School of Psychology Seminar

Contact: Dr. Ian Charest (i.charest@bham.ac.uk)

When & Where	Speaker	Title & Abstract	Host & Group	Link
Wed 28/09/2016 **1-2pm** **LC UG06**	**Prof. Russell Foster, University of Oxford**	**THE BODY CLOCK AND SLEEP: Science to Medicine** All life on earth has evolved under a rhythmically changing cycle of light and darkness, and organisms from single-celled bacteria up to man possess an internal representation of time. These 24 hour cycles, termed circadian rhythms, persist in the absence of external cues, and provide a means of anticipating changes in the environment rather than passively responding to them. In mammals, including man, light provides the critical input to the circadian system, synchronising the sleep/wake cycle to the external world. Russell's talk will include how sleep and circadian rhythms are generated, why sleep is important for health and cognition, how these systems are regulated by light, and the impact of sleep and circadian rhythm disruption on productivity and health.	**Andrew Bagshaw** School Seminar	http://www.ndcn.ox.ac.uk/team/russell-foster
Wed 9/11/2016 1-2pm University House 205	**Prof. Ed Wilding,** University of Nottingham	**Source constrained memory processing** In this talk I will draw on behavioural and electrophysiological data that is relevant to the question of how people interrogate their memories and perhaps prioritise some memory contents over others. For both forms of data, inferences about how people interrogate their memories are based on assessments of the cognitive operations to which new (unstudied) words are subjected during memory retrieval tasks. The findings point to fruitful ways in which investigations of memory retrieval processing can be pursued.	**Dr. Damian Cruse** School Seminar	https://www.nottingham.ac.uk/psychology/people/edward.wilding
Wed 23/11/2016 1-2pm University House 205	**Prof. Ole Jensen**	**Phase coding in sensory system** Networks in the brain must rely on powerful mechanism for routing and prioritizing information processing. In a larger set of attention and memory studies we have investigated the notion that alpha oscillations (9 – 12 Hz) are inhibitory and serve to route the information flow: 'gating by inhibition'. The alpha band activity is under top-down control by areas in the dorsal attention network. As such the alpha band activity serves an important role for shaping the functional architecture of the working brain. Gamma band activity (50 – 100 Hz) reflects feed-forward processing and is modulated by the alpha oscillations. Importantly, the gamma activity is coupled to the phase of the alpha oscillations. We propose that these	**Internal Seminar**	http://www.neuosc.com/

		coupled oscillations organize a code in the visual system serving to prioritize visual processing. In particular different visual objects are encoded a different phases of the alpha activity during encoding and working memory maintenance.		
	Dr. Thomas Schreiner	**The impact of replaying memories during sleep on memory formation** Sleep is essential for consolidating and integrating new memories into long-term memory, probably due to spontaneous reactivations of newly acquired memories. Reactivation processes can be triggered and enhanced when the sleeping brain is re-exposed to auditory memory cues, leading to improved recall performance. In this talk I will present a series of recent studies on the impact of replaying foreign vocabulary during sleep on memory performance and associated oscillatory activity. I will demonstrate that re-exposure to vocabulary cues during sleep benefits memory formation, while activity in the theta and sleep spindle range seems to play a prominent role in this context. Furthermore, I will illustrate the boundaries of cueing paradigms and present preliminary data on the phase-dependent cueing of memories during sleep.		https://scholar.google.com/citations?user=ZBgdvS0AAAAJ&hl=en
Wed 7/12/2016 1-2pm University House 205	**Prof. Richard Henson,** MRC-Cognition and Brain Sciences Unit	**Ageing, Brain and Cognition: Some results from the Cambridge Centre for Ageing & Neuroscience (CamCAN)** I will describe a range of results from neuroscientific investigation of approximately 700 people from 18-88 years of age in the CamCAN project (www.cam-can.org), including: 1) separating the effects of age on vascular vs neural components of the BOLD response by combining resting-state fMRI and MEG; 2) effects of white matter (measured from diffusion kurtosis imaging) on age-related changes in latency of evoked MEG responses, 3) state-dependent effects of age on fMRI connectivity across rest, sensorimotor-responding and movie-watching; and 4) structural equation modelling of the relationship between gray- and white-matter integrity, executive function, memory and age.	**Dr. Ian Charest** School Seminar	https://www.mrc-cbu.cam.ac.uk/people/rik.henson/
Wed 11/01/2017 1-2pm University House G03	**Dr. Rohan Borschmann**	**Self-harm in vulnerable and marginalised populations: Does it differ from the general population?** Self-harm continues to be a significant global health problem and is associated with considerable morbidity and mortality. Despite this, relatively little is known about the prevalence and patterns of self-harm in	**Dr. Jessica Woodhams** School Seminar	https://scholar.google.co.uk/citations?user=D-L2KmsAAAAJ&hl=en

		marginalised populations. Population-level risk factors for self-harm (such as mental disorder, substance use, a history of trauma and extreme socio-economic disadvantage) are normative in socially marginalised, vulnerable samples. As such, whilst population data can elucidate risk factors for self-harm at the population level, only data from marginalised cohorts can identify risk factors specific to marginalised cohorts. Drawing on multiple studies of the general population and of vulnerable adolescent and adult samples - such as those with a history of incarceration and victims of human trafficking - Rohan will discuss the differences and similarities between patterns of self-harm in the general population and in these vulnerable, marginalised populations.		
Wed 18/01/2017 1-2pm University House G03	**Dr. Eva Feredoes** Lecturer at the School of Psychology and Clinical Language Sciences, University of Reading	**Zapping states and maps: Exploring neural representations in attention and working memory using combinations of TMS and fMRI** Current models of attention and working memory suggest many shared cognitive processes and neural mechanisms, and I will present causal evidence using TMS and concurrent TMS-fMRI that contributes to this view. Specifically, across a series of behavioural TMS studies, we have shown that visual working memory items are in a flexible state determined by the allocation of attention, and which requires the involvement of visual brain areas. I will also present results from several concurrent TMS-fMRI studies suggesting that enhancement of neural representations is a general mechanism by which attention might protect relevant information in the face of competing irrelevant information. This work contributes to a growing body of evidence showing that short-term information representation is neurally more complex and dynamic than previously thought.	**Dr. Maria Wimber** School Seminar	http://www.reading.ac.uk/psychology/about/staff/e-a-feredoes.aspx
Wed 22/02/2017 1-2pm University House G03	**Dr. Roshan Cools** Donders Institute for Brain, Cognition and Behaviour, NL	**Dopamine, Decisions and Cognitive Control** Failures of cognitive control are common. Why do we so often fail to exert cognitive control? Classic (prefrontal) models of cognitive control address our ability to implement control. Recent advances have shifted the question to how we decide whether to recruit cognitive control. This involves re-conceptualizing cognitive control as a cost/benefit-based decision instead of an ability of implementation. I will review evidence that dopaminergic drugs like methylphenidate alter cognitive control, not just by modulating the ability to implement cognitive control, but also by biasing cost/benefit decision making about whether or not to exert cognitive control.	**Dr. Jennifer Cook** School Seminar	http://www.roshancools.com/

Wed 01/03/2017 1-2pm University House G03	**Prof. Lars Muckli** Centre for Cognitive Neuroimaging (CCNi) / Institute of Neuroscience and Psychology	**Visual Predictions in different layers of visual cortex** Normal brain function involves the interaction of internal processes with incoming sensory stimuli. We have created a series of brain imaging experiments that sample internal models and feedback mechanisms in early visual cortex. Primary visual cortex (V1) is the entry-stage for cortical processing of visual information. We can show that there are two information counter-streams concerned with: (1) retinotopic visual input and (2) top-down predictions of internal models generated by the brain. Our results speak to the conceptual framework of predictive coding. Internal models amplify and disamplify incoming information. The brain is a prediction-machinery. Healthy brain function will strike a balance between precision of prediction and prediction update based on prediction error. Our results incorporate state of the art, layer-specific ultra-high field fMRI and other imaging techniques.	**Dr. Ian Charest** School Seminar	http://muckli.psy.gla.ac.uk/
Wed 15/03/2017 1-2pm University House G03	**Dr. Simon Hanslmayr**	**Searching for memory in brain waves – The synchronization/desynchronization Conundrum** Brain oscillations have been proposed to be one of the core mechanisms underlying episodic memory. But how do they operate in the service of memory? Reviewing the literature a conundrum emerges as some studies highlight the role of synchronized oscillatory activity, whereas others highlight the role of desynchronized activity. In this talk I will describe a framework that potentially resolves this conundrum and integrate these two opposing oscillatory behaviours. I will present results from studies using different techniques to study oscillations (i.e. from EEG/MEG, EEG-fMRI, to human single unit and LFP recordings) and argue, based on these findings, that the synchronization and desynchronization reflect a division of labour between a hippocampal and a neocortical system, respectively. Specifically, whereas desynchronization is key for the neocortex to represent information, synchronization in the hippocampus is key to bind information. This novel oscillatory framework integrates synchronization and desynchronization mechanisms in order to explain how the two systems (i.e. neocortex and hippocampus) interact in the service of episodic memory. Finally, I will discuss open questions, specific predictions and challenges that follow from this framework. **Research Background** My research is focused on the role of brain oscillations for human cognition.	**Internal Seminar**	http://www.memorybham.com/simon-hanslmayr/

		Specifically I am interested in how brain oscillations mediate our ability to form and retrieve memories, or to attend to a particular aspect in our environment. In order to address these very complex questions I use an array of electrophysiological and imaging methods, such as EEG/MEG, fMRI, combined EEG-fMRI, and intracranial EEG.		
	Dr. Jessica Woodhams	**Crime linkage: Real world implications of testing its underlying assumptions.** Crime linkage is a police technique which is used internationally. It rests on theories of behavioural consistency and distinctiveness which have their roots in social and cognitive psychology. Behavioural consistency and distinctiveness have a long history of empirical research in psychology and models of personality such as the Cognitive Affective Personality System (Mischel & Shoda, 1995) would predict both consistency in behaviour over time and distinctiveness between individuals, in some circumstances. Prior to becoming an academic in 2002, I was a crime analyst specialising in the analysis of serial sexual offences and conducted crime linkage on a regular basis. Since becoming an academic most of my research has focused on testing the empirical underpinning of crime linkage as a practice with a variety of crime types (but mainly sexual offences). In 2013, the empirical support for crime linkage came under legal scrutiny in the Scottish Appeal case of HM Advocate v Thomas Ross Young. During the seminar, I will briefly outline what crime linkage is, how it is used, why it was important in this particular legal case, and how the research informed the decision made by the Appeal Court.		
Wed 17/05/2017 1-2 pm Murray Learning Centre UG05	**Dr. Tamar Makin**	**Brain plasticity in amputees** Following arm-amputation brain areas that previously operated the hand will become “freed-up” to work for other body parts. This process of brain plasticity is widely held to result in the experience of phantom limb pain (pain that is perceived to be arising from the missing hand), and is therefore considered to be maladaptive. I will present evidence to challenge this prevalent view, and instead demonstrate that representation of the missing hand persists decades after amputation. I will show that the cortical resources of the missing hand can be used by a multitude of body parts, and even artificial limbs. Based on this evidence, I suggest that plasticity in amputees is experience-dependant, and is not inherently maladaptive.	**Dr. Joseph Galea** School Seminar	https://www.ndcn.ox.ac.uk/team/tamar-makin

Wed 19/04/2017 1-2pm Law LT3	**Dr. Sam Chamberlain**	**title and abstract will appear soon**	**Dr. Stephane de Brito** School Seminar	http://www.neuroscience.cam.ac.uk/directory/profile.php?src33

Past Seminars

When & Where	Speaker	Title & Abstract	Host & Group	Link
Wed 7/10/2015 1-2pm Gisbert Kapp N225	**Internal School Seminar** Howard Bowman & Ian Charest	**Howard Bowman** – ***Attention Increases the Acuity of Conscious Perception: All-or none Percepts, Temporal Variance and the Simultaneous Type/ Serial Token Model*** We discuss EEG findings that suggest that conscious perception is more accurate when temporal attention is freely available. Specifically, we present evidence that conscious percepts are more delayed, more jittered and less strength sensitive during the attentional blink. We also discuss how the Simultaneous Type/ Serial Token model can explain these losses of acuity. **Ian Charest** – ***The brain of the beholder: Honouring individual representational idiosyncrasies*** In the early days of neuroimaging, brain function was investigated by averaging across voxels within a region, stimuli within a category, and individuals within a group. These three forms of averaging discard important neuroscientific information. Recent studies have explored analyses that combine the evidence in better-motivated ways. Multivariate pattern analyses enable researchers to reveal representations in distributed population codes, honouring the unique information contributed by different voxels (or neurons). Condition-rich designs more richly sample the stimulus space and can treat each stimulus as a unique entity. Finally, each individual's brain is unique and recent studies have found ways to model and analyse the interindividual representational variability, and relate an individual's brain representational geometries to his or her individual perceptual idiosyncrasies. Beyond basic science, the characterisation of individually unique brain function is likely to contribute to our understanding of disorders and of the continuous variation across patients. If functional brain imaging is to become useful in the diagnosis and monitoring of patients, we will need to develop a rich repertoire of methods for characterising subtle functional differences between individual brains and minds. In my talk, I will describe how combining neuroimaging, psychophysics and computational modelling can enable us to better understand the idiosyncratic nature of an individual's internal world, with the example case of the Autism Spectrum Condition.	Stephane De Brito, Internal School Seminar	http://www.birmingham.ac.uk/schools/psychology/people/profile.aspx?ReferenceId=69922 http://www.neuroscience.cam.ac.uk/directory/profile.php?ianc

