COLLOQUIUM

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Nonparametric boundary regression

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Abstract

We consider a nonparametric regression model with one-sided errors. Our aim is, on the one hand, the estimation of the regression function and, on the other hand, to develop hypotheses tests for the error distribution. We focus on models with irregular error distribution in the sense that sufficient mass is concentrated in the neighbourhood of zero. We prove uniform rates of convergence for suitable nonparametric regression estimators in models with one-sided errors. When the error distribution is irregular the regression function can be estimated at a faster rate than in conventional nonparametric settings. Further we consider the empirical process of estimated residuals. It is shown that, under appropriate conditions, the asymptotic distribution is not influenced by the nonparametric estimation of the regression function.
This is remarkably different from corresponding results in models with regular error distributions. The results are applied to derive hypotheses tests such as a test for monotonicity of the boundary function.

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