

*For favour of posting*

DEPARTMENT OF STATISTICS AND ACTUARIAL SCIENCE  
THE UNIVERSITY OF HONG KONG

Seminar

**Dr. Debashis MONDAL**

Department of Statistics  
Oregon State University  
USA

will give a talk

entitled

**MATRIX-FREE COMPUTATIONS FOR GAUSSIAN  
MARKOV RANDOM FIELDS AND RELATED SPATIAL  
PROCESSES**

Abstract

Since their introduction in statistics through the seminal works of Julian Besag, Gaussian Markov random fields have become central to spatial statistics, with applications in agriculture, epidemiology, geology, image analysis and other areas of environmental science. Specified by a set of conditional distributions, these Markov random fields provide a very rich and flexible class of spatial processes, and their adaptability to fast statistical calculations, including those based on Markov chain Monte Carlo computations, makes them very attractive to statisticians. In recent years, new perspectives have emerged in connecting Gaussian Markov random fields with geostatistical models, and in advancing fast statistical computations. In this talk, I will briefly discuss the scaling limit of lattice-based Gaussian Markov random fields, namely, the de Wijs process that originated in the works of George Matheron on gold mines in South Africa. I will then explore how this continuum limit connection holds out further possibilities to fit a wide range of new continuum models by using Gaussian Markov random fields. The main focus of the talk will be on various novel matrix-free computations for these models. In particular, for spatial mixed linear models, I will present novel frequentist residual maximum likelihood inference via matrix-free h-likelihood computations. I will draw applications both from areal-unit and point-referenced spatial data.

on

**Wednesday, December 14, 2016**

*(Refreshments will be served from 2:15 p.m. outside Room 301 Run Run Shaw Building)*

**2:30 p.m. – 3:30 p.m.**

at

**Room 301, Run Run Shaw Building**

**Visitors Please Note that the University has limited parking space. If you are driving please call the Department at 3917 2466 for parking arrangement.**

All interested are welcome