

A New Class of Estimating Equation-based Variable Selectors for Marginal Regression Models

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Abstract

We propose a new class of estimating equation-based Dantzig selectors that can achieve simultaneous estimation and variable selection in the absence of a likelihood function, even when the number of covariates exceeds the number of samples. Our research was motivated by practical problems encountered in two studies: a clinical trial of therapies for head and neck cancer, and a genomics study of multiple myeloma patients. These problems proved difficult to analyze under the likelihood setting and must instead be approached with estimating equations. We prove nonasymptotic probability bounds on the accuracy of our estimator, report extensive simulation results, and use our method to analyze the aforementioned problems and construct more accurate prediction rules.

Keywords: Variable selection; Estimating equation; Risk prediction; Cancer genomics; Clinical trials.

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