

MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

Soutir Bandyopadhyay

Assistant Professor
Department of Mathematics
Lehigh University

A General Frequency Domain Method for Assessing Spatial Covariance Structures

Thursday, February 9, 2017
10:20 a.m. - 11:10 am
Refreshments 10:00 am
C405 Wells Hall

Abstract

Current methods for testing spatial covariance are often intended for specialized inference scenarios, usually with spatial lattice data. We propose instead a general method for estimation and testing of spatial covariance structure, which is valid for a variety of inference problems *and* applies to a large class of spatial sampling designs with irregular data locations. In this setting, spatial statistics have limiting distributions with complex standard errors depending on the rate of spatial sampling, the distribution of sampling locations, and the process covariance. The proposed method has the advantage of providing valid inference in the frequency domain without knowledge of such factors or estimation of standard errors. To illustrate, we develop the method for formally testing isotropy and separability in spatial covariance and consider confidence regions for spatial parameters in variogram model fitting; extensions to other testing applications are also presented. The approach uses spatial test statistics, based on an extended version of empirical likelihood, having simple chi-square limits. We demonstrate the proposed method through several numerical studies.

To request an interpreter or other accommodations for people with disabilities, please call the Department of Statistics and Probability at 517-355-9589.