MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

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An optimal transport based theory of hierarchical Bayesian inference

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Refreshments 10:00 am
C405 Wells Hall

Abstract

Hierarchical Bayesian models present a versatile tool in statistics and applied fields. Statistical dependence can be easily expressed via latent variables, which may also be objects of inference. In a hierarchical model, the latent hierarchy enables the "borrowing of strength" between different data sets through shared parameters in the latent hierarchy. We will discuss a statistical theory for hierarchical model-based inference, taking a view that places latent variables at the center of the inference. We establish posterior concentration behaviors of the latent variables that arise in several hierarchical Bayesian nonparametric models, including the Dirichlet process mixture and the hierarchical Dirichlet processes. We also show how to quantify in a precise sense the benefits of borrowing strength in a nonparametric and hierarchical model based setting. Central to our theory is the development of optimal transport distances defined on a Bayesian hierarchy of (random) probability measures.

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