UK Symposium on Neuromodulation and Neurotechnology

Thursday 12th and Friday 13th September 2024

Jubilee Hotel & Conference Centre, Nottingham

Programme

Day 1: Thursday 12th September		
From 10.30	*Registration*	*Main Entrance*
10.30-11.00	*Coffee*	*West Atrium*
11.00-11.15	Welcome	**Andrew Jackson** CloseNIT, Newcastle University **Simon Schultz** Neuromod+, Imperial College London
Plenary Talk (chair Andrew Jackson)		
11.15-12.15	A wrist-based surface EMG neuromotor interface for human computer interaction that works across a population	**Abigail Russo** Meta Reality Labs
Network Research Showcase – Movement Disorders (chair TBC)		
12.15-12.45	Suppression of essential tremor via transcutaneous spinal cord electrical stimulation	**Alejandro Pascual Valdunciel** Imperial College London
12.45-13.15	Closing the loop with transcranial temporal interference stimulation	**Edward Rhodes** UK Dementia Research Institute, Imperial College London
13.15-14.00	*Lunch*	*West Atrium*
14.00-14.30	Closed-loop vibrotactile stimulation for dystonia	**Petra Fischer** University of Bristol
Network Research Showcase – Cognitive Disorders (chair TBC)		
14.30-15.00	Respiratory-gated transcutaneous auricular vagus nerve stimulation (taVNS) in healthy volunteers	**Tiago da Silva Costa** Newcastle University
Neurotech Bites (chair JeYoung Jung)		
15.00-15.30	Lightning talks	**Mahnaz Arvaneh**, University of Sheffield **Nick Holmes**, University of Birmingham **Jessica Scaife**, University of Oxford **Salim El Hadwe**, University Of Cambridge **Nir Grossman**, Imperial College London
15.30-15.45	*Break*	*West Atrium*
15.45-16.15	Lightning talks	**Elizabeth Michael**, University of Cambridge **Aidan McConnell-Trevillion**, University of Edinburgh **Jane Ollis**, MindSpire **Alexander Zhigalov**, Aston University
Neurotechnology in translation (chair Andrew Jackson)		
16.15-17.00	Industry panel discussion: challenges, opportunities, and new developments in neurotechnology	**Paul Cable**, Neupulse **Sean Doherty**, Amber Therapeutics **Dorian Haci**, MintNeuro
17.00	*Tea and networking*	*West Atrium*
18.00	*Close*	
19.00	***Symposium dinner***	***Spokes Restaurant***

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Day 2: Friday 13th September			
08.30-09.00	*Coffee*		*West Atrium*
09.00-10.00	*Optional meet and greet for PPI representatives*		*West Atrium*
09.00-16.30	*During session breaks we invite you to try our Neuromod+ virtual reality demonstration to learn more about some of the minimally invasive neuromodulation techniques (non-VR version also available).*		
Plenary Talk (chair Simon Schultz)			
09.00-10.00	Exploring Low-Intensity Focused Ultrasound as a Treatment Strategy for Substance Use Disorder		**Daisy Thompson-Lake** Rockefeller Neuroscience Institute, West Virginia University
Neurotech Bites (chair Mark Baker)			
10.00-10.20	Lightning talks	**Stuart Black**, Applied Neuroscience Solutions Ltd **Chris Griffiths**, Northamptonshire Healthcare NHS Foundation Trust **Mark Humphries**, University of Nottingham **Paul Stevenson**, Genius Within CIC, Tourettes Action	
Public Involvement in Neurotechnology (chairs Marcus Kaiser, Tamar Makin)			
10.20-10.50	Introduction to neuromodulation, public attitudes to neuromodulation		**Marcus Kaiser** Neuromod+, University of Nottingham
10.50-11.30	Public Involvement in funding calls and research projects: panel Q&A	**Nikul Bakshi**, Parkinson's UK **Harry Dyson**, McPin Foundation **Kate Frost**, Nottingham University Hospitals NHS Trust **Rachel Knowles**, Medical Research Council (MRC) **Kate Reading**, Engineering & Physical Sciences Research Council (EPSRC) Moderator: **Tamar Makin**, University of Cambridge	
11.30-11.45	*Break | Neuromod+ VR demo available*		*West Atrium*
11.45-12.05	Public Involvement in Neurotechnologies: Developing shared guidelines and resources		**Tiago da Silva Costa**, Newcastle University **Amparo Güemes González**, University of Cambridge **Tamar Makin**, University of Cambridge **Antonio Valentin**, King's College London
12.05-12.25	Discussion session		
12.25-12.45	Feedback and next steps		
12.45-13.30	*Networking Lunch | Neuromod+ VR demo available*		*West Atrium*
Network Research Showcase – Cognitive Disorders (chair TBC)			
13.30-14.00	Transcranial ultrasound stimulation to the human amygdala in emotion and decision making		**Miriam Klein-Flügge** University of Oxford
14.00-14.30	Enhancing transcranial magnetic stimulation (TMS) for depression and anxiety conditions using synchronised transcranial alternating current stimulation (tACS)		**Paul Briley** University of Nottingham
14.30-15.00	A Device for Ultrasound Modulation with Multi-Photon Imaging		**Sophie Morse** Imperial College London, Dementia Research Institute
15.00-15.15	*Break | Neuromod+ VR demo available*		*West Atrium*
15.15-15.45	Enhancing Semantic Memory with Transcranial Focused Ultrasound Stimulation of the Anterior Temporal Lobe		**JeYoung Jung** University of Nottingham

