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Real-time Functional Imaging and Neurofeedback meeting |

3-6 November | Heidelberg / Mannheim, Germany

PROGRAM BOOKLET

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VENUES

WORKSHOPS, LAB TOUR

Workshops on November 3:

CUBEX ONE | Franz-Volhard-Straße 5 | Mannheim

Website: <https://cubex.next-mannheim.de/en/>

Workshops on November 4, lab tour on November 3 and 4:

Central Institute of Mental Health (CIMH), Therapy Building | J5 | Mannheim

Website: <https://www.zi-mannheim.de/en/index.html>

MEET & GREET

November 3, 17:30:

CUBEX ONE | Franz-Volhard-Straße 5 | Mannheim

Website: <https://cubex.next-mannheim.de/en/>

MAIN CONFERENCE

November 4-6:

Heidelberg Congress Center | Czernyring 20 | Heidelberg

Website: <https://heidelberg-congress.com/en/heidelberg-congress-center/>

SOCIAL EVENT

November 4, 19:00:

Halle02 | Zollhofgarten 2 | Heidelberg

Website: <https://halle02.de>

CONFERENCE DINNER

November 5, 19:00:

Palais Prinz Carl | Kornmarkt 1 | Heidelberg

Website: <https://palaisprinzcarl.de>

See → FIND YOUR WAY for maps and information on traveling

WORKSHOP PROGRAM

	VENUE	VENUE
Sunday, November 3	CONFERENCE NOW CUBEX ONE	ZIPP LOUNGE CIMH
Morning session 10:00 – 12:00	EEG NEUROFEEDBACK IN CLINICAL PRACTICE – ASSESSMENT, QEEG, AND PRACTICAL IMPLEMENTATION	LAB TOUR To begin 10:30
Lunch break 12:00 – 13:00		
	CONFERENCE NOW CUBEX ONE	THINKER SPACE CUBEX ONE
Afternoon session I 13:00 - 16:00	FROM BASIC REAL-TIME NEUROFEEDBACK PARADIGMS TO ADVANCED SEMANTIC NEUROFEEDBACK USING TURBO-BRAINVOYAGER	NEUROPHENOMENOLOGY IN NEUROFEEDBACK RESEARCH: A TUTORIAL OVERVIEW
Afternoon session II 16:00 – 18:00	REAL-TIME FNIRS DATA QUALITY ASSESSMENT AND EXTRACTION OF COMPLEMENTARY PHYSIOLOGICAL MARKERS	GRAYMATTERS HEALTH: INSIGHTS INTO SCIENTIST ENTREPRENEURSHIP
Meet & Greet 17:30		
Monday, November 4	GREAT LECTURE HALL CIMH	ZIPP LOUNGE CIMH
Morning session 9:30 - 11:30	REAL-TIME FNIRS EXPERIMENTAL DESIGN AND PROCESSING WITH TURBO-SATORI	LAB TOUR To begin 10:00

MAIN CONFERENCE PROGRAM

Monday, November 4	HALL HEIDELBERG CONGRESS CENTER	FORUM HEIDELBERG CONGRESS CENTER
Opening 13:00	WELCOME ADDRESS Organizing Committee and Andreas Meyer-Lindenberg, Director of CIMH	
Keynote 13:30 – 14:30	FROM EEG TO BCI: 100 YEARS IN 1 HOUR Andrea Kübler	
Opening symposium 14:30 – 16:00	CUSTOMIZING REAL-TIME NEUROFEEDBACK	
Break 16:00	COFFEE	
Symposia 16:30-18:00	MULTI-MODAL NEUROFEEDBACK METHODS FOR POST-STROKE REHABILITATION	FMRI-BASED NEUROFEEDBACK APPROACHES TO BORDERLINE PERSONALITY DISORDER
Social event 19:00	HALLE 02	

Tuesday, November 5	HALL HEIDELBERG CONGRESS CENTER	FORUM HEIDELBERG CONGRESS CENTER
Oral presentations 8:30	ORAL PRESENTATIONS 1	ORAL PRESENTATIONS 2
Oral presentations 9:30	ORAL PRESENTATIONS 3	ORAL PRESENTATIONS 4
Break 10:30	COFFEE	
Symposia 11:00-12:30	FROM SCANNER BENCH TO BEDSIDE: FMRI-BASED BIOMARKER IDENTIFICATION AND TRANSFER TO TREATMENT	REAL-TIME FMRI NEUROFEEDBACK AS A TOOL TO PROMOTE COGNITION OR THE REWARD SYSTEM
Break 12:30	LUNCH	
Keynote 13:30 – 14:30	SYNCHRONIZING THE PULSE OF MIND AND MACHINE: REAL-TIME FUNCTIONAL IMAGING AND CLOSED-LOOP NEUROMODULATION Surjo Soekadar	
Poster Session 1 14:30 – 16:30	WITH COFFEE POSTER HALL	
Symposia 16:30 – 18:00	NEUROFEEDBACK INNOVAITONS FOR THE TREATMENT OF POSTTRAUMATIC STRESS DISORDER, DEPRESSION, AND SUBSTANCE USE DISOTDER: FACTORS ASSOCIATED WITH REGULATION SUCCESсанд TRANSFORMATIVE OUTCOMES	THE INVOLVEMENT OF MENTAL STRATEGIES IN NEUROFEEDBACK TRAINING: EMPIRICAL EVIDENCE AND THEORETICAL MODELS
Public lecture 18:00	Rainer Goebel <i>(for the general public, will be held in German, Alte Aula, University of Heidelberg)</i>	
Conference dinner 19:00 Reception 19:30 dinner	PALAIS PRINZ CARL	

Wednesday, November 6	HALL HEIDELBERG CONGRESS CENTER	FORUM HEIDELBERG CONGRESS CENTER
Symposia 8:30 – 10:00	ADVANCES IN NEUROTHERAPEUTICS IN CHILD AND ADOLESCENT PSYCHIATRY	REINFORCEMENT FOR BETTER OR WORSE: IMPLICATIONS OF THE REWARD SYSTEM IN NEUROFEEDBACK
Poster Session 2 10:00 – 12:00	WITH COFFEE POSTER HALL	
Break 12:00	LUNCH	
Panel discussion 13:00 – 14:00	PANEL DISCUSSION	
Keynote 14:00 – 15:00	STRATEGIC AUTONOMOUS NEUROMODULATION OF LEARNING: DISCOVERY SCIENCE AND TRANSLATIONAL PROMISE Alison Adcock <i>This keynote is supported by the German Center of Mental Health (DZPG)</i>	
Closing remarks 15:00	CLOSING REMARKS	

WORKSHOPS

EEG NEUROFEEDBACK IN CLINICAL PRACTICE – ASSESSMENT, QEEG, AND PRACTICAL IMPLEMENTATION

November 3, 10:00, CUBEX ONE

Tobias Heiler

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

November 3, 13:00, CUBEX ONE

Assunta Ciarlo, Michael Lühns, Rainer Goebel

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

November 3, 13:00, CUBEX ONE

Eddy J. Davelaar

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

November 3, 16:00, CUBEX ONE

Thijs van Aalten, Mohammad Shahbakhti

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

November 3, 16:00, CUBEX ONE

Bodo Brückner, Rani Cohen, Talma Hendler

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

November 4, 9:30 PM, CIMH

Maria Adelia Albano de Aratanha, Elina Zmeykina

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.

LAB TOUR: GUIDED TOUR THROUGH THE CENTER FOR INNOVATIVE PSYCHIATRIC AND PSYCHOTHERAPEUTIC RESEARCH (ZIPP) OF THE CENTRAL INSTITUTE OF MENTAL HEALTH (CIMH / ZI)

November 3, 10:30, and November 4, 10 AM, Central Institute of Mental Health

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 rooms for neuropsychological testing, blood 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 trial unit.

