



INDIAN STATISTICAL INSTITUTE

Theoretical Statistics and Mathematics Unit, Kolkata

SEMINAR

Date: November 25, 2024

Time: 04:00 PM

VENUE:

L- Infinity

(5th Floor, A.N. Kolmogorov Bhavan), ISI Kolkata

TITLE:

Exact distribution-free tests of spherical symmetry applicable to high dimensional data

SPEAKER:

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ABSTRACT:

We develop some graph-based tests for spherical symmetry of a multivariate distribution using a method based on data augmentation. These tests are constructed using a new notion of signs and ranks that are computed along a path obtained by optimizing an objective function based on pairwise dissimilarities among the observations in the augmented data set. The resulting tests based on these signs and ranks have the exact distribution-free property, and irrespective of the dimension of the data, the null distributions of the test statistics remain the same. These tests can be conveniently used for high-dimensional data, even when the dimension is much larger than the sample size. Under appropriate regularity conditions, we prove the consistency of these tests in high dimensional asymptotic regime, where the dimension grows to infinity while the sample size may or may not grow with the dimension. We also propose a generalization of our methods to take care of the situations, where the center of symmetry is not specified by null hypothesis. Several simulated data sets and a real data set are analyzed to demonstrate the utility of the proposed tests.

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