When & Where	Speaker	Title & Abstract	Host & Group	Link
Wed 14/10/2015 1-2pm Gisbert Kapp N225	**Professor Susan Gathercole,** University of Cambridge	**Working memory training: what works or rather, what doesn't?** There has been immense interest in the potential of intensive training to improve cognitive capacities over the past decade, particularly in the field of WM. The critical issue both for theory and potential practical application is precisely what changes with training. Here I will present a framework for conceptualising transfer based on a systematic review of the field. Predictions from the framework are testedagainst training data from a large sample of children, using a Bayesian approach to weigh up evidence for the null hypothesis that training does not transfer. I conclude that transfer results from the establishment of new routines forunfamiliar tasks and the development of highly specific metacognitive strategies. The abilities to adapt to training in these ways relate to other general cognitive capacities.	Kimron Shapiro, School Seminar	http://www.mrc-cbu.cam.ac.uk/people/susan.gathercole/
Wed 28/10/2015 1-2pm Gisbert Kapp N225	**Professor Kia Nobre,** University of Oxford	**The tempos of attention** The proactive nature of the brain extends into the fourth dimension. In my talk I will discuss our research investigating how the brain uses various sources of temporal structure and prediction in the environment to shape our perception and cognition**.**	Uta Noppeney, School Seminar	http://www.ohba.ox.ac.uk/team/core-staff/kia-nobre
Wed 18/11/2015 Gisbert Kapp N225	**Internal School Seminar** Andrea Krott & Robin Thompson	**Andrea Krott – *Executive functions in bilingual speakers*** Bilingual speakers have been suggested to have developed superior executive control through life-long practice of controlling the interference of their 'other' language when speaking. They have been shown to outperform their monolingual counterparts in non-verbal tasks, especially in tasks that require the inhibition of task-irrelevant information such as the Simon or Eriksen Flanker task (Bialystok, Craik, Green, & Gollan, 2009). I will present results that suggest that the bilingual domain-general advantage stems from better attentional control rather than inhibitory control in these tasks. In addition, I will present ERP results that suggest that bilingual speaker's practice in inhibiting competing words from their 'other' language has improved their ability to resolve lexical competition within a language. **Robin Thompson – *Language as a multimodal communication system: insights from sign language*** Signed languages offer a unique window into language, and in particular, the extent to which it is shaped by and dependent on cognitive systems such as perception and action. Using a multimodal (signed and spoken languages) approach, I present research that sheds new light on aspects of language processing and learning. For example we see that lexical processing may be	Stephane De Brito, Internal School Seminar	http://www.birmingham.ac.uk/staff/profiles/psychology/krott-andrea.aspx http://www.birmingham.ac.uk/schools/psychology/people/profile.aspx?ReferenceId=71086

		shaped by modality, and that signers make use of iconicity, or transparency between meaning and form, in processing and acquisition (pointing to a general role of iconicity in grounding language into human experience). Simply put, sign language research can further our understanding of language, not as a system separated from other aspects of cognition, but one in which language is a system highly integrated with and dependent on other cognitive systems.		
When & Where	**Speaker**	**Title & Abstract**	**Host & Group**	**Link**
Wed 25/11/2015 1-2pm Gisbert Kapp N225	**Professor Martin Yeomans,** University of Sussex	**Satiety: The Integration of Cognition, Sensory and Nutritional signals.**There is still widespread belief that satiety, the suppression of appetite after eating, is purely a consequence of the effects of ingested nutrients. A wide variety of behavioural data challenge this basic view of satiety. Building on the satiety cascade idea first proposed by Blundell and Tremblay, this talk highlights a variety of lines of recent evidence arising from human experimental studies of satiety that demonstrate how subtle changes in the way foods and drinks are labelled and experienced alter the experience of satiety. A key concept is "honest signalling": the idea that the nutritional content of foods has to be signalled at the point of consumption for consumers to be able to adjust their subsequent intake, an idea that challenges the traditional approach to development of diet products. This research demonstrates the import role of expectations and orosensory processing in generating satiety, and shows how top-down control of the gut has been largely overlooked as an important component of satiety.	Suzanne Higgs/Jason Thomas, School Seminar	http://www.sussex.ac.uk/profiles/3030
Wed 2/12/2015 1-2pm Gisbert Kapp N225	**Professor David Sharp**, Imperial College, London	**Network dysfunction after traumatic brain injury** Diffuse axonal injury after traumatic brain injury (TBI) produces neurological impairment by partially disconnecting brain networks. This structural damage can be mapped using diffusion MRI, and its functional effects investigated in large-scale intrinsic connectivity networks (ICNs). I will review evidence that TBI significantly disrupts ICN function, and that this predicts cognitive impairment. This will be illustrated by focusing on two ICNs, the Salience Network and the Default Mode Network. The activity of these networks is normally tightly coupled, which is important for attentional control. Damage to the networks structural connectivity produces predictable abnormalities of network function and cognitive control. The demonstration of specific types of network dysfunction provides a target for novel treatments. Network oscillations are thought to support transient communication across the brain and play an important role in the control of	Andy Bagshaw, School Seminar	http://www.imperial.ac.uk/people/david.sharp

		behaviour. Therefore, the ability to externally modulate brain networks through transcranial brain stimulation is a promising new therapeutic direction. Transcranial alternating current stimulation (tACS) is a non-invasive neurostimulation technique by which alternating currents applied through the skull entrain, in a frequency-specific fashion, the neural oscillations of the underlying brain regions. I will present our early work using concurrent tACS and functional MRI to investigate the neural effects of phase dependent network modulation and discuss how this might be applied in clinical populations.		
Wed 9/12/2015 1-2pm Gisbert Kapp N225	**Internal School Seminar** Pia Rotshtein & Stephanie Burnett-Heyes	**Pia Rotshtein – *Cogwatch: The art of making tea in an FP7 interdisciplinary-multi-centre project.*** Cogwatch was a 3 year FP7 project with about 3.5m to spend between 7 partners. The aim of the project was to develop rehabilitative technology to support stroke survivors in activity of daily living. The project focused on two fronts. The first was to conduct research to understand the neuro-cognitive mechanisms supporting daily activity, the points these activities breakdown and defining efficient rehabilitation methods. The second front was to develop an intelligent technology based on the research findings that can be used in rehabilitation context. The talk will summarise in brief the achievement of the project on both fronts. **Stephanie Burnett-Heyes – *Peer networks in adolescence: Experimental correlates and factor structure*** Complete social network mapping provides a way to quantify features of real-world social relationships (e.g. their strength). Across several studies, adolescent peer networks (school classes) were mapped, and network variables interrogated for a relationship with experimental social cognition variables, i.e., investment in peers in Dictator Games. Results show an impact of relationship strength on investment, and of relationship reciprocation on investment in some groups, with mixed evidence for an effect of cross-sectional age on the impact of reciprocation. In an fMRI study, complete network mapping was undertaken for 30 adolescent participants prior to completing Dictator Games, ostensibly with peers, in the scanner. Results of cluster analyses to construct regressors for BOLD signal change based on social network variables will be discussed.	Stephane De Brito, Internal School Seminar	https://www.researchgate.net/profile/Pia_Rotshtein http://www.birmingham.ac.uk/schools/psychology/people/profile.aspx?ReferenceId=96221

Wed 13/01/2016 1-2pm LAW LT3	**Internal School Seminar** Amanda Wood & Jennifer Cook	**Amanda Wood – *Identifying predictors of risk and resilience for poor neuropsychological outcome following childhood brain insults (PROBIt)*** The impact of insults to the developing brain upon cognition and behaviour has far-reaching consequences for the child, their family, education and health care systems, and government expenditure. Many variables (illness, environmental) contribute to different outcomes following similar insults, and they exert their influence via the child's developing brain. Predicting which child will recover from early brain insult and identifying those at risk of poor outcome represents a major challenge, with significant health economic implications. An unexplored question is whether direct measurement of the structure and function of the developing brain can improve our ability to predict outcomes in the long-term. In this talk I will provide an overview of a series of planned studies that address key clinical, imaging and computational questions. **Jennifer Cook – *Social learning: fundamental mechanisms and individual differences*** Difficulties with social learning are thought to comprise a core characteristic of autism spectrum conditions. However, social learning difficulties are not restricted to the clinic, indeed problems with learning socially are thought to cost organisations billions in lost productivity each year. In this talk I will discuss the fundamental mechanisms underpinning social learning, question whether they can be dissociated from those that underpin learning from one's own experience, and comment on individual differences in social learning.	Stephane De Brito, Internal School Seminar	http://www.birmingham.ac.uk/staff/profiles/psychology/wood-amanda.aspx http://www.birmingham.ac.uk/staff/profiles/psychology/cook-jennifer.aspx
Wed 10/02/2016 1-2pm LAW LT3	**Professor Cristina Atance,** University of Ottawa	**Future-Oriented Reasoning in Children: Self, Other, and Psychological Distance** The last decade has seen a marked increase in research on children's, adults', and non-human animals' capacity to think about the future – often termed "episodic future thinking," "prospection," or "mental time travel." Although a key feature of such thought is a "mental projection of the self into the future," in the current talk, I describe data showing that in certain contexts children reason more accurately about another person's future than they do about their own. This "other-over-self" advantage is discussed in relation to "psychological distance" or, the capacity to mentally separate oneself or "step back" from the immediate situation and environment. More specifically, I argue that distancing from the self by adopting another person's perspective (i.e., "social distancing") helps children focus less on	Sarah Beck School Seminar	https://socialsciences.uottawa.ca/psy/professor-profile?id=136&pageID=1

		their own current, salient states, and more on the future states that they must predict. In addition, I describe data that hint at the fact that self-other differences are influenced by "who" the other person is, and by the nature of the task. I conclude my talk by briefly discussing the theoretical relevance of these findings, as well as their practical implications for optimizing future-oriented reasoning.		
Wed 17/02/2016 1-2pm LAW LT3	**Internal School Seminar** Stephen Wood & Damian Cruse	**Stephen Wood – *The relationship between schizophrenia and autism*** Although now believed to be two distinct disorders, autism spectrum disorders (ASD) and schizophrenia spectrum disorders (SSD) share multiple phenotypic similarities and risk factors, and have been reported to co-occur at elevated rates. In this presentation, I will give a brief overview of the phenomenological, genetic, environmental, and imaging evidence for the overlap between ASD and SSD, highlighting similarities and areas of distinction. I will go on to present data that provides evidence for and against possible alternate models of explanation for the association and comorbidity between the disorders. Understanding how and why these disorders co-occur has important implications for diagnosis, treatment, and prognosis, as well as for developing fundamental aetiological models of the disorders. **Damian Cruse – *Cognitive electrophysiology and disorders of consciousness*** Following a severe brain injury, many patients develop a disorder of consciousness in which they appear to be awake but exhibit little or no awareness of themselves or their environments. Electroencephalography provides an inexpensive, portable, and clinically viable means of characterising the perceptual and cognitive abilities retained by these non-behavioural patients. This information can inform more accurate diagnoses and prognoses, and can even be used to provide a communication outlet for some patients. In this talk, I will give an overview of my previous work in this area and outline my future plans for Birmingham.	Stephane De Brito, Internal School Seminar	http://www.birmingham.ac.uk/staff/profiles/psychology/wood-stephen.aspx http://www.birmingham.ac.uk/schools/psychology/people/profile.aspx?ReferenceId=103757
Wed 9/03/2016 1-2pm LAW LT3	**Internal School Seminar** **Carmel Mevorach & Davinia Fernández-Espejo**	**Carmel Mevorach – *Individual differences in distractor suppression – could that be all the difference?*** Distractor suppression is a fundamental attention process that is called upon in a variety of scenarios. However, we are not all equally able to efficiently suppress irrelevant distractors. The most obvious example is following brain damage to the parietal cortex (particularly to the left hemisphere), were we have previously shown that patients are almost unable to ignore a distractor if it is more salient than the target (Mevorach et al., 2006, Mevorach et al., 2014).	Stephane De Brito Internal School Seminar	http://www.birmingham.ac.uk/schools/psychology/people/profile.aspx?ReferenceId=8857 http://www.birmingham.ac.uk/schools/psychology/people/profile.aspx?ReferenceId=103759

