

# gamboostLSS: boosting generalized additive models for location, scale and shape

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Generalized additive models for location, scale and shape (GAMLSS) model not only the mean but every parameter of the conditional distribution of the outcome (e.g. location, scale and shape) using distinct sets of covariates (Rigby and Stasinopoulos, 2005). We present a boosting algorithm for GAMLSS (*gamboostLSS*; Mayr et al., 2010), which was developed to allow model fitting for potentially high-dimensional data and that overcomes limitations of the original fitting algorithm related to variable selection based on (potentially problematic) information criteria. Furthermore, our approach allows to include a wide variety of possible covariate effects such as linear, smooth, random, or even spatial effects. As the algorithm relies on boosting, estimation of the effects with intrinsic variable selection is possible.

We apply the *gamboostLSS* approach to data of the Munich Rental Guide, which is used by landlords and tenants as a reference for the rent of a flat depending on its characteristics and spatial features. The net-rent predictions resulting from the high-dimensional GAMLSS are highly competitive to classical GAMs while covariate-specific prediction intervals show a major improvement.

A software implementation of the algorithm is available in the *R* package **gamboostLSS** (Hofner et al., 2010).

## References

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