## Machine bias versus human bias: generalized linear models

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## Abstract

Penalized and shrinkage regression have been widely used in highdimensional data analysis. Much of recent work has been done on the study of penalized least square methods in linear models. In this talk, I consider estimation in generalized linear models when there are many potential predictor variables and some of them may not have influence on the response of interest. In the context of two competing models where one model includes all predictors and the other restricts variable coefficients to a candidate linear subspace based on prior knowledge, we investigate the relative performances of absolute penalty estimator (APE), shrinkage in the direction of the subspace, and candidate subspace restricted type estimators. We develop large sample theory for the estimators including derivation of asymptotic bias and mean squared error. The asymptotics and a Monte Carlo simulation study show that the shrinkage estimator overall performs best and in particular performs better than the APE when the dimension of the restricted parameter space is large. The estimation strategies considered in this talk are also applied on a real life data set for illustrative purpose.

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