

國家理論科學研究中心學術演講

NCTS Industrial Statistics Research Group Seminar

Date: 1:30pm~5:00pm, March 22 (Fri.), 2013

(1) 1:30pm-3:00pm

Speaker: Dr. Cheng-Hung Hu 胡政宏教授
(Yuan Ze University, Taiwan)

Topic: Optimum Step-Stress Accelerated Degradation
Test for Wiener Degradation Process under Time
Constraint

Abstract:

Accelerated Degradation Test (ADT) has been used to obtain reliability information in a timely manner. