

ACMS Statistics Seminar

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154 Hurley Hall
3:30 PM – 4:30 PM



Adaptive Testing in High Dimension

In this talk, I will introduce a general U-statistic based approach to adaptive testing for high-dimensional data. Our work extends the recent work by He et al. (2020) who proposed an adaptive test by combining U-statistics for l_q norm of the parameter vector with different q 's from 2 to infinity, as the larger the q the better the power against sparse alternatives. For a general parameter vector we have proved that the U-statistic for the l_q norm is asymptotically normal under mild regularity conditions. More importantly such U-statistics for different q 's are still asymptotically independent, which has already been shown for the specific problems discussed in He et al. (2020). We further develop a new test only using subsamples with monotone indices to reduce the computational cost with mild efficiency loss. We proved that the new method can speed-up the calculation by a lot with mild efficiency loss. We will also discuss an application of the proposed test to change point detection. Simulation studies indicate that the new method is powerful against both dense and sparse alternative, for numerous problems including spatial sign test, testing the nullity of linear model coefficients and testing component wise independence for high-dimensional observations.

The Department of Applied and Computational
Mathematics and Statistics

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