

Structured robust covariance estimation

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In this work, we introduce prior structure to Tyler's well known robust covariance estimator. This prior information allows for improved accuracy using a small number of samples. The problem is challenging as the estimator is based on a non-convex optimization which does not easily extend to the constrained case. We propose two solutions: the first is based on identifying an underlying geodesic convexity; the second is based on the Generalized Method of Moments and convex relaxation. We demonstrate their advantages on various structures including: known center, smoothness, properness, Toeplitz, sparsity and low rank. Joint work with Ilya Soloveychik.

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