11th ANNUAL PROBABILITY & STATISTICS DAY AT UMBC

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Workshop on
Our physical world: Finding the curves and surfaces
Presented by
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Friday, April 21,2017. 2.00PM–6.30PM; Information Technology/Engineering (ITE) Building Lecture Hall 7 (Room 104)
Registration is FREE but required.
Registration Deadline: Friday, April 7, 2017
Registration Website: www.umbc.edu/circ/hosting/ProbStatDay2015

Abstract

The workshop will be an introduction to the statistics of estimating smooth functions from observations and simulations of the environment. The applications of these methods are ubiquitous: from spatial statistics for temperature observations, to inverting remote sensed measurements, to summarizing the complex simulations from earth system models. In all these areas, the basic problem is finding a curve or surface in the midst of noisy and irregular data, and, once found, quantifying the uncertainty in the estimate. The key is to distill the problem into two parts: a statistical model that describes how the observations are related to unknown function and another model for the unknown function itself. Using maximum likelihood or Bayes theorem one can use these parts to estimate the function. One useful connection is the equivalence of these statistical techniques with data smoothers and variational methods such as splines. Examples will be given using digital elevation models, extremes, and paleoclimate.

Lecture 1: An introduction to spatial statistics
Lecture 2: Spatial data analysis in R
Lecture 3: A multi-resolution spatial model
Lecture 4: Statistics and inverse problems