

Estimation of additive quantile regression

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Abstract We consider the nonparametric estimation problem of conditional regression quantiles with high-dimensional covariates. For the additive quantile regression model, we propose a new procedure such that the estimated marginal effects of additive conditional quantile curves do not cross. The method is based on a combination of the marginal integration technique and non-increasing rearrangements, which were recently introduced in the context of estimating a monotone regression function. Asymptotic normality of the estimates is established with a one-dimensional rate of convergence and the finite sample properties are studied by means of a simulation study and a data example.

Keywords Conditional quantiles · Additive models · Marginal integration · Non-increasing rearrangements