



The University of Chicago
Department of Statistics

MASTER'S THESIS PRESENTATION

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**A Simulation Study of Resampling Methods
for Confidence Intervals of Variogram Estimates**

THURSDAY, November 11, 2010, at 2:00 PM

110 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

Resampling methods such as subsampling and the moving block bootstrap are used for capturing spatial dependence in spatial data. Asymptotic results for resampling methods have been based on increasing the number of observations along with increasing domain size under restriction on the range of dependence of the data. While estimates for dependent data do not have to be consistent on a fixed domain (Stein,1999), Loh and Stein (2008) showed the block-of-blocks bootstrap yielded asymptotically correct inferences for the first-order and the second-order variograms on a fixed domain for a Gaussian random field with the Matérn covariance function with the smoothness parameter $\nu=0.5$ and 1.5.

In this talk, I will present the simulation results of three resampling methods for confidence intervals of variogram estimates using the model in the literature to see if there is the asymptotic tendency with increasing the number of observations on a fixed lattice. Empirical coverages of confidence intervals of the first-order and of the second-order variograms are computed for various choices of the Matérn model parameters and the resampling methods: the moving block, subsampling, and the block of blocks methods. I will discuss dependence structure in data that causes a poor empirical coverage regardless of choice of the resampling methods at the end if time allows.

Information about building access for persons with disabilities may be obtained in advance by calling Sandra Romero at 773.702-0541 or by email (sandra@galton.uchicago.edu).