The University of Mississippi
Department of Mathematics

Statistics Seminar

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Title: Marginal Empirical Likelihood Independence Screening in Sparse Ultrahigh Dimensional Additive Models

2:00 pm, Thursday, Dec 3, 2015
Hume Hall 321

Abstract: Additive models have been proven to be very useful as they increase the flexibility of the standard linear model and allow a data-analytic transform of the covariates to enter into the linear model. In a high-dimensional setting where the dimensionality grows exponentially with the sample size, the urgent issue is to reduce dimensionality from high to a moderate scale. In this paper, we investigate the marginal empirical likelihood screening methods for ultrahigh dimensional additive models. The proposed nonparametric screening method selects variables by ranking a measure of the marginal empirical likelihood ratio evaluated at zero in order to differentiate the contributions of each covariate made to the response variable. We show that, under some mild technical conditions, the proposed marginal empirical likelihood screening method has a sure screening property. And the extent to which the dimensionality can be reduced is also explicitly quantified. We also propose a data-driven thresholding and an iterative marginal empirical likelihood method to enhance the finite sample performance for fitting sparse additive models. Simulation results and real data analysis demonstrate that the proposed methods work competitively and perform better than the competing methods in a heteroscedastic scenario.