Arthur Imperatore School of Sciences and Arts

Department of Mathematical Sciences

Stevens Institute of Technology

Jinfeng Xu

Department of Statistics
Columbia University

Parameter Estimation, Model Selection and Inferences in ℓ_1-based Linear Regression

Tuesday, March 7, 2006
4:00 pm
Peirce 218

Abstract:

Due to recent advances in interior point methods for solving linear programs, ℓ_1 methods exhibit significant computational advantages besides its well known robustness superiority. The development of the least absolute shrinkage and selection operator (LASSO) further provides the impetus for a unified ℓ_1 solution for parameter estimation, model selection and inferences in high dimensional regression analysis.

In this talk, we introduce an adaptive two-stage ℓ_1 approach in linear regression model to achieve this goal. Numerically, our procedure can be easily implemented by efficient linear programming algorithm. Theoretically, it can achieve best parameter estimation and consistent variable selection simultaneously. Its optimality is justified via modern empirical processes theory and certain novel inequalities.

A parallel approach is developed for the rank estimation in the linear regression. The latter is important due to its link to the accelerated failure time model in survival analysis where the response variable is often subject to the right censorship. The new method handles the right censoring in a natural way and retains desirable large sample properties. Simulation studies also show its favorable finite sample performance.

Refreshments will be provided.
For more information contact Darinka Dentcheva, Michael Zabarankin, Ionut Florescu, or call 201-216-5449.