

COLLOQUIUM ANNOUNCEMENT

“Varying Coefficient Models for Neuroimaging Data”

Presented by

Linglong Kong, UNC – Chapel Hill

Thursday, January 19, 2012

300 Seitz

3:30 p.m.

Abstract: Motivated by recent work studying massive imaging data in the neuroimaging literature, we propose two varying coefficient models: multivariate varying coefficient models (MVCM) for modeling the relation between multiple functional responses and a set of covariates, and spatial varying coefficient models (SVCM) for spatially modeling the relation between high-dimensional imaging measures on a two-dimensional (2D) or three-dimensional (3D) region and a set of covariates. MVCM and SVCM allow the coefficients change to characterize the varying associations between responses and a set of covariates, for example, the age effects of fiber bundle diffusion properties may change in term of arc length along the fiber tract. We use weighted least squares and multiscale adaptive estimation methods to estimate the varying coefficient functions and a functional principal component analysis to delineate the structure of the variability in responses. We propose a global test statistics to test hypotheses of interest in MVCM and SVCM and develop a simultaneous confidence band to quantify the uncertainty in the estimated coefficient functions in MVCM. The asymptotic properties of the estimation and inference procedures are established. We conduct Monte Carlo simulation to examine the finite-sample performance of the proposed procedures. We then illustrate real data analysis on various neuroimaging data.



Hosted by the
Department of Statistics
Virginia Tech

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