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A unified precision matrix estimation framework via sparse column-wise inverse operator under weak sparsity

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Abstract

In this paper, we estimate the high-dimensional precision matrix under the weak sparsity condition where many entries are nearly zero. We revisit the sparse column-wise inverse operator estimator and derive its general error bounds under the weak sparsity condition. A unified framework is established to deal with various cases including the heavy-tailed data, the non-paranormal data, and the matrix variate data. These new methods can achieve the same convergence rates as the existing methods and can be implemented efficiently.

Keywords Gaussian graphical model · High-dimensional data · Lasso · Precision matrix · Weak sparsity

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