NIHR | Brain Injury MedTech Co-operative

CAMBRIDGE WIRELESS

PROGRAMME

Brain Injury Technologies Think (BITT) Tank 2019:

Augmented and Virtual Reality Technologies

Thursday 4 April 2019

9.30 – 16:30

Madingley Hall, Cambridge, CB23 8AQ

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Unique Wi-fi codes will be provided to delegates on the day

The NIHR Brain Injury MedTech Co-operative is delivered in partnership between Cambridge University Hospitals NHS Foundation Trust and University of Cambridge

About the event

The NIHR Brain Injury MedTech Co-operative welcomes you to the BITT Tank 2019!

The aim of the BITT Tank series is to provide the opportunity to showcase and disseminate clinical academic evidence, novel technologies and solutions, and future funding and potential collaborations. To achieve this, the BITT Tank brings the relevant professional, clinical, academic, industry and charity representatives together and facilitates networking.

Augmented and Virtual Reality applications are increasingly proposed for the prevention and treatment of brain injuries. At a time when technology is rapidly evolving, this event brings together leading clinical experts to define areas of unmet needs and potential applications of the technology.

It will also provide an opportunity for technology developers and clinical teams to showcase their technologies and on-going applications.

The event is supported by members of patient advisory groups as well as key personnel from grant funding and investing organisations who will provide critical advice on proposed products and applications.

The event is designed to encourage networking and future collaborations as well as provide for supportive exhibits of products.

Confidentiality request

We kindly request that, for the protection of all organisations and individuals represented at the BITT Tank, all presentations, discussions and recommendations are kept confidential to this meeting.

Any subsequent detailed discussions regarding potential collaborations will be subject to nondisclosure agreements, which will be coordinated by the MIC on behalf of its members, the relevant companies and any other party.

PLEASE NOTE: The agenda is extremely busy and we must work with the chairman and organisers to keep to time!

Speakers and Chairs

Prof. John Pickard, Honorary Director, NIHR Brain Injury MIC

Professor John Pickard FRCS FMedSci is Professor (Emeritus) of Neurosurgery in the Department of Clinical Neurosciences of the University of Cambridge. He is the honorary director of the National Institute for Health Research Brain Injury MedTech Co-operative for brain injury (MIC). His research focuses on advancing the care of patients with acute brain injury, hydrocephalus and prolonged disorders of consciousness through functional brain imaging, studies of pathophysiology and new treatments as well as focusing on health, economic and ethical aspects.

www.brainmic.nihr.ac.uk info@brainmic.org

Prof. Mark Wilson, Pre Hospital and Prevention Theme Lead, NIHR Brain Injury MIC

Professor Mark Wilson is Consultant Neurosurgeon and Pre-Hospital Care Specialist (Imperial College, Kent, Surrey & Sussex Air Ambulance), Professor of Practice Brain Injury (Imperial College London) and Honorary Professor of Pre-Hospital Care (Faculty of Pre-Hospital Care, Royal College of Surgeons, Edinburgh).

Mark established the Neurotrauma service at St Mary's, Imperial's Major Trauma Centre in 2010. His specialist areas are acute brain injury (mostly traumatic brain injury) and its very early management. He is co-director of the Imperial Neurotrauma Centre. He is the founder of GoodSAM (www.goodsamapp.org), a revolutionary platform that alerts doctors, nurses, paramedic and those trained in basic life support to emergencies around them and is now enabling video triage to optimise resource deployment to patients. He has worked extensively overseas (India, Nepal, South Africa, as a GP in Australia, Researcher for NASA and as an expedition doctor on Arctic and Everest expeditions). His research focus is the hyper-acute management of brain injury and the physiological effects of hypoxia on the brain.