		Differences in our ability to suppress distractors are also visible in healthy aging (e.g., Tzvetanov et al., 2013) and there is also growing body of evidence pointing to the effects of expression of Autism or Psychosis on distractor suppression (e.g., Riby et al., 2012; Poirel et al., 2010), though the pattern here seems less straight forward. In this talk I will present some new data looking at how differences in distractor suppression can be linked to other tasks – such as motor control, supporting the notion that individual differences in distractor suppression may have an overarching effect. Furthermore, I will make the case that distractor suppression itself may be performed in (at least) two different ways (pro-active vs. re-active suppression, cf. Braver, 2012) and that individual/group differences in Autism and Psychosis may be associated with different biases towards one or the other modes. Finally I will consider the brain mechanisms (particularly in the parietal cortex) that may be critically related to these differences. **Davinia Fernández-Espejo – *I can only imagine; the overt versus covert paradox in the Vegetative State*** It is well accepted that a significant number of vegetative state patients are covertly aware and capable of following commands by modulating their neural responses in motor imagery tasks, despite remaining entirely non-responsive behaviorally. However, to date there has been no attempt to explain this dissociation between preserved covert and absent overt behavior. In this talk, I will present a mechanistic explanation for this cognitive-motor dissociation, based on multimodal neuroimaging data. I will argue that two separate clinical syndromes may arise as a result of subtle regional differences in the patterns of brain damage after severe brain injury: a 'true' vegetative state and the still un-named condition of covert awareness with absent physical responses. Finally, I will discuss potential in vivo biomarkers for their differential diagnosis.		
Wed 23/03/2016 1-2pm LAW LT3	**Professor Susan Gathercole,** University of Cambridge	**CALM and collected: A dimensional approach to developmental disorders of attention, learning and memory** There are few invariant cognitive characteristics within the diagnostic categories of ADHD, dyslexia, Specific Language Impairment or dyscalculia, but the overlap of symptoms and co-morbidity across the different diagnoses are high. Findings are reported from a study designed to identify the common and potentially co-occurring cognitive dimensions that underpin this pattern of low sensitivity and specificity of conventional diagnoses. A new research clinic has been established in Cambridge for children that span attention, learning (to include language and academic attainment) and/ or memory, referred by practitioners in education and health. At the clinic, children complete a wide	Kimron Shapiro School Seminar	http://www.mrc-cbu.cam.ac.uk/people/susan.gathercole/

		range of cognitive assessments, and parent rate their behaviour. The children are also invited back for MRI scanning. Despite high variability in routes by which the children are referred and the reasons cited for their referral, a simple dimensional structure characterises the profiles of the first 230 children attending the clinic. General learning abilities are highly associated with a verbal dimension, and a highly specific association has been established between nonverbal abilities, rated behavioural problems, and maths achievement. This approach illustrates the value of adopting a broad-based dimensional approach not only for understanding the fundamental constraints on children's learning, but on the guiding the selection of appropriate interventions that are based on symptom profile rather than diagnosis		
Tues 19/04/2016 1-2pm MECH-B05	**Dr François Osiurak,** Université de Lyon, France	**On the neurocognitive origins of human tool use: Toward a reasoning-based approach** Tool use is a defining feature of human species. So, the issue of the underlying neurocognitive bases should be intensively explored. Yet, this issue has received very little interest, mainly because of the profound belief that tool use is based on manipulation knowledge, as if tool use did not require any reasoning skills. In this talk, I will discuss the main recent advances in neuropsychology and cognitive neurosciences that have contributed to revise the idea that manipulation is central to tool use. This will lead me to present a new theoretical model suggesting that specific reasoning skills are involved in tool use.	Dietmar Heinke & Sarah Beck, School Seminar	http://tinyurl.com/jrskjdf
Wed 27/04/2016 1-2pm LAW LT1	**Professor Stephanie van Goozen,** Cardiff University	**Identifying Risk Pathways in Aggressive Children** Antisocial behaviour committed by youngsters is an issue of concern. Although most research focuses on identifying specific contextual or social factors that impinge on the developing child, there is a growing consensus that child-specific (i.e., genetic, temperamental) factors contribute importantly to the development and persistence of antisocial behaviour. We have shown in previous work that conduct disordered (CD) children and juvenile offenders have an under-activity of the ANS and HPA axis systems, which could explain why they experience difficulties in regulating affect and behaviour, and that attenuated reactivity of the ANS in infants predisposes to aggressive behaviour later in life. In this talk I will present recent findings from a line of research on the role of emotional deficits in children with Attention-	Stephane De Brito School Seminar	http://psych.cf.ac.uk/contactsandpeople/academics/vangoozen.php

		Deficit/Hyperactivity Disorder (ADHD). Although approximately 20-50% of children with ADHD develop antisocial behavioural problems or conduct disorder, the processes underlying this link are not fully understood. Genetic risks strongly contribute to the development of antisocial and aggressive behaviour in ADHD and previous studies have shown involvement of COMT Val158Met, a gene variant that is thought to be associated with emotional dysfunction (Langley et al., 2010; Thapar et al., 2005). We tested whether COMT Val158Met is associated with impaired affective response, and whether impaired affective response mediates between COMT Val158Met and aggressive behaviour in children with ADHD (Van Goozen et al., 2015). In my presentation I will argue that researching neurobiological functioning in at-risk youngsters not only indicates which individuals are most likely to persist in engaging in aggressive behaviour, but can also guide the development of new interventions that target these neurobiological deficits.		
Wed 18/05/2016 1-2pm LAW LT1	**Professor Martijn van den Heuvel,** UMC Utrecht	**Exploring the human connectome** Embracing network science as a general framework to study the wiring of nervous systems, a species' connectome, studies have shown nervous systems to reveal several features of an efficient communication network, including cost-effective wiring, pronounced community structure, short communication relays, combined with the existence of densely connected hub regions interlinking multiple domains. As observed across the nervous systems of a wide range of species, emerging evidence suggests the ordering of brain connectivity into topological local systems to form the anatomical structure for the emergence of specialised brain functions. However, the formation of clustered connectivity networks and brain specialisation alone cannot account for all aspects of brain function. Indeed, mounting evidence suggests that integrative processes and dynamic interactions across multiple distributed regions and systems underpin advanced cognitive processes. In my talk, I will highlight and discuss findings of a 'rich club organization' of nervous systems, discussing the important role of a densely connected 'rich club' core in	Sam Lucas, BUIC Seminars	http://www.myconnectome.nl/

		brain systems, suggesting the existence of a selective group of high-degree hub regions that form a densely connected backbone of neural connectivity. Offsetting their high cost in terms of investment of neural resources, I will discuss theories that suggest that rich club organisation may bring topological integration in nervous systems, bringing significant advantages for complex brain function. I will discuss a potential 'richness' of this club at different scales of brain organization, discuss findings of macroscale and microscale aspects of neural connectivity to be linked, and discuss how disruption in a rich club system may form an important factor in the aetiology of brain disorders, in particular for brain disorders that are characterised by a disruption of integrative brain processes, such as schizophrenia.		
Wed 29/06/2016 1-2pm LAW LT1	**Professor Jonn Duncan,** University of Cambridge	**A core brain system in assembly of cognitive episodes** All human cognition is controlled in a series of attentional episodes, breaking complex problems into simpler, more solvable sub-problems. In human fMRI studies, a common or multiple-demand (MD) pattern of frontal and parietal activity is associated with diverse cognitive demands, and with standard tests of fluid intelligence. Based on behavioural, neuropsychological, fMRI and single unit data, I suggest that the core function of MD cortex is to control complex cognition in a structured sequence of attentional episodes. Using multivoxel pattern analysis of human fMRI data, I show widespread coding of attended information across MD regions. Using single unit data from the behaving monkey, I examine dynamics of task representation as a complex sequence of attentional episodes is constructed and executed.	Kim Shapiro School Seminar	http://www.neuroscience.cam.ac.uk/directory/profile.php?johnduncan
Wed 28/09/2016 **1-2pm** **LC UG06**	**Professor Russell Foster, University of Oxford**	**THE BODY CLOCK AND SLEEP: Science to Medicine** All life on earth has evolved under a rhythmically changing cycle of light and darkness, and organisms from single-celled bacteria up to man possess an internal representation of time. These 24 hour cycles, termed circadian rhythms, persist in the absence of external cues, and provide a means of anticipating changes in the environment rather than passively responding to them. In mammals, including man, light provides the critical input to the circadian system, synchronising the sleep/wake cycle to the external world. Russell's talk will include how sleep and circadian rhythms are generated, why sleep is important for health and cognition, how these systems are regulated by light, and the impact of sleep and circadian rhythm disruption on productivity and health.	Andrew Bagshaw School Seminar	http://www.ndcn.ox.ac.uk/team/russell-foster

When & Where	Speaker	Title & Abstract	Host & Group	Link
Tue 23/09/14, 1-2 pm Mechanical Engineering B01	**Zyg Pizlo,** Psychology, Purdue	**A new look at human problem solving: near-optimal solutions to NP-hard problems.** The systematic study of human problem solving started a century ago as part of the Gestalt Revolution. Concepts such as insight, means-ends, goal-directedness, purposiveness, mental representation, and heuristics stimulated a substantial amount of research that set the stage for the modern work of Newell and Simon. Newell and Simon relegated mental representation to the back burner of Artificial Intelligence when they emphasized the role of search in problem solving. In hindsight (always 20/20) it is obvious that search cannot form the basis of intelligent problem solving because the search spaces of most interesting problems are too big and human working memory is too small. During the last 20 years there has been a growing interest in documenting and explaining human performance in combinatorial optimization tasks, such as the Traveling Salesman Problem (TSP). These tasks are interesting because their search spaces are enormous and many real-life problems belong to this class. I will begin by describing experiments showing how humans produce near-optimal TSP tours in linear-time. I follow this with a presentation of a computational model that emulates this kind of human performance. This model is based on the known anatomy and physiology of the human visual system. It also incorporates the known limitations of human working memory, as well as what we know about visual attention. The two main operations of the model are: (i) hierarchical clustering, and (ii) a coarse-to-fine sequence of approximations of the TSP tour. The key element of this model is starting with the correct mental representation of the problem; this allows the search of the problem space to be kept to a minimum. This approach is completely opposite to the way in which human problem solving has been studied and modeled during the last half a century. The abstract nature of the new model, along with its key operations of clustering (chunking) and top-down reasoning, should make this model a good starting point for formulating a general theory of human problem solving.	Andrew Schofield, CN-CR	http://www1.psych.purdue.edu/~zpizlo/
Thu 02/10/2014 4-5 pm Learning Centre UG06	**Peter Jones,** Psychiatry, Cambridge	**Is the 'At-Risk Mental State' at risk?** Bio: Prof. Peter B. Jones MSc MD PhD FRCP FRCPsych FMedSci Peter Jones is Professor of Psychiatry & Head of the Department of Psychiatry at the University of Cambridge. He is a board member of Cambridge University Health Partners and directs the NIHR Collaboration for Leadership in Applied Health Research & Care (CLAHRC) for Cambridgeshire & Peterborough. Peter's research concerns the epidemiology of mental illness, particularly the psychoses, early life course influences on adult mental health and illness, and the interface between population-based and biological investigations and explanations, including genetics. He also works in treatment research with randomised trials of drug and psychological treatments for psychotic illness. Clinically, Peter works as an honorary consultant to the Cambridgeshire & Peterborough Foundation Trust's early intervention service for young people with first episode psychosis (CAMEO http://www.cameo.nhs.uk/). He has been a non-executive director of a specialist mental health NHS trust (2001-2005), served as a co-opted expert on the Advisory Council on the Misuse of Drugs consideration of the legal status of cannabis (2005 & 2008) and coordinates the Royal College of Psychiatrists Early Intervention Network. He became a NIHR Senior Investigator in 2010.	Stephen Wood, School of Psychology	http://www.neuroscience.cam.ac.uk/directory/profile.php?pbj21

When & Where	Speaker	Title & Abstract	Host & Group	Link
Thu 09/10/2014 1-2 pm Learning Centre UG05	**Bernhard Spitzer,** Freie Universitat Berlin	**From sensation to abstraction: Post-sensory integration of quantity information in humans** The mind's faculty of evaluating most different types of information quantitatively is ubiquitous in human cognition and forms a cornerstone of traditional psychophysics, yet the neural mechanisms behind subjective assessments of magnitude are not fully understood. Building on previous single-cell findings in sensory and numerical delay tasks, I will present studies of large-scale brain mechanisms that may underlie the encoding, maintenance, and comparison of magnitude information in humans. A particular focus will be on EEG studies of oscillatory alpha- and beta-band activity in sensory and prefrontal areas during scalar working memory processing, with supplementary evidence from fMRI and TMS. More recent work, utilizing convolution modeling, addresses the role of low-frequency cortical dynamics during the online-integration of discrete events into concepts of abstract quantity, as may underlie our daily decisions and comparative choice. Collectively, the analyses highlight the operation of modality-independent, potentially abstract quantification mechanisms at post-sensory processing stages in fronto-parietal cortices.	Maria Wimber, BUIC	http://www.ewi-psy.fu-berlin.de/en/einrichtungen/arbeitsbereiche/neurocom_neuroimag/team/b_spitzer/index.html
Wed 15/10/2014 1-2 pm Learning Centre UG05	**Patrick Haggard,** UCL	**Sense of agency for voluntary, goal-directed actions** Sense of agency refers to the feeling of controlling one's own intentional actions, and, through them, causing changes in the outside world. Sense of agency is thus a key product of the healthy adult mind, while many psychopathologies involve abnormal sense of agency. However, sense of agency is difficult to measure. Explicit reports of agency are rather unusual in everyday life, and display numerous biases. I will describe an alternative approach based on implicit measures of agency, from time perception. Intentional actions and their outcomes are perceived as compressed, or bound together in time. I will report a number of studies on the neural mechanism of this effect, and also describe more recent data suggesting how it may contribute to the control of goal-directed action.	Uta Noppeney, CN-CR	http://iris.ucl.ac.uk/iris/browse/profile?upi=PHAGG98
Wed 22/10/2014 1-2 pm Mechanical Engineering B01	**Marko Nardini,** Durham University	**Learning and the organisation of brain mechanisms for sensory inference during childhood** Obtaining knowledge about the world through the senses is challenging because mappings from sensory to behaviourally-relevant properties are often indirect. For example, one cannot directly map the array of light registered on the retina to correct judgments of whether an object is edible or not. However, multi-layer neural networks can solve problems of this kind, and information processing in the brain has long been characterised as hierarchical. Many perceptual operations also seem to be well described as a form of probabilistic inference. Thus, both theory and anatomy lead to an understanding of perception as statistical inference dependent on hierarchically organised cortical processing. Key components of this broad framework that are not yet understood are the processes of development and learning by which hierarchical cortical networks are tuned to provide efficient solutions to problems of sensory inference. Recent findings that human perceptual development continues long into childhood and even adolescence indicate that the finely tuned perceptual systems seen in adults emerge only following a very long period of experience-dependent learning. I will present recent studies on the development of visual and multisensory cue combination, which provide a way in to understanding how brain mechanisms for sensory inference are organised via learning during childhood.	Ulrik Beierholm, School of Psychology	https://www.dur.ac.uk/psychology/staff/?id=11704

