Model averaging via penalized least squares in linear regression

Antti Liski[1] **and Erkki P. Liski**[2]

[1] *Tampere University of Technology, Finland*
[2] *University of Tampere, Finland*

Abstract

We consider parameter estimation under model uncertainty by averaging across least squares estimates obtained from a set of models. Existing model averaging methods usually require estimation of a single weight for each candidate model. However, in applications the number of candidate models may be huge. Then the approach based on estimation of single weights becomes computationally infeasible. Utilizing a connection between shrinkage estimation and model weighting we present an accurate and computationally efficient model averaging estimation method. The performance of our estimators is displayed in simulation experiments which utilize a realistic set up based on real data.

Keywords

Shrinkage estimation, Model selection, Mean square error, Efficiency bound, Simulation experiment.

References

[1] Hansen, B.E. (2007). Least squares model averaging. *Econometrika 75*, 1175–1189.

[2] Magnus, J.R., O. Powell and P. Prüfer (2010). A comparison of two model averaging techniques with an application to growth empirics. *J. Econometrics 154*, 139–153.

[3] Sund, R., M. Juntunen, P. Lüthje, T. Huusko, M. Mäkelä, M. Linna, A. Liski and U. Häkkinen (2006). *PERFECT - Hip Fracture, Performance, Effectiveness and Cost of Hip Fracture Treatment Episodes* (In Finnish), National Research and Development Centre for Welfare and Health, Helsinki.