www.brainmic.nihr.ac.uk info@brainmic.org

Dr Jen Martin, Senior Programme Manager, NIHR MindTech MedTech Co-operative

Dr Jen Martin has worked in the healthcare technology field for more than 15 years and is currently Senior Programme Manager of the NIHR MindTech MedTech Co-operative and NIHR Nottingham Biomedical Research Centre. Prior to this, Jen was Senior Research Fellow in Human Factors at the University of Nottingham where her research focused on user-centred design methods for healthcare. Jen's current work is focussed on the evaluation and adoption of mental health technologies such as Virtual Reality, games and digital interventions. She is a member of NHS England's Expert Reference Group for Digital Innovation and Adoption and is also an advisor to NICE as part of their work on accreditation of mobile health apps.

www.mindtech.org.uk Jennifer.Martin@nottingham.ac.uk

Dr Andrew Bateman, Neuropsychology Theme Lead, NIHR Brain Injury MIC

Dr Andrew Bateman is Head of Neurorehabilitation services in Cambridgeshire Community Services NHS Trust. Since 2002 he has been Clinical Manager at Oliver Zangwill Centre for Neuropsychological Rehabilitation. He is affiliated lecturer in the Department of Psychiatry in Cambridge. He is President of the Society for Research in Rehabilitation, a scholarly society

that aims to promote excellence in rehabilitation research. He is Chair of the United Kingdom Acquired Brain Injury Forum (UKABIF), a national charity that aims to provide a route for lobbying, continuing professional development and networking for people working in the brain injury sector. He has published research on a wide range of aspects of brain injury rehabilitation including exercise, cognitive neuropsychology, psychometrics, rehabilitation service development, and social media.

www.brainmic.nihr.ac.uk www.ozc.nhs.uk info@brainmic.org

Dr Naomi Deakin, Study Coordinator, Cambridge University Hospitals NHS FT

Dr Deakin is a PhD student in Clinical Neurosciences, co-supervised by Prof Peter Hutchinson (Neurosurgery) and Prof John Suckling (Psychiatry). Dr Deakin completed her medical training in Cambridge, followed by the Academic Foundation Programme in Edinburgh. She has worked as a Junior Neurotrauma Fellow in Neurosurgery at Addenbrooke's Hospital. Dr Deakin is a Registered Doctor with the UK Motor Sports Association and has conducted motorsport research at Silverstone Race Circuit since 2012. Dr Deakin is Concussion Fellow for TOCA, a UK motorsports events package, and is the 2018 Sid Watkins Scholar - a funded research position with the Global Institute for Motorsport Safety. Currently, Dr Deakin is the Study Coordinator for RESCUE-RACER, a two-year longitudinal study of concussion in motorsport based at the University of Cambridge/Cambridge University Hospitals and funded by the world governing body for motorsport, the FIA.

naomi.deakin@cantab.net

Dr Michael Grey, Neurorehabilitation Deputy Theme Lead, NIHR Brain Injury MIC

Michael Grey is a neuroscientist specialising in neuroplasticity and neurorehabilitation following acquired brain injury. He is investigating novel uses of virtual reality technology for neurorehabilitation and uses non-invasive electrophysiology, brain stimulation and neuroimaging techniques to study neuroplasticity. Dr Grey works with the Acquired Brain Injury Rehabilitation Alliance (ABIRA) and the NIHR Brain Injury MedTech Co-operative. At the University of East Anglia, Dr Grey leads research investigating the use of virtual reality for assessment of sport concussion and acquired brain injury rehabilitation.

www.brainmic.nihr.ac.uk info@brainmic.org

Mr Abhi Naha, Chief Commercial Officer, Cambridge Wireless

Abhi has a long heritage with CW having previously founded the CW Handset Special Interest Group (SIG) in 2008, now called Future Devices. Prior to CW, Abhi studied Electronics and Electrical Engineering, has a MBA in International Marketing and interestingly, was approached by Cambridge University Press (alongside a colleague at the time) to write a book on Mobile Handset Design which was successfully launched in New Delhi. 20 years in the ICT industry, it's fair to say Abhi has built up an enviable network of contacts, to the great fortune of CW! He joined the team in June 2015 as Head of Marketing before landing his current role as CCO. Abhi is responsible for commercial operations, engagement with the start-up community, and is a key driving force behind CW Unplugged, an initiative aimed at the younger generation. A strong advocate of digital inclusion and diversity within the technology industry, Abhi champions this across all areas within CW and actively mentors several young CEO Founders.

