
YI LI, University of Michigan

Gateaux Differential-Based Boosting for Time-Varying Effects in Survival Analysis

Survival models with time-varying effects provide a flexible framework for modeling the effects of covariates on event times. However, the difficulty of model construction increases dramatically as the number of variable grows. Existing constrained optimization and boosting methods suffer from computational complexity. We propose a new Gateaux differential-based boosting procedure for simultaneously selecting and automatically determining the functional form of covariates. The proposed method is flexible in that it extends the gradient boosting to functional differentials in general parameter space. In each boosting learning step of this procedure, only the best-fitting base-learner (and therefore the most informative covariate) is added to the predictor, which consequently encourages sparsity. In addition, the method controls smoothness, which is crucial for improving predictive performance.