When & Where	Speaker	Title & Abstract	Host & Group	Link
Thu 30/10/2014 1-2 pm Frankland 309b	**Niko Kriegeskorte,** CBU, Cambridge	**The geometry of high-level visual representations** Vision can be understood as the transformation of representational geometry from one visual area to the next, and across time, as recurrent dynamics converge within a single area. The geometry of a representation can be usefully characterized by a representational distance matrix computed by comparing the patterns of brain activity elicited a set of visual stimuli. This approach enables us to compare representations between brain areas, between different latencies after stimulus onset, between different individuals and between brains and computational models. Results from fMRI suggest that the early visual image representation is transformed into an object representation that emphasizes behaviorally important categorical divisions more strongly than accounted for by visual-feature computational models that are not explicitly optimized to distinguish categories. Twenty-eight computational model representations, ranging from classical computer-vision features to neuroscientifically motivated models like HMAX, failed to fully explain the strong categorical divisions in IT. A deep convolutional neuronal network trained by supervised techniques on over a million category-labeled images came closest to explaining the IT representation. The categorical clusters appear to be consistent across individual human brains. However, the continuous representational space is unique to each individual and predicts individual idiosyncrasies in object similarity judgements. The representation flexibly emphasizes task-relevant category divisions through subtle distortions of the representational geometry. MEG results further suggest that the categorical divisions emerge dynamically, with the latency of categoricality peaks suggesting a role for recurrent processing	Maria Wimber, BUIC	https://www.mrc-cbu.cam.ac.uk/people/nikolaus.kriegeskorte/
Thu 6/11/2014 4-5 pm Frankland 309b	**Karina Linnell,** Goldsmiths University of London	**Lessons learnt from a remote culture: Urbanisation, the 'big picture', and attentional (dis)engagement** I will report findings with a remote culture, the Himba of northern Namibia, which demonstrate their extraordinary capacity to ignore contextual information and to concentrate on the task in hand, as long as they stay in their remote villages. Himba who move to town become indistinguishable from our London-based undergraduates in their selection behaviour. I will suggest that urbanisation encourages exploration at the cost of attentional engagement and report the first test of this attentional-state account of urbanisation.	Dietmar Heinke, School of Psychology	http://www.gold.ac.uk/psychology/staff/linnell/
Tue 11/11/2014 1-2pm Hills 1.20	**Prof. Ted Milner** , Dep. Biomed. Eng., McGill	**Robot-assisted rehabilitation of hand function following stroke** Impairment of hand function is one of the most persistent motor deficits following stroke. Given the biomechanical complexity of the hand and the critical role played by somatosensory feedback in the control of dexterous hand movements, rehabilitation of hand function presents a significant challenge. We began designing systems for robot-assisted rehabilitation of hand function about 8 years ago, focusing primarily on grasp and twist motion and coordinated finger actions. In this talk, I will describe the impairments that we have identified, the rehabilitation exercises that we have developed and the improvements in hand function that post-stroke subjects are able to achieve following training. I will also describe current projects aimed at better understanding how sensory information is processed in motor (re-)learning following stroke using functional connectivity analysis in resting-state fMRI.	Chris Miall, CN-CR	http://www.mcgill.ca/edu-kpe/facilities/ncl

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Thu 13/11/2014 1-2 pm Frankland 309b	**Máté Lengyel,** Cambridge	**A sampling-based representation of uncertainty: neural and behavioural evidence** A broad range of cognitive processes, including perception, memory, and motor control, operate in the face of substantial uncertainty, due to noise and ambiguity in the environment, the body, and the brain itself, by closely following the rules of optimal probabilistic inference. However, the neural representation of uncertainty underlying these probabilistic computations is currently unknown. I will describe the mathematical theory of a sampling-based representation of uncertainty, according to which the cortex generates sequential statistical samples from the probability distributions that it needs to represent. I will then present two lines of evidence supporting this hypothesis, using multielectrode recordings in the visual cortex of awake ferrets, and psychophysical data in a perceptual decision making performed by human participants.	Ulrik Beierholm, CN-CR	http://www3.eng.cam.ac.uk/~ml468/
Wed 19/11/2014 1-2 pm Frankland 309b	**Internal School Seminar** Fay Julal & Andrew Bagshaw	**Fay Julal: Attachment style predicts change in placement of mother and father in adults' attachment networks** The hierarchical mapping technique (HMT) assesses the organisation and content of attachment networks. Parents with whom adults report an insecure attachment are placed at a further distance from the core-self. Yet, the extent to which attachment style predicts distance from the core-self over and above other important relationship characteristics is unknown. Further, the longitudinal effects of attachment style on change in distance from the core-self have not been explored. I will report the findings of a short-term longitudinal, mixed methods study that examined characteristics of parent-adult child relationship as predictors of change in the organisation and content of young adults' attachment networks over time. **Andrew Bagshaw: Sleep and the Human Brain** Although sleep is ubiquitous across the animal kingdom and affects every aspect of waking life, its purpose remains unclear. One thing that most people agree on is that sleep is 'of the brain, by the brain, and for the brain' (see the paper of the same name by Hobson, Nature 2005). When trying to understand human sleep, this means that non-invasive brain imaging tools need to be developed and applied. I will summarise our recent work using fMRI, EEG-fMRI and MEG to study the sleeping brain and the relationship between sleeping patterns and waking brain function.	Stephane De Brito	http://www.birmingham.ac.uk/staff/profiles/psychology/bagshaw-andrew.aspx
Wed 26/11/2014 1-2 pm Frankland 309b	**Mike X Cohen,** Univ. Amsterdam	**Midfrontal Cortex Theta Oscillations: Causes and Consequences** We and others have been studying the role of midfrontal theta-band (~6 Hz) activity in cognitive control. This field is about 10 years old, although it started gaining traction in 2009. I'll briefly review this nascent literature, outline what I think are the main discoveries and challenges, and describe what I think are the important future developments.	Simon HansImayr, BUIC	http://www.mikexcohen.com/
Wed 3/12/2014 1-2 pm Frankland 309b	**Chris Bird,** University of Sussex	**Remembering complex events** Humans are able to remember in detail events from our lives. This ability involves many complementary processes carried out by different structures in the brain. For example, the hippocampus plays a role in representing the spatial context in which events take place. Other brain regions reactivate memories in a similar manner to which they were first experienced, allowing us to recreate past events in our "mind's eye". Finally, a different set of brain regions may be necessary to tell a story about what happened, transforming the memory from	Maria Wimber, BUIC	http://www.sussex.ac.uk/psychology/people/peoplelists/person/280383

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		a rich sensory experience that is likely to be forgotten rapidly, into a fixed narrative that can be stored for long periods.		
Wed 10/12/2014 1-2 pm Hills 1.20	**Internal School Seminar** Joff Lee & Bernhard Staresina	**Joff Lee: Memory reconsolidation: what, when & why.** When memories are reactivated (i.e. recalled), this is not a simple read-out of the stored trace, but instead can trigger and active destabilisation of the memory, necessitating its reconsolidation in order to restabilise it. This phenomenon has been observed is species from sea slugs to humans, though we primarily study rodent memory paradigms. I will summarise our recent work showing that reconsolidation is likely universal and that it provides an ideal substrate for modifying memories. This may make the targeting of reconsolidation a therapeutic strategy for conditions such as PTSD and drug addiction. **Bernhard Staresina: Episodic reinstatement in the awake and resting brain.** The essence of episodic memory is the notion that past events and experiences are phenomenologically reinstated when we remember. In the first functional magnetic resonance imaging study, I will present data showing that event-specific brain patterns present during learning are indeed reinstated during successful recall. I will then ask whether this mechanism of episodic reinstatement may also be used by the resting brain to automatically replay and thus solidify past experiences.	Stephane De Brito	http://www.birmingham.ac.uk/staff/profiles/psychology/lee-jonathan.aspx http://www.birmingham.ac.uk/schools/psychology/people/profile.aspx?ReferenceId=85571
Wed 21/1/2015 1-2 pm MECH-B22	**Internal School Seminar** Jane Raymond & Dietmar Heinke	**Jane Raymond: Interactive Effects of Attention and Motivation on Visual Cognition** Traditionally, studies of human selective visual attention and working memory have involved simple relatively meaningless stimuli without affective content, such a letters or numbers. Yet, everyday experiences tell us that familiarity and past experience plays an important role in determining what we notice and what we ignore. To explore the mechanisms by which prior learning and long-term memory alter on-going visual cognition (attention and working memory), my lab group have conducted a series of behavioural and EEG experiments combining value-learning procedures with visual cognition tasks. In general we find that stimuli imbued with positive or negative value associations are processed faster and more efficiently than similarly familiar stimuli of no value and that reward-associated stimuli are particularly successful at capturing higher order visual processes. **Dietmar Heinke: Highlights from the Computational Psychology Lab (CPL)** I will present highlights from three lines of research in my lab. In the first part I present a connectionist model of spontaneous traits inference (STI) and spontaneous traits transference (STT). Currently differences found between the two processes are explained by a dual-process theory. Our model demonstrates that the current evidence is not sufficient to support this theory and instead, evidence can be explained with a single, associative process. A crucial assumption in the connectionist model is that less attention is paid in STT than in STI. In an eye movement study we found supporting evidence for this assumption. Second, a large body of evidence supports the automatic extraction of visual affordance (i.e. action possibilities) in single object displays. We examined affordance processing of object pairs commonly used together, e.g. a spoon and a bowl. We demonstrated that this scenario results in an affordance selection, i.e. the affordance of the active object (e.g. spoon) is	Stephane De Brito	http://www.birmingham.ac.uk/staff/profiles/psychology/raymond-jane.aspx http://www.birmingham.ac.uk/staff/profiles/psychology/heinke-dietmar.aspx

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		facilitated while the affordance of the passive object (e.g. bowl) is inhibited. Third, evidence from our lab and work by Song and Nakayama suggests that attentional selection "leaks" into reaching movements. We developed a neurologically inspired robotics model of this leakage using LEGO Mindstorms. Moreover, a large body of evidence indicates that attention operates with a coarse-to-fine strategy when selecting objects in visual scenes. We showed that this attentional strategy also "leaks" into reaching movements.		
Wed 4/02/2015 1-2 pm LC-UG05	**Krish Singh,** Psychology, Cardiff	**Dynamic causal modelling of MEG-measured sensory-motor oscillatory dynamics: New synaptic insights into individual variability, disease and pharmacological manipulation?** There has been increasing recent interest in using EEG/MEG oscillatory responses as "windows" onto synaptic function, both in terms of probing individual variability and how this might impact cognitive functions, but also in terms of new markers of disease and testing the action of pharmacological agents. These oscillatory responses can come from very simple low-level sensory-motor tasks, that are robust and repeatable, and in this talk I shall describe several studies from our group using both visual and motor paradigms. In addition, by using appropriate physiologically-informed modelling approaches, such as Dynamic Casual Modelling (DCM), we may be able to make inferences about modulations in synpatic connection strengths or temporal dynamics within specific neural populations, providing additional information about variability, disease mechanism, and pharmacological action that may go beyond the simple data features. In this talk I shall show several examples of using DCM in this way to illustrate both strengths and limitations of this approach.	Kim Shapiro, School of Psychology	http://psych.cf.ac.uk/contactsandpeople/academics/singh.php
Mon 9/02/2015 2-3pm MECH-B22	**Joo-Hyun Song,** Brown University	**How do perception, cognition, and action interact in a complex visual environment?** Most real world visual scenes are complex and crowded. Instead of a single isolated object, multiple objects compete for attention and directed action. Thus, successful interactions with this complex external world require seamless coordination among multiple brain systems. To date, this integrated process has typically been broken down into three general components—cognition, perception, and action—each studied independently, rather than as part of an integrated whole. Furthermore, at present, the motor systems are mostly seen merely as tools that implement action plans chosen by cognitive processes. However, we demonstrated that visually-guided action tasks not only provide insight into visuo-motor behavior itself, but also reveal glimpse into otherwise hidden yet significant dynamic internal representations. In addition, we also showed that that motor areas known to be involved in planning and executing eye and hand movements are also critically involved in higher-level cognitive processes. Taken together, perception, cognition and action are highly flexible and interactive processes.	Dietmar Heinke, School of Psychology	http://www.brown.edu/Departments/CLPS/people/joo-hyun-song
Wed 18/02/2015 1-2pm LC UG07	**Anil Seth,** University of Sussex	**Mind the body** The brain is not just a machine to think with, and the body is not just a machine to move with. We are "beast machines" with our intelligence, and our conscious experiences, deeply rooted in our specific physiology. In particular, the experience of embodied selfhood rests critically on how the brain perceives its body, both from the outside (exteroception), and from the inside (interoception). In this talk I will develop a view of embodied selfhood through the lens of 'predictive processing', by which perception is construed as a	Uta Noppeney, School of Psychology	www.anilseth.com

