



THE UNIVERSITY OF  
**CHICAGO**

Department of Statistics  
**FIRST YEAR PHD MINI SEMINARS**

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**Thresholding Estimation of Covariance Matrix**

**FRIDAY, May 24, 2013, at 4:00 PM**

110 Eckhart Hall, 5734 S. University Avenue

**ABSTRACT**

Thresholding is an effective approach to permutation-invariant covariance matrix estimation. Both universal and adaptive thresholding estimators are consistent over some large classes of sparse matrices in the high-dimensional setting. They also estimate true zeros as zeros with probability tending to 1 under some mild conditions. Moreover, adaptive estimators achieve the optimal rate of convergence over a larger class of covariance matrix under spectral norm, compared with the universal ones in the same parameter space. Data-driven choice of tuning parameters in the estimators is discussed as well. All these procedures carry little computational burden and are illustrated in an example of gene clustering from a small round blue-cell tumor microarray experiment.

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