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Tuning parameter selection for the adaptive nuclear norm regularized trace regression

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Abstract

Regularized models have been applied in lots of areas in recent years, with high dimensional data sets being popular. Because that tuning parameter decides the theoretical performance and computational efficiency of the regularized models, tuning parameter selection is a basic and important issue. We consider the tuning parameter selection for adaptive nuclear norm regularized trace regression, which achieves by the Bayesian information criterion (BIC). The proposed BIC is established with the help of an unbiased estimator of degrees of freedom. Under some regularized conditions, this BIC is proved to achieve the rank consistency of the tuning parameter selection. That is the model solution under selected tuning parameter converges to the true solution and has the same rank with that of the true solution in probability. Some numerical results are presented to evaluate the performance of the proposed BIC on tuning parameter selection.

Keywords Tuning parameter selection · Adaptive nuclear norm regularized trace regression · Bayesian information criterion · Degrees of freedom

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