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		process of (active) inference on the causes of sensory signals. I will introduce a model of interoceptive inference which says that subjective feeling states (emotions) arise from actively inferred predictive models of the causes of interoceptive signals. The model also predicts that embodied selfhood is grounded in active inference of those signals "most likely to be me" across interoceptive and exteroceptive domains. I will present some recent evidence illustrating this view, including a novel version of the 'rubber hand illusion' incorporating visual feedback of heartbeat signals via augmented reality. These ideas and findings guard against naïve computational theories of mind, brain, and consciousness, which push the body into the background. At the same time they also bring new relevance to some old ideas in AI that are typically associated with cybernetics and predictive control.		
Wed 4/03/2015 1-2 pm Frankland 309b	**Dr. Jon Roiser,** ICN, UCL	**Bonsai trees in your head: the powerful influence of reflexive processes on goal-directed decision-making** Decision-making in the real world is tricky, because the decisions we make now affect future choices, and future choices and outcomes should guide current decisions. The exponentially increasing number of combinations of future choices and actions means that brute-force approaches to sequential decision-making only work for trivially small problems. Using a computational modelling approach to analyse responses on a deterministic sequential decision-making task, we demonstrate a novel and powerful influence on goal-directed decision-making in humans, "pruning"; a simple reflexive process that cuts down (or prunes) an expanding decision tree to a computationally manageable size. Pruning involves automatically discounting sequences of decisions that feature large negative outcomes, no matter what the overall outcome; it is different to loss aversion. Our participants used this pruning strategy even when it was disadvantageous, and the tendency to prune was related to mild depressive symptoms. In a follow-up neuroimaging study we replicated this behavioural pattern, and found that pruning was associated with responses in the subgenual anterior cingulate cortex and amygdala, which are implicated in mood and anxiety disorders. Finally, initial psychopharmacological evidence supports the hypothesis that pruning is influenced by serotonin signalling. We interpret these findings within a theoretical framework that relates Pavlovian behavioural inhibition to serotonin and mood disorders.	Stephane De Brito, School of Psychology	http://www.icn.ucl.ac.uk/Staff-Lists/MemberDetails.php?Title=Dr&FirstName=Jonathan&LastName=Roiser
Wed 18/03/2015 1-2 pm Frankland 309b	**Dr. Tristan Bekinschtein,** University of Cambridge	**Transitions of consciousness: how wakefulness modulates different aspects of cognition** Understanding levels of consciousness and the transitions between conscious and unconscious states has important theoretical and clinical implications. Yet despite the fact that we typically enter a state of unconsciousness every night, remarkably little is known about how we fall asleep or lose consciousness while getting sedated. In a series of hd-EEG experiments of people falling asleep or getting sedated with propofol, we explored the limits of perceptual and semantic decisions, inhibitory control, top-down and bottom-up target detection and introspection. We found there is a differential modulation of the cognitive control capacities by wakefulness. In the transition to unconsciousness, drowsiness affects inhibitory control and top-down target detection earlier than perceptual and abstract (semantic) decisions. We can take decisions, learn, perceive when losing consciousness and even when unconscious, but these are different. We believe these results may help to link experimentally the Information Integration Theory of Consciousness and the Global Neuronal Workspace Theory.	Uta Noppeney, School of Psychology	http://www.neuroscience.cam.ac.uk/directory/profile.php?trisbke

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Wed 25/03/2015 1-2pm MECH-G26	**Prof Rolf Ulich,** University of Tuebingen	**Temporal discrimination and the internal reference model** Several findings from duration perception literature suggest that when making decisions about time, participants rely on an internal reference memory for time rather than merely on the current physical stimuli. According to a recent account, such an internal reference is formed by a continuous dynamic updating process that integrates duration information from previous trials and the current trial. In the present work, I show how such a dynamic mechanism can account for various psychophysical phenomena including the classical yet unresolved Vierordt effect.	Max Di Luca, CN-CR	http://www.uni-tuebingen.de/en/faculties/faculty-of-science/departments/psychologie/research-groups/cognition-and-perception/research-group/rolf-ulrich.html
Wed 15/04/2015 1-2pm LC-UG07	**Prof Shihui Han,** McGovern Institute for Brain Research, Peking	**Racial in-group bias in empathy: What, why, and wow** Humans empathize for others' pain but do not empathize everyone equally. I'll talk about our recent brain imaging research of racial in-group bias in empathic neural responses to others' suffering. These studies demonstrate the key role of social intergroup relationship in emotional understanding and sharing, reveal the neural, cognitive, and genetic mechanisms underlying racial in-group bias in empathy, and illustrate how laboratory manipulations and life experiences can reduce the racial in-group bias in empathic neural responses. The implications of these studies will be discussed.	Pia Rotshtein, School Seminar	http://www.psy.pku.edu.cn/LABS/CSCN_lab/index.html
Wed 13/05/2015 1-2pm LC-UG09	**Prof Sophie** Scott, UCL	**The science of laughter** Research into laughter is dwarfed by the scale of work into emotions such as fear and disgust, however it is probably one of the most frequently encountered emotional expressions. In this talk I will outline the physical bases of laughter, and aspects of its evolution. I will describe the disparities between people's lay understanding of when we laugh, which tend to be focussed on humour with studies which reveal the social foundations of laughter. I will address the neural basis of the perception of laughter and discuss how these studies may relevant to the roles of laughter in interactions.	Stephane De Brito, School Seminar	http://www.icn.ucl.ac.uk/Staff-Lists/MemberDetails.php?Title=Prof&FirstName=Sophie&LastName=Scott
Mon 18/05/2015 1-2pm LC-UG06	**Prof Melissa Green**, UNSW	**Carving psychosis at its biological joints: genetic traction or academic friction?** The use of clinical diagnostic categories as targets for genetic investigation arguably represents the Achilles' heel of modern psychiatric research. Despite continuing advances in genomics, and the cooperation of global consortia providing ever-larger discovery samples, the "missing heritability" problem remains. That is, while heritability for schizophrenia and bipolar disorder is estimated at 70-80% (and an estimated 60% of genetic risk shared by these conditions), large-scale genome-wide studies of samples comprising both disorders have so far implicated many common alleles of small effect, accounting for only 23% of variance in risk. Other studies that implicate rare genetic variants (of larger effect) are limited in the capacity to generalize to the broader population of psychosis sufferers. Strategies for delineating biologically homogenous sub-phenotypes of these disorders are therefore critical to advance knowledge of the genetic contributions to psychosis. My research addresses these issues with the application of well-established statistical methods to large samples of patients with schizophrenia and bipolar disorder, in an effort to establish genetic contributions to cognitive and brain abnormalities associated with these conditions . This presentation will describe my recent and ongoing work in this area, including novel findings to date, and the pervasive barriers to progress that the field of psychiatric genetics has yet to overcome.	Stephen Wood, School Seminar	https://research.unsw.edu.au/people/associate-professor-melissa-jayne-green

When & Where	Speaker	Title & Abstract	Host & Group	Link
Wed 15/07/2015 1-2pm Hills 1.20	**Dr Martin Wilson, BUIC**	**Magnetic Resonance Spectroscopy: from neuro-oncology to neurocognition.** This is an introductory lecture from BUIC's new MR Physicist, highlighting his previous work at Birmingham Children's Hospital and future research focus.	Maria Wimber, BUIC Seminar	
Tue 23/09/14, 1-2 pm Mechanical Engineering B01	**Zyg Pizlo,** Psychology, Purdue	**A new look at human problem solving: near-optimal solutions to NP-hard problems.** The systematic study of human problem solving started a century ago as part of the Gestalt Revolution. Concepts such as insight, means-ends, goal-directedness, purposiveness, mental representation, and heuristics stimulated a substantial amount of research that set the stage for the modern work of Newell and Simon. Newell and Simon relegated mental representation to the back burner of Artificial Intelligence when they emphasized the role of search in problem solving. In hindsight (always 20/20) it is obvious that search cannot form the basis of intelligent problem solving because the search spaces of most interesting problems are too big and human working memory is too small. During the last 20 years there has been a growing interest in documenting and explaining human performance in combinatorial optimization tasks, such as the Traveling Salesman Problem (TSP). These tasks are interesting because their search spaces are enormous and many real-life problems belong to this class. I will begin by describing experiments showing how humans produce near-optimal TSP tours in linear-time. I follow this with a presentation of a computational model that emulates this kind of human performance. This model is based on the known anatomy and physiology of the human visual system. It also incorporates the known limitations of human working memory, as well as what we know about visual attention. The two main operations of the model are: (i) hierarchical clustering, and (ii) a coarse-to-fine sequence of approximations of the TSP tour. The key element of this model is starting with the correct mental representation of the problem; this allows the search of the problem space to be kept to a minimum. This approach is completely opposite to the way in which human problem solving has been studied and modeled during the last half a century. The abstract nature of the new model, along with its key operations of clustering (chunking) and top-down reasoning, should make this model a good starting point for formulating a general theory of human problem solving.	Andrew Schofield, CN-CR	http://www1.psych.purdue.edu/~zpizlo/
Tue 08/07/2014, 11 am, NG08 in Biosciences (R27)	**Paul Mullins,** Psychology, Bangor University	**Functional Spectroscopy? What is it and why would we do it?**	Stephen Mayhew, BUIC	http://www.bangor.ac.uk/psychology/people/profiles/paul_mullins.php.en
Thu 26/06/2014 4-5 pm Hills 1.20	**Internal School Seminar**	Howard Bowman "Is Conscious Perception Necessary (and / or Sufficient) for Working Memory Encoding: Dissociating Identification Accuracy from Subjective Visibility in the Attentional Blink" & Chris Oliver "Behavioural phenotypes of genetic disorders: Getting beyond the group stage"		
Tue 10/06/2014 1-2 pm Aston Webb	**Richard Epstein & Chew Soo Hong,** Psych. & Econ, Nat. Univ.	**Molecular genetics of economic decision making and behavior** This talk is based on a large scale study of the molecular genetics of choice behaviour involving more than 3000 Han subjects in China and in Singapore who each contributed blood or saliva samples. We analysed subjects' DNA and	Ulrik Beierholm, Psychology	http://www.fas.nus.edu.sg/psy/_people/ebstein.htm

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WG05	Singapore	observed their choice behaviour in incentivized tasks involving both individual decision making, such as risk, ambiguity, and time, and social decision making, including other regarding behaviour (such as altruism, fairness, envy, and trust) and strategic thinking (inferred from auctions and the p-beauty game). This talk will focus on two specific findings (see appended abstracts). One is based on risk taking behaviour observed over three individual choice tasks. Another finding concerns a sense of indignation elicited from responders' behavior in a standard ultimatum game in contrast with their behavior in a modified ultimatum game with a randomized proposer. Time permitting, I will discuss additional findings such as those based on telomere length, hormonal response, and gene expression.		
Thu 15/5/2014 4-5 pm Hills 1.20	**Aidan Horner,** UCL	**Episodic memory, the hippocampus and pattern completion** Episodic memory refers to our ability to consciously recall previous life events. Such events are often complex in nature, requiring the binding of multiple multimodal elements. For example, we might remember where we were, who we were talking to and what object they gave us at the time. The hippocampus is thought to support this binding process by acting as a 'convergence zone', receiving input from multiple unimodal sensory regions. The binding of multiple elements into coherent 'event engrams' is believed to allow for their complete retrieval following the presentation of a partial cue ('pattern completion'). Here I present neuropsychological evidence that the hippocampus is critical to the retrieval of multimodal (pairwise) associations, and that non-hippocampal medial temporal lobe regions can support retrieval of single event elements. Using magnetoencephalography, I further provide insight into the temporal progression of such retrieval. I will also present new behavioural and fMRI work that provides evidence for the existence of complex multi-element (i.e., >2 elements) event engrams and show that these engrams are retrieved via pattern completion. Taken together, the work supports the notion that the hippocampus binds the multiple multimodal elements of an event into coherent 'event' representations, allowing for their retrieval via pattern completion.	Maria Wimber, BUIC	http://www.icn.ucl.ac.uk/ahorner/
Thu 8/5/2014 4-5 pm Hills 1.20	**Marius Usher,** Tel Aviv University	**We See More Than We Can Report: Cost-Free Color Phenomenality Outside Focal Attention** The distinction between access consciousness and phenomenal consciousness is a subject of intensive debate. According to one view, visual experience overflows the capacity of the attentional and working memory system: We see more than we can report. According to the opposed view, this perceived richness is an illusion—we are aware only of information that we can subsequently report. This debate remains unresolved because of the inevitable reliance on report, which is limited in capacity. In this talk I will describe a number of studies, in which we attempt to bypass the report capacity limitation, by probing color diversity—a unique summary statistic—which is sensitive to detailed visual information. Participants were shown a Sperling-like array of colored letters, one row of which was precued. After reporting a letter from the cued row, participants estimated the color diversity of the noncued rows. Results showed that people could estimate the color diversity of the non cued array without a cost to letter report, suggesting that color diversity is registered automatically, outside focal attention, and without consuming additional working memory resources.	Howard Bowman, CN-CR	http://socsci.tau.ac.il/psy-eng/index.php/staff/faculty/32-marius-usher

