SCHOOL OF PSYCHOLOGY
SEMINAR SERIES

2020-2021

Organisers

Dr Wiekse van Zoest
W.VanZoest@bham.ac.uk

Ms Sophie Watson
S.Watson.2@bham.ac.uk
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<tr>
<th>Date/Location</th>
<th>Speaker</th>
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<tr>
<td>Oct 7th, 1pm-2pm</td>
<td>Prof. James Haxby</td>
<td>Hyperalignment: Modeling shared information encoded in idiosyncratic cortical topographies</td>
<td>Dr Clayton Hickey</td>
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<tr>
<td>Nov 4th, 4pm-5pm</td>
<td>Prof. Steve Luck</td>
<td>Linking scalp ERPs to computational models of language and vision with representational similarity analysis</td>
<td>Prof. Kim Shapiro</td>
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### Hyperalignment: Modeling shared information encoded in idiosyncratic cortical topographies
Information that is shared across brains is encoded in idiosyncratic fine-scale functional topographies. Hyperalignment jointly models shared information and idiosyncratic topographies. Pattern vectors for neural responses and connectivities are projected into a common, high-dimensional information space, rather than being aligned in a canonical anatomical space. Hyperalignment calculates individual transformation matrices that preserve the geometry of pairwise dissimilarities between pattern vectors. Individual cortical topographies are modeled as mixtures of overlapping, individual-specific topographic basis functions, rather than as contiguous functional areas. The fundamental property of brain function that is preserved across brains is information content, rather than the functional properties of local features that support that content.

### Linking scalp ERPs to computational models of language and vision with representational similarity analysis
Linking neural data from humans to computational models can be challenging given that the empirical data and the model outputs are in completely different representational spaces (e.g., voxels/electrodes versus processing units). This problem is solved by representational similarity analysis (RSA), which involves presenting many different inputs to each system and examining the similarity of the neural or model responses to each pair of inputs. Although one might expect that the spatial resolution of the ERP technique would be too poor for RSA, we have found that RSA can effectively link ERP scalp topographies to computational models in the context of complex natural stimuli, providing millisecond-level temporal resolution. In this presentation, I will describe two of these studies. In the
first, ERPs were recorded while participants listened to stories, and we used RSA to link the word-level ERP data to computational models of natural language processing. In the second study, ERPs were recorded while participants viewed photographs of natural scenes, and we used RSA to link the ERP sensory responses to a computational model of saliency, to spatial maps of semantic richness, and to a deep convolutional neural network model of scene classification.

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<tr>
<td>Weds 18th Nov 1pm-2pm Online – Zoom link TBC</td>
<td>Prof. Martin Pickering University of Edinburgh, UK</td>
<td>TBC</td>
<td>Dr Steven Frisson</td>
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<tr>
<td>Weds 25th Nov 1pm-2pm Online – Zoom link TBC</td>
<td>Dr Joo-Hyun Song Brown University, USA</td>
<td>TBC</td>
<td>Dr Dietmar Heinke</td>
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**December 2020**

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<tr>
<td>Weds 9th Dec 1pm-2pm Online – Zoom link TBC</td>
<td>Dr Suliann Ben Hamed The CNRS Lyon, France</td>
<td>TBC</td>
<td>Dr Joff Lee</td>
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**March 2021**

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<tr>
<td>Weds 24th Mar 1pm-2pm Online – Zoom link TBC</td>
<td>Prof. Holly Branigan University of Edinburgh, UK</td>
<td>TBC</td>
<td>Dr Katrien Segaert</td>
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**SCHOOL OF PSYCHOLOGY SEMINAR SERIES**

**2019-2020**

### September 2019

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<tr>
<td>Mon 9th Sept 11am-1pm</td>
<td>Prof. Roberto Giugliani</td>
<td>Rare Diseases Landscape in Brazil</td>
<td>Kate Woodcock</td>
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<td>LC-UG06</td>
<td>Federal University of Rio Grande do Sul (UFRGS)</td>
<td>Brazil is a country of continental dimensions, with over 200 million inhabitants and many social inequalities. The latter are reflected on its health system, which comprises a large public health care provider called Unified Health System (SUS), and a private health insurance component. Around seventy five percent of the Brazilian population depends on SUS, which thus far does not provide adequate coverage for rare diseases. In 2014, it was introduced by the Ministry of Health the “Policy for the Integral Attention to Subjects with Rare Diseases”, establishing guidelines for offering diagnosis and treatment for these conditions. The policy defines the two main axes, genetic and non-genetic rare diseases. According to the policy, reference services for rare diseases will be installed throughout the country and will receive public funds to provide comprehensive diagnosis and management, including to the citizens whose health care depends on SUS. Despite this policy was not effectively implemented so far, there are several initiatives in operation in the country in this field, and thousands of patients, families and health professionals from all Brazilian regions have already benefited from the services, training programs and research projects provided. An overview about rare diseases in Brazil and about how the creative solutions were implemented to partially address the needs on diagnosis and management of these conditions, will be presented.</td>
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### October 2019

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<tr>
<td>Weds 2nd Oct 1-3pm</td>
<td>Prof. Sam Johnson</td>
<td>Improving educational outcomes for children born preterm: From evidence to intervention</td>
<td>Andrew Surtees</td>
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<td>Old Gym LG10</td>
<td>University of Leicester</td>
<td>Two to three children in an average sized primary school class are likely to have been born preterm, before 37 weeks of gestation. Increasing preterm birth rates coupled with improved survival rates means that many more preterm</td>
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children will enter the education system in the coming years. Preterm birth can have lifelong consequences for the developing child and can affect attainment at school. This presentation will review evidence about the cognitive, behavioural and educational outcomes of children born preterm and outline how we have built on the evidence base to develop and evaluate an e-learning programme for education professionals to improve preterm children’s performance at school.

