Nonparametric Variable Selection via Sufficient Dimension Reduction for Cross-sectional Survival Data Without Follow-up

Ming-Yueh Huang

Institute of Statistical Science, Academia Sinica

Abstract

In this talk, I will focus on the regression analysis based on two types of survival data without survival time: prevalent data without follow-up as well as incident and prevalent covariate data. Under fully nonparametric consideration, the conditional survival function, and hence the absolute covariate effect, is not estimable due to fully right censoring. However, the central subspace can still be estimated based on these two types of data. Different from existing methods in the literature, this feature requires no parametric or semiparametric model assumptions. In addition, the basis matrix of central subspace can be interpreted as relative covariate effects and used to screen inactive covariates. According to these findings, we propose a penalized cross-validation type criterion to estimate the central subspace and select active covariates. This method requires no stringent distributional assumptions on covariates such as linearity condition or constant variance. Moreover, the proposed estimator is shown to have the oracle property of variable selection.