15.45-16.15	Adaptive closed-loop fMRI neurofeedback for social learning	**Wako Yoshida** University of Oxford
Closing Remarks		
16.15-16.30	Closing remarks	**Andrew Jackson,** CloseNIT **Simon Schultz,** Neuromod+
16.30	***End***	

About the speakers

Day 1	
	**Abigail Russo** is a Research Scientist at Meta Reality Labs, where she is researching strategies for extending human motor capabilities with a non-invasive, wrist-worn brain computer interface. She did her PhD at Columbia University with Mark Churchland where she researched motor cortical network function during voluntary movement, drawing on insights from artificial neural networks. **Talk title:** A wrist-based surface EMG neuromotor interface for human computer interaction that works across a population **Description:** We describe the development of a noninvasive neuromotor interface that allows for computer input using surface electromyography (sEMG). We developed a highly-sensitive and robust hardware platform that is easily donned/doffed to sense sEMG at the wrist and transform intentional neuromotor commands into computer input. We paired this device with an infrastructure optimised to collect training data from thousands of consenting participants. This allowed us to develop generic sEMG neural network decoding models with performant out-of-the-box generalisation across people (median performance for test users on a continuous navigation task: 0.5 target acquisitions/second; discrete gesture detection task: 0.9 gestures / second; handwriting task: 19.6 words per minute).
	**Alejandro Pascual Valdunciel** completed his undergraduate and master's degrees in Biomedical Engineering at the Universidad Politécnica of Madrid (Spain). He completed his PhD in 2022 with the Neural Rehabilitation Group (NRG) at the Cajal Institute (Spain). His thesis focused on the application of peripheral electrical stimulation as a treatment to reduce pathological tremors. During his doctoral studies, he spent 9 months as a pre-doctoral visiting fellow at the Shirley Ryan Ability Lab in Chicago (USA). In 2022, he joined the group led by Prof. Farina at Imperial College London as a postdoctoral researcher, a position he holds to the present day. His research focuses on electrophysiology to understand nervous system diseases, such as Essential Tremor and Parkinson's Disease, and the application of neuromodulation techniques to manage motor symptoms. **Talk title:** Suppression of essential tremor via transcutaneous spinal cord electrical stimulation **Description:** Tremor is a motor disorder which can severely affect the quality of life of patients, leading to significant socio-economic impact. In this project we aim to explore a non-invasive and cost-effective solution for mitigating tremor. Particularly, we investigated the effectiveness of transcutaneous spinal cord stimulation (tSCS) in treating tremor. tSCS involves weak currents delivered through electrodes attached to the skin. We explored the tremor reduction efficacy and safety of tSCS in Essential Tremor and attempt to characterise the neuromodulatory effects on motor control of different stimulation parameters.
	**Edward Rhodes** is a postdoctoral researcher at the UK Dementia Research Institute, Imperial College London. He holds a PhD in motor neuroscience, where his research focused on neural oscillations in motor control within both healthy and disordered brains. Since joining Nir Grossman's lab in late 2018, Eddy has been working on translating temporal interference stimulation (TI) into a treatment for dementia, alongside various other projects involving closed-loop neural stimulation. His recent work has centred on enabling the research community to record EEG brain activity during TI, without stimulation artefacts, and developing new forms of TI stimulation that can be used within closed-loop systems. **Title:** Closing the loop with transcranial temporal interference stimulation **Description:** We have demonstrated that temporal interference stimulation (TI), can safely and completely non-invasively alter activity within the human hippocampus, in turn, improving

