

## Statistics Seminar

### *More powerful test procedures for multiple hypothesis testing*

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**Abstract:** We propose a new multiple test called the minPOP test and two of its modified versions (the left truncated and the double truncated minPOP tests) for testing multiple hypotheses simultaneously. We show that these tests have multiple testing procedures based on these tests have strong control of the family-wise error rate. A method for finding the p-values of the proposed multiple testing procedures after adjusting for multiplicity is also developed. Simulation results show that the minPOP tests in general have higher global power than the existing well known multiple tests, especially when the number of hypotheses being compared is relatively large. Among the multiple testing procedures we developed, we find that the ones based on the left truncated and double truncated minPOP tests tend to have higher number of rejections than the existing multiple testing procedures. In the case of correlated test statistics, simulation results show that only the double truncated minPOP test is reasonably robust to positively correlated test statistics, while all the other tests seem to be robust to negatively correlated test statistics.

Wednesday, April 11 at 4:00 PM in SEO 636