A Semiparametric Approach to Simultaneous Covariance Estimation for Bivariate Sparse Longitudinal Data

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Abstract

Estimation of the covariance structure for irregular sparse longitudinal data has been studied by many authors in recent years but typically using fully parametric specifications. In addition, when data are collected from several groups over time, it is known that assuming the same or completely different covariance matrices over groups can lead to loss of efficiency and/or bias. Nonparametric approaches have been proposed for estimating the covariance matrix for regular univariate longitudinal data by sharing information across the groups under study. For the irregular case, with longitudinal measurements that are bivariate or multivariate, modeling becomes more difficult. In this talk, to model bivariate sparse longitudinal data from several groups, we propose a flexible covariance structure via a novel matrix stick-breaking process for the residual covariance structure and a Dirichlet process mixture of normals for the random effects. We analyze a subset of Framingham Heart Study data to examine how the blood pressure trajectories and covariance structures differ for the patients from different BMI groups (high, medium and low) at baseline.

Speaker's Profile:

Kiranmoy Das is currently appointed as an assistant professor, department of Statistics, Presidency University. He did his Ph.D from The Pennsylvania State University and his master degree from Indian Statistical Institute, Kolkata. His primary research interest includes Longitudinal data analysis, Bayesian modeling, Statistics in Medicine and Biology, Wireless sensor Networks.