	memory function. However, while TI is set to be the method of choice for state-of-the-art neural stimulation, its full potential has yet to be unlocked. Here, I discuss the future of TI as a technique and the development progress we have made to this point, how we plan to close the loop with ongoing biological processes and how it may become a treatment for movement disorders.
	**Petra Fisher** is a Lecturer in Neuroscience at University of Bristol. In 2017, Petra received her DPhil in Clinical **Neurosciences** at the University of Oxford supervised by Professor Peter Brown and Huiling Tan. During her PhD, she studied electroencephalography and local field potential activity from the subthalamic nucleus in Parkinson's patients to understand the role of cortico-subcortical oscillations in movement control. Petra continued to work at the *MRC Brain Network Dynamics Unit* in Oxford as postdoctoral researcher for four years, studying spike-field coupling in an international collaboration. In August 2021, Petra moved to the University of Bristol as a Lecturer in Neuroscience to set up her own research group, where she has secured funding from the Rosetrees Trust and the Close-NIT network for her work on dystonia. In 2024, she was also awarded an MRC grant to develop new neurostimulation strategies for Parkinson's disease. **Talk title:** Closed-loop vibrotactile stimulation for dystonia **Description:** Dystonia is a movement disorder characterised by involuntary muscle contractions. Currently available treatments often provide only partial relief or may even be ineffective in some cases. Neurophysiological studies have shown excessive neural synchronisation, captured as 4-12 Hz oscillations in sensorimotor networks. We have trialled a novel closed-loop vibrotactile stimulation protocol where we interacted with patients' neural oscillations by employing real-time EEG phase-tracking to trigger brief vibration pulses. We found that our protocol could alleviate dystonia symptoms in most participants with some reporting superior improvements to conventional treatments. I will discuss potential mechanisms and challenges for implementing closed-loop technologies for the treatment of dystonia.
	**Tiago da Silva Costa** is a specialist trainee in general adult psychiatry, currently out of programme for a clinical PhD funded by the NIHR Newcastle Biomedical Research Centre. His research interest is in difficult-to-treat depression (DTD). The transdiagnostic benefits of vagus nerve stimulation (VNS) on mood, fatigue and quality of life make it an obvious area of focus. Clinically, I work for the Regional Affective Disorders Service (RADS), a tertiary level NHS service for people with difficult to treat mood disorders, part of the Cumbria, Northumberland, Tyne and Wear (CNTW) NHS Foundation Trust, where he helps run the (implanted) VNS clinic for depression. **Talk title**: Respiratory-gated transcutaneous auricular vagus nerve stimulation (taVNS) in healthy volunteers **Description**: Implanted vagus nerve stimulation (VNS) directly targets the autonomic nervous system. VNS consistently improves fatigue, functional ability and quality-of-life across different clinical and research samples. The mechanisms behind this are not clear. Transcutaneous auricular VNS (taVNS) is a non-invasive alternative, making mechanistic exploration easier. Other groups have demonstrated that respiratory-gated taVNS modulates cardiovascular autonomic modulation, that electroencephalography (EEG) can be used as a biomarker of taVNS and that task performance reaction times are reduced by non-invasive VNS. We will talk about the development of our in-house respiratory-gated taVNS system and present data focusing on EEG and cognitive continuous performance tasks.

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Industry panel

Paul Cable has over 30 years of experience in the medical device and pharmaceutical field, working previously for Baxter Healthcare and lately through his own consultancy working with startups and established businesses.

Paul helped the University of Nottingham to spin out Neurotherapeutics Ltd and has lead the company as CEO since February 2021.

Sean Doherty is the Director of Research and Development at Amber Therapeutics, where he leads a team of focuses on developing adaptive neuromodulation therapies. His work is centred on translating new neurotechnology medical devices into clinical practice. In addition to his industry role, Sean is a Research Fellow at University College London, where he explores the use of neurotechnologies to restore bladder and bowel control for people following spinal cord injury. His experience in both industry and academia provides him with a balanced perspective on the challenges and opportunities in the field of neurotechnology translation.

