

Penalty, Pretest and Shrinkage Strategies in GLM

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Abstract

I will consider the estimation and prediction strategies in the context of generalized linear models when there are a number of predictors available to Data Scientist, and some of them may have no and/or weak affect in predicting the response variable. We scrupulously investigate the relative performances of shrinkage, pretest, and penalty estimators with respect to the full model estimator. We examine and appraise the asymptotic properties of the non-penalty estimators. A Monte Carlo simulation study shows that the mean squared error (MSE) of an adaptive shrinkage estimator is comparable to the risk of the penalty estimators in many situations. Interestingly, when the dimension of the restricted parameter space is large, the shrinkage estimators perform better than the penalized likelihood estimators do. We illustrate the usefulness of the proposed strategies by applying to a real data set. Finally, we discuss how to extend these strategies to ultra high dimensional data.

References

- [1] Ahmed, S.E. (2014). *Penalty, Shrinkage and Pretest Strategies: Variable Selection and Estimation*. Springer.
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