are receiving significant pressures from the environment, their obstacles

mostly come from society and the unsustainable future of women football. Despite they are trying to get away from the restrain of the traditional social norms, however, they are still experiencing the existing discrimination in the club and nonsupport from their family. From this project, I start to pay attention to the gender issues within the football area, not only I developed the skill of conducting the survey, but this project also adjusts my attitude toward female athletes and female managers.

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