www.cambridgewireless.co.uk hello@cambridgewireless.co.uk

Dr Peter Jarritt, Deputy Director, NIHR Brain Injury MIC

Peter is Deputy Director and technology theme lead for the National Institute for Health, Health Technology Cooperative for Brain Injury. He is an Honorary Fellow of the Royal College of Physicians as well as a Fellow of Institute of Physics and Engineering in Medicine (IPEM). He is also a member of the Advisory Board of the Centre for Healthcare Photonics at the Centre for Process Innovation (CPI). He is also a member of the advisory board of the newly established KTN Neurotechnology SIG. Peter has more than 20 years' experience directing and delivering a comprehensive range of Medical Physics and Clinical Engineering services at the highest level. Most recently Peter was the Clinical Director and Head of Medical Physics and Clinical Engineering at Cambridge University Hospitals NHS Foundation Trust.

www.brainmic.nihr.ac.uk info@brainmic.org

Prof David Crawford, School of Computer Science & Electronic Engineering, University of Essex

David Crawford is a Professor at the Universities of Essex and Ravensbourne in the UK, with interests in next generation networks and 'beyond HD' multimedia services. He is well-known in the engineering and business fraternities, having worked for over 40 years in the telecoms and broadcast industries and academia. David has expertise in digital media, AR/VR, immersive technologies, Internet of Things and lectures on ICT, Networks and Broadcast Technology, and is Director of a small high-tech start-up in France. He also runs his own technical consultancy company, TTL, and chairs and presents regularly at technical and business conferences. David is a Member of the Royal Television Society, an ex-Board and Council Member of the Institute of Engineering & Technology (IET) and has been the Executive Producer for the annual IBC Multimedia Conference in Amsterdam for many years.

www.essex.ac.uk/people/crawf69903/david-crawford

Dr Ian Newington, Head of Special Projects, Innovations, NIHR Central Commissioning Facility

Having led the i4i Programme Team until July, Ian now heads up Special Projects and medtech SME engagement in the CCF Innovations team. He also manages a portfolio of funded projects across i4i and Health Innovation Challenge Fund (HICF) and the contract for the NIHR Innovation Observatory. Prior to this, a DPhil (Oxon) in chemistry led to Ian joining Kodak Ltd, becoming a Principal Scientist in the European R&D labs, followed by 9 years at GE Healthcare Life Sciences, Imaging R&D, leading the Discovery portfolio for molecular imaging in neurodegenerative disease. Ian is a (co-)inventor on 38 patent applications.

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Mr Mark Otto-Smith, Economic Growth & Innovation Programme, Eastern Academic Health Science Network

Mark has wide experience of the UK health system and the use of technologies to transform NHS services. He has led innovator programmes at Eastern since 2017, engaging with over 400 healthtech companies. Many of these have received grant funding and achieved adoption in the NHS following AHSN support. Previously he advised UK government trade teams, NHS Trusts and UK companies on international commercial development through the Department of Health and Social care agency Healthcare UK. Based on his experience in large and start-up

companies, his aim is to help clinically-led technology initiatives maximise benefits for the population.

www.eahsn.org enquiries@eahsn.org

Dr Shreepali Patel, StoryLab Director, Anglia Ruskin University

Dr Patel is Director of StoryLab ARU. Her research explores multimodal and immersive storytelling, creative technologies and user experience. She is a former BBC Producer/Director, BAFTA Award winning filmmaker and co-director of Emmy Award winning Eyeline Film. She has over 25 years of worldwide extensive filmmaking experience. Her work crosses genres (documentary, drama, artist moving image, promos and commercials) and platforms (multiscreen, cinema, exhibition, interactive and immersive digital media).

