Full programme for the Neurotechnology Demonstration Lessons Symposium

Time: 9:00 – 14:45 Date: Jan 25, 2010
Location: Room FR5516, Franklinstraße 28, 10587 Berlin

General remark: Each lecture will last for 30 minutes. The 15 minute gaps between each lecture will be used for direct communication between the candidates and interested students. Students can participate during that part if they like, but it is not part of the lecture as such.

09:00–09:30 Dietrich, Ohm–Hochschule Nuernberg

Title: Beyond Phrenology: will multivariate pattern recognition make functional neuroimaging ready for prime time? One current problem of functional neuroimaging, especially fMRI, is that its impressive output graphics are often misinterpreted and their value on the individual functionings of the brain is overestimated. This is due to the nature of statistical data analysis methods currently used just focussing on group analyses. Recently, machine learning techniques and multivariate pattern recognition (MVPR) methods have been proposed to pass the bottleneck. My talk will give an introduction on neuroimaging methods with a special focus on fMRI and opportunities of MVPR in the field. Students will be given some comprehensive and helpful suggestions on the technical, medical but also neuroethical backgrounds. The lecture’s goal is to inspire students to look ‘beyond Phrenology’ and gain direct access to some of the most fascinating questions in today’s science.

09:45–10:15 Raizada, Darthmoth College

Title: Pattern–based fMRI analyses: how do they help us to understand the brain? The problem with standard fMRI studies is that they all too often just tell you which part of the brain "lights up", but without telling you anything about how underlying neural representations are structured.
This talk will outline how pattern-based fMRI analyses can help us to move beyond that, and will show a couple of simple demos using Matlab.

10:30–11:00 Blankertz, TU Berlin

Title: Practical Guide to Linear Classification in High-Dimensional Feature Spaces

The analysis of high dimensional data is challenging, not only because complex models of pattern recognition are required, but also since it eludes easy visualization. In this lecture, I will show in two illustrative examples, how high dimensional distributions can be investigated. Furthermore, I introduce a powerful method for the linear classification of such data, which provides insight into what the model 'learnt' from the data.

11:15–11:45 Schultz, University of Karlsruhe

Title: tba

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12:45–13:15 Pipa, University of Osnabrueck

Title: Multivariate pattern recognition lecture: After a brief presentation of my teaching concept I will start the lecture by introducing the Bayesian framework, and giving an overview of different classes of pattern recognition procedures. In the main part we will discuss pattern recognition based on generative and discriminative models, i.e.logistic regression.

13:30–14:00 Schlögl, TU Graz

Title: "Missing Values" and statistical classifiers

Missing values are an important problem in multivariate pattern matching. Various methods for dealing with missing values are discussed.
In this lecture I will begin with an overview of the field of pattern recognition. Subsequently, I will elaborate on supervised learning methods for classification and present some of their applications in modern brain science.