Research with Impact

Centre for Digital Entertainment

A Two-Person Neuroscience Approach for Social Anxiety: Prospects into Bridging Intra- & Inter-brain Synchrony with Neurofeedback

Marcia Saul, Centre for Digital Entertainment
Dr Fred Charles & Dr Xun He, Bournemouth University
Stuart Black, Applied Neuroscience Solutions Ltd, t/a BrainTrainUK

Social anxiety has become one of the most prominent of anxiety disorders, with many of its symptoms overlapping into the realms of other mental disorders such as depression, autism spectrum disorder, schizophrenia, ADHD, etc. Neurofeedback (NF) is well known to modulate these symptoms using a metacognitive approach of relaying a participant's brain activity back to them for self-regulation of the target brainwave patterns. In this project, we explore the potential of integrating Intra- and inter-brain Synchrony to explore the potential of a more effective NF procedure. By using realistic multimodal feedback in the delivery of NF, we can amplify the concept of collaboration or co-operation during tasks – utilising the 'power of two' in two-person neuroscience – to help reach our goal of synchronising brainwaves between two participants and aiming to alleviate symptoms of social anxiety.

www.digital-entertainment.org/about-cde/our-students-projects/

Bournemouth University

BrainTrainUK
Changing Lives With Neurofeedback

EPSRC
Engineering and Physical Sciences Research Council

Centre for Digital Entertainment

Marcia Saul - CDE Research Engineer

Marcia is now in her second year of the EngD programme and based primarily at Bournemouth University. She is currently conducting a literature review of her interdisciplinary research, with plans to begin experiments towards the beginning of her third year. Since starting the EngD programme, Marcia has participated and won first place in a group hackathon at the BCI Society Meeting in California 2018 where she and her group created a ‘mind-controlled’ zombie avatar, moving based on the user’s motor imagery, and collecting brains in a Unity game. Additionally, she has attended an intensive 5-day Neurofeedback workshop lead by pioneers in Neurofeedback research during the Biofeedback Federation meeting in Wales 2019. She has also published and presented a research paper on re-sampling techniques in machine learning at the UK Computational Intelligence conference in Nottingham 2018.
Marcia came into the EngD programme after completing an MSc in Computational Neuroscience and Cognitive Robotics, dissertation titled ‘Human Wrist Position and Movement Coding using Computational Proprioception and Artificial Neural Networks’.

Stuart Black - founder and Managing Director of Applied Neuroscience Solutions Ltd, trading as BrainTrainUK

Stuart obtained a BSc in Electronic Engineering from King’s College London and Master’s in Coaching & Development from Portsmouth Business School. Stuart is a Chartered Engineer and has worked in defence, management consultancy and healthcare. He was Executive Director at the Cromwell Hospital in Kensington from 2009 to 2012. His interest in the intersection of technology and wellbeing led him to Neurofeedback and how it could be used for therapy and peak performance, founding BrainTrainUK in 2013. BrainTrainUK specialises in anxiety issues and developmental trauma.

BrainTrainUK
Changing Lives With Neurofeedback

Applied Neuroscience Solutions Ltd (trading as BrainTrainUK) are the leading UK service provider for Advanced QEEG Brain Mapping and EEG Neurofeedback services.
This research expands our academic footprint, gives us access to expertise to test our ideas and vision out, and develops our relationships with other academic institutions.
Find out more at https://www.braintrainuk.com

Dr Fred Charles - Bournemouth University

Dr Fred Charles' main research interests focus on Computational Intelligence applied to Computer Games including Artificial Intelligence combined with Human-Computer Interaction. For the last 18+ years, he has been involved in research on Interactive Storytelling which led to the development of several interactive systems which have won several awards. More recently, he has been involved in the development of several prototypes in the field of Brain-Computer Interfaces (BCI) using affective interaction (PFC asymmetry) in a Neurofeedback paradigm using EEG and FNIRS.
BU profile: https://staffprofiles.bournemouth.ac.uk/display/fcharles

Dr Xun He - Bournemouth University

Dr Xun He is an experimental psychologist and social neuroscientist. He studies the behavioural components and neural underpinnings of social attention and social perception. The main research question Xun asks is how human attention and perception performance is shaped by social interactions. He is an expert in the electroencephalography (EEG) technique, including the hyperscanning EEG (recording EEG from multiple persons simultaneously) employed in the current project.
BU profile: https://staffprofiles.bournemouth.ac.uk/display/xhe

Bournemouth University

BrainTrainUK
Changing Lives With Neurofeedback

EPSRC
Engineering and Physical Sciences Research Council