

BAMLSS, Bayesian Additive Models for Location, Scale and Shape (and Beyond)

Nikolaus Umlauf, Universitt Innsbruck

Abstract

Bayesian analysis provides a convenient setting for the estimation of complex generalized additive regression models (GAM). Since computational power has tremendously increased in the past decade it is now possible to tackle complicated inferential problems, e.g., with Markov chain Monte Carlo (MCMC) simulation, on virtually any modern computer. This is one of the reasons why Bayesian methods have become quite popular and it has lead to a number of highly specialized and optimized estimation engines. Because of the very general structure of the additive predictor in GAMs, we propose an unified modeling architecture that can deal with a wide range of types of model terms and can benefit from different algorithms in order to estimate Bayesian distributional regression models (BAMLSS) and beyond. An implementation is provided in the R package `bamlss`. (<http://BayesR.R-Forge.R-project.org/>). The talk illustrates the usefulness of the approach on several examples.