

HEIBRIDS LECTURE SERIES

LECTURE SERIES



Wednesday

4th January 2023

16.00–17.00

Location: ZOOM ([register here](#))

Reconstructing brain sources and their interactions from M/EEG recordings

Speaker: Stefan Haufe, TUB/PTB/Charité

Abstract

In this lecture we will introduce the M/EEG (magneto- and electroencephalography) inverse problem and present classical as well as modern solutions to it. In particular, we will present recent hierarchical/empirical Bayesian approaches that are capable of learning spatiotemporal priors as well as noise distributions jointly with the reconstructed sources and thereby circumvent the necessity to tune a regularization parameter. In a second part we will focus on the problem of estimating brain interactions from the reconstructed time series. Specifically, we will focus on measures of synchronicity, Granger causality, phase-amplitude coupling and delay estimation, where the main technical challenge is to devise metrics that are robust to (residual) instantaneous mixing of signals and/or noise that are due to the measurement process.