

ENB Elite Master Program Neuroengineering (MSNE) Invited Presentation

Prof. Dr. phil. Klaus Gramann
Technische Universität Berlin

Mobile Brain/Body Imaging (MoBI) to image brains in action

Abstract: Recent years have shown a remarkable shift in using established EEG technologies to leave the traditional lab environments and to record brain dynamics in actively behaving participants in complex technical setups and the real world. Imaging human brain dynamics usually requires stationary setups and immobile participants to avoid movement-related artifacts from distorting the signal of interest. Interaction with technical systems, however, often requires physical movement to interact with some form of interface to reach the desired system state. This movement itself provides kinesthetic feedback that contributes to and sometimes builds the very basis of the interaction. The brain dynamics underlying such physical interaction are hitherto unknown because of the restrictions of established brain imaging modalities. To overcome these restrictions, new mobile brain imaging methods can be employed. Here, I will give an overview of new technological developments in the field and applications that are now possible using mobile electroencephalography and Mobile Brain/Body Imaging (MoBI). The requirements and pros and cons of different approaches will be discussed and examples for recent interactive VR experiments are shown. In addition, challenges regarding recording hardware and analyses approaches often leading to difficulties in comparing the results with established laboratory EEG-parameters will be discussed.

Biography: Klaus Gramann received a pre-diploma in psychology from Justus Liebig University Giessen, Germany, and the Diploma and Ph.D. degrees in Psychology from RWTH Aachen, Germany in 1998 and 2002, respectively. He was an Assistant Professor with the Ludwig Maximilians University of Munich, Germany, and a Research Associate with the Swartz Center for Computational Neuroscience, University of California at San Diego. After working as a visiting professor at the National Chiao Tung University, Hsinchu, Taiwan and as a professor for cognitive psychology at the University of Osnabrueck, Germany, he became the chair of biopsychology and neuroergonomics with the Technical University of Berlin, Germany in 2012. Since 2017, he has also been a Professor with the School of Computer Science, University of Technology Sydney, Australia. His research covers the neural foundations of cognitive processes with a special focus on the brain dynamics of embodied cognitive processes. He is involved in the field of spatial cognition, visual attention, and the development of a mobile-brain imaging method to leverage the fundamental research results in applied neuroergonomics.



The Talk is hosted by Prof. Markus Ploner (Klinikum rechts der Isar / TUM / PainLabMunich)

Monday, November 18 2019, 17:30

Theresienstrasse 90, 80333 Munich (Room N1135)

All talks in the MSNE Invited Speaker Series are open to students, staff, and members of the public. Attendance is free.

Contact: msne@ei.tum.de / www.msne.ei.tum.de
MSNE is supported by the Elite Network of Bavaria.

**MS
NE**



Elitenetzwerk
Bayern

