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Fakultät für
Mathematik, Informatik
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# Kolloquium über Mathematische Statistik und Stochastische Prozesse

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## 27.01.2015, 16:15 Uhr, Hörsaal 5

## Semiparametric conditional quantile estimation through copula-based multivariate models

Abstract:

We consider a new approach in quantile regression modelling based on the copula function that defines the dependence structure between the variables of interest. The key idea of this approach is to rewrite the characterization of a regression quantile in terms of a copula and marginal distributions. After the copula and the marginal distributions are estimated, the new estimator is obtained as the weighted quantile of the response variable in the model. The proposed conditional estimator has three main advantages: it applies to both iid and time series data, it is automatically monotonic across quantiles, and unlike other copula-based methods it can easily consider the case of multiple covariates in the estimation without introducing any extra complication. We show the asymptotic properties of our estimator when the copula is estimated by maximizing the pseudo log-likelihood, and the margins are estimated non-parametrically including the case where the copula family is misspecified. We also present the finite sample performance of the estimator and illustrate the usefulness of our proposal by an application to the historical volatilities of Google and Yahoo companies.

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