

COLLOQUIUM ANNOUNCEMENT

“Dynamic connectivity regression: Determining state-related changes in brain connectivity”

Presented by

Ivor Cribben, Columbia University

Thursday, February 2, 2012
300 Seitz
3:30 p.m.

Abstract: Most statistical analyses of fMRI data assume that the nature, timing and duration of the psychological processes being studied are known. However, many times it is hard to specify this information a priori. In this work, we introduce a data-driven technique for partitioning the experimental time course into distinct temporal intervals with different multivariate functional connectivity patterns between a set of regions of interest (ROIs). The technique, called Dynamic Connectivity Regression (DCR), detects temporal change points in functional connectivity and estimates a graph, or set of relationships between ROIs, for data in the temporal partition that falls between pairs of change points. Hence, DCR allows for estimation of both the time of change in connectivity and the connectivity graph, which is assumed to remain constant within each partition. Permutation and bootstrapping methods are used to perform inference on the change points. The method is applied to various simulated data sets as well as to an fMRI data set from a study (n=26) of a state anxiety induction using a socially evaluative threat challenge. The results illustrate the method's ability to observe how the networks between different brain regions changed with subjects' emotional state.

Joint work with Ragnheidur Haraldsdottir, Lauren Y. Atlas, Tor D. Wager and Martin A. Lindquist



Hosted by the
Department of Statistics
Virginia Tech

Please join us after the colloquium for refreshments at
Top of the Stairs (217 College Ave.)