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Elastic net penalized quantile regression model. (English) [Zbl 1464.62263]

Summary: Sparse penalized quantile regression is a useful tool for variable selection and robust estimation in high-dimensional data analysis. The high-dimensionality often induces the high correlations among variables, and this problem should be properly handled by the ideal method. However, many existing penalized quantile regression methods fail to achieve this goal. In this paper, we propose the Elastic net penalized quantile (Q-EN) model that combines the strengths of the quantile loss and the Elastic net. Under some conditions, the model selection oracle property of the proposed model is established. Furthermore, we introduce alternating direction method of multipliers (ADMM) algorithm for computing the Elastic net penalized quantile regression. Numerical studies and real data analysis demonstrate the favorable finite-sample performance of the proposed model.

MSC:

62G08 Nonparametric regression and quantile regression
62J05 Linear regression; mixed models
62R07 Statistical aspects of big data and data science
62P10 Applications of statistics to biology and medical sciences; meta analysis

Keywords:
elastic net penalty; quantile regression; sparse; high-dimensional data analysis; Leukemia data set

Software:
QICD

Full Text: DOI

References:

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