MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

Xuan Cao
University of Florida

Graphical Models, Non-local Priors in High-dimensional Bayesian Analysis

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10:20 AM - 11:10 AM
Refreshments 10:00 AM
C405 Wells Hall

Abstract

Covariance estimation and selection for high-dimensional multivariate datasets is a fundamental problem in modern statistics. Gaussian directed acyclic graph (DAG) models are a popular class of models used for this purpose. Gaussian DAG models introduce sparsity in the Cholesky factor of the inverse covariance matrix, and the sparsity pattern in turn corresponds to specific conditional independence assumptions on the underlying variables.
A variety of priors have been developed in recent years for Bayesian inference in DAG models, yet crucial convergence and sparsity selection properties for these models have not been thoroughly investigated. Most of these priors are adaptations/generalizations of the Wishart distribution in the DAG context. In this paper, we consider a flexible and general class of these DAG-Wishart priors with multiple shape parameters. Under mild regularity assumptions, we establish strong graph selection consistency and establish posterior convergence rates for estimation when the number of variables p is allowed to grow at an appropriate sub-exponential rate with the sample size n.

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