storylabresearch.com storylab@anglia.ac.uk

Organisers

NIHR Brain Injury MedTech Co-operative

The NIHR Brain Injury MedTech Co-operative is one of the eleven Medtech and In vitro diagnostic Co-operatives (MIC) funded by the National Institute for Health Research (NIHR) across the country. The NIHR Brain Injury MIC works with patients, carers, NHS, charities, academia, inventors, SMEs and business angels to support the development of new medical devices and healthcare technologies, to improve the effectiveness and quality of healthcare services in the brain injury care pathway. The NIHR Brain Injury MIC aims to Find, Facilitate and Foster ideas for early stage evaluation to meet the needs of those who have been affected by brain injury.

www.brainmic.nihr.ac.uk info@brianmic.org

Cambridge Wireless (CW)

CW is the leading international community for companies involved in the research, development and application of wireless and mobile, internet, semiconductor and software technologies. With over 400 members from major network operators and device manufacturers to innovative start-ups and universities, CW stimulates debate and collaboration, harnesses and shares knowledge, and helps to build connections between academia and industry. CW's 19 Special Interest Groups (SIGs) provide its members with a dynamic forum where they can network with their peers, track the latest technology trends and business developments and position their organisations in key market sectors. CW also organises major conferences and start-up competitions along with other high-quality industry networking events and dinners. With headquarters at the heart of Cambridge, UK, CW partners with other international industry clusters and organisations to extend its reach and remain at the forefront of global developments and business opportunities.

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Agenda

Brain Injury Technologies Think (BITT) Tank 2019:

Augmented and Virtual Reality Technologies

Registration & Coffee	*9.30 – 10.00*
Session 1: Clinical & Patient Unmet Needs *Chaired by Professor (Emeritus) John Pickard, Honorary Director, NIHR Brain Injury MedTech Co-operative (MIC)*	**10.00 – 11.15**

Talks from:

- **What 'AR' the Needs for Brain Injury Patients?** Prof Mark Wilson, NIHR Brain Injury MIC
- **Virtual reality applications in mild TBI; research in the pre-hospital and clinic environments**, Dr Naomi Deakin, Cambridge University Hospitals NHS Foundation Trust
- **Development of virtual reality based concussion assessment prototype**, Dr Michael Grey, University of East Anglia
- **Virtual reality to transform the lives of people psychosis**, Dr Jen Martin, NIHR MindTech MedTech Co-operative
- **AR/VR in Neuropsychology: What's the potential?** Dr Andrew Bateman, NIHR Brain Injury MIC

Coffee Break	*11.15 – 11.30*
Introduction to Cambridge Wireless, Mr Abhi Naha	
Session 2: Technology Showcase - Part 1	**11.30 – 12.55**
Session 2: Technology Showcase - Part 2	**13.55 – 15.00**
Chaired by Dr Peter Jarritt, Deputy Director, NIHR Brain Injury MedTech Co-operative (MIC)	

- 8 Technology Showcase presentations confirmed with Q&A

Lunch & Networking	*12.55 - 13.55*
Tea Break	*15.00 – 15.15*
Session 3: Horizon Scanning *Chaired by Prof David Crawford, CW Special Interest Group Champion, Universities of Essex and Ravensbourne*	**15.15 – 15:45**

Panel discussion with:

- Dr Ian Newington, National Institute for Health Research (NIHR) i4i
- Mr Mark Otto-Smith, Economic Growth & Innovation Programme, Eastern Academic Health Science Network
- Dr Shreepali Patel, Director, StoryLab, Anglia Ruskin University