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Thu 10/4/2014 4-5 pm Hills 1.20	**Rodrigo Quian Quiroga,** University of Leicester	**Concept cells** Intracranial recordings in patients suffering from intractable epilepsy allow studying the firing of multiple single neurons in awake and behaving human subjects. These studies have shown that neurons in the human medial temporal lobe respond in a remarkably selective, invariant and explicit manner to particular persons or objects, such as Jennifer Aniston, Luke Skywalker or the Sydney Opera House. I will show the main characteristic of these neurons and argue that they are the building blocks for declarative memory functions.	Simon HansImayr, BUIC	http://www2.le.ac.uk/departments/engineering/research/bioengineering/neuroengineering-lab/
Thu 3/4/2014 4-5 pm Hills 1.20	**Chris Summerfield,** Oxford	**Attention and adaptation in human perceptual categorisation** Decisions typically require information to be gathered from multiple sources, evaluated and combined. Canonical views in sensory neuroscience argue that human perceptual classification judgments are optimised by lossless integration of reliability-weighted evidence, furnishing choices that match those of an ideal observer. Here, we describe a series of experiments in which participants viewed multiple discrete samples of information, either simultaneously or sequentially, and made a judgment based on their average. We show that the impact (weight) that information carries on choice varies with slow fluctuations in cortical excitability over the parietal cortex, leading to a rhythmic "bottleneck" that gates the passage of information into a accumulator signal in motor beta-band activity. Dividing attention between two streams does not preclude the conversion of perceptual to decision signals in the parietal cortex, but allows information to leak away from the accumulator. Finally, I will describe a computational model of adaptive gain control in human perceptual categorisation, with evidence from behaviour, pupillometry, and functional neuroimaging.	Uta Noppeney, CN-CR	http://decisions.psy.ox.ac.uk/
Fri 28/3/2014 4-5 pm, Frankland 309	**Ming Hsu,** UC Berkeley	**Neural and Genetic Basis of Strategic Learning** Decision-making in the presence of other competitive intelligent agents is fundamental for social and economic behavior. Such decisions require agents to behave strategically, where in addition to learning about the rewards and punishments available in the environment, they also need to anticipate and respond to actions of others competing for the same rewards. However, whereas we know much about strategic learning at both theoretical and behavioral levels, only recently have researchers begun to uncover their biological underpinnings. In this talk I will discuss three studies where my colleagues and I sought to address these questions using data from functional neuroimaging, focal lesion patients, and gene pathway analysis.	Ulrik Beierholm, School of Psychology	http://neuroecon.berkeley.edu
Thu 20/3/2014 4-5 pm Hills 1.20	**Roi Cohen Kadosh,** Oxford	**Enhancing Cognition Using Neuromodulation in the Typical and Atypical Brain: Promises and Perlis** Cognitive disabilities, with either developmental or acquired origin, are linked to structural and functional abnormalities in certain brain areas. They are also associated with poor educational and occupational outcomes. Cognitive interventions show only limited success for treatment. In order to alleviate the burden on affected individuals and society as a whole, we need to target neural deficits. Transcranial electrical stimulation (tES), which can either enhance or decrease cortical excitability, is a promising neuromodulation tool that has the capacity to selectively modulate brain activity and induce positive behavioral changes. In a series of experiments with healthy adults and children with learning difficulties we found that it is possible to enhance performance using tES in a variety of cognitive tasks, such as numerical, and problem solving and adaptive reasoning	Jason Braithwaite, School of Psychology	http://cohenkadosh.psy.ox.ac.uk/

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		tasks. In some cases the observed improvements were long-lasting, and were specific to the trained material and stimulated site. Overall, this suggests that tES is a possible method for the improvement of cognition. This has important implications for the future of education, learning, and neuroplasticity. However, do such enhancements come at a cost? For this, you will need to attend the talk.		
Thu 13/3/2014 4-5 pm Hills 1.20	**Dimitris Pinotsis,** UCL	**Extracting novel information from Electrophysiological data using Biophysical Modelling and Bayesian inference** Dynamic Causal Modelling (DCM) allows for a formal (Bayesian) characterization of local and global cortical interactions in terms of connectivity. These characterizations are based on Bayesian model selection of neuronally plausible biophysical models. In the past years, a wide variety of biophysical models has been implemented within the framework of DCM. In this talk, I first overview these recent advances and then focus on models that allow one to characterize the spatial parameters of cortical infrastructures (like the extent of lateral connections and the conduction speed of signal propagation on the cortex). I will try to highlight the relationship among the current biophysical models available and address how the hypothesis or question being addressed informs the choice of an appropriate model.	Ulrik Beierholm, CN-CR	
Thu 13/2/2014 4-5 pm Hills 1.20	**Internal School Seminars**	Karen Mullinger & Andrew Schofield		
Thu 30/1/2014 4-5 pm, Hills 1.20	**Prof. Nicholas Wheeler,** Director of the Institute for Conflict, Cooperation and Security, Dep. Political Science and International Studies, University of Birmingham	**Building Trust Between Adversaries: the contribution of a multidisciplinary approach**	School of Psychology	
Thu 23/1/2014 4-5 pm Hills 1.20	**Internal School Seminars**	Maria Wimber “Neural processes supporting selective remembering” Our episodic memory is capable of storing a virtually unlimited amount of information. One of the big challenges in cognitive neuroscience is to understand how our neural system enables us to bring back to mind one particular past event, without being swamped with memories of similar but irrelevant events. Results will be presented from a series of studies aimed at elucidating the neural mechanisms that support selective memory recall. Specifically, evidence will be presented suggesting that competition arises when a reminder simultaneously reactivates multiple memory traces. Regions in the prefrontal cortex can bias this mnemonic competition, such that target memories are gradually enhanced while competing memories are gradually suppressed. Our findings also suggest that the neural changes resulting from repeated selective recall strengthen the recalled memories but can induce		

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		forgetting of the competing, suppressed memories. Episodic memory thus seems to be a highly adaptive system in which the underlying neural representations are constantly shaped by active use. & Simon Hanslmayr "How brain oscillations form memories" Brain oscillations are considered to play a central role in the formation of human episodic memories. Most theories in this regard are centred on the notion that brain oscillations induce synchronized firing between cell assemblies, thereby shaping synaptic plasticity. Accordingly, most prior studies focused on the role of synchronization for episodic memory, as reflected in theta (~5Hz) and gamma (>40 Hz) power increases. A neglected phenomenon, however, is that memory formation and retrieval is also accompanied by massive oscillatory power decreases in the alpha and beta frequency band (8–30 Hz). In the first part of this talk I will present several results showing that this alpha/beta desynchronization is a central component which actively and causally supports episodic memory formation and retrieval. These findings will be discussed with relation to a recently proposed preliminary model linking neural desynchronization to the richness of information represented in the brain. In the second part of the talk I will discuss the role that is played by theta and gamma oscillations in the medial temporal lobe for episodic memory, namely item context binding, enabling the fast reinstatement of contextual details during memory retrieval.		
Thu 5/12/2013 4-5 pm, Hills 1.20	**Prof. Marion Hetherington,** Psychology, Leeds Univ.	**V is for … Vegetables – learning to like novel vegetables in early life**	Suzanne Higgs, School of Psychology	http://www.psyc.leeds.ac.uk/cgi-bin/10/people/index.pl?marionh
Thu 28/11/2013 4-5 pm, Hills 1.20	**Prof. Mark Richardson,** Kings College London	**Modelling brain networks in epilepsy**	BUIC, Andrew Bagshaw	http://www.iop.kcl.ac.uk/staff/profile/default.aspx?go=10988
Tue 26/11/2013 3-4 pm, Learning centre UG09	**Dr. Andrea d'Avella, Santa Lucia Foundation, Rome, Italy**	**Muscle synergies for modular and adaptive human motor control** A fundamental challenge in neuroscience is understanding how the central nervous system (CNS) acquires and controls complex motor skills that require coordinating a large number of degrees-of-freedom. A long standing hypothesis is that the CNS relies on a modular architecture to simplify motor control and skill learning. Evidence for modularity has come from the observation of regularities in the spatiotemporal organization of the muscle activation patterns recorded in different species, behaviors, and conditions. For example, a large fraction of the variation in the muscle patterns recorded in humans subjects during reaching and catching is captured by the linear combination of a small number of muscle synergies, coordinated activations of groups of muscles. These results suggest that muscle synergies are basic modules providing a low-dimensional representation of the motor commands that exploits the inherent structure of the musculoskeletal system and of the motor tasks. However, whether muscle synergies are only a parsimonious description of the regularities of the control policies' output rather than a key feature of their neural organization is still debated. A novel experimental approach in which	Orna Rosenthal, Special CN-CR seminar	

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		human subjects use myoelectric control to move a mass in a virtual environment has now provided direct evidence for modularity. By altering the mapping between recorded muscle activity and simulated force applied on the mass, as in a complex surgical rearrangement of the tendons, it has been possible to test the prediction that in a truly modular controller it must be harder to adapt to perturbations that are incompatible with the modules. After identifying muscle synergies, two types of virtual surgeries were performed. After compatible virtual surgeries, a full range of movements could still be achieved recombining the synergies, whereas after incompatible virtual surgeries new or modified synergies were required. As predicted by modularity, adaptation after compatible surgeries was found to be faster than after incompatible ones. These results indicate that muscle synergies are basic structural elements of a modular and adaptive control architecture		
Thu 21/11/2013 4-5 pm, Hills 1.20	**Dr. Chris Chambers,** Cardiff Univ.	**The importance of study preregistration in psychology and cognitive neuroscience** In this talk I will discuss the new publishing initiative at Cortex called Registered Reports. Unlike conventional publishing models, Registered Reports involves peer review of experimental procedures and planned analyses before data is collected. By reaching decisions about the publishability of papers before researchers conduct their experiments, our aim is to incentivise best practice in science by eliminating p-hacking, insufficient statistical power, lack of data transparency, HARKing, and publication bias.	School of Psychology	http://psych.cf.ac.uk/contactsandpeople/researchfellows/chambers.php
Thu 7/11/2013 4-5 pm Hills 1.20	**Internal school seminars**	Claudio Tennie: "" & Stephen Wood "Adolescent brain development and the onset of psychosis'"		
Thu 24/10/2013 4-5 pm, Hills 1.20	**Dr Charlotte Stagg,** FMRIB, University of Oxford	**Using multimodal approaches to understand the role of inhibition of motor learning and recovery after stroke** There has been a recent surge of interest in the use of non-invasive techniques such as Magnetic Resonance Spectroscopy (MRS) to quantify neurotransmitters within the brain. Increasing evidence from human MRS studies suggests that local GABA levels are behaviourally relevant in task performance and that various forms of plasticity can be linked to local decreases in inhibition. I will review the role of the modulation of inhibitory processing in plasticity, both in terms of motor learning and the recovery after stroke. I will also discuss some recent data demonstrating that transcranial stimulation approaches modulate local GABA levels and how that modulation can be related both to local and network-level function. Finally, I will put these findings in the context of the potential use of transcranial stimulation for rehabilitation after stroke.	BUIC, Andrew Bagshaw	http://www.fmrib.ox.ac.uk/team/principal-investigators/charlotte-stagg
15/10/2013 4-5 pm TBD	**Dr. Jonathan Peirce,** Dept. Of Psychology, University of Nottingham	**PsychoPy : free, flexible software for stimulus generation** PsychoPy is a free, open-source software package for stimulus presentation. It allows a very wide range of stimuli to be presented in a dynamic and flexible way. It also provides a choice of interfaces, from the graphical Builder environment (like a more powerful version of e-Prime) or the Coder interface (like a Python equivalent to PsychophysicsToolbox). There are also several half-way houses, allowing you to combine pieces of code with our graphically-created experiments. This variety of interfaces and large range of stimuli mean that PsychoPy can be used for everything from teaching undergraduates to psychophysics to neuroimaging. In this seminar I'll introduce the concepts of PsychoPy and generate an experiment or two to show the common use cases.	CN-CR, Max di Luca	http://www.psychopy.org/

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10/10/2013 4-5 pm, Hills 1.20	**Internal School Seminars**	Uta Noppeney "See what you hear - The neural basis of audiovisual integration" & Alan Wing "Follow my leader? String quartet synchronisation."		
24/09/2013 4-5 pm Hills 1.20	**Prof. Bill Phillips,** Dept. Of Psychology, School of Natural Sciences, Univ. Of Stirling	**The coordination of cognitive activities by synaptic and local-circuit mechanisms for context-sensitive gain-control** I will outline arguments and evidence suggesting that the adaptively organised complexity of mental life depends on many concurrent probabilistic inferences that are coordinated by widely distributed synaptic and local-circuit mechanisms for context-sensitive gain-control. They amplify relevant and suppress irrelevant activities. I will argue that perceptual organization, contextual disambiguation, surround-suppression, attention, working memory, and motor-coordination all depend upon these mechanisms. Previous evidence for this perspective has come from studies of anatomy, neurophysiology, psychophysics and the pathophysiology of psychosis. It is now being strongly supported by optogenetic studies from the Scanziani lab in UCSD which use brief pulses of light to switch genetically specified subtypes of neuron on or off with millimetre and millisecond precision. Information-theoretic formalization and neural-net simulations of the central ideas will be summarized. Finally, I will note that we need a better understanding of major transitions in the evolution of cognitive capabilities, and will briefly explain how engineering synaptic gene mutations could contribute to this. It seems to me that convergence of these theoretical and empirical developments is revolutionizing our understanding of what brains do and how they do it, so any comments on this view will be welcome.	CN-CR, Aaron Sloman	http://www.psychology.stir.ac.uk/staff/staff-profiles/honorary-staff/bill-phillips
25/6/2013 12-1.30 pm Mechanical Engineering B22	**Prof. Essi Viding & Dr. Eamon McCrory,** UCL	**The origins of conduct problems** Antisocial behavior is a substantial societal concern and a considerable amount of resources are targeted into its prevention and treatment. However, the success of the prevention and treatment efforts is, at best, moderate. Decades of developmental psychopathology research highlight that we should be mindful of the phenomenon of 'equifinality', namely that individuals may present with similar behaviors for a number of different underlying reasons. In this talk I will review studies that have employed a variety of methodologies and focused on heterogeneity among children with conduct problems - i.e. those who present with antisocial behaviour. In particular, I will overview evidence from behavioral, experimental, neuroimaging, and genetically informative studies, which suggest that presence vs. absence of callous-unemotional traits characterize children for whom the origins of conduct conduct problems appear different. & **Investigating the neurobiological impact of childhood maltreatment: What can we learn about risk and resilience?** Childhood maltreatment is associated with later psychopathology, including conduct disorder, anxiety, and depression. However, the neurobiological mechanisms by which childhood adversity heightens vulnerability to psychopathology and the neurobiological processes associated with resilience remain poorly understood. This short presentation will review several recent brain imaging studies reporting structural and functional differences associated with early adversity. It is suggested that these differences are likely to be associated with patterns of psychological adaptation that may for some children increase the risk of later psychopathology.	Stephane De Brito, School of Psychology	http://www.drru-research.org/

