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講演 1

Sparse Quantile Regression via ℓ 0-penalty

概要

We consider model selection via ℓ 0-penalty for high-dimensional sparse quantile regression models. This procedure is almost equivalent to model selection via information criterion due to similarity in penalty. We deal with linear models, additive models, and varying coefficient models in a unified way and establish the model selection consistency results rigorously when the size of the relevant index set goes to infinity. The treatment of this situation is challenging and the theoretical novelty of our results is important because such information criteria are commonly used. We consider two different setups and propose tuning parameters in the ℓ 0-penalty. Besides, we propose a feasible algorithm for computation of our estimator and the numerical study results are presented. This is joint work with Wei-Ying Wu.

講演 2

Expected Shortfall Regression with High-Dimensional Covariates

概要

The expected shortfall (ES) regression can be a powerful and useful tool to analyze the relation between the response variable and the covariates through the conditional mean. As is well-known, there is no single loss function for expected shortfall estimation and there is a suitable loss function for joint estimation of quantile and expected shortfall. In addition to them, recently a very useful two-step procedure for ES regression was proposed : carry out quantile regression and then estimate the ES regression model by applying the least squares method. This procedure is successful due to the Neyman orthogonality. Then high dimensional linear regression models was considered based on the that findings. By exploiting those results, we assume additive models for both quantile and expected shortfall in the high-dimensional setting and consider the group Lasso and SCAD estimators. We establish the oracle inequality and the oracle property for them. Our theoretical results also imply that quantile estimation does not affect ES estimation asymptotically. We also present numerical results. This is joint work with Po-Hsiang Peng.