Model Averaging Estimation for Sparse High-dimensional Data

Guohua Zou
ghzou@amss.ac.cn
Chinese Academy of Sciences, China

Studying model averaging for high-dimensional models with possibly sparse relevant covariates, we incorporate penalized regression for narrowing the set of candidate models. This saves us from considering all possible combination of models as in the case where the number of covariates is small. We suggest a criterion for choosing weights. The corresponding model averaging estimators have a sparsity property, and the estimators of the relevant coefficients are asymptotically normal under some regularity conditions. Furthermore, the proposed procedure is asymptotically optimal in the sense that its squared loss and risk are asymptotically identical to those of the infeasible best possible model averaging estimator. Simulation experiments provide numerical evidence of these results.