STATISTICS SEMINAR

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Thursday, March 10, 2016
Dickens Hall, Room 207, 4:00-5:00 pm
Refreshments: Dickens 108, 3:30-4:00 pm

Covariance Models on the Surface of a Sphere: When does it matter?

There is a growing interest in developing covariance functions for processes on the surface of a sphere due to wide availability of data on the globe. Utilizing the one-to-one mapping between the Euclidean distance and the great circle distance, isotropic and positive definite functions in a Euclidean space can be used as covariance functions on the surface of a sphere. This approach, however, may result in physically unrealistic distortion on the sphere especially for large distances. We consider several classes of parametric covariance functions on the surface of a sphere, defined with either the great circle distance or the Euclidean distance, and investigate their impact upon spatial prediction. We fit several isotropic covariance models to simulated data as well as real data from NCEP/NCAR reanalysis on the sphere. We demonstrate that covariance functions originally defined with the Euclidean distance may not be adequate for some global data. This is a joint work with Jaehong Jeong.