

ACMS Statistics Seminar

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Tuesday, October 9
154 Hurley Hall
3:30– 4:30 PM



Maximum Pairwise Bayes Factors for Covariance Structure Testing

Hypothesis testing of structure in covariance matrices is of significant importance, but faces great challenges in high-dimensional settings. Although consistent frequentist one-sample covariance tests have been proposed, there is a lack of simple, computationally scalable, and theoretically sound Bayesian testing methods for large covariance matrices. Motivated by this gap and by the need for tests that are powerful against sparse alternatives, we propose a novel testing framework based on the maximum pairwise Bayes factor. Our initial focus is on one-sample covariance testing; the proposed test can optimally distinguish null and alternative hypotheses in a frequentist asymptotic sense. We then propose diagonal tests and a scalable covariance graph selection procedure that are shown to be consistent. A simulation study evaluates the proposed approach relative to competitors. The performance of our graph selection method is demonstrated through applications to a sonar data set.

The Department of Applied and Computational
Mathematics and Statistics

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