

T4: Introduction to EEG Decoding for Music Information Retrieval Research

Perceptual and cognitive approaches to MIR research have very recently expanded to the realm of neuroscience, with MIR groups beginning to conduct neuroscience research and vice versa. First publications have already reached ISMIR and for the very first time, there will be a dedicated satellite event on cognitively based music informatics research (CogMIR) at this year's ISMIR conference. Within the context of this growing potential for cross-disciplinary collaborations, this tutorial will provide fundamental knowledge of neuroscientific approaches and findings with the goal of sparking the interest of MIR researchers and leading to future intersections between these two exciting fields. Specifically, our focus for this tutorial is on electroencephalography (EEG), a widely used and relatively inexpensive recording modality which offers high temporal resolution, portability, and mobility – characteristics that may prove especially attractive for applications in MIR. Attendees of this tutorial will gain a fundamental understanding of EEG responses, including how the data are recorded as well as standard procedures for preprocessing and cleaning the data. Keeping in mind the interests and objectives of the MIR community, we will highlight EEG analysis approaches, including single-trial analyses, that lend themselves to retrieval scenarios. Finally, we will review relevant open-source software, tools, and datasets for facilitating future research. The tutorial will be structured as a combination of informational slides and live-coding analysis demonstrations, with ample time for Q&A with the audience.



Sebastian Stober is head of the recently established junior research group on “Machine Learning in Cognitive Science” within the interdisciplinary setting of the Research Focus Cognitive Science at the University of Potsdam. Before, he was a post-doctoral fellow at the Brain and Mind Institute of the University of Western Ontario where he investigated ways to identify perceived and imagined music pieces from electroencephalography (EEG) recordings. He studied computer science with focus on intelligent systems and music information retrieval at the

Otto-von-Guericke University Magdeburg where he received his diploma degree in 2005 and his Ph.D. in 2011 for his thesis on adaptive methods for user-centered organization of music collections. He has also been co-organizer for the International Workshops on Learning Semantics of Audio Signals (LSAS) and Adaptive Multimedia Retrieval (AMR). With his current research on music imagery information retrieval, he combines music information retrieval with cognitive neuroscience.



Blair Kaneshiro is a Ph.D. candidate (ABD) at the Center for Computer Research in Music and Acoustics at Stanford University. She earned her B.A. in Music, M.A. in Music, Science, and Technology, and M.S. in Electrical Engineering, all from Stanford. Her research explores musical engagement and expectation through brain responses, with an emphasis on multivariate and single-trial approaches to EEG analysis. Other research interests include the study of musical engagement using behavioral and large-scale social-media data, and promotion of

reproducible and cross-disciplinary research through open-source tools and datasets. She is affiliated with CCRMA's Music Engagement Research Initiative (MERI) led by professor Jonathan Berger; music tech company Shazam; and the Brain Research group (formerly Suppes Brain Lab)

