

Nonparametric Regression with a Randomly Censored Independent Variable

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Abstract: Censoring occurs often in data collection. In this paper, we consider the nonparametric regression when the covariate is censored. In contrast to censoring in the response variable as does in most survival analysis, regression with censored covariates is more challenging. We propose to estimate the regression function using conditional hazard rates. Asymptotic normality of our proposed estimator is established. Compared with that based on complete cases, both theoretical results and simulation studies demonstrate that the proposed nonparametric method could estimate unknown regression functions more efficiently especially with high censoring rate. We illustrate and compare methods using the well-known dataset from a randomized placebo controlled clinical trial of the drug D-penicillamine (DPCA).