Estimation of Kronecker Structured Covariance Based on Modified Cholesky Decomposition

Abstract

This paper is to investigate covariance estimation problems for high-dimensional matrix-valued data. We propose a covariance estimator for the matrix-valued data from penalized matrix normal likelihood. Modified Cholesky decomposition of the covariance matrix is utilized to construct positive definite estimators. The method is applied for identify parsimony and for producing a statistically efficient estimator of a large covariance matrix of matrix-valued data. The consistent property of the proposed estimator is proven. Simulation results and a real data example are illustrated.

Keywords

Multivariate longitudinal data; covariance matrix estimation; modified Cholesky decomposition; shrinkage penalty.