KEYNOTES

FROM EEG TO BCI: 100 YEARS IN 1 HOUR

Monday, November 4, 13:30, Hall

Andrea Kuebler

Abstract: In 1924 Hans Berger measured for the first time the electrical activity of the brain. In 1930 he published his revolutionary paper(s) about the "Elektrenkephalogramm des Menschen". He was a great scientist, but also a doctor and a tagalong in Nazi Germany. Before and after the 2nd World War many more seminal discoveries followed, for example EEG activity changes during sleep, the link between abnormal activity and diseases such as epilepsy or depression, and the possibility to voluntarily change such activity via neurofeedback followed by the development of brain-computer interfaces for different interventions. During the decades it became clear that the electrical activity of the brain in different frequency bands and related topography is linked to different states of consciousness. By now we can easily distinguish coma from REM sleep from mind wandering from active wakefulness. But do we really know how the brain realizes the sense of self and how this may be linked to successful BCI operation? There are still secrets to discover.

SYNCHRONIZING THE PULSE OF MIND AND MACHINE: REAL-TIME FUNCTIONAL IMAGING AND CLOSED-LOOP NEUROMODULATION

Tuesday, November 5, 13:30, Hall

Surjo Soekadar

Abstract: Moving beyond observation, real-time functional imaging allows not only for novel neurofeedback paradigms but also for innovative closed-loop approaches based on electric or magnetic neuromodulation. While opening various avenues for personalized interventions and treatments, establishing these approaches is technically very challenging because stimulation artifacts impede reliable assessment of brain activity. This is particularly true when using established non-invasive brain stimulation (NIBS) techniques due to their limited focality and required stimulation intensities. This key-note lecture will provide an overview of how these challenges can be addressed through advancements in neuroimaging technology and signal processing techniques. Moreover, recent strides in the development of more targeted and precise NIBS methodologies will be introduced. Finally, clinical applications will be explored emphasizing the potential for improved patient outcomes and quality of life. Additionally, the lecture will touch upon the evolving ethical considerations and regulatory frameworks associated with the clinical deployment of these cutting-edge

technologies, highlighting the importance of a balanced and patient-centered approach.

STRATEGIC AUTONOMOUS NEUROMODULATION OF LEARNING: DISCOVERY SCIENCE AND TRANSLATIONAL PROMISE

Wednesday, November 6, 14:00, Hall

Alison Adcock

Abstract: The same neurotransmitter systems that fine tune our memories take the multifaceted mental images that embody our hopes and fears and distill them into simple signals. This capability implies that we can regulate our own brain chemistry using imagination. Using fMRI, we have demonstrated that people can indeed learn to activate small nuclei – specifically, those that produce most of the brain’s dopamine – using nothing but mental imagery. Like the discovery that runners can trigger endorphin release with physical activity, the self-regulation of neurochemistry with mental activity suggests many methods for changing brain function in response to the current moment. Our discovery science investigates brain systems for motivation to better understand memory mechanisms and neurotransmitter systems. Specifically, we aim to delineate the full range of motivational states that shape human learning and their distinct neural architectures, each with a signature impact on learning and on the memories that underlie behavior. Our translational work aims to help define ways to tune a learners’ brain state, matching it precisely to a specific challenge.

SYMPOSIUM

CUSTOMIZING REAL-TIME NEUROFEEDBACK

Monday, November 4, 14:30, Hall

Chair: Jessica Elizabeth Taylor

In this symposium, we will address how real-time neurofeedback (rt-NFB) could be better fit with neural, behavioral, and/or symptom data from individual participants via the use of novel statistical analyses and methodology. We will discuss some of the benefits that should be seen with such customization- including how we would expect this to improve rt-NFB task performance in general and how this might reduce the ratio of non-responders. Throughout, we will bear clinical applications in mind.

First, David Soto (Basque Center on Cognition, Brain and Language, Spain) will describe a machine learning approach that allows brain decoders to be updated in real-time based on predictions across rt-NFB trials. He will describe how this leads to improved learning curves and therefore improved rt-NFB interventions. Second, Michal Ramot (Weizmann Institute of Science, Israel) will describe a type of analysis that allows for better deconstruction of behavioral variance into distinct processes, so that the networks relevant for rt-NFB can better be identified for each individual participant. Third, Guy Gurevitch (Sagol Brain Institute and Tel Aviv University, Israel) will describe the neural correlates of neuromodulation capacity (which extend beyond the region targeted by rt-NFB) and how we might harness this for optimized rt-NFB interventions in the future. Finally, Jessica Taylor (Advanced Telecommunications Research Institute International (ATR), Japan), will describe how symptom-specific neural activity can be targeted in functional connectivity rt-NFB and discuss the potential this shows for the use of rt-NFB in precision medicine.

Overall, this symposium will be of interest to a wide range of researchers- from those using rt-NFB to address fundamental neuroscience questions to those planning to using it for clinical interventions. Together we hope these talks will provide a glimpse of the current state of rt-NFB customizability and the way forward in improving this.

- 1. ENHANCING DECODED NEUROFEEDBACK TRAINING THROUGH CO-ADAPTATION: INSIGHTS BASED ON A PARADIGM TO MANIPULATE CONCEPTUAL REPRESENTATIONS**
David Soto, Najemeddine Abdenmour and Pedro Margollés
- 2. DECONSTRUCTING COMPLEX BEHAVIORS AND IMPROVING LOCALIZATION OF FUNCTION-SPECIFIC NETWORKS**
Michal Ramot
- 3. AMYGDALA SELF-NEUROMODULATION CAPACITY AS A WINDOW FOR PROCESS-RELATED NETWORK RECRUITMENT**
Guy Gurevitch, Nitzan Lubianiker, Taly Markovits, Neomi Singer and Talma Hendler
- 4. FUNCTIONAL CONNECTIVITY NEUROFEEDBACK FOR PRECISION TREATMENT OF PSYCHIATRIC SYMPTOMS**
Jessica Elizabeth Taylor, Taika Oka & Aurelio Cortese

MULTI-MODAL NEUROFEEDBACK METHODS FOR POST-STROKE REHABILITATION

Monday, November 4, 16:30, Hall

Chair: Claire Cury, Inria France

Neurofeedback has proven, during the past decades, its potential to become a powerful technique for various brain rehabilitations. Today, the main limitation for efficient NF training comes from the “inefficiency problem”, that refers to the variability in NF performances that has been associated with brain signal quality recording, the adaptability of the NF training to the participant (target specificity, and feedback specificity), and attentional and motivational factors. This inefficiency problem is a challenge to be raised before offering efficient NF trainings to participants.

To address those challenges, this symposium focuses on multi-modal aspects of NF. The multi-modality can be injected at different stages of the NF loop. Several brain image modalities can be used together to measure brain activity and estimate more specific NF scores. Several modalities can be also used to monitor the task engagement of participants, a key point to automatically adapt the NF target and maintain a good level of attention during the training. Finally, various modalities can be considered as feedback to improve its impact.

A first talk presented by Pierre Maurel, will report an EEG-fMRI-NF study, from the technical challenges of the data acquisition to the application to post-stroke rehabilitation. We will follow by the work of Caroline Pinte, addressing the issue of signal quality by exploring machine learning methods to extract fMRI information with EEG only. Camille Muller will present her work about the use of fNIRS together with EEG, to determine if fNIRSEEG can provide more specific NF targets. Then Agustina Fragueiro will present a study on automatically monitoring the task engagement level of participants during NF sessions using eye-tracking and skin conductance signals, to address the issue of motivational factors. Finally, François Lejeune will present a study with multi-modal feedback, looking for efficient feedback combination for motor rehabilitation.

