Faculty of Electrical Engineering & Computer Science
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Evaluation of Signal Processing Methods for Brain Connectivity.

ABSTRACT - Masterthesis

During cognitive activities, various brain areas interact with each other. One way to interpret the information flow in the brain is to analyze the connectivity among the various channels of the EEG data. Such brain connectivity can be studied at three different levels: a) anatomical connectivity, b) functional connectivity, and c) effective connectivity. Functional connectivity is the study of a symmetrical relationship, while effective connectivity is a study of a directed relationship based on the principle of Granger causality, i.e one channel (the cause) has an influence an another channel (the effect). The goal of this thesis is to evaluate various measures of functional and effective connectivity (e.g. Directed Transfer Function, Partial Directed Coherence, Geweke Granger Causality) based an signal processing techniques and the multivariate autoregressive model. Before evaluating the different connectivity measures, the methods have been implemented and tested on simulated data.