November 2019

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<tr>
<td>Weds 6th Nov 1-3pm Old Gym LG10</td>
<td>Prof. Sonia Johnson University College London</td>
<td>Is loneliness a good target for interventions in mental health?</td>
<td>Matthew Broome</td>
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Loneliness has risen rapidly to prominence in public discourse and in research. It is closely, perhaps inextricably linked to various forms of mental health problem, and thus a potential target for interventions to improve quality of life and outcomes among people with mental health problems, and also potentially to prevent mental health problems. In my talk I will discuss why the social has lagged behind the other elements in the biopsychosocial triad in intervention development, and what we currently know about the relationship between loneliness and mental health problems. I will describe some approaches to loneliness in mental health contexts, and introduce the work of the UKRI Loneliness and Social Isolation in Mental Health network and the opportunities offered, aimed at achieving a step change in research in this area.

December 2019

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<tr>
<td>Mon 9th Dec 1-3pm Hills 120</td>
<td>Dr Michael Barnett-Cowan University of Waterloo</td>
<td>The need to accelerate content generation for virtual and augmented technologies</td>
<td>Max Di Luca</td>
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Virtual reality (VR) and augmented reality (AR) are interactive computer interfaces that immerse the user in a synthetic three-dimensional environment giving the user the illusion of being in that virtual setting in the case of VR or coexisting in physical and digital content in the case of AR. These technologies have rapidly grown in their accessibility to the general public and to researchers due to lower cost hardware and improved computer graphics. However, the true potential of these technologies is held back due to delays and costs associated with content generation. In this talk I will highlight a number of approaches we use in the multisensory brain and cognition lab to better understand the neural systems and processes that underlie multisensory integration in real and virtual environments. I will highlight the utility of using both commercially available virtual content as well as constructing
virtual content with gaming engines for experimental purposes. I will also suggest that recent advances using machine learning have the potential to dramatically reduce the time required to create highly realistic virtual content. I will also discuss the need to form multidisciplinary teams and industrial partnerships with the games industry in order to accelerate the development of VR and AR technology that have the potential to form the third revolution of computing.

### February 2020

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<tr>
<td>Tues 4th Feb</td>
<td>Dr Volker Steuber</td>
<td>Multi-level Models of Multiple Functional Roles of Synaptic Plasticity in the Brain</td>
<td>Maria Pssarrou</td>
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<td>10.30-12pm</td>
<td>University of Hertfordshire</td>
<td>In this talk, I will describe a number of modelling studies at different levels of description that explore computational functions, and the underlying mechanisms, of different types of synaptic plasticity. I will focus on the functional roles and mechanisms of synaptic plasticity in the cerebellum, a brain structure that is important for the control of movements, motor learning and many higher cognitive functions. Our results suggest that different forms of synaptic plasticity at different time scales can implement many diverse functions such as associative memory, noise resistance, multiplicative operations and the transformation between different types of neural code. I will discuss the relation between cerebellar synaptic plasticity and movement disorders that are based on cerebellar dysfunction, and I will describe the application of machine learning algorithms to analyse neuronal activity during epileptic seizures. Furthermore, I will touch on the interactions between homeostatic synaptic and structural plasticity in neuronal networks with asynchronous irregular activity.</td>
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<td>Chemical Engineering 124</td>
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<tr>
<td>Weds 12th Feb</td>
<td>Dr Riikka Mottonen</td>
<td>Stimulating the talking and listening brain</td>
<td>Hyojin Park</td>
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<td>1-3pm</td>
<td>University of Nottingham</td>
<td>The human brain enables us to communicate using speech. In this talk I will argue that speech production and perception rely on both motor and auditory systems and interactions between them. I will also demonstrate that non-invasive brain stimulation, especially TMS, provides a powerful tool to investigate auditory-motor mechanisms underlying speech communication. I will present evidence that age-related hearing loss affects the involvement of articulatory motor system in speech processing. Finally, I will discuss the role of auditory-motor and cognitive processes in language learning.</td>
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Despite much research, we have failed to make significant progress in developing lasting treatments for mental health disorders like addiction, binge eating and post-traumatic stress disorder in the past 50 years. These disorders are all largely acquired or ‘learned’ through maladaptive experience-dependent plasticity. This raises an intriguing question: can this maladaptive learning be ‘undone’ or suppressed and if so, how? I will present recent and ongoing work examining whether maladaptive memories can be pharmacologically or behaviourally altered for long-term behaviour change. I will focus on interference with memory reconsolidation, highlighting the state of the field and discussing how an understanding of the mechanisms that determine the memories’ fates will be key for developing improved treatments.
2018-2019 Programme

19.09.18 – Dr Athena Demertz

26.09.18 – Xavier Rodde and Rommany Jenkins

10.10.18 - Open Science Seminar

17.10.18 – Prof. Björn Rasch

07.11.18 – Prof. Frederic Gosselin

16.11.18 - Prof. Sabine Kastner

05.12.18 - Open Science Seminar

19.12.18 - Dr Heleen Slagter

09.01.19 - Open Science Seminar

30.01.19 – Dr Donna Littlewood & Dr Juulia Paavonen

13.03.19 – Dr Adam Hampshire

20.03.19 – Grant Workshop

27.03.19 – Dr Jacqui Rodgers

03.04.19 – Dr Maria Michail

11.04.19 – Dr Deborah Talmi

01.05.19 – Dr Andrew Bremner

22.05.19 – Prof. Sven Bestmann

05.06.19 – Dr Frankie Harrison

14.06.19 – Dr Mark Nielsen