rtFIN 2024
Heidelberg – Germany

Real-time Functional Imaging and Neurofeedback meeting |

3-6 November | Heidelberg / Mannheim, Germany

Pre-conference Workshops

Want to participate? Participation in the workshops is included for registered participants of the rtFIN conference. You need to register for the rtFIN conference in order to participate in the workshops. Visit the conference website to register for the conference.

DATE: 2024, November 3-4
VENUE:
Workshops on Nov 3: CUBEX ONE | Franz-Volhard-Straße 5 | Mannheim
Lab Tour, Workshop on Nov 4: Central Institute of Mental Health | J5 | Mannheim

CONFERENCE WEBSITE: https://rtfin2024.org

Get in touch: rtFIN@zi-mannheim.de

EEG Neurofeedback in Clinical Practice – Assessment, QEEG, and Practical Implementation

Tobias Heiler

November 3, 10 AM, CUBEX ONE, Room: CONFERENCE NOW

This workshop provides a comprehensive introduction to the clinical application of EEG Neurofeedback. Participants will gain a thorough understanding of the assessment process, including QEEG analysis, and learn how to practically implement neurofeedback protocols for various conditions. The workshop combines theoretical knowledge with hands-on experience, ensuring participants are equipped with the skills to effectively utilize neurofeedback in their clinical practice.

FROM BASIC REAL-TIME NEUROFEEDBACK PARADIGMS TO ADVANCED SEMANTIC NEUROFEEDBACK USING TURBO-BRAINVOYAGER

Assunta Ciarlo, Michael Lührs, Rainer Goebel

November 3, 1 PM, CUBEX ONE, Room: tba

In this workshop, participants will learn the general procedure of how to perform real-time fMRI experiments using Turbo-BrainVoyager (TBV), one of the most often used software for real-time fMRI applications. The workshop will start with a general introduction to the topic of real-time fMRI at 3 and 7 Tesla and its potential application to neurofeedback based on ROIs, multivariate patterns, and connectivity measures. This will provide an overview for beginners and a recap for experienced users. We will then go into detail about Turbo-BrainVoyager and will explain the general structure of the software and the workflow to perform real-time experiments. Here will focus on best practices and real-time quality measures to improve the quality of the real-time applications. The last big section of the workshop will focus on the design of semantic neurofeedback paradigms within TBV and using a Python interface for custom designs.

NEUROPHENOMENOLOGY IN NEUROFEEDBACK RESEARCH: A TUTORIAL OVERVIEW

Eddy J. Davelaar

November 3, 1 PM, CUBEX ONE, Room: tba

Neurofeedback researchers have increased efforts to understand the neural and psychological processes involved in neurofeedback learning. This has led to the adoption of a variety of research methods, from computational approaches to qualitative analyses. These methods are so varied that early career researchers are unlikely to learn about the full range available. This workshop is intended for students who want to learn about neurophenomenology and how it can be integrated with neurofeedback research and for researchers who want to remain up to date on best

practices within qualitative research. We will start with a general introduction of qualitative methodologies, analyses, and the benefits and limitations of using AI, after which the neurophenomenological research agenda is covered. In the second hour, we will analyse a number of published and unpublished neuroscience and neurofeedback research that integrate neurophenomenology. The workshop will end with points for reporting standards to allow comparison and integration across studies. No prior knowledge of qualitative methods is necessary to follow this workshop.

REAL-TIME FNIRS DATA QUALITY ASSESSMENT AND EXTRACTION OF COMPLEMENTARY PHYSIOLOGICAL MARKERS

Thijs van Aalten, Mohammad Shahbakhti

November 3, 4 PM, CUBEX ONE, Room: tba

In this workshop, we present recent advancements in Artinis-developed algorithms for real-time (i) data quality assessment and (ii) extracting additional physiological markers from high-sample-rate fNIRS data, typically exceeding 50 Hz. In the first part, we introduce a new signal quality index algorithm designed for real-time assessment. This algorithm quantitatively evaluates data quality by integrating IMU data analysis, enabling operators to identify and understand the reasons behind low-quality data and facilitating informed corrective actions. In the second part, we demonstrate how to extract additional physiological markers, such as heart rate and respiratory rate, from fNIRS data to complement brain activity analysis

GRAYMATTERS HEALTH: INSIGHTS INTO SCIENTIST ENTREPRENEURSHIP

Bodo Brückner, Rani Cohen, Talma Hendler

November 3, 4 PM, CUBEX ONE, Room: tba

Bodo Brückner, Coordinator of the Life Science Accelerator Baden-Wuerttemberg, will introduce participants of this workshop to the Dos and Don'ts of intellectual property for inventors and startups from universities. Rani Cohen and Talma Hendler, founders of GrayMattersHealth, will share how scientific findings can be translated into a scalable brain-based medical product. The company’s flagship product, Prism for Post-Traumatic Stress Disorder (PTSD), is the first non-invasive, self-neuromodulation device to receive FDA clearance as a prescribed adjunct to standard-of-care treatment of PTSD.

REAL-TIME FNIRS EXPERIMENTAL DESIGN AND PROCESSING WITH TURBO-SATORI

Maria Adelia Albano de Aratanha, Elina Zmeykina

November 4, 9:30 PM, CUBEX ONE, Room: tba

Functional near-infrared spectroscopy (fNIRS) is rapidly becoming a valuable tool in neuroscience research, providing real-time insights into cerebral hemodynamics. This workshop aims to provide participants with the essential knowledge and skills to design and perform real-time fNIRS experiments. Beginning with an introduction to the basic principles of fNIRS and key considerations for data acquisition and experimental design, the session will navigate the challenges of applying fNIRS in real-time scenarios. We will also walk through the real-time processing techniques specifically tailored for neurofeedback experiments. The workshop will conclude with a live demonstration of the practical application of these concepts through data acquisition and real-time processing using the Turbo-Satori software. This hands-on experience will provide theoretical knowledge and demonstrate the practical implementation of fNIRS in research settings, opening the way for innovative studies in cognitive neuroscience and beyond.

GUIDED TOUR THROUGH THE CENTER FOR INNOVATIVE PSYCHIATRIC AND PSYCHOTHERAPEUTIC REESEARCH (ZIPP) of the CENTRAL INSTITUTE OF MENTAL HEALTH (CIMH / ZI)

November 3, 4 PM and November 4, 10 AM, Central Institute of Mental Health
(Tour will be given if minimum number of participants registers)

The ZIPP opened in 2019 after the remodeling and redesign of two floors in CIMH's therapy building. The overall goal of ZIPP is to discover and establish innovative, personalized psychotherapeutic and pharmacotherapeutic mechanisms of action for mental disorders through a novel integrated approach that combines experimental medical and mechanistic neuroscience research. To this end it hosts a study center with several room sfpr neuropsychological testing, blodd drawing and other test/examination methods, two 3T Prisma, a 7T Terra.X, and a 3T PET-MR scanner, an MEG, several EEGs, fNIRS, rTMS, a virtual reality lab, neurophysiology labs, a biobank, and an early clinical trail unit.

- **MEET & GREET** at CUBEX ONE on Sunday Nov 3 in the end of the workshop day

Central Insitute of Mental Health (CIMH / ZI) is the host of rtFIN 2024. Workshops are hosted by CIMH / ZI in collaboration with CUBEX ONE.

Zentralinstitut für Seelische Gesundheit

CUBEX NEXT MANNHEIM

Workshops are presented by

Brain Innovation Maastricht, NL

artinis medical systems

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