Matrix Computations & Scientific Computing Seminar

Organizer(s): James Demmel, Ming Gu & Beresford Parlett

Wednesday, 11:00am–12:00pm, 380 Soda

Oct. 14 **Prof. Kristoffer Madsen**, Technical University of Denmark

Modelling strategies in Functional Magnetic Resonce Imaging

Functional magnetic resonance imaging (fMRI) allows non-invasive functional measurement on the human brain. I will briefly introduce the Blood Oxygenation Level Dependent (BOLD) signal and discuss signal preprocessing and the standard univariate statistical parametric mapping (SPM) technique including modelling of nuisance effects to supress physiological noise. In the remainder of the talk I'll discuss unsupervised analysis techniques using "factor analysis"-type models and present some recent work on unsupervised machine learning techniques for the analysis/modelling of fMRI and ElectroEncephaloGraphy (EEG) data. In particular this includes extensions to explicitly handle unmixing of delayed and convolutive mixtures as well as generalisations to higher order arrays.