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Sufficient reductions in regression with mixed predictors

Wednesday, November 2, 2022
11:50 AM

110 Frelinghuysen Road, Hill Center, Room 552

Zoom Meeting: Meeting ID: 99075124232
Password: 952486

https://rutgers.zoom.us/j/99075124232?pwd=UDdPVjRncXZFcXpvbFE0OWJyMVdSUT09

Light refreshments will be served

Abstract: Most data sets comprise of measurements on continuous and categorical variables. Yet, modeling high-dimensional mixed predictors has received limited attention in the regression and classification statistical literature. We study the general regression problem of inferring on a variable of interest based on high dimensional mixed continuous and binary predictors. The aim is to find a lower dimensional function of the mixed predictor vector that contains all the modeling information in the mixed predictors for the response, which can be either continuous or categorical. The approach we propose identifies sufficient reductions by reversing the regression and modeling the mixed predictors conditional on the response. We derive the maximum likelihood estimator of the sufficient reductions, asymptotic tests for dimension, and a regularized estimator, which simultaneously achieves variable (feature) selection and dimension reduction (feature extraction). We study the performance of the proposed method and compare it with other approaches through simulations and real data examples.

Bio: I am heading the Applied Statistics Research Unit (ASTAT) in the Institute of Statistics and Mathematical Methods in Economics with the Faculty of Mathematics and Geoinformation at the Vienna University of Technology (TU Wien). My work focuses on dimension reduction in regression and classification, high-dimensional statistics, multivariate analysis, and applications in biostatistics, econometrics and legal statistics.