Robust Hotelling's T2 Statistic based on M-estimator

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Abstract:
Hotelling's T2 statistic is the multivariate generalization of the student's t-statistic. Hotelling's T2 statistics is a method for testing hypotheses about multidimensional means. However, the classical Hotelling's T2 statistic is very sensitive to the presence of outliers. In order to overcome this limitation, we modify the classical Hotelling's T2 statistic by substituting covariance matrix with a robust estimator, i.e., M-estimator. The performance of robust Hotelling's T2 statistic will be compared with the classical Hotelling's T2 statistic and will be discussed in this paper to illustrate the advantage of robust Hotelling's T2 statistic towards outliers.

Keywords: Hotelling's T2 statistic; M-estimator; Robust estimator; Outlier

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