Variable selection and estimation in generalized linear models with measurement error

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Abstract: We study the variable selection problem in linear and generalized linear models when some of the predictors are measured with error. We demonstrate how measurement error (ME) affects the selection results and propose regularized instrumental variable (RIV) methods to correct for the ME effects. We show that the proposed estimators have the oracle property in a linear model and we derive their asymptotic distribution under general conditions. We also investigate the performances of the estimators in generalized linear models. Our simulation studies show that the RIV estimators outperform the naive estimator in both linear and some generalized linear models. Finally, the proposed method is applied to a real dataset. This is a joint work with Lin Xue.