The University of Chicago
Department of Statistics

Master's Seminar

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"Hierarchical Models Using Mixture of Normal Distributions And Dirichlet Process"

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110 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

The practice of hierarchical modeling has enabled marketers to understand market heterogeneity and make decentralized marketing decision. Due to the development of MCMC methods, modeling disaggregate data with emphasis on individual or unit-level parameters is made possible through specifying the joint prior over unit-level parameters. Much of the work has used normal conjugate prior for this joint prior distribution, however, the restrictions of normal density may prevent us from observing new data structure, about which there is usually considerable uncertainty. Therefore, the flexibility in the form of the prior distribution has been a concern about the sensitivity of resulting reasonable inferences. In this paper, we use mixtures of normal distributions and Dirichlet process components to approximate non-normal data densities with simulation-based analysis. The setting is further introduced into the functional form of first-stage prior in hierarchical linear and hierarchical multinomial logit models. The methodology and algorithm is illustrated with simulated data along with actual data sets.

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