

Simultaneous estimation and variable selection for Interval-Censored Data with Broken Adaptive Ridge Regression

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Abstract: The simultaneous estimation and variable selection for Cox model has been discussed by several authors (Fan and Li, 2002; Huang and Ma, 2010; Tibshirani, 1997) when one observes right-censored failure time data. However, there does not seem to exist an established procedure for interval-censored data, a more general and complex type of failure time data, except two parametric procedures in Scolas et al. (2016) and Wu and Cook (2015). To address this, we propose a broken adaptive ridge (BAR) regression procedure that combines the strengths of the quadratic regularization and the adaptive weighted bridge shrinkage. In particular, the method allows for the number of covariates to be diverging with the sample size. Under some weak regularity conditions, unlike most of the existing variable selection methods, we establish both the oracle property and the grouping effect of the proposed BAR procedure. We conduct an extensive simulation study and show that the proposed approach works well in practical situations and deals with the collinearity problem better than the other oracle-like methods. An application is also provided.