



The University of Chicago
Department of Statistics

MASTER'S THESIS PRESENTATION

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**Regularization Parameter Selection Methods
for Gaussian Graphical Models**

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ABSTRACT

In Gaussian graphical models, the conditional independence structure among features of a system is revealed by the sparsity pattern of the inverse covariance matrix of the features, and the graphical lasso is often used for the estimation of this inverse covariance matrix when the number of features p is large compared to the number of samples n . However, the selection of an appropriate regularization parameter is critical in the application of the graphical lasso since the regularization parameter eventually determines the sparsity level of the estimated graph. In this study, the extended Bayesian information criterion (EBIC) and the stability approach to regularization selection (StARS), both of which have recently been introduced as possible methods for choosing the regularization parameter in the case where p is large relative to n , are compared with each other in terms of their graph estimation performance on synthetic datasets.