Temple University

ANNOUNCES A
COLLOQUIUM

Michael Daniels
University of Florida

will speak on

A Nonparametric Prior for Simultaneous Covariance Estimation

Time: 3:00 PM – 4:00 PM
Date: Friday, March 23, 2012
Place: Alter Hall 233

Abstract

In the modeling of longitudinal data from several groups, appropriate handling of the dependence structure is of central importance. In many cases, one assumes that the covariance (or correlation) structure is the same for all groups. However, this assumption, if it fails to hold, can have an adverse effect on inference for mean effects. Conversely, if one specifies each of the covariance matrices without regard to the other groups, this can lead to a loss of efficiency if there is information to be gained across groups. It is desirable to develop methods to simultaneously estimate the covariance matrix for each group that will borrow strength across groups in a way that is ultimately informed by the data. In addition, for several groups with covariance matrices of even medium dimension, it is difficult to 'manually' select a single best parametric model given a huge number of possibilities (e.g., structural zeros and/or commonality of individual parameters across groups). In this paper we develop a family of nonparametric priors using the matrix stick-breaking process of Dunson et al. (2008) that seeks to accomplish this task by parameterizing the covariance matrices in terms of the parameters of their modified Cholesky decomposition (Pourahmadi, 1999). We establish some theoretic properties of these priors, examine their effectiveness via a simulation study, and illustrate the priors using data from a longitudinal clinical trial.

Joint work with Jeremy Gaskins, University of Florida

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