Dorian Haci is an accomplished entrepreneur, engineer, and researcher with over a decade of experience in academia and industry. As the CEO and founder of MintNeuro, a neurotechnology startup, he is pioneering the next generation of neural implants with innovative semiconductor technologies. He also serves as an Enterprise Fellow at the Royal Academy of Engineering and a Visiting Researcher at Imperial College London, where he earned his PhD in microelectronics for implantable medical devices. Under his leadership, MintNeuro has secured over £2m in collaborative grants from the UK's National Institute of Health and Care Research (NIHR) and Innovate UK to support various R&D and translational projects. Dorian is actively involved in these as an Investigator, advancing the development of medical technologies for managing and treating neurological conditions.

Day 2

Daisy Thompson-Lake is an Assistant Professor and Addictions Research Neuroscientist at the Rockefeller Neuroscience Institute, West Virginia University. She investigates cutting-edge neuromodulation technologies to improve outcomes for patients with substance use disorder. She is involved with several clinical trials using techniques such as low-intensity focused ultrasound, deep brain stimulation, and transcranial magnetic stimulation to reduce cravings in substance use disorders. Using multiple neuroimaging methods, she endeavours to enhance understanding of the functional and structural changes occurring after treatments to help uncover the underlying mechanisms of low-intensity focused ultrasound.

Talk title: Exploring Low-Intensity Focused Ultrasound as a Treatment Strategy for Substance Use Disorder

Description: Deaths from opioid overdoses continue to rise at a staggering level despite the current medication and behavioral treatments available. We explore low intensity focused ultrasound of the nucleus accumbens, a key region in the brain's reward circuitry, as a potential treatment for severe and treatment-refractory opioid use disorder.

Miriam Klein-Flügge is an Associate Professor, Wellcome Trust Sir Henry Dale and UKRI-ERC fellow at the Departments of Experimental Psychology and Psychiatry and the Wellcome Centre for Integrative Neuroimaging at the University of Oxford. Her research group studies human cognitive processes, with a particular focus on motivation and decision making. She has extensive experience with neuroimaging and neuromodulation approaches. Her long-term vision is to conduct fundamental research that provides a platform for translation to psychiatric disease.

Talk title: Transcranial ultrasound stimulation to the human amygdala in emotion and decision making

	Description: Human decision making has been studied with a focus on simple binary choices and the role of the prefrontal cortex. In ecological situations, however, decisions often occur in complex settings and rely on interactions with older subcortical brain structures. I will present work focusing on the role of the amygdala, a region frequently implicated in depression, in decisions to approach or avoid emotional stimuli. Until recently, it has been difficult to establish the causal role of the amygdala in humans because traditional neurostimulation techniques could not reach deep brain targets. I will present work from two ongoing studies using offline transcranial ultrasonic stimulation (TUS) to target the amygdala in an emotional approach/avoidance learning task. The second study examines TUS state-dependency effects and was supported by a Neuromod+ pilot grant. I will show preliminary data examining the role of the functional state of the amygdala in influencing behaviour, mood, and physiology.
	**Paul Briley** is a psychiatrist and early career researcher developing approaches for making transcranial magnetic stimulation ("TMS") more effective for more people with depression and anxiety conditions. He worked on the Nottingham-led BRIGhTMIND TMS trial, recently publishing a study identifying distinct trajectories of improvement across TMS treatment sessions (https://doi.org/10.1038/s44184-024-00077-8). He has also published a systematic review of brain connectivity features that predict TMS outcomes (https://doi.org/10.1016/j.pscychresns.2024.111846). His key focus at present is on the use of synchronised transcranial alternating current stimulation ("tACS" - weak, oscillating, electrical stimulation) to boost the effectiveness of TMS, by enhancing brain receptiveness to TMS (https://doi.org/10.1162/imag_a_00073). **Talk title:** Enhancing transcranial magnetic stimulation (TMS) for depression and anxiety conditions using synchronised transcranial alternating current stimulation (tACS) **Description:** Whilst TMS helps many people with depression and anxiety conditions, there is wide variability in response. A key reason for this variability is thought to be variability in "brain state" at the time of stimulation - active brain regions and connectivity pathways. In this presentation, I describe initial work on combining TMS with a second form of well-tolerated neuromodulation - tACS, intended to optimise brain state during stimulation, thereby making TMS work faster and for more people.
	**Sophie Morse** completed her PhD in Bioengineering at Imperial College London, developing a non-invasive focused ultrasound technology to deliver drugs to the brain efficiently and safely. She was then awarded an EPSRC doctoral prize fellowship and has more recently become an Imperial College Research Fellow and an Emerging Leader within the UK Dementia Research Institute. She currently leads an interdisciplinary group at Imperial focused on modulating the activity of glial cells in the brain to delay and treat brain diseases. **Talk title:** A Device for Ultrasound Modulation with Multi-Photon Imaging **Description:** In this talk, I will show our work in building a device for simultaneous ultrasound modulation and 2/3-photon imaging in vivo
	**JeYoung Jung**. I obtained my PhD in Brain and Cognitive Engineering from Korea University, South Korea, in 2013. After completing my PhD, I worked as a post-doctoral research associate with Prof. Matt Lambon Ralph at the Neuroscience and Aphasia Research Unit at the University of Manchester. In 2018, I joined the University of Nottingham as a Beacon Anne McLaren Research Fellow in the School of Psychology and the Precision Imaging Beacon. In 2022, I began my role as an Assistant Professor in the School of Psychology at the University of Nottingham. Additionally, since 2024, I have served as a Visiting Professor at the College of Medicine, Korea University in Seoul.

