

A More Powerful Test Procedure for Multiple Hypothesis Testing

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Abstract : We propose a new multiple test called the minPOP test for testing multiple hypotheses simultaneously. Under the assumption that the test statistics are independent, we show that the minPOP test has higher global power than the existing multiple testing methods. We further propose a stepwise multiple-testing procedure based on the minPOP test and two of its modified versions (the Double Truncated and Left Truncated minPOP tests). We show that these multiple tests have strong control of the family-wise error rate (FWER). A method for finding the p-values of the proposed tests after adjusting for multiplicity is also developed. Simulation results show that the Double Truncated and Left Truncated minPOP tests, in general, have a higher number of rejections than the existing multiple testing procedures.

Keywords : multiple test, single-step procedure, stepwise procedure, p-value for multiple testing

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