CoxFlexBoost: Fitting Structured Survival Models

Benjamin Hofner[1,*] , **Torsten Hothorn**[2] and **Thomas Kneib**[2]

1. Institut für Medizininformatik, Biometrie und Epidemiologie; Friedrich-Alexander-Universität Erlangen-Nürnberg
2. Institut für Statistik; Ludwig-Maximilians-Universität München

* Contact author: `benjamin.hofner@imbe.med.uni-erlangen.de`

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In many situations, medical applications require flexible survival models that allow to extend the classical Cox-model via the inclusion of time-varying and nonparametric effects. These structured survival models are very flexible but additional difficulties arise when model choice and variable selection are desired. In particular, it has to be decided which covariates should be assigned time-varying effects or whether linear effects are sufficient for a given covariate. Component-wise boosting (e.g., Bühlmann & Hothorn, 2007) provides a means of likelihood-based model fitting that enables simultaneous variable selection and model choice. Extending likelihood-basting boosting algorithms for generalised additive models proposed in Tutz & Binder (2006), we developed a component- wise, likelihood-based boosting algorithm for survival data that permits the inclusion of both parametric and nonparametric time-varying effects as well as nonparametric effects of continuous covariates utilizing P-splines as the main modeling technique (Hofner *et al.*, 2008). The properties and performance of the algorithm were investigated in a simulation study. A software implementation is available in the R package **CoxFlexBoost** (Hofner, 2008).

References

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