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Efficient empirical Bayes variable selection and estimation in linear models. (English)

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Summary: We propose an empirical Bayes method for variable selection and coefficient estimation in linear regression models. The method is based on a particular hierarchical Bayes formulation, and the empirical Bayes estimator is shown to be closely related to the LASSO estimator. Such a connection allows us to take advantage of the recently developed quick LASSO algorithm to compute the empirical Bayes estimate, and provides a new way to select the tuning parameter in the LASSO method. Unlike previous empirical Bayes variable selection methods, which in most practical situations can be implemented only through a greedy stepwise algorithm, our method gives a global solution efficiently. Simulations and real examples show that the proposed method is very competitive in terms of variable selection, estimation accuracy, and computation speed compared with other variable selection and estimation methods.

MSC:

62-XX Statistics

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