

# Dantzig Selector for Censored Linear Regression Models with High Dimensional Predictors

by

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## **Abstract**

The Dantzig variable selector has recently received a considerable amount of attention and has shown promising usage. A key advantage of the Dantzig selector is that it does not pertain to a particular likelihood or objective function, as opposed to the existing LASSO, and hence has the potential for wide applications. However, to our knowledge, all the Dantzig selector work has been performed under the assumption that the response variable can be fully observed and none has been done for censored outcome data. In the motivating study of detecting predictive genes for myeloma patients' phenotype, the main outcomes, namely event-free survival and overall survival, are subject to right censoring. This paper proposes a new adaptive Dantzig variable selector for linear regression models when the response variable is subject to right censoring. Under some mild conditions, we establish the theoretical properties of our procedure, including consistency in model selection (namely, the right subset model will be identified with a probability tending to 1) and the oracle property of the estimation (namely, the asymptotic distribution of the estimates is the same as that when the true subset model is known a priori). Extensive numerical studies show that the Dantzig selector is a strong competitor with the other competing methods. We apply the new method to the aforementioned myeloma study and identify important predictive genes for patients' event free survival.