1. SIMULTANEOUS EEG-FMRI NEUROFEEDBACK FOR POST-STROKE MOTOR REHABILITATION

Pierre Maurel

2. GENETIC ALGORITHM APPLIED TO HYPERPARAMETER SELECTION FOR FMRI NEUROFEEDBACK SCORE PREDICTION FROM EEG SIGNALS

Caroline Pinte

3. EVALUATION OF MULTIMODAL EEG-FNIRS NEUROFEEDBACK FOR MOTOR IMAGERY

Camille Muller

4. EYE AND SKIN FEATURES TO MONITOR COGNITIVE ENGAGEMENT DURING NEUROFEEDBACK

Agustina Fragueiro

5. INSIGHTS ON THERMAL NEUROFEEDBACK FOR BRAIN-COMPUTER INTERFACES USER TRAINING

François Le Jeune

FMRI-BASED NEUROFEEDBACK APPROACHES TO BORDERLINE PERSONALITY DISORDER

Monday, November 4, 16:30, Forum

Chair: Christian Schmahl

Borderline Personality Disorder (BPD) is a pervasive mental disorder encompassing dysregulated interpersonal relationships, self-image, and emotions. Individuals struggle to regulate their own emotional reactions, often show impulsive behavior and suffer from frequent feelings of abandonment. BPD is characterized by risky behavior (e.g. heavy drinking), aggressive tendency, suicidal ideation, and self-harm (both with and without suicidal intention). First-line treatment of BPD is psychotherapy, whereas a considerable number of patients does not respond sufficiently from specific, evidence-based treatment programs. Current psychobiological models of BPD postulate an imbalance between hypersensitive emotional brain systems such as the amygdala and hypo-active “emotion regulation systems”, encompassing the dorsolateral prefrontal cortex. This makes individuals with BPD vulnerable to intense emotions, for which they compensate with dysfunctional regulation behaviors (e.g. non-suicidal self-injury), leading to frequent medical treatment, social turbulences and negative emotions against the self. A neuromodulation approach to target the dysregulated neural systems is obvious. In this symposium, four speakers present their research using fMRI-based neurofeedback. Young adapted an intervention for major depressive disorder to BPD. Jindrová applied neurofeedback adjunctive to a residential psychotherapy treatment with Dialectical Behavior Therapy (DBT). Whitfield-Gabrieli developed mindfulness-based real-time neurofeedback training to augment DBT. Quevedo used amygdala rtfMRI-neurofeedback during self-processing.

1. RTFMRI-NEUROFEEDBACK TRAINING TO INCREASE THE AMYGDALA'S RESPONSE TO POSITIVE MEMORIES IN ADULTS WITH BORDERLINE PERSONALITY DISORDER

Laurie Compere, Scott Barb, Carolyn Webb, Emily Riley, Emily K. Leiker, Greg J. Siegle, Kymberly Young

2. A NEUROFEEDBACK BOOSTER FOR EMOTION REGULATION THERAPY: RANDOMIZED CONTROLLED TRIAL IN BORDERLINE PERSONALITY DISORDER

Miroslava Jindrová, Christian Schmahl, Christian Paret

3. MINDFULNESS-BASED NEUROFEEDBACK TO AUGMENT DBT PSYCHOTHERAPY FOR ADULTS WITH BORDERLINE PERSONALITY DISORDER (MIND-BPD)

Clemens C.C. Bauer, Wenjing Luo, Katie Dixon-Gordon, Jillian Papa, Michelle Hampson, Sarah K. Fineberg, Susan Whitfield-Gabrieli

4. RIGHT AMYGDALA RTFMRI-NEUROFEEDBACK DURING SELF-PROCESSING FOR BORDERLINE PERSONALITY DISORDER

Karina Quevedo, Janani Ranatunga, Hoang-Giang Nguyen, Natasha Das, Corey Shneider, Gina Yi, Talia Bodi. Mathew Maurice, Anna Zilverstand

FROM SCANNER BENCH TO BEDSIDE: fMRI-BASED BIOMARKER IDENTIFICATION AND TRANSFER TO TREATMENT

Tuesday, November 5, 11:00, Hall

Chair: Christian Paret

Numerous examples from the real-time fMRI literature testify to the great potential of neurofeedback for the treatment of mental disorders. It is a long, research-intensive path from the identification of a biomarker for mental (dys)function to the clinical application of neurofeedback training to modulate this biomarker in patients. This symposium will shed light on different stages of this process, including the identification of an fMRI-based biomarker, clinical proof of concept research, analysis of neuropsychological mechanism, and the transfer of treatment to clinical practice. Starting with the development of diagnostic markers for different groups of mental disorders, Kawato shows how functional-connectivity neurofeedback can be used to improve various cognitive functions. Zhao analyzed fMRI resting-state data from a randomized clinical fMRI neurofeedback trial conducted in patients with Post-traumatic Stress Disorder (PTSD). His results emphasize amygdala-hippocampus connectivity as potential target to alleviate avoidance symptoms. Zooming in on PTSD symptoms as surrogate marker for suicide, Chiba discusses fMRI-Decoded Neurofeedback as alternative therapy to exposure-based PTSD treatment. Fine presents a treatment rationale to integrate neurofeedback in psychotherapy treatment of PTSD. Hendler will show insights from amygdala-EFP neurofeedback training of patients with generalized anxiety disorder in the real-world clinical practice.

1. TOWARDS PRECISION PSYCHIATRY: STATE-BIOMARKER BASED FUNCTIONAL CONNECTIVITY NEUROFEEDBACK

Mitsuo Kawato

2. AMYGDALA-HIPPOCAMPUS CONNECTIVITY CHANGES IN PTSD FOLLOWING NEUROFEEDBACK TRAINING

Zhiying Zhao, Or Duek, Rebecca Seidemann, Charles Gordon, Christopher Walsh, Emma Romaker, William N Koller, Mark Horvath, Jitendra Awasthi, Yao Wang, Erin O'Brien, Harlan Fichtenholtz, Michelle Hampson, Ilan Harpaz-Rotem

3. NEUROFEEDBACK AS A POTENTIAL SUICIDE PREVENTION TECHNIQUE VIA REDUCTION OF PTSD SYMPTOMS

Toshinori Chiba, Aurelio Cortese, Mitsuo Kawato

4. INTEGRATION OF LIMBIC SELF-NEUROMODULATION WITH PSYCHOTHERAPY FOR COMPLEX POST-TRAUMATIC STRESS DISORDER: TREATMENT RATIONALE

Naomi B. Fine, Ellie Neuman Fligelman, Nora Carlton, Miki Bloch, Liat Helpman, Zivya Seligman, Daphna Bardin Armon, **Talma Hendler**

5. REAL-WORLD CLINICAL EXPERIENCE WITH AMYGDALA-EFP-NF IN PATIENTS WITH GENERALIZED ANXIETY

Talma Hendler, Amit Bar Natan and Yulia Lerner

REAL-TIME FMRI NEUROFEEDBACK AS A TOOL TO PROMOTE COGNITION OR THE REWARD SYSTEM

Tuesday, November 5, 11:00, Forum

Chair: Jessica Peter & Lydia Hellrung

Cognition and reward are linked in a brain network comprising the prefrontal cortex, the ventral tegmental area, the hippocampus, and the insula (among others). Real-time fMRI neurofeedback holds promise for enhancing cognitive functions and optimizing reward processing, which may be useful for patients with substance use disorder or with a cognitive disorder. This symposium will therefore focus on using real-time fMRI neurofeedback as a tool to promote cognition or reward processing by targeting areas of the aforementioned brain network in healthy adults or in clinical populations. Our symposium is of interest to the rtFIN community as insight gained from these studies can be relevant for anyone working in the field of psychiatric disorders in which cognition and or the reward system are impacted (e.g., depression, schizophrenia).

We will have four presentations. The first two talks (Hellrung & Engeli) will focus on the reward system, the final two on cognition (Michel & Klink). We will present data on the influence of cognitive control networks on neurofeedback performance and provide an outlook on how to optimize training on an individual level. Then, a study combining neurofeedback and a pharmacological intervention in addicted individuals will be presented. Next, we will provide evidence to suggest that prefrontal neurofeedback will improve attention in healthy adults. Finally, we will present a study in patients with mild cognitive impairment, in which hippocampal neurofeedback improved memory performance.

1. NEUROFEEDBACK ON THE DOPAMINERGIC REWARD SYSTEM

Lydia Hellrung

2. NEUROFEEDBACK OF THE REWARD SYSTEM IN COCAINE USE DISORDER

Etna Engeli

3. NEUROFEEDBACK AS A TOOL TO IMPROVE ATTENTION

Lars Michels

4. REAL-TIME FMRI NEUROFEEDBACK REDUCES HIPPOCAMPAL HYPERACTIVITY AND IMPROVES PATTERN SEPARATION IN MILD COGNITIVE IMPAIRMENT

Katharina Klink

NEUROFEEDBACK INNOVATIONS FOR THE TREATMENT OF POSTTRAUMATIC STRESS DISORDER, DEPRESSION, AND SUBSTANCE USE DISORDER: FACTORS ASSOCIATED WITH REGULATION SUCCESS AND TRANSFORMATIVE OUTCOMES

Tuesday, November 5, 16:30, Hall

Chair: Andrew Nicholson

Decades of research have identified neural correlates of onset and recovery from various psychiatric disorders, including major depressive disorder (MDD), substance use disorder (SUD) and posttraumatic stress disorder (PTSD). Using real-time fMRI neurofeedback, we can directly target dysregulated neural circuits with the goal of recalibrating brain activity. This method is non-invasive and trains patients to directly modify neural activity associated with their symptoms, leading to neuroplasticity and/or the implementation of strategies that become transferable to everyday life.

1. FACTORS ASSOCIATED WITH SUCCESSFUL RT-FMRI NEUROFEEDBACK UPREGULATION IN DEPRESSION

Laurie Compère, Greg J. Siegle, Sair K. Lazzaro, Emily Riley, Marlene Strege, Gia Canovali, Scott Barb, Theodore Huppert, Kymberly Young

2. ADAPTIVE BRAIN-BASED CUE EXPOSURE TO SUPPORT SMOKING CESSATION

Amelie Haugg, Cindy Sumaly Lor, Mirjam Habegger, Anna Speckert, Sarah Meier, Ronald Sladky, Philipp Staempfli, Ellen van Maren, Apurva Watve, Andrei Manoliu, Erich Seifritz, Matthias Kirschner, Marcus Herdener, Boris B. Quednow, Frank Scharnowski

3. CONNECTIVITY-INFORMED PREDICTION OF REGULATION SUCCESS IN REAL-TIME FMRI NEUROFEEDBACK

Jana Zweerings, Erik Röcher, Arezoo Taebi, Klaus Mathiak

4. A TALE OF TWO TARGETS: EXAMINING POSTERIOR CINGULATE CORTEX- AND AMYGDALA-TARGETED FMRI NEUROFEEDBACK FOR THE TREATMENT OF PTSD

Andrew A. Nicholson, Jonathan Lieberman, Ruth Lanius, Jean Théberge, Tomas Ros

THE INVOLVEMENT OF MENTAL STRATEGIES IN NEUROFEEDBACK TRAINING: EMPIRICAL EVIDENCE AND THEORETICAL MODELS

Tuesday, November 5, 16:30, Forum

Chair: Nitzan Lubianiker

In typical explicit Neurofeedback (NF) protocols, participants are instructed to choose and apply mental strategies – self-invoked perceptual, affective, cognitive, or meta-cognitive contents – that result in a desired neural pattern. However, despite their central role in training, mental strategies are not often documented or characterized in NF experiments. Therefore, their role in NF training remains unclear. In the current symposium we will discuss a paradigm shift regarding mental strategies, by presenting NF experiments and computational models that tackle this oversight, by systematically analyzing the application of mental strategies using newly developed questionnaires, advanced computational approaches and theoretical considerations. By this, we hope to familiarize the NF community with new empirical evidence on the involvement of mental strategies in NF regulation with relevance both for healthy and clinical populations, to present methodological and quantitative approaches for mental strategies assessment, and to discuss new theoretical models that account for their key role in NF learning.

1. EXPLORING THE CHARACTERISTICS OF SUCCESSFUL MENTAL STRATEGIES FOR EMOTION REGULATION DURING AMYGDALA-EFP-NEUROFEEDBACK

Miroslava Jindrová, Noel Wieland, Christian Schmahl, Christian Paret

2. THE ROLE OF STRATEGIES IN NEUROFEEDBACK LEARNING

Guilherme Wood & Silvia Kober

3. STRUCTURE AND TEMPORAL DYNAMICS OF SELF-GENERATED MENTAL STRATEGIES ARE ASSOCIATED WITH EEG AND FMRI-NF REGULATION PATTERNS

Nitzan Lubianiker, Avigail Lerner, Talma Hendler

4. MENTAL STRATEGIES DURING NEUROFEEDBACK THROUGH TRANSITIONING FROM MODEL-FREE TO MODELBASED REINFORCEMENT LEARNING: A COMPUTATIONAL MODEL

Eddy Davelaar

ADVANCES IN NEUROTHERAPEUTICS IN CHILD AND ADOLESCENT PSYCHIATRY

Wednesday, November 6, 8:30, Hall

Chair: Pascal Aggensteiner, Amelie Haugg

This symposium will explore the latest advancements in neurotherapeutics in the field of child and adolescent psychiatry. Specifically, for attention deficit/hyperactivity disorder (ADHD), disruptive behavior disorders and reading-related problems focusing on the efficacy and mechanisms of various Bio- and Neurofeedback modalities.

Talk 1: Real-time fMRI Neurofeedback in ADHD: This presentation will present recent RCT studies on real-time functional magnetic resonance imaging (rt-fMRI) neurofeedback targeting frontal brain activations in individuals with ADHD. The talk will include methodological challenges and potential for future research.

Talk 2: Meta-analysis of Neurofeedback in ADHD: This talk will present findings from the latest meta-analysis led by the European ADHD Guidelines group assessing neurofeedback for ADHD. The implications of these findings for clinical practice and future research directions will be discussed.

Talk 3: Neuro/Biofeedback in Disruptive Behavior Disorders (DBD): This presentation will present results of the latest RCTs of rt-fMRI neurofeedback and biofeedback techniques in treating aggression in disruptive behavior disorders.

Talk 4: Real-time fMRI Neurofeedback of Reading-Related Brain Activation: This session will focus on the use of real-time fMRI neurofeedback to enhance reading-related brain activation. The potential benefits for individuals with reading difficulties will be explored.

Modern neurotherapeutics based on feedback of physiological signals offer promising but yet to be better validated approaches for treating ADHD and related disorders. This symposium will provide a comprehensive overview of the current evidence and highlight gaps in the research.

1. EFFECTS OF RTFMRI NEUROFEEDBACK OF RIGHT INFERIOR FRONTAL CORTEX IN CHILDREN WITH ADHD ON CLINICAL, COGNITIVE AND BRAIN FUNCTION MEASURES

Katya Rubia

2. META-ANALYSIS OF NEUROFEEDBACK IN ADHD

Anna Kaiser

3. NEURO/BIOFEEDBACK IN DISRUPTIVE BEHAVIOR DISORDERS (DBD)

Sarah Baumeister

4. REGULATING BRAIN ACTIVITY IN THE VISUAL WORD FORM AREA WITH REAL-TIME FMRI NEUROFEEDBACK

Hugg, A.

REINFORCEMENT FOR BETTER OR WORSE: IMPLICATIONS OF THE REWARD SYSTEM IN NEUROFEEDBACK

Wednesday, November 6, 8:30, Forum

Chair: Talma Hendler

The role of reward-related mesolimbic processing in Neurofeedback (NF) is widely acknowledged. Yet, the way it is integrated in the learning and/or outcome of NF remains unclear. In this symposium, we will address different ways of leveraging the reward-related mesolimbic processing to gain a better understanding of the mechanistic features underlying neurofeedback learning. Overall, we will discuss the importance of the reward-related mesolimbic processing to neurofeedback training and how by probing and modulating this neural pathway we can gain new insights about neurofeedback learning and/or outcomes.

