ACMS Statistics Seminar

Joseph Guinness

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Tuesday, September 11

154 Hurley Hall

3:30– 4:30 PM

Spectral Density Estimation for Random Fields via Periodic Embeddings

We will describe methods for estimating the spectral density of a random field on a d-dimensional lattice from incomplete gridded data. The methods iteratively impute missing data with periodic conditional simulations on an expanded lattice. Periodic conditional simulations are convenient computationally, in that circulant embedding and preconditioned conjugate gradient methods can produce imputations in O(n log n) time and O(n) memory. They also have desirable theoretical properties, producing very accurate estimates via the amelioration of edge effects. The methods are particularly useful for multivariate and spatial-temporal data, where it is difficult to specify parametric models. We present an application to multivariate spatial-temporal data from geostationary satellites.