

MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

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Statistical Approaches to Regression Analysis of Spatial Data and Mapping of Ecological Processes

Tuesday, March 31, 2015
10:20 a.m. - 11:10 am
Refreshments 10:00 am
C405 Wells Hall

Abstract

Modeling spatial data in ecology and drawing statistical inference are challenging especially for discrete and bounded responses. The motivating data examples are from the Public Land Survey System records in the Midwest. In this talk, new models are presented for regression analysis of spatial proportional data and connections are drawn to the existing spatial ordinal probit models. A composite likelihood approach is developed for parameter estimation and standard error calculation based on the asymptotic properties. Mapping of ecological processes on the landscape based on field data is also considered. Bayesian hierarchical models are developed for forest structures that balance model flexibility and computational feasibility for large amounts of spatial data. Numerical examples, including simulated and real data, are given to illustrate the proposed methods and evaluate their performance.

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