First, Aurelio Cortese (Advanced Telecommunications Research Institute, Kyoto, Japan) will present efforts in fitting a computational model based on reinforcement learning to track ongoing neural changes during learning of decoded neurofeedback. This presentation will include a description of the theoretical foundations of the model and the relevant predictions that may arise from it. Next, Guy Gurevitch (Sagol Brain Institute and Tel Aviv University, Tel Aviv, Israel) will present work on the differential responses to reward during different stages of NF learning procedure. The presentation will describe the modified sensitivity to reward in mesolimbic areas during different learning stages, and the implication of such dynamics to mechanistic as well as practical aspects of neuromodulation capacity and efficacy. Finally, Nitzan Lubianiker (Tel Aviv University, Tel Aviv, Israel and Princeton University, USA) will present a randomized controlled neurofeedback study targeting upregulation of core mesolimbic regions in order to improve vaccination efficiency in humans. Building on previous animal works relating the reward related mesolimbic activity with effective immunity, this is the first attempt to causally modulate the immunological response through mesolimbic guided training. Intriguingly, this study shows that a domain general NF process in the ventral tegmental area along with mental strategies of positive expectations drove the immunity effect.

1. REINFORCEMENT LEARNING TO MODEL OUTCOME-RELATED ACTIVITY IN DECODED NEUROFEEDBACK

Aurelio Cortese

2. REWARD RELATED RESPONSE DYNAMICS OVER THE COURSE OF NEUROFEEDBACK TRAINING

Guy Gurevitch and Talma Hendler

3. UPREGULATION OF REWARD MESOLIMBIC ACTIVITY VIA FMRI-NEUROFEEDBACK IMPROVES VACCINATION EFFICIENCY IN HUMANS

Nitzan Lubianiker, Tamar Koren, Meshi Dgerasi, Rita Sirotkin, Neomi Singer, Itamar Jalon, Avigail Lerner, Roi Sar-el, Haggai Sharon, Hilla Azulay-Debby, Asya Rolls and Talma Hendler

ORAL PRESENTATIONS

ORAL PRESENTATIONS 1

Tuesday, November 5, 8:30, Hall

ENHANCING VISUOSPATIAL PERCEPTION NETWORKS THROUGH INDIVIDUALIZED FMRI NEUROMODULATION: A PROOF-OF-CONCEPT STUDY

Anthony Allam, Vincent Allam, Sandy Reddy, Emmanouil Froudarakis, Eric M. Rohren, Sameer Sheth, Dorina T. Papageorgiou

LEARNING TO CONTROL THE VISUAL CORTEX AND AFFECTING VISUAL ATTENTION VIA FMRI-BASED NEUROFEEDBACK

Riccardo Mattia Galli, Patrik Vuilleumier

EFFECTS OF VISUAL DBS-NEUROFEEDBACK ON MOVEMENT QUALITY IN PARKINSON'S DISEASE

Lena Salzmann, Oliver Bichsel, Manabu Rohr-Fukuma, Lennart H. Stieglitz, Markus F. Oertel, Bartosz Bujan, Piotr Jedrysiak, Lukas L. Imbach, Olivier Lambercy, Roger Gassert

MULTI-DAY BETA-OSCILLATORY POWER CONTROL IN PARKINSON'S DISEASE THROUGH A FULLY IMPLANTED NEUROFEEDBACK SYSTEM

Manabu Rohr-Fukuma, Lennart H. Stieglitz, Bartosz Bujan, Piotr Jedrysiak, Markus F. Oertel, Lena Salzmann, Lukas L. Imbach, Roger Gassert, Oliver Bichsel

ORAL PRESENTATIONS 2

Tuesday, November 5, 8:30, Forum

LIVE AUDITORY EMOTIONS MODULATE LIMBIC BRAIN ACTIVITY IN REAL-TIME IN A CLOSED-LOOP SETUP

Sascha Frühholz

THE HEDONIC EVALUATION OF NEUROFEEDBACK STIMULI IS FAST, AUTOMATIC AND IMPLICIT: AN ERP STUDY ON STIMULUS DESIGN

Adrian Naas, Danpeng Cai, Payam S. Shabestari, Delphine Ribes, Nicolas Henchoz, Patrick Neff, Tobias Kleinjung, Andreas Sonderegger

NEUROFEEDBACK OF MEDITATION STATES – A CLOSED LOOP BETWEEN PHENOMENOLOGY AND NEURAL ACTIVITY

Henrik Roehr, Andreas Tzschaschel, Nursena Armagan, Marieke van Vugt, Stefan Schmidt, Fynn-Mathis Trautwein

MULTI-DAY 7 TESLA FMRI NEUROFEEDBACK-GUIDED MEDITATION TRAINING: TRANSLATIONAL INSIGHTS FROM LONGITUDINAL FOLLOW-UP AND INTENSIVE ECOLOGICAL SAMPLING

Saampras Ganesan, Nicholas T. Van Dam, Bradford Moffat, Aki Tsuchiyagaito, Masaya Misaki, Matthew D. Sacchet, Sunjeev K. Kamboj, Valentina Lorenzetti, Andrew Zalesky

ORAL PRESENTATIONS 3

Tuesday, November 5, 9:30, Hall

EVALUATING THE DOSING IMPACT OF ALPHA-RHYTHM EEG NEUROFEEDBACK IN PTSD: RESULTS FROM A RANDOMIZED CONTROLLED TRIAL

Jonathan Lieberman, Tomas Ros, Jean Theberge, Ruth Lanius, Andrew Nicholson

GETTING STRESS-RELATED DISORDERS UNDER CONTROL: THE UNTAPPED POTENTIAL OF NEUROFEEDBACK

Florian Krause

A DOUBLE-BLIND SUBJECT-INDEPENDENT PATTERN-BASED EEG-NEUROFEEDBACK PROTOCOL FOR DEPRESSION

Jaime Pereira, Andreas Ray, Mohit Rana, Ranganatha Sitaram, Sergio Ruiz

COGNITION-GUIDED NEUROFEEDBACK IMPROVES RESPONSE INHIBITION CAPABILITY IN PEOPLE WITH METHAMPHETAMINE USE DISORDER

Junjie Bu, Huixing Gou, Xiaochu Zhang

ORAL PRESENTATIONS 4

Tuesday, November 5, 9:30, Forum

ADVANCED VISUAL FEEDBACK STIMULI FOR NEUROFEEDBACK

Danpeng Cai, Lara Défayes, Emily Groves, Sebastian Baez-Lugo, Andrea Schneider, Gabriel Luthier, Adrian Naas, Nicolas Gninenko, Payam S. Shabestari, Tobias Kleinjung, Nicolas Henchoz, Andreas Sonderegger, Patrick Neff, Delphine Ribes

LEARNING ON THE MANIFOLD OF HUMAN BRAIN ACTIVITY THROUGH REAL-TIME NEUROFEEDBACK

Erica Lindsey Busch, Chandra Fincke, Guillaume Lajoie, Smita Krishnaswamy, Nicholas Turk-Browne

PHYSIOLOGICAL ARTEFACT CONTROL IN FMRI NEUROFEEDBACK – A SYSTEMATIC REVIEW AND META-ANALYSIS

Jingying Zhang, Franziska Weiss, Peter Kirsch, Martin Fungisai Gerchen

PROMOTING PUBLIC TRUST IN NEUROTECHNOLOGY: A COMPREHENSIVE GUIDEBOOK AND EVIDENCE-BASED APPROACH

Mitsuaki Takemi, Ryota Kanai

POSTER

POSTER SESSION 1

Tuesday – November 5, 14:30

Posters with odd-numbers will be presented.

POSTER SESSION 2

Wednesday – November 6, 10:00

Posters with even-numbers will be presented.

