

Spring Lecture Series N.32 Spatial and Spatio-Temporal Statistics (2007)

Principal Lecturer: Noel Cressie (Ohio State University)

Dr. Cressie will present lectures that concentrate on spatial processes with continuous index. The models used to describe spatial dependence are variogram- or covariance-function-based, commonly called geostatistical models. When embedded in a hierarchical model, geostatistical models can provide statistically optimal spatial predictors that address important science problems, which include spatial mapping: (1) on river networks; (2) in the presence of location error; (3) for exceedances and exceedance regions; (4) for massive datasets remotely sensed over the globe. Spatio-temporal mapping, where both past and current data are used to filter and forecast a spatio-temporal process, will be presented in the context of remote sensing. The emphasis of these lectures will be on hierarchical statistical modeling for processes with continuous spatial index. Opportunities will be taken to put the formulation in a Bayesian context and to point out connections with spatial lattice processes.

Invited Speakers:

Alan Gelfand (Duke University)

Title: Stochastic Space-time Modelling Using Differential Equations

Marc Genton (Texas A&M University), "Modeling and Testing Properties of Space-time Covariance Functions"

Richard Smith (University of North Carolina--Chapel Hill)

Title: Extreme Precipitation Trends Over the Continental United States

Jay Ver Hoef (National Marine Mammal Laboratory)

Title: Space-Time Zero-Inflated Count Models of Harbor Seals

Christopher Wikle (University of Missouri)

Title: Nonlinear Spatio-Temporal Dynamic Models

Jun Zhu (University of Wisconsin--Madison)

Title: Markov Chain Monte Carlo for a Spatial-Temporal Autologistic Regression Model

James Zidek (University of British Columbia)

Title: Using a Multivariate Approach to Model Univariate Environmental Space Time Processes

Sujit Ghosh (North Carolina State University)

Title: A Class of Kernel-Based Conditionally Autoregressive Models for Spatial Data

Victor De Oliveira (The University of Texas at San Antonio)

Title: Objective Bayesian Analysis of Spatial Data With Measurement Error