

Some multivariate multi-sample tests based on spatial medians

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Abstract

The multivariate multi-sample location problem in case of spherically or elliptically symmetric distributions is considered and we test the hypothesis about equality of the location parameters (see e.g. [1]). We present some analogies of the well-known Lawley-Hotelling test statistic based on spatial medians of the samples.

In case of spherical symmetry, asymptotic distribution of the median-based test statistics is derived under the hypothesis and also under the sequence of Pitman's alternatives. Using the Bahadur-type representation of the spatial median (see [2]) the asymptotic equality of the median-based statistics to an obvious multi-sample extension of the well-known Rayleigh test statistic is proved under the hypothesis.

Some Monte Carlo results are introduced, involving also the case when the underlying distribution is elliptically symmetric.

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References

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