ACMS Statistics Seminar

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154 Hurley Hall

4:00 – 5:00 PM

Two-Stage Bayesian Estimation in Structural Equation Modeling

Bayesian estimation (BE) methods have gained vast popularity in estimating structural equation models (SEMs), given its flexibility to estimate more complex models and incorporate prior information. However, for the existing methods, specifying priors is often difficult and convergence diagnostic of the MCMC iterative procedures is challenging for applied researchers. In this study, a two-stage procedure is proposed to obtain Bayesian estimates of structural equation models. In the first stage, samples for the covariance parameter matrices are independently drawn from its posterior distribution. In the second stage, the model parameter estimates are obtained by fitting a SEM model to the covariance matrices. The newly proposed two-stage procedure solves the challenges faced by the conventional Bayesian SEM. First, prior distributions are specified on the covariance parameter matrix, regardless of the model used. Second, the samples of parameters obtained using the two-stage procedure are independent of each other and thus the convergence diagnostic is not necessary. Simulation studies show that the new method performs well comparing to the conventional Bayesian SEM.