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Master's Thesis Presentation

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Estimation of Large Covariance Matrices

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ABSTRACT

The existing literature on estimation of covariance or its inverse can be loosely divided into two categories. One large class of methods covers the situation in which variables have a natural ordering, and those far apart in the ordering have small correlations. These estimators usually rely on modified Cholesky decomposition of the inverse covariance matrix, since nice regression regularization can be applied. I will review the literature in this field and discuss the pros and cons of each method. Moreover, there are many applications in which an ordering of the variables is not available. A common approach to permutation-invariant covariance regularization is based on adding penalty to the normal likelihood. I will discuss a simple alternative to penalized likelihood, which is thresholding the sample covariance matrix, and compare different generalized thresholding in a simulation study.