Bootstrap Methods in Statistics

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January 7, 2009

In this talk we give an introduction to bootstrap methods in statistics. Those computer intensive procedures are named after Münchausen's method "to pull oneself up by one's bootstraps".

They are applied, for instance, when characteristics of an estimator are to be estimated or when asymptotic distributions of testing procedures depend on unknown features of the data distribution. Bootstrap methods are based on generating "new" data from the originally observed data in a way that should resemble the original data generation.

We particularly consider different bootstrap methods in nonparametric regression models with special focus on procedures based on residual empirical processes.

Applications to hypothesis testing for model assumptions and approaches in quantile regression models are mentioned.