Mathematical Sciences

Spring 2022

Colloquium Series

Dr. Sunil Mathur

Texas A&M University - Corpus Christi

⋮ **Online (Zoom) Meeting** ⋮

⋮ **Friday, February 4** ⋮ **3pm** ⋮

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Ranked-Set Sampling and Empirical Distribution Functions in Statistical Testing

Abstract

Ranked-set sampling (RSS) has been used to get a better representation of the population for the variable of interest and RSS has been shown to result in improved statistical inference as compared to simple random sampling (SRS). A few methods have been developed based on RSS by modifying the existing statistical tests. In this paper, we propose a new test based on empirical distribution functions for the two-sample location problem for ranked set samples. The test statistic is constructed based on the divergence between the empirical distribution functions. We show that the proposed test is asymptotically distribution-free. The null distribution of the proposed test statistic is approximately distributed as a linear combination of independent and identical chi-square random variables. We also found the quantiles of the proposed test under null distribution. We empirically show that the sampling distribution of the proposed test in the RSS case is stochastically smaller than the SRS case. Monte Carlo power simulations study shows that the proposed test performs better than its competitor under several distributions. The application of the proposed test is provided using a real data set.

For further information, please contact Dr. Emil Schwab, eschwab@utep.edu

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