

Colloquium  
Michigan State University  
Department of Statistics and Probability

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A Nonparametric Prior for Simultaneous Covariance Estimation  
in Longitudinal Data

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10:20 a.m. - 11:10 a.m.  
Refreshments 10:00am  
C405 Wells Hall

**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 covariance matrices for each group that will borrow strength across groups in a way that is ultimately informed by the data. In this paper we develop a family of nonparametric priors using the Matrix Stick-Breaking Process of Dunson et al. (2008) that seek 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 at UF.