Robust Estimation in the Additive Hazards Model

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ABSTRACT

In the *Additive Hazards Model* the hazard function of a survival variable T is modeled additively as $\lambda(t) = \lambda_0(t) + \boldsymbol{\beta}'\boldsymbol{z}$, where $\lambda_0(t)$ is a common nonparametric baseline hazard function and $\boldsymbol{z}$ is a vector of independent variables. For this model, the pioneering work of Lin and Ying (1994) develops a closed-form estimator for the regression parameter $\boldsymbol{\beta}$ from a new estimating equation which has a similar structure to (Cox's 1972) partial likelihood score function. Their estimator is asymptotically normal and highly efficient. However, a potential drawback is that it is very sensitive to outliers. In this talk we propose a family of robust alternatives for estimation of the parameter $\boldsymbol{\beta}$ in the Additive Hazards Model which is highly efficient and still asymptotically normal. We prove Fisher-consistency, obtain the influence function we and illustrate the estimators with a traditional real dataset regarding cancer deaths in miner workers.