Refreshments & Networking	*15.45 - 16.30*

The Prince Room will be open all day with demo and displays

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Technology Showcase

Part 1			
Dr Isabel Van De Keere Immersive Rehab Ltd	IMMERSIVE REHAB	Dr Isabel Van De Keere is the Founder & CEO of Immersive Rehab, a digital health startup that focuses on the creation and development of physical & neuro-rehabilitation programmes in Virtual Reality that improve patient recovery. The goal is to increase the effectiveness of physical & neuro-rehabilitation, to reduce referral times, to make rehab fun and engaging, and to have a better patient outcome. Following a long physical rehab period Isabel went through herself due to a work accident, she decided to start Immersive Rehab in September 2016.	11.40 - 11.55
Dr Brigitta Zics, SoftV Ltd	SOFT/U DIGITAL GAMIFICATION	SoftV Ltd is a dynamic digital gamification company formed in 2013 with the aim to gamify Neuroscience and related Medical Applications including Apps and online services of benefit to the wider public and patient community.	11.55 - 12.10
Dr David Fried, Evolv Ltd	evolv Rehabilitation Technologies	Evolv is a certified medical device manufacturer specializing in developing rehabilitation technologies using the latest in virtual reality, motion capture systems and gamification. Our flagship product VirtualRehab is a pioneering cloud-based telerehabilitation platform that uses gaming to complement traditional rehabilitation and has been used by thousands of patients in over 150 centres in 20 countries around the world. Our solutions empower patients by allowing them to take an active role in their rehabilitation, thereby improving adherence to treatment and ultimately leading to improved patient outcomes.	12.10 - 12.25
Mr Szczepan Orlowski Animorph Ltd	ANIMORPH	**VR Training for Nurses** - A mobile VR communication training app for hospital staff working with young people suffering from cancer. It aims to increase confidence in interactions with patients. This empathy tool will improve the patient experience, and turn the knowledge of medical staff into innovative best-practice immersive training. **AR Navigator** - Wearable Augmented Reality app for Magic Leap One glasses that uses computer vision to recognise real life objects, and present users with the information about them using speech synthesis. The prototype has many potential use cases such as helping people navigate their surroundings.	12.25 - 12.40 12.40 - 12.55

Part 2			
Dr Alex Kiderman Neuro Kinetics Incorporated (NKI)	RESCUE RACER	RESCUE-RACER utilises the most promising and technologically-advanced concussion assessments currently available, including NKI's innovative I-PAS™ (I-Portal® Portable Assessment System), which will be demonstrated by the company's Chief Technological Officer.	13.55 - 14.10
Dr Jen Martin Virtual Reality for Mental Health: NIHR MindTech MIC and OxfordVR	NIHR | Mental Health MedTech Co-operative	Many people with mental health conditions find day-to-day life extremely frightening and this has a devastating impact on their life. VR provides a way to quickly and safely take people into these situations and help them learn how to overcome their fears through psychological therapy, and excitingly, research shows that the learning in VR translates to the real world. In this session we will introduce the gameChange project, which is using VR within NHS services to transform the lives of people with psychosis and also allow delegates to try out OxfordVR's new fear of heights intervention.	14.10 - 14.25
Dr Stephanie Rossitt University of East Anglia	SIGHT Spatial Inattention Grasping Home-based Therapy	**Portable patient-led virtual reality tools for assessment and rehabilitation of spatial neglect** Spatial neglect is a highly prevalent and severe neuropsychological disorder defined as a failure to respond to the side of the space opposite to the side of the brain lesion. Neglect is major predictor of disability, yet, conventional assessments lack sensitivity and there are no recommended effective treatments for the disorder. Virtual Reality (VR) provides an interactive platform with strong potential to enhance detection sensitivity and increase rehabilitation adherence. Together with an industry collaborator (Evolv Rehabilitation Technologies), we are developing and testing new tools for the diagnosis and treatment of neglect using portable low-cost motion-tracking VR technology.	14.25 - 14.40
Dr Shreepali Patel StoryLab - Anglia Ruskin University	StoryLab Anglia Ruskin University	**The Power of Immersive Storytelling – Clinical and Patient Needs.** This talk will look at two projects. The Golden Window, a short film exploring the patient / carer relationship and cooling techniques for babies experiencing traumatic birth through a heightened and immersive visual and sonic landscape. The second project, a VR project 'The River' made for hospice and immobile patients – part of a pioneering VR experience for healthcare professionals to engage with patients and their families in a different way. We will discuss the technical parameters of the filmmaking process – how we made both projects with the patients / carers as the primary audience.	14.40 - 14.55