MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

Sudheesh K Kattumannil

Michigan State University

ON SOME TESTING PROBLEM RELATED TO AGE REPLACEMENT MODEL

Tuesday, December 2, 2014
10:20 a.m. - 11:10 am
Refreshments 10:00 am
C405 Wells Hall

Abstract

The mean time to failure is a widely used concept to describe the reliability characteristic of a repairable system. In this paper, we develop a non-parametric method to test exponentially against decreasing mean time to failure class. We derive the exact null distribution of the test statistic and then and the critical values for different sample sizes. Asymptotic properties of the proposed test statistic are studied. The test statistic is shown to be asymptotically normal and consistent against the alternatives. The Pitman's asymptotic efficacy shows that our test performs better than the other tests available in the literature. We also discuss how does the proposed method take the censoring information into consideration. Some numerical results are presented to demonstrate the performance of the testing method. We illustrate the test procedure using two real data sets. We also propose a class of estimators that can be used as a test statistic for a particular testing problem. We bring several existing problem in this direction in to our uniform framework. We noted that the class of estimators proposed here has use in other areas as well.

Keywords: Exponential distribution; Mean time to failure; Pitman's asymptotic efficacy; Replacement model; U-statistics.

To request an interpreter or other accommodations for people with disabilities, please call the Department of Statistics and Probability at 517-355-9589.