	Talk title: Enhancing Semantic Memory with Transcranial Focused Ultrasound Stimulation of the Anterior Temporal Lobe **Description:** Low-intensity Focused Ultrasound Stimulation (FUS) is a non-invasive brain modulation technology with promising therapeutic applications. It uses acoustic energy to transiently alter brain function and offers advantages such as safety, painlessness, spatial precision, and the ability to modulate both cortical and deep brain regions. Semantic memory, crucial for knowledge of concepts and meanings, involves the anterior temporal lobe (ATL) as a key hub. This study applied FUS to the ATL to enhance semantic memory. Using MR spectroscopy and functional MRI, we observed that FUS 1) enhanced semantic memory performance, 2) decreased GABA and increased glutamate in the ATL, 3) increased N-acetylaspartate and choline levels in the ATL, 4) decreased task-induced regional activity in the semantic system. These findings demonstrate FUS's potential to enhance semantic memory, highlighting its therapeutic promise.
	**Wako Yoshida** is a research fellow at the University of Oxford, working in computational cognitive and social sciences. She received her PhD from NAIST, and has worked at ATR, UCL and Cambridge University, and worked as an Associate Professor at Kyoto University prior to joining Oxford University. Her research addresses the computational neuroscience of human cognitive decision making and social interaction, with a particular focus on the function of the prefrontal cortex. In recent years, she has been involved in a number of research projects, including 'hyperscanning', in which two subjects interact (cooperate) in separate fMRI scanners to solve tasks together; real-time neurofeedback experiments on social learning; VR experiments to understand learning mechanisms during sleep; and human brain during complex decision-making tasks. Her team is engaged in research to elucidate human brain activity during complex decision-making tasks. **Talk title:** Adaptive closed-loop fMRI neurofeedback for social learning. **Description:** People with autism spectrum disorders have behavioural differences, including in social learning and theory of mind. Amongst other things, this has been proposed to have a negative impact on learning in educational contexts, which often relies heavily on dynamic human-human interaction. To better understand how to help support social learning, and explore the potential for developing a 'brain-in-the-loop' closed-loop BMI system to assist people with these social behavioural differences, we developed a neurofeedback system using real-time fMRI signals. We implemented an observational learning task in which people learn from others by observing their actions and applying this knowledge to their own behaviour and developed a computational model of learning in this task. We found that the inferior frontal gyrus appears to integrate observed information with information based on one's own experience. We designed and conducted preliminary task-based neurofeedback experiments to control this activity.
Public involvement panel	
	**Nikul Bakshi** joined Parkinson's UK in February 2022 as the new Patient Involvement Manager. Nikul manages Parkinson's UK's Patient and Public Involvement (PPI) programme, with a specific focus on Parkinson's UK's Virtual Biotech area of work. He also works on several collaborative research projects with academic and commercial organisations, ensuring the voice of people affected by Parkinson's is heard and used to shape these projects.

