

Brain Patterns: from EEG Coherence Networks to Prediction of Neurodegenerative Diseases

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Laboratoriebygget, room 9.1, 9th floor, HUS

Abstract:

In this talk, I will discuss some recent work on the **visualization and analysis of brain patterns** obtained from neuroimaging data, and their use in the understanding of brain (mal)functioning. **In the first part** of the talk, I will discuss multichannel EEG recordings. From these data, we extract functional unit (FU) maps, where each FU is a data-driven region of interest (ROI) consisting of spatially connected set of electrodes recording pairwise significantly coherent signals. The method is applied to the analysis of EEG coherence networks in two case studies, one on mental fatigue and one on patients with corticobasal ganglionic degeneration (CBGD). We also discuss a preliminary extension of the method to fMRI data.

The second part of the talk is devoted to the recently started GLIMPS ("GLucose IMaging in ParkinsonismS") project at the University of Groningen. This project concerns the creation of a national database of FDG-PET scans which reflect the glucose consumption of the brain in patients with neuro-degenerative diseases. The goal is to identify distinctive structural and functional brain patterns and derived quantities like network patterns of brain activity, which display statistically significant differences in healthy subjects and patients with certain types of neuro-degenerative disease. The database will be used for clinical practice as well as for research purposes. Pattern classification and machine learning methods will be developed to associate brain patterns to various types and stages of neuro-degenerative disease. First results will be shown and discussed.

