Department of Mathematics,
University of California, San Diego

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Special Statistics Seminar

Prof. John Lafferty

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Statistical Learning of Functions and Graphs in High Dimensions

Abstract:

A fundamental difficulty in statistical learning is the "curse of dimensionality," where most learning problems become notoriously difficult when the data are high dimensional. Even the simplest of methods—the linear model—has proved to be interesting and challenging to understand in the high dimensional setting, and has attracted the recent attention of multiple communities, including applied mathematics, signal processing, statistics, and machine learning.

In this talk we present some recent work on several nonparametric learning problems in the high dimensional setting. In particular, we present theory and methods for estimating sparse regression functions, additive models, and graphical models. For nonparametric regression, we present a greedy algorithm based on thresholding derivatives that achieves near optimal minimax rates of convergence. For additive models, we present a functional version of methods based on L1 regularization for linear models. For graphical models, we present a method for estimating the graph underlying an unknown graphical model based only on observations.

The talk is based on work with Larry Wasserman, Pradeep Ravikumar, Han Liu, and Martin Wainwright.

Host: Dimitris Politis

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