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	**Harry Dyson** joined McPin Foundation in 2023 as a Peer Researcher and Public Involvement Officer. He works on psychosis research from a lived experience perspective. Prior to this he worked in a variety of lived experience roles including a co-produced NIHR research project on psychosis recovery and the urban environment, and a project using VR headsets for training psychiatrists. He also volunteered as a peer mentor for people recovering from psychosis during this period.
	**Kate Frost** joined Research and Innovation in December 2018 as the Head of Patient and Public Involvement and Engagement. She is responsible for the overall approach to Patient and Public Involvement for all research sponsored and hosted at Nottingham University Hospitals NHS Trust, the NIHR Nottingham Biomedical Research Centre, NIHR Nottingham Clinical Research Facility and NIHR Rehabilitation Health Technology Centre. Kate is based in the Research & Innovation department of Nottingham University Hospitals NHS Trust.
	**Rachel Knowles** is the lead for Clinical Research Policy, Ethics and Governance at the Medical Research Council (MRC). She has responsibility for clinical research ethics guidance and policy, as well as developing the MRC public involvement and engagement strategy and MRC policies on Embedding Diversity in Research Design (inclusive research practice) and clinical trials transparency. She sits on the steering committees for Understanding Patient Data and the Global Forum for Bioethics in Research.
	**Kate Reading** is a portfolio manager in the Healthcare Technologies theme of the Engineering and Physical Sciences Research Council (EPSRC). Kate particularly monitors the portfolio relevant to the prediction and diagnosis challenge of EPSRC's healthcare technologies strategy: EPSRC health technologies strategy – UKRI. As for all portfolio managers, there is a range of things included in the role, including providing a contact point for the neurotechnologies network plus that were jointly funded by EPSRC and MRC.
Public involvement session chairs	
	**Tiago da Silva Costa** is a specialist trainee in general adult psychiatry, currently out of programme for a clinical PhD funded by the NIHR Newcastle Biomedical Research Centre. His research interest is in difficult-to-treat depression (DTD). The transdiagnostic benefits of vagus nerve stimulation (VNS) on mood, fatigue and quality of life make it an obvious area of focus. Clinically, I work for the Regional Affective Disorders Service (RADS), a tertiary level NHS service for people with difficult to treat mood disorders, part of the Cumbria, Northumberland, Tyne and Wear (CNTW) NHS Foundation Trust, where he helps run the (implanted) VNS clinic for depression.
	**Amparo Güemes González** is a postdoctoral 1851 Research Fellow at the Bioelectronic Lab at the University of Cambridge. She received her B.S. in Biomedical Engineering from Polytechnic University of Madrid (Spain), and her M.S. in Biomedical Engineering and PhD in Electrical Engineering from Imperial College London (UK). Amparo distinguishes herself in the field of metabolic treatments based on neuromodulation. The interdisciplinary nature of her work includes signal processing, modelling, bioelectronics and electrophysiology to develop advanced algorithms and neurotechnology to be integrated into a closed-loop platform aiming to improve metabolic control.
	**Marcus Kaiser** is Professor of Neuroinformatics, working on computational approaches to inform diagnosis and interventions for brain network or connectome disorders. His research interest is to develop novel ways for brain stimulation, informed by neuroimaging and computer models, to improve cognition in health and disease. He leads Neuroinformatics UK, representing more than 600 researchers in the field.

	His current work is focused on predicting the effects of brain stimulation, either invasive approaches such as optogenetics or stimulation through implanted electrodes or non-invasive approaches such as focused ultrasound stimulation. For this, he uses a combination of techniques from machine learning and network analysis to computer simulations. The aim is to improve the treatment of brain disorders and mental health conditions.
	**Tamar Makin** is a professor of Cognitive Neuroscience at the MRC Cognition and Brain Unit. Her main interest is in understanding the key drivers and limitations of reorganisation in the adult brain. Tamar's primary model for this work is studying differently abled individuals. A particular focus is on how habitual behaviour, such as prosthesis usage or motor augmentation, shapes brain reorganisation. For this purpose, she integrates methods from the fields of neuroscience, experimental psychology, engineering and rehabilitation. Tamar hopes her research will enable clinical populations and those relying on motor augmentation to take advantage of the benefits of brain plasticity, rather than to suffer from their adverse effects.
	**Antonio Valentin** is a Reader in Clinical Neurophysiology and Epilepsy at the Department of Basic and Clinical Neuroscience and Institute of Psychiatry, Psychology & Neuroscience (IoPPN), Kings College London. His research is mainly based in neuromodulation in patients with refractory epilepsy. He is presently working in new diagnostic and potential treatments for this condition, including different techniques using electrical and transcranial magnetic brain stimulation.