When & Where	Speaker	Title & Abstract	Host & Group	Link
18/6/2013 4-5 pm Hills 1.20	**Prof. Ian Loram,** Manchester Metropolitan University	**Is human motor control serial ballistic? Emerging evidence and implications for motor function**	Chris Miall, CN-CR	http://www.irm.mmu.ac.uk/staff/staff_details/?staff_id=742
11/6/2013 4-5 pm Hills 1.20	**Internal School Seminars**	Stephen Mayhew "Studying the neurophysiological origins of brain responses with simultaneous EEG-fMRI" & Andrew Welchman "How do we see things in 3-D?"		
4/6/2013 4-5 pm Hills 1.20	**Dr. Duncan Astle,** MRC, Cambridge	**Interactions between attention and memory in typically developing children and adults** In recent years research on attention and memory, both in the cognition and neuroscience literatures, has seen a rapid advancement in our understanding of their common and separate mechanisms in adulthood. This is partly due to some very elegant cognitive science; new and novel paradigms have enabled researchers to explore with much greater precision the mechanisms that underlie these processes. Furthermore, researchers in the adult neuroscience literature have developed a wide repertoire of techniques enabling them to explore how the neural systems responsible for attentional control interact with memory representations, during maintenance and at retrieval. In this talk I will discuss how we are adapting these techniques and approaches for explaining memory performance during development, and, in particular, to explain variability in memory performance in childhood. This includes work using behavioural techniques, such as cueing studies, to demonstrate the role of spatial attention in memory maintenance. The work also includes electrophysiological scalp recordings, demonstrating the role of attention in memory retrieval. Finally I will discuss our work utilizing magnetoencephalography, exploring the neural networks that underpin the interaction between attentional control and memory in childhood, and how these more advanced neuroimaging techniques enable us to implicate the role of attentional control mechanisms in memory performance more directly.	Ulrik Beierholm, School of Psychology	http://www.neuroscience.cam.ac.uk/directory/profile.php?Duncan.Astle
28/5/2013 4-5 pm Hills 1.20	**Prof. Gregor Thut,** Psychology, University of Glasgow	**Visual attention, brain oscillations and frequency-tuned TMS**	Ulrik Beierholm, School of Psychology	http://www.psy.gla.ac.uk/staff/index.php?id=GT001
14/5/2013 4-5 pm Hills 1.20	**Internal School Seminars**	Stephane De Brito & Chris Miall		
7/5/2013 4-5 pm Hills 1.20	**Dr. Simon Watt,** Bangor University	**Visual-haptic integration in tool use**	Andrew Schofield, CN-CR	http://pages.bangor.ac.uk/~psse2d/
16/4/2013 4-5 pm Hills 1.20	**Internal School Seminars**	Max di Luca & Joe McCleery "Motor development and motor resonance difficulties in autism: Relevance to Early Intervention for language and communication skills."		

When & Where	Speaker	Title & Abstract	Host & Group	Link
9/4/2013 4-5 pm Hills 1.20	**Prof. Martha Alibali,** Psychology, University of Wisconsin - Madison	**Understanding Change in Mathematical Thinking: An Embodied Perspective** Learners vary in their perceptual encoding of mathematical objects and inscriptions, and in the actions they perform when solving mathematics problems. In this talk, I argue that a focus on perception and action can enrich our conceptions of mathematical thinking, learning, and instruction. The talk will proceed in three parts. First, I will consider learners' perceptual encoding of mathematics problems. I will argue that perceptual encoding guides problem-solving actions and generation of problem-solving strategies. Second, I will consider the role of physical actions in mathematical problem solving. I will argue that mathematical actions are often grounded in physical actions, and as a consequence, physical actions can also affect mathematical thinking. Finally, I will consider how mathematics instruction guides learners' perceptions of mathematics problems and their mathematical actions. Teachers use instructional gestures and speech to guide students' encoding and to express the physical grounding of mathematical concepts and actions. Taken together, these lines of work contribute to knowledge about learners' perceptions and actions in mathematics, and in turn, to a deeper understanding of change processes in mathematics learning.	Kita Sotaro, School of Psychology	http://glial.psych.wisc.edu/index.php/psychsplashfacstaff/90
26/3/2013 4-5 pm Hills 1.20	**Internal School Seminars**	Joseph Galea "Dissociating the influence of punishment- and reward-based reinforcement on error-based learning" & Ian Apperly "Insert exciting title here"		
19/3/2013 4-5 pm Hills 1.20	**Dr. Nick Medford,** Psychology, Univ. Sussex	**The Unreal Self: Depersonalization, and Why It Matters**	Jason Braithwaite, School of Psychology	
12/3/2013 4-5 pm Hills 1.20	**Dr. Darren Cosker,** Computer Science, Univ. of Bath	**The Role of Perception and Analysis in Developing Realistic Facial Animation** How do we create faces and performances that are perceptually equivalent to real ones? This is a challenging question, and one that incorporates computer vision, graphics and psychology. In this talk I will outline work targeted at answering these questions, and describe research which combines these three areas. This includes building detailed 3D models of human faces, extracting subtle (skin pore level) facial movement and analysing this, creating systems that can replicate and recreate this information, and how the perception of faces can be changed given subtle alterations in the movement of faces. I will also discuss implications in terms of visual effects in movies - which have come closest to this solution but at great expense and time.	Andrew Schofield, CN-CR	http://www.cs.bath.ac.uk/~dpc/
5/3/2013 4-5 pm Hills 1.20	**Dr. Rob Leech,** Dept. Medicine, Imperial College	**The control of global brain dynamics: opposing actions of fronto-parietal control and default mode networks on attention** The brain can be viewed as a complex dynamical system. I will discuss using this framework to study the brain's critical behaviour. Brain networks are thought to be in a critical state, poised between order and disorder, at a 'tipping' point. I present evidence investigating the relationship between global brain dynamics and cognitive state using FMRI and neurobiolgoically-inspired computational models. We show, with FMRI, that the criticality of the system is 'tuned' by cognitive state and, using computational simulations, that well-characterized brain networks such as the default mode network or fronto-parietal control networks have opposing roles in modulating this criticality.	BUIC	http://www1.imperial.ac.uk/medicine/people/r.leech/

When & Where	Speaker	Title & Abstract	Host & Group	Link
26/2/2013 4-5 pm Hills 1.20	**Internal School Seminars**	Kimron Shapiro & Suzanne Higgs	26/2/2013 4-5 pm Hills 1.20	**Internal School Seminars**
19/2/2013 4-5 pm Hills 1.20	**Prof. Peter Morris,** SPMMRC, University of Nottingham	**Multimodal Approaches to Functional Neuroimaging**	BUIC	http://www.nottingham.ac.uk/physics/people/peter.morris
12/2/2013 4-5 pm Hills 1.20	**Prof. Kevin Gurney** Univ. Sheffield	**Computational models of action discovery in animals** How can animals acquire a repertoire of actions enabling the achievement of their goals? Moreover, how can this be done in an intrinsically motivated way without the animal being instructed, or without having some overt, primary reward assigned to successful learning? The relation between actions and outcomes are presumed to be held in internal models, encoded in associative neural networks. In order for these associations to be learned, representations of the motor action, sensory context, and the sensory outcome must be repeatedly activated in the relevant neural systems. This requires a transient change in the action selection policy of the agent, so that the to-be-learned action is selected more often than other competing actions. A programme of work seeking the biological underpinning of this computational framework requires an understanding of action selection in the brain, a key component of which is a set of sub-cortical nuclei - the basal ganglia. The basal ganglia are subject to reinforcement learning, mediated by phasic activity in midbrain dopamine neurons constituting a reinforcement signal. We propose that this signal encodes a sensory prediction error, initiated when the agent's actions elicit 'surprising' events, thereby fostering intrinsically motivated exploration of the environment. I will describe models of intrinsically motivated action learning in basal ganglia based on these ideas. They are tested in a simple autonomous agent whose behaviour is constrained to mimic that of rats in an in vivo experiment. The model shows a complex interplay of several mechanisms that we believe are responsible for biological action discovery.	Ingo Bojak, CN-CR	http://www.shef.ac.uk/psychology/staff/academic/kevin-gurney
5/2/2013 4-5 pm Hills 1.20	**Prof. Gerry Altmann,** Psychology, Univ. York	**Event comprehension in the brain: objects 'before' compete with themselves 'after'** To understand that an object has changed state during an event, we must represent the 'before' and 'after' states of that object. Because a physical object cannot be in multiple states at any one moment in time, these 'before' and 'after' object states are mutually exclusive. In the same way that alternative states of a physical object are mutually exclusive, are cognitive and linguistic representations of alternative object states also incompatible? If so, comprehending an object state-change should involve interference between the constituent object states. Through a series of functional magnetic resonance imaging experiments, we test the hypothesis that comprehension of object state-change, during language understanding, requires the cognitive system to resolve conflict between representationally distinct brain states. Results from these experiments suggest that distinct and incompatible representations of an object do compete when representing object state-change; and that the greater the dissimilarity between the described object states, the greater the dissimilarity between rival brain states, and the greater the conflict. I shall include an obligatory statement on why anyone should care,	Steven Frisson, School of Psychology	http://www.york.ac.uk/psychology/staff/faculty/gtma1/

When & Where	Speaker	Title & Abstract	Host & Group	Link
		as well as discussion of how neuroimaging can inform cognitive theory.		
29/1/2013 4-5 pm Hills 1.20	**Prof. Richard Wise,** CUBRIC, Cardiff University	**Quantifying brain function using fMRI: more than a BOLD approach** Most functional MRI studies use blood oxygenation level dependent (BOLD) contrast to qualitatively map 'brain activity'. BOLD fMRI signals can be hard to interpret in studies of drug and disease effects where the underlying state of the brain can be altered. I will discuss complementary approaches to BOLD fMRI and their potential applications. I will explore measurement of cerebral blood flow and cerebrovascular function and how to put numbers to brain activity by measuring cerebral oxygen metabolism.	BUIC	http://psych.cf.ac.uk/contactsandpeople/academics/wise.html
22/1/2013 4-5 pm Hills 1.20	**Internal School Seminars**	Sarah Beck "Children's Tool Innovation" & Ulrik Beierholm "Testing a computational model of movement vigour through psychophysics and pharmacology"		
15/1/2013 4-5 pm Hills 1.20	**Dr. Paul Allen,** Psychiatry, Kings College London	**Neuroimaging Auditory Hallucinations - Neuroanatomy to Neurochemistry**	Stephen Wood, School of Psychology	http://www.iop.kcl.ac.uk/staff/profile/default.aspx?go=10768
8/1/2013 4-5 pm Hills 1.20	**Dr. Steve Phelps,** University of Essex	**Direct and indirect reciprocity in dynamic social networks: a data-mining approach** Many models of social network formation implicitly assume that network properties are static in steady-state. In contrast, actual social networks are highly dynamic: allegiances and collaborations expire and may or may not be renewed at a later date. Moreover, empirical studies show that human social networks are dynamic at the individual level but static at the global level: individuals' degree rankings change considerably over time, whereas network level metrics such as network diameter and clustering coefficient are relatively stable. There have been some attempts to explain these properties of empirical social networks using agent-based models in which agents play social dilemma games with their immediate neighbours, but can also manipulate their network connections to strategic advantage. However, such models cannot straightforwardly account for reciprocal behaviour based on reputation scores ("indirect reciprocity"), which is known to play an important role in many economic interactions. In order to account for indirect reciprocity, we model the network in a bottom-up fashion: the network emerges from the low-level interactions between agents. By so doing we are able to simultaneously account for the effect of both direct reciprocity (e.g. "tit-for-tat") as well as indirect reciprocity (helping strangers) in order to increase one's reputation). We test the implications of our model against a longitudinal dataset of Chimpanzee grooming interactions in order to determine which types of reciprocity, if any, best explain the data. We discuss the importance of the temporal and micro-properties of the data in analysing reciprocity: in particular determining the length of window over which direct recprocity occurs, and the importance of network-motifs in detecting patterns of indirect reciprocity.	Andrew Howes, CN-CR	http://sphelps.net/

When & Where	Speaker	Title & Abstract	Host & Group	Link
15/11/2012 4 pm Frankland 309b	**Prof. Christian Wallraven** Korea University	**Grasping the world: Active multisensory object processing of humans and robots** The processing of shape is one of the most fundamental abilities of the human brain, enabling us to efficiently recognize and interact with objects in the environment. Given the importance of touch and interaction - both in the early stage of human development as well as in general - I argue that shape and object representations should be regarded as multisensory, dynamic entities. To date, the vast majority of research into object processing, however, has been conducted in the visual modality with static, non-interactive images. Spurred by new developments in multisensory rendering technologies, rapid prototyping, and interactive technologies, I will present results from several experiments investigating the active and multisensory components of object processing. A first line of experiments demonstrates that humans are able to represent complex shape spaces surprisingly well by touch alone. Additional experiments show that the integration of vision and haptic representations even allows for haptic face recognition of visually learned faces (and vice versa). Experiments with novel objects using a tablet interface furthermore show that object representations become significantly more detailed when objects are actively explored (versus passive exploration). Finally, I will discuss how to transfer these results to a humanoid robot in order to endow it with multisensory perceptual skills that help it to learn and recognize objects more efficiently.	Ales Leonardis CN-CR	http://cogsys.korea.ac.kr/Cognitive_Systems.html
30/10/2012 4.30-5.30 pm Hills 1.20	**Prof. Konrad Kording** Northwestern University	**Generalizing uncertainty for motor control**	Ulrik Beierholm CN-CR	http://www.koerding.com/
16/10/2012 4-5 pm Hills 1.20	**Dr Markus Rank** Institute of Automatic Control Engineering Technische Universität München München, Germany	**TBA**	Max Di Luca CN-CR	bit.ly/TfItzn
02/10/2012 4.15-5 pm Frankland 309B (Notice room!)	**Prof. Rajiv Sarin** Univ. Birmingham, Dept. Economics	**Learning and Risk Aversion** We study the manner in which learning shapes behaviour towards risk when individuals are not assumed to know, or to have beliefs about, probability distributions. In any period, the behaviour change induced by learning is assumed to depend on the action chosen and the payoff obtained. This is equivalent to the problems studied in psychological theories of Reinforcement Learning, where an animal is placed in a novel environment. We characterise learning processes that, in expected value, increase the probability of choosing the safest (or riskiest) actions and provide sufficient conditions for them to converge, in the long run, to the choices of risk averse (or risk seeking) expected utility maximizers. We provide a learning theoretic motivation for long run risk choices, such as those in expected utility theory with known payoff distributions.	Ulrik Beierholm School of Psychology	bit.ly/SYpxmf

