ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

Invitation to the Doctoral Seminar

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"Sparse Dynamic Bayesian Graphical Models"

N.2.35 | Wednesday, 9 April 2025 | 10:00 a.m.

Abstract

Gaussian graphical models have become a staple in statistical modeling and for estimating partial correlation networks. In this talk we extend the baseline approach to a time series framework by introducing temporal dependence for the entries of the precision matrix. In order to conduct statistical inference, a fully Bayesian approach is adopted, relying on global-local shrinkage priors to deal with high-dimensional data and mitigate (temporal) overfitting. The framework has several special cases of interest, including a variant of the standard Bayesian graphical lasso. A blocked Gibbs sampler for posterior simulation is presented. An interweaving strategy is applied to enhance the mixing of the sampler. As a by-product, the proposed method allows for estimating a time series of (sequentially dependent) networks from partial correlations among the variables in the system. Using synthetic and real data, the performance of the model is investigated in comparison to standard Bayesian in terms of both covariance matrix estimation and graphical structure learning.

Gregor Kastner and the Department of Statistics look forward to seeing you at the talk!