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Title: Testing high-dimensional general linear hypotheses under a multivariate regression model with spiked noise covariance

Abstract: This talk considers the problem of testing linear hypotheses in a multivariate regression model with a high-dimensional response and spiked noise covariance. The proposed family of tests consists of test statistics based on a weighted sum of projections of the data onto the estimated latent factor directions, with the weights acting as the regularization parameters. We establish asymptotic normality of the test statistics under the null hypothesis. We also establish the power characteristics of the tests and propose a data-driven choice of the regularization parameters under a family of local alternatives. The performance of the proposed tests is evaluated through a simulation study. Finally, the proposed tests are applied to the Human Connectome Project data to test for the presence of associations between volumetric measurements of human brain and behavioral variables. The talk is based on joint work with Haoran Li, Debashis Paul and Jie Peng.