Generalizing Multistage Partition Procedures for Two-parameter Exponential Populations

Rui Wang, PhD

University of New Orleans, Department of Mathematics, New Orleans-LA

ABSTRACT

ANOVA analysis is a classic tool for multiple comparisons and has been widely used in numerous disciplines due to its simplicity and convenience. The ANOVA procedure is designed to test if a number of populations are all different. This is followed by usual multiple comparison tests to rank the populations. However, the probability of selecting the best population via ANOVA procedure does not guarantee the probability to be larger than some desired pre-specified level. This lack of desirability of the ANOVA procedure was overcome by researchers in early 1950's by designing experiments with the goal of selecting the best population. In this talk, a single-stage procedure is introduced to partition k treatments into "good" and "bad" groups with respect to a control population assuming some key parameters are known. Also, the proposed partition procedure is generalized for the case when the parameters are unknown and a purely-sequential procedure and a two-stage procedure are derived. Theoretical asymptotic properties, such as first order and second order properties, of the proposed procedures are derived to document the efficiency of the proposed procedures. These theoretical properties are studied via Monte Carlo simulations to document the performance of the procedures for small and moderate sample sizes.