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# The Influence Function of Graphical Lasso Estimators

G. Louvet[1], J. Raymaekers[2], G. Van Bever[1], and I. Wilms[2]

[1]University de Namur, Belgium
[2]Maastricht University, The Netherlands

Graphical models are nowadays often estimated using regularization that is aimed at reducing the number of edges in a network. By relying on edge-sparsity as a simplifying structure, the conditional dependency network among (potentially a large number of) variables can then be presented in a compact manner. The Graphical Lasso (Glasso) is a common choice to obtain such sparse graphical models. Glasso lacks, however, robustness to outliers. To overcome this problem, one typically applies a robust plug-in procedure where the Glasso is computed from, for instance, an initial pairwise robust covariance/correlation estimate instead of the classical sample covariance estimate, thereby providing protection against outliers. We derive and compare the influence function of the classical Glasso to various robustified versions, as well as their corresponding asymptotic variances [1]. Simulation results provide further insights into their finite sample performance.

[1] G. Louvet, J. Raymaekers, G. Van Bever, and I. Wilms, "The influence function of graphical lasso estimators," *Econometrics and Statistics*, 2023.