	AUTHORS	TITLE
1	Férat, Deiber, Hasler, Perroud, Michel, Ros	BEYOND THETA-BETA RATIO: EEG MICROSTATE D AS A TARGET FOR ADHD NEUROFEEDBACK
2	Abdenmour, Margolles, Soto	PYDECNEF2.0: AN OPEN-SOURCE FRAMEWORK FOR FMRI-BASED DECODED NEUROFEEDBACK
3	Ajmera, Jung, Sutton, Husain	ADDRESSING TINNITUS DISTRESS BY REGULATING CINGULATE CORTEX ACTIVITY WITH NEUROFEEDBACK TRAINING
4	Barth, Dresler, Rana, Schopp, Ladegast, Fallgatter, Ehlis	PROBING UNDERLYING PROCESSES OF THREE DIFFERENT FUNCTIONAL NEAR-INFRARED SPECTROSCOPY NEUROFEEDBACK PROTOCOLS
5	Brechmann, Angenstein, Lommerzheim, Stadler, Wolff	FEEDBACK INTERVENTION INTO CATEGORY LEARNING WITH FMRI IN THE LOOP
6	Chiba, Kawato, Cortese	CAN PTSD SYMPTOMS BE A SURROGATE MARKER FOR SUICIDE? - A POSSIBLE TARGET OF NEUROFEEDBACK

7	Chiba, Taylor, Cortese, Kawato	DECNEF TECHNIQUE APPLICATION IN PTSD THERAPY
8	Ciarlo, Lührs, Russo, Di Salle, Goebel, Esposito	ADVANCES IN THE DESIGN OF SEMANTIC FMRI NEUROFEEDBACK EXPERIMENTS
9	De Filippi, Eleonora	RESONATE: RESTORING EMOTIONAL STABILITY THROUGH NEUROFEEDBACK AND AI FOR TRANSFORMATIVE EMPOWERMENT
10	de Vos, Leibold, Lührs, Schruers, Goebel, Linden	LINKING INTEROCEPTION AND INTROSPECTION VIA INSULA TARGETED NEUROFEEDBACK – A FEASIBILITY STUDY
11	Eken, Klein, Kranczioch	SIMULATION OF TASK-EVOKED SYSTEMIC ACTIVITY IN FNIRS: AN ONGOING INVESTIGATION
12	Feng, Baqapuri, Zweerings, Taebi, Li, Cong, Mathiak	BOLD RESPONSE IDENTIFICATION AND ENHANCEMENT USING MULTI-ECHO EPI: A PROMISING METHOD FOR ROBUST FUNCTIONAL CONNECTIVITY IN REAL-TIME NEUROFEEDBACK TARGET REGIONS
13	Ferreira Marins, Grössinger, Witte, Koschutnig, Ninaus, Neuper, Kober, Wood,	THE SENSE OF AGENCY AND THE REGULATION NETWORK
14	Frei, Haugg, Menghini, Stutz, Steinegger, Pamplona, Röthlisberger, Brem	REGULATING BRAIN ACTIVITY IN THE VISUAL WORD FORM AREA WITH REAL-TIME FMRI NEUROFEEDBACK IN ADULTS WITH TYPICAL AND POOR READING SKILLS

15	Fu, Iglesias Fuster, Cong, Mathiak	MULTIVARIATE PATTERN ANALYSIS DETECTS WIDESPREAD DIFFERENCES IN BETWEEN LEFT- AND RIGHT-HEMISPHERIC PFC NEUROFEEDBACK TARGETING DEPRESSION
16	Furnari, Park, Yaffe, Hampson	SOCIETAL IMPACTS OF NEUROFEEDBACK AND RELEVANT REGULATORY FRAMEWORKS IN THE UNITED STATES
17	Ganesan, T. Van Dam, Moffat, Tsuchiyagaito, Misaki, D. Sacchet, K. Kamboj, Lorenzetti, Zalesky	MULTI-DAY 7 TESLA FMRI NEUROFEEDBACK-GUIDED MEDITATION TRAINING: TRANSLATIONAL INSIGHTS FROM LONGITUDINAL FOLLOW-UP AND INTENSIVE ECOLOGICAL SAMPLING
18	Georgiou, Ringels, Graeve, Lührs, Kohl, Knobloch, Jäger, Sanfilippo, Mutlu, Chechko, Eickhoff, Mathiak, Klein, Mehler	FNIRS NEUROFEEDBACK TRAINING FOR EMOTION REGULATION: A FEASIBILITY STUDY
19	Gu, Chen, Xu, Dexter, Becker, Zhao	REAL-TIME FMRI NEUROFEEDBACK IN YOUNG ADULTS WITH INTERNET GAMING DISORDER RISKS: A RANDOMIZED CONTROLLED TRIAL
20	Gubser, Trippel, Engeli, Conradi, Herdener	BOOSTING AND GUIDING NEUROPLASTICITY BY COMBINING KETAMINE WITH NEUROFEEDBACK-ASSISTED LEARNING
21	Hellrung, Liu, de Hollander, Nebe, Tobler	SELF-MODULATION OF HUMAN MIDBRAIN ENHANCES WILLINGNESS TO EXERT MENTAL EFFORT

22	Helmbold, Meeh, von Bismarck, Poggemann, Baune, Sarkheil	DO WE CONSIDER THE IMPACT OF MENTAL STRATEGIES ON NEUROFEEDBACK EFFECTS? A SYSTEMATIC REVIEW OF STUDIES ON NEUROFEEDBACK OF AFFECTIVE DISORDERS
23	Hennings, Scotti, Kempner, Nguyen, McDevitt, Wallace, Li, Turk-Browne, Cohen, Norman	RT-CLOUD: CLOUD-BASED SOFTWARE FRAMEWORK TO SIMPLIFY AND STANDARDIZE REAL-TIME FMRI
24	Ibrahim, Zweerings, Baqapuri, Ramadan, Feng, Mathiak	A NOVEL VIRTUAL ENVIRONMENT RT-FMRI NEUROFEEDBACK PARADIGM TO IMPROVE RESILIENCE AND WELL-BEING
25	Kampourelli, Strawson, Racey, Bressler, Lührs, Ciarlo, Bouyagoub, Berens, Linden, Eccles, Goebel, Rae, Critchley	REAL-TIME FMRI NEUROFEEDBACK FOR SUSTAINED ATTENTION TRAINING IN ADULT ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)
26	Kempf, Wazulin, Kiefer, Kirsch, Gerchen	REAL-TIME FMRI NEUROFEEDBACK TO INVESTIGATE THE ROLE OF NEURAL STRESS REGULATION IN PROBLEMATIC ALCOHOL USE
27	Kim, Margolles, Cortese, Soto	INDUCING REWARD PREDICTION ERROR WITH DECODED NEUROFEEDBACK TO ENHANCE PROBLEM-SOLVING PERFORMANCE

28	Kim, Orloff, Lisinski, Kim-Spoon, LaConte, Chiu, Casas	CLASSIFICATION OF RISKY DECISION-MAKING PROCESSES IN ADOLESCENTS VIA REAL-TIME FMRI NEUROFEEDBACK: PRELIMINARY STUDY
29	Kuai, Enriquez-Geppert	CURRENT STATUS OF ADVANCED BRAIN FEATURE EXTRACTION METHODS FOR NEUROFEEDBACK
30	LaConte, Lisinski, Berenbaum, Mistri, Kucharski, Lutzell, Soldate, Marvel	CONTROL OF MOTOR IMAGERY USING NEUROFEEDBACK IN CEREBELLAR ATAXIA
31	Li, Park, Awasthi, Rolison, Li, Scheinost, Chawarska, Hampson	DISRUPTED RIGHT POSTERIOR-MIDDLE SUPERIOR TEMPORAL SULCUS CONNECTIVITY: A POTENTIAL BIOMARKER FOR FMRI NEUROFEEDBACK TRAINING IN AUTISM SPECTRUM DISORDER
32	Lubianiker, Koren, Djerassi, Sirotkin, Singer, Jalon, Lerner, Sar-el, Sharon, Azulay-Debby, Rolls, Hendler	UPREGULATION OF REWARD MESOLIMBIC ACTIVITY VIA FMRI-NEUROFEEDBACK IMPROVES VACCINATION EFFICIENCY IN HUMANS
33	Lubianiker, Lerner, Greental, Gurevitch, Jalon, Or-Borichev, Fine, Singer, Fruchtman-Steinbock, Lorenz, Benjamini, Hendler	STRUCTURE AND TEMPORAL DYNAMICS OF SELF-GENERATED MENTAL STRATEGIES ARE ASSOCIATED WITH EEG AND FMRI-NF REGULATION PATTERNS

