

MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

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Model-Free Feature Screening for Ultrahigh Dimensional Discriminant Analysis

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10:20 a.m. - 11:10 am
Refreshments 10:00 am
C405 Wells Hall

Abstract

This work is concerned with marginal sure independence feature screening for ultrahigh dimensional discriminant analysis. The response variable is categorical in discriminant analysis. This enables us to use conditional distribution function to construct a new index for feature screening. In this paper, we propose a marginal feature screening procedure based on empirical conditional distribution function. We establish the sure screening and ranking consistency properties for the proposed procedure without assuming any moment condition on the predictors. The proposed procedure enjoys several appealing merits. First, it is model-free in that its implementation does not require specification of a regression model. Second, it is robust to heavy-tailed distributions of predictors and the presence of potential outliers. Third, it allows the categorical response having a diverging number of classes in the order of $O(n^{\kappa})$ with some $\kappa \geq 0$. We assess the finite sample property of the proposed procedure by Monte Carlo simulation studies and numerical comparison. We further illustrate the proposed methodology by empirical analyses of two real-life data sets.

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