When & Where	Speaker	Title & Abstract	Host & Group	Link
04/09/2012 4-5 pm Hills 1.20	**Prof Howard Bowman** School of Computing University of Kent	**The Simultaneous Type/ Serial Token Model of temporal attention and working memory encoding, with applications in brain-computer interaction and lie detection** The Simultaneous Type/ Serial Token (STST) model [Bowman & Wyble, 2007] was developed as a theory of how attention is deployed through time and how working memory representations are formed. It provides a neural explanation of perceptual phenomena, particularly those observed using Rapid Serial Visual Presentation (RSVP), e.g. attentional blink, repetition blindness, temporal conjunction errors and perceptual episodes, e.g. see [Wyble et al., 2011]. Its activation dynamics have also been tied to the P3 event related potential component [Craston et al., 2009], which has been argued to be an electrophysiological correlate of conscious perception. I will describe the STST model and its behavioural and electrophysiological verification. Finally, I will highlight applications of these RSVP-P3 effects in brain computer interaction and lie detection. I will also discuss what I consider to be the motivation for computational modelling.	Kimron Shapiro CN-CR	bit.ly/MnnnAb
12/06/2012 4-5 pm Hills 1.20	**Prof Christos Pantelis** Melbourne Neuro-psychiatry Centre University of Melbourne Melbourne, Australia	**Drugs, stress and inflammation: Explaining progressive brain changes in schizophrenia**	Stephen Wood School of Psychology	bit.ly/MTdlVS
01/05/2012 4-5 pm Hills 1.20	**Prof Rachel Jewkes** South African Medical Research Council Pretoria, South Africa	**Streamlining: understanding gang rape in South Africa** Multiple perpetrator rape, locally known as streamlining, is very common in South Africa. Studies show that between 7-9% of adult men have engaged in completed acts of rape with other perpetrators, and many more men have been involved in support roles. In many communities engaging in streamlining is regarded as a 'normal' part of adolescent boyhood. This presentation will outline the social and cultural context in which this occurs. It will draw on data from population-based studies of men to discuss its prevalence, men's motivations and associated male practices. The presentation will also present data from police and court records on processing of cases and legal outcomes when they are reported to the police, to reflect on the question of the extent to which women who have been victims of streamlining can access criminal justice.	Jessica Woodhams School of Psychology	bit.ly/wmzkPy
27/03/2012 4-5 pm Hills 1.20	**Dr Marc Guitart-Masip** Institute of Cognitive Neuroscience University College London	**Disambiguating action and valence in decision-making using pharmacology, computational models, and fMRI** Previous neurobiological research on decision-making has focused on the neural mechanisms of reward and punishment in the striatum and the substantia nigra/ventral tegmental area (SN/VTA). However, the functional organization of the striatum reflects its role in the generation of action and the control of action vigour. Our goal is to elucidate the impact of possible asymmetries between action and valence on affective decision-making at a behavioural, computational, and neurobiological level. In a series of experiments, we manipulated subjects' requirement to emit or withhold an action independent from subsequent receipt of reward or avoidance of	Ulrik Beierholm CN-CR	bit.ly/yWSA63

When & Where	Speaker	Title & Abstract	Host & Group	Link
		punishment. We show that at the neural level, action representations dominate over valence representations in the striatum and the SN/VTA and that action controls the dopaminergic enhancement of reward representations when dopamine levels are pharmacologically enhanced. We also show the existence of an asymmetric link between action and valence such as reward facilitates learning of active choices and punishment learning of passive choices. Finally, we show how this assymetric link between action and valence is differentially modulated by the dopaminergic and the serotonergic systems. Thus, our results point a need for an enriched account of opponency between reward and punishment in the dopaminergic system that includes notions of action control.		
20/03/2012 4-5 pm Hills 1.20	**Prof Joachim Gross** Centre for Cognitive Neuroimaging School of Psychology University of Glasgow	**About the role of brain oscillations in active sensing** The last decade has seen a paradigm shift in our understanding of how human sensory systems support higher cognitive functions. The traditional view of sensory systems as 'passive recording devices' has given way to a view that emphasizes the dynamic nature of sensory information processing to actively adapt to the changing environment and task demands. This adaptability is crucial for optimally interacting with a complex, changing environment. I discuss recent evidence that support a causal role for brain oscillations in 'Active Sensing'. Specifically, I discuss the alignment of brain oscillations to rhythmic external events (in spatial attention and speech processing) and subsequent consequences for behavioural performance.	Kimron Shapiro CN-CR	bit.ly/xKdzih
13/03/2012 4-5 pm Hills 1.20	**Dr Andrew Spence** Structure and Motion Laboratory Royal Veterinary College University of London	**Insects on rubber, dogs on springs, and robots in a field: An integrative approach to discovering how animals move, and making better robots** One of the grand challenges in biology is to understand how animals move. Movement results from the dynamic interaction of many complex, nonlinear constituents: the nervous system, muscles, the mechanics of the body, and an often unpredictable external environment. Yet animals move quickly through heterogeneous, three-dimensional environments with stability and economy that far surpass our technology. This talk will present work that seeks to discover the control targets used by fast running, legged animals to achieve their remarkable performance. Results from insects, dogs, and a six-legged robot running over soft surfaces will be presented, suggesting that many-legged runners use a different strategy than that of bipedal runners to compensate for soft surfaces. Yet the intriguing possibility exists in both systems that sinking into a surface may simplify the task for the neural controller, because of the mechanics of an altered leg posture on foot touchdown. Recent work to formalize a new controller for quadrupedal systems will be discussed. The integrative nature of this work, drawing on biology, physics, dynamical systems and control theory, as well as robotics, will be highlighted.	Nick Hawes CN-CR	bit.ly/yJAbdT

When & Where	Speaker	Title & Abstract	Host & Group	Link
28/02/2012 4-5 pm Hills 1.20	**Dr Thomas Nowotny** Department of Informatics University of Sussex	**General purpose GPU computing: Transforming your desktop into a personal super-computer** Driven by the ever-increasing computational demands of the games industry graphical processing units (GPUs) have developed from simple co-processors to powerful compute platforms. Unlike modern CPUs that are still essentially using a sequential compute model, GPUs are massively parallel with half a thousand cores on a single chip in modern graphics cards. With the introduction of the CUDA (common unified device architecture) application programming interface, NVIDIA, one of the leading GPU manufacturers, has made their GPUs accessible to general purpose computing applications. Given a suitable computational problem and an optimized parallel implementation, modern GPUs can achieve speed-ups of up to 50 to 100 times over a classical CPU core of a recent CPU. In this talk I will introduce the opportunities and challenges of general purpose GPU computing and illustrate them with the GPU enhanced neuronal network (GeNN) framework we are developing at Sussex. I will argue that building meta-compilers that generate code from a simpler domain-specific problem description is one of the better approaches to GPU programming. GeNN is based on such an approach which offers many decisive advantages: The system can provide for a large number of potential model elements, it can optimise for specific model structures and GPU hardware properties at compile time and it can be extended more easily than pre-compiled solutions. The present beta version shows encouraging competitive computing performance and is available under the GPL v2 licenses at http://genn.sourceforge.net.	Ingo Bojak CN-CR	bit.ly/wXx4w9
21/02/2012 4-5 pm Hills 1.20	**Dr Roi Cohen Kadosh** Institute of Cognitive Neuroscience University College London	**Stimulating the prefrontal and the parietal cortices to enhance the mathematical brain** The last two decades have seen an exponential increase in our understanding of how animals, infants, children, and adults process numerical information, as well as what the neurocognitive mechanisms associated with a cognitive impairment in numerical understanding might be. However, it is unclear whether and how this knowledge could be used to improve cognitive functions in the numerical domain. In this talk, I will discuss how a combination of cognitive training and non-invasive brain stimulation to the brain areas associated with numerical competence can enhance numerical and arithmetic abilities, and what might be the physiological mechanism for this enhancement. I will also describe the longevity of these effects, possible side effects on other cognitive functions, and its possible application to children, elderly, neurological patients and young adults in the future.	Pia Rotshtein School of Psychology	bit.ly/pUtes7
14/02/2012 4-5 pm Hills 1.20	**Prof Lynne Kiorpes** Center for Neural Science New York University USA	**Plasticity of visual motion perception: Development and learning** Visual function is poor in infants and develops to adult levels during the early months and years after birth. Basic visual processes such as acuity and contrast sensitivity develop over well-defined time courses that are thought to reflect the maturation of neuronal mechanisms early in the visual pathways. On the other hand higher level visual functions like motion perception, which requires integration of information over space and time, develop over more protracted time courses and depend at least in part on the maturation of extrastriate visual areas. These developmental programs can be modified by visual experience, with the longer developing functions showing greater vulnerability to visual disorders. This talk will describe the development of motion perception in nonhuman primates and the influence of abnormal visual experience and perceptual learning.	Zoe Kourtzi BNG	bit.ly/w7wy8t

When & Where	Speaker	Title & Abstract	Host & Group	Link
07/02/2012 12-1 pm Hills 1.20	**Dr Rafal Bogacz** Department of Computer Science University of Bristol	**Neural mechanisms of decision making** This talk will review our modeling and related experimental research regarding neural mechanisms of decision making. It will first describe a model proposing that the cortico-basal-ganglia circuit computes probabilities, that considered alternatives are correct, according to Bayes' theorem. The talk will also present experiments testing predictions of this model. Next, it will be discussed, how the trade-off between speed and accuracy of decisions is controlled in the cortico-basal-ganglia network. Finally, an fMRI study will be described investigating how humans make decisions in competitive situations.	Zoe Kourtzi BNG	bit.ly/waNoy1
06/12/2011 4-5 pm Hills 1.20	**Prof Constantine Sedikides** School of Psychology University of Southampton	**Nostalgia as a Source of Meaning**	Kim Quinn, Nina Powell School of Psychology	bit.ly/sW3OJA
22/11/2011 4-5 pm Hills 1.20	**Prof Tony Prescott** Department of Psychology University of Sheffield	**Investigating brain architecture through active touch sensing in animals and robots** The systems approach in the brain sciences has demonstrated that there is no straightforward decomposition of the brain into modules, or even a simple means to separate the brain from the body (in control terms), or the body from the environment. So how should we proceed to understand the relationship between brain and behaviour? Our approach has been to investigate a complete sensorimotor loop, specifically, the guidance of exploratory behaviour by tactile sensing signals. We have focused on the rat whisker (vibrissal) system as a model. The neurobiology of this system indicates multiple layers of control, that can be loosely mapped to the different levels of the neuraxis, and that exhibit both some redundancy and some modularity. Neuroethological experiments show a tight coupling between sensory signals and active control of the movement and positioning of the sensors. Electrophysiological and modelling studies suggest a system that is capable of rapidly extracting relevant affordances for action, rather than constructing complex internal representations of the external world. These ideas will be illustrated with examples from our research on active touch sensing in animals and in biomimetic robots.	Joe McCleery School of Psychology	bit.ly/prC4jY
11/10/2011 4-5 pm Hills 1.20	**Prof Dorothy Bishop** Department of Experimental Psychology University of Oxford	**Early intervention for late talkers: a no-brainer?** It seems blindingly obvious that it is better to intervene early than to wait until problems develop. From the neurological perspective, this allows us to intervene while the brain is still plastic, and it also has the potential to avoid secondary problems that arise when a child starts to fall behind. In the context of late talkers, however, there is a problem. A very high proportion of children who are late to talk go on to catch up and develop normally without intervention. Early intervention could waste valuable resources unless we can identify which children are likely to have long-term persisting problems. I shall present data from a study following a group of late talkers from 18 months to 4 years to consider how far it is possible to predict outcomes of late-talking toddlers.	Joe McCleery School of Psychology	bit.ly/qgErQp

When & Where	Speaker	Title & Abstract	Host & Group	Link
04/10/2011 4-5 pm Hills 1.20	**Prof Mike Nicholls** School of Psychology Flinders University Adelaide, Australia	**Space, the parietal cortex and everything** Some branches of neuroscience research attempt to circumscribe the functions of the brain into neat compartments. Through its extensive links to other brain regions, the posterior parietal cortex appears to defy such neatness. Although normally associated with symptoms of clinical unilateral neglect, the posterior parietal cortex also plays an important role in attentional asymmetries in the intact brain and affects a number of everyday activities. What's more, these attentional asymmetries appear to be related to many other dimensions, such as number, size and time. This talk reviews research that investigates the links between various types of magnitude and discusses the cognitive/neural mechanisms that might underlie this association.	Amanda Wood School of Psychology	bit.ly/ntFf10