34	Mantei, Li, Crowley, Awasthi, Harris-starling, Pittman, Park, Bloch, Fernandez, Sukhodolsky, Hampson	RESTING-STATE GLOBAL CONNECTIVITY IN ADOLESCENTS WITH TICS BEFORE AND AFTER NEUROFEEDBACK
35	Martz, McCurry, Angstadt, Litinas, Soules, Jung, Sripada, Heitzeg, Peltier,	DEVELOPMENTAL DIFFERENCES IN REWARD-RELATED BRAIN ACTIVATION AND FUNCTIONAL CONNECTIVITY THROUGH REAL-TIME FMRI NEUROFEEDBACK
36	Marvel, Berenbaum, Lisinski, Mistri, Kucharski, Lutzel, Soldate, LaConte	REAL-TIME FMRI NEUROFEEDBACK IMPROVES MOTOR PRECISION IN PEOPLE WITH CEREBELLAR ATAXIA
37	McCurry, Jung, Soules, Litinas, Peltier, Sripada, Heitzeg, Martz	NUCLEUS ACCUMBENS REWARD RESPONSE MODULATION USING REAL-TIME FMRI NEUROFEEDBACK IN ADOLESCENTS AND YOUNG ADULTS
38	Meeh, Helmbold, von Bismarck,Poggemann, Lührs, Bauer, Baune, Sarkheil	UTILIZING RT-FMRI NEUROFEEDBACK FOR THE REDUCTION OF RUMINATION IN PATIENTS WITH DEPRESSION
39	Misaki, Chen, Kaya, Tsuchiyagaito, Guinjoan	EEG-INFORMED FMRI OF EARLY BRAIN RESPONSE TO FEEDBACK DISTINGUISHES NEUROFEEDBACK TRAINING RESPONDERS
40	Müller, Gninenko, Loukas, Van De Ville, Aybek	REAL-TIME FMRI NEUROFEEDBACK OF THE RIGHT TEMPOROPARIETAL JUNCTION IN FUNCTIONAL NEUROLOGICAL DISORDER — A PROOF-OF-CONCEPT STUDY

41	Nath, Reggente	HEARTBEAT EVOKED POTENTIALS INCREASE WITH MEDITATIVE DEPTH: IMPLICATIONS FOR PERSONALIZED, MULTIMODAL NEUROFEEDBACK
42	Park, Sukhodolsky, Pittenger, Hampson	NEURAL CORRELATES OF FEEDBACK PROCESSING DURING REWARD RELATED NEUROFEEDBACK LEARNING
43	Peltier, Litinas, Lisinski, LaConte	FORGOING THE FOURIER: FEASIBILITY OF K-SPACE MULTI-BAND CLASSIFIERS FOR RTFMRI NEUROFEEDBACK
44	Morris, Beltrán, Obie, Chowdhury, Jacob, Murrough	REAL-TIME BIOFEEDBACK OF THE VENTRAL TEGMENTAL AREA IN MAJOR DEPRESSIVE DISORDER WITH 7-TESLA FMRI
45	Pereira, Faria, Direito, Araújo, Duarte, Mouga, Banca, Andrade, Macedo, Castelo-Branco, Sousa	AN FNIRS-BASED APPROACH FOR THE VOLITIONAL NEUROMODULATION OF OCD CIRCUITRY
46	Pereira, Sousa, Faria, Direito, Luhrs, Goebel, Castelo-Branco	OPTIMIZING FEEDBACK CALCULATION AND PRESENTATION IN A FUNCTIONAL CONNECTIVITY-BASED NEUROFEEDBACK APPROACH USING FUNCTIONAL NEAR-INFRARED SPECTROSCOPY (FNIRS)
47	Pfeiffer, Kübler	THE IMPACT OF NEUROFEEDBACK ON FRONTAL MIDLINE THETA ACTIVITY: A REANALYSIS OF PARIETAL ALPHA TRAINING
48	Pindi, Lavialle, Koush, Pigué, Polosan, Gard, Houenou, Pavre	IMPROVING EMOTION REGULATION IN HEALTHY SUBJECTS WITH REAL-

TIME FMRI NEUROFEEDBACK: A PILOT STUDY		
49	Poggemann, Orth, Meeh, von Bismarck, Helmbold, Baune, Sarkheil	REAL-TIME FMRI NEUROFEEDBACK MODULATES FRONTOSTRIATAL CONNECTIVITY IN OCD NEUROPHYSIOLOGY
50	Poh, Wright, Dickerson, Hakimi, Eom, Muzekari, Adcock	VOLITIONAL UPREGULATION OF THE VENTRAL TEGMENTAL AREA IN ADHD WITH REAL-TIME FMRI NEUROFEEDBACK
51	Reinhold, Schnabel, Hartmann, Schmahl, Reininghaus, Paret	A HUMAN-CENTERED DESIGN CO-CREATION APPROACH OF A NEUROFEEDBACK-BASED MOBILE APP TO TRANSFER REGULATION STRATEGIES TO DAILY LIFE
52	Russman Block, Hovakimian, Litinas, Fitzgerald, Fresco, Adcock, Peltier, Taylor	DEVELOPMENT OF A REALTIME FMRI NEUROFEEDBACK PARADIGM TO ENHANCE COGNITIVE REAPPRAISAL
53	Sayal, Pereira, Sousa, Direito, Castelo-Branco	A NOVEL INTERFACE FOR RT-FMRI NEUROFEEDBACK USING MUSIC
54	Schopp, Nagashima, Hudak, Barth, Fallgatter, Ehlis	SPECIFIC EFFECTS OF FUNCTIONAL NEAR-INFRARED SPECTROSCOPY NEUROFEEDBACK IN A COMPARISON OF THE INFERIOR FRONTAL GYRUS VS THE DORSOLATERAL PREFRONTAL CORTEX IN HIGHLY-IMPULSIVE PARTICIPANTS
55	Sugawara, Shiina, Ueda, Hoshi, Usuda, Okuma, Nishijima,	THE VENTRAL MIDBRAIN NEUROFEEDBACK ENHANCES MOTOR OUTPUTS

	Momoki, Ibaraki, Hoshino, Nishimura	
56	Tong, Wang, Friedman, Thorp, Spagna, He	A REALTIME EEG NEUROFEEDBACK PLATFORM TO PREDICT STUDENTS’ ATTENTION LEVEL
57	Trippel, Gubser, Enegele, Haugg, Herdener	INTERMITTENT NEUROFEEDBACK TO REGULATE VTA ACTIVITY USING REAL-TIME FMRI IN HEALTHY PARTICIPANTS – A PILOT STUDY
58	van der Miesen, Raible, Eck, Vossen, Joosten, Peters, Linden	FMRI NEUROFEEDBACK FOR PAIN: A PROOF OF CONCEPT STUDY
59	Wang, Ciarlo, Lührs, Atanasyan, Böken, Roßmann, Schluse, Jäger, Graeve, Nordt, Mathiak, Linden, Goebel, Mehler, Zweerings	NEUROFEEDBACK-GUIDED SEMANTIC CONTROL FOR EMOTIONAL STATES
60	Wang, Lührs, Mathiak, Linden, Goebel, Ciarlo, Zweerings, Mehler	SEARCHLIGHT ANALYSIS FOR NEUROFEEDBACK-GUIDED EMOTION REGULATION
61	Wazulin, Kempf, Bach, Kirsch, Kiefer, Gerchen	NEURAL CORRELATES OF INDIVIDUAL STRESS RESPONSES AND PROBLEMATIC ALCOHOL USE
62	Wright, Poh, Yost, Hakimi, MacInnes, Dickerson, LaBar, Adcock	WHOLE-BRAIN NETWORKS SUPPORT ACTIVATION OF THE VENTRAL TEGMENTAL AREA DURING MOTIVATIONAL THINKING WITH REAL-TIME FMRI NEUROFEEDBACK
63	Zhang, Kiefer, Gerchen, Kirsch	MINDFULNESS-BASED INSTRUCTION TO IMPROVE REAL-TIME FMRI NEUROFEEDBACK EFFICIENCY IN PROBLEMATIC ALCOHOL USE

64	Zhao, Leong, Galiana, Zillo, Camarro, Qiu, Papademetris, Hampson	HALO: A SOFTWARE TOOL FOR REAL-TIME HEAD ALIGNMENT IN THE MR SCANNER
65	Wieland, Jindrová, Schmahl, Paret	EXPLORING THE CHARACTERISTICS OF SUCCESSFUL MENTAL STRATEGIES FOR EMOTION REGULATION DURING AMYGDALA-EFP-NEUROFEEDBACK
66	Yaari, Wilf, Ramot	HOME-BASED OLFACTORY BIOFEEDBACK FOR IMPLICIT LEARNING TO REDUCE SLEEP BRUXISM
67	Papageorgiou, Allam, Sturgis, Hutcheson, Froudarakis	INDIVIDUALIZED MRI NEUROMODULATION TARGETED FOR THE ALLEVIATION OF RADIATION-INDUCED-CRANIAL-NEUROPATHY IN HEAD AND NECK CANCER.
68	Reddy, Presto, Allam, Vemu, Noorbakhsh, Froudarakis, Hutcheson, Papageorgiou	CAUSAL MODELING OF SWALLOW REGULATION VIA INDIVIDUALIZED FMRI NEUROMODULATION
69	Papageorgiou, Allam, Noorbakhsh, Vemu, Presto, Reddy, Hutcheson, Froudarakis	CASE STUDY: AMELIORATION OF LOWER CRANIAL NEUROPATHY SYMPTOMS VIA INDIVIDUALIZED MRI-NEUROMODULATION TARGETED FOR LOWER CRANIAL NEUROPATHY TREATMENT.
70	Papageorgiou, Allam, Reddy Noorbakhsh, Vemu, Presto, Loor, Froudarakis	CASE STUDY: REHABILITATION OF VISUOSPATIAL PERCEPTION VIA INDIVIDUALIZED FMRI NEUROMODULATION

71	Baqapuri, Terneusen, Luehrs, Goebel, Linden	BASAL GANGLIA AS AN FMRI-NEUROFEEDBACK TARGET IN PARKINSON’S DISEASE
72	S. Shabestari, Ribes, Défayes, Cai, Groves, Behjat, Vand De Ville, Kleinjung, Baez, Luthier, Naas, Henchoz, Sonderegger, Neff	ADVANCES ON REAL TIME M/EEG NEURAL FEATURE EXTRACTION
73	Wright, Poh, Yost, Hakimi, MacInnes, Dickerson, LaBar, Adcock	WHOLE-BRAIN NETWORKS SUPPORT ACTIVATION OF THE VENTRAL TEGMENTAL AREA DURING MOTIVATIONAL THINKING WITH REAL-TIME FMRI NEUROFEEDBACK
74	Kostorz, Nguyen, Pan, Melinscak, Steyrl, Hu, Sorger, Hoehl, Scharnowski	SYNCING BRAINS THROUGH HYPERFEEDBACK: CHALLENGES AND CHANCES
75	Nath, Reggente	HEARTBEAT EVOKED POTENTIALS INCREASE WITH MEDITATIVE DEPTH: IMPLICATIONS FOR PERSONALIZED, MULTIMODAL NEUROFEEDBACK
76	Linden, Goebel, Eck, Baqapuri, Paret, Reinhold, Luehrs	PLANNING A NEUROFEEDBACK STUDY UNDER THE EUROPEAN UNION’S MEDICAL DEVICE REGULATIONS
77	Chander, Morgen, Jamin, Ende	ENHANCING MINDFULNESS-BASED THERAPIES: EXPLORING MEG-BASED MARKERS FOR NEUROFEEDBACK

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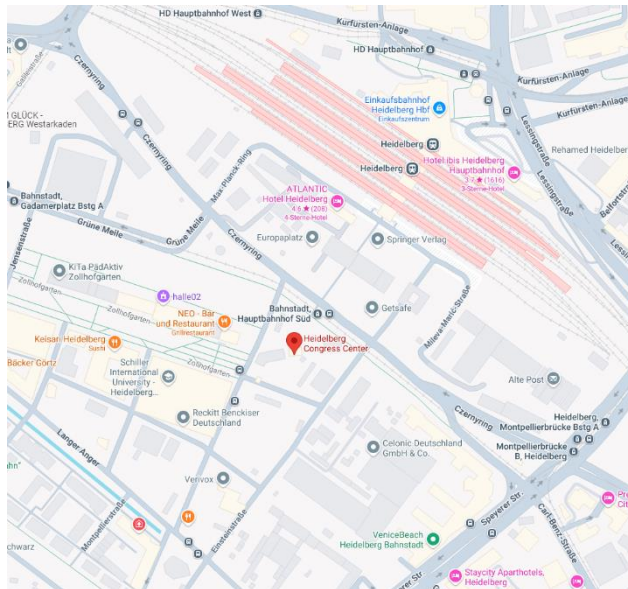
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Website: <https://heidelberg-congress.com>

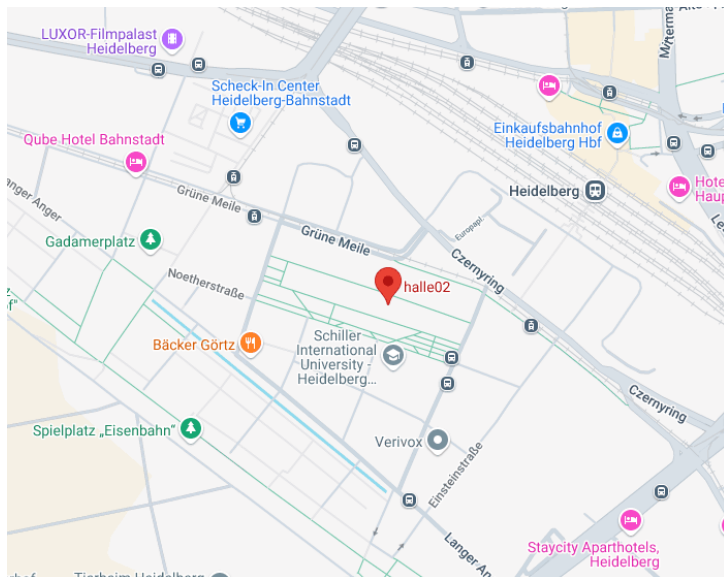


Directions: Parking garage *Kongresszentrum*, entrance to the underground car park: *Goeppert-Mayer-Straße 2*

HALLE 02

Address: Zollhofgarten 2
69115 Heidelberg

Website: <https://halle02.de>

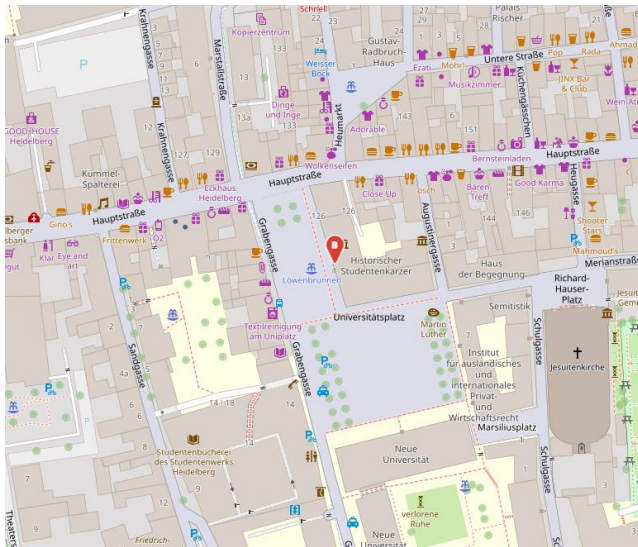


Directions: Rail lines: Stations *Gadamerplatz*, *HD Hauptbahnhof Süd*, *Hauptbahnhof*

ALTE AULA (PUBLIC LECTURE)

Address: Grabengasse 1
69117 Heidelberg

Website: <https://www.uni-heidelberg.de>



Directions: From the main train station: take bus 32 in the direction of *Universitätsplatz*, bus 34 to *Bismarckplatz* and bus 31 to *Universitätsplatz*; alternatively, you can take the BRN 735 and BRN 755 buses to the *Kongresshaus* and walk to *Universitätsplatz* in around six minutes

PALAIS PRINZ CARL

Address : Kornmarkt 1

69117 Heidelberg

Website: <https://palaisprinzcarl.de>

Map:

