

Graduate Seminar

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Thursday, August 10, 2017

2:00p.m., HH-3017

***A Power Comparison of Robust Tests for
Monotonic Trends in Recurrent Event Processes***

Abstract

The analysis of the existence and form of time trends in repairable systems is an important issue in reliability studies. Hence, many trend tests have been proposed and studied in the literature. There has been a recent interest in the use of robust trend tests based on estimating functions to test the absence of time trends in the rate functions of recurrent event processes. These tests are appealing because they do not require strong assumptions about the nature of the processes, and are powerful in a wide range of settings. In this study, we consider monotone time trends in recurrent event data from repairable systems, and develop a robust trend test based on rate functions of the power law processes. Our main goal is to discuss the power of robust trend tests as well as to compare their power with other well-known trend tests under various settings. We therefore conducted extensive Monte Carlo simulations to compute and compare the power of these tests under various scenarios. Finally, we analyze a data set from industry to illustrate the methodology.