

Wong, Frederick; Carter, Christopher K.; Kohn, Robert

Efficient estimation of covariance selection models. (English) Zbl 1436.62346

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Summary: A Bayesian method is proposed for estimating an inverse covariance matrix from Gaussian data. The method is based on a prior that allows the off-diagonal elements of the inverse covariance matrix to be zero, and in many applications results in a parsimonious parameterisation of the covariance matrix. No assumption is made about the structure of the corresponding graphical model, so the method applies to both nondecomposable and decomposable graphs. All the parameters are estimated by model averaging using an efficient Metropolis-Hastings sampling scheme. A simulation study demonstrates that the method produces statistically efficient estimators of the covariance matrix, when the inverse covariance matrix is sparse. The methodology is illustrated by applying it to three examples that are high-dimensional relative to the sample size.

MSC:

62J10 Analysis of variance and covariance (ANOVA)

62F15 Bayesian inference

Cited in **45** Documents

Keywords:

Bayesian estimation; Gaussian graphical model; model averaging; multivariate regression; partial correlation

Full Text: [DOI](#)