

A high dimensional MANOVA test with fewer observations than the dimension

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Abstract

We consider the problem of testing a linear hypothesis in a multivariate linear model when the $N \times p$ observation matrix is normally distributed with unknown covariance matrix, and $N \leq p$. This includes the case of testing the equality of several mean vectors. A test is proposed which is a generalized version of the two-sample test proposed by Srivastava and Du (2008). The asymptotic null and non-null distributions are obtained. The performance of this test is compared, theoretically as well as numerically, with the corresponding generalized version of the two-sample Dempster's (1958) test, or equivalently Bai-Saranadasa test (1996) who gave its asymptotic version.

Keywords

MANOVA, Asymptotic null and non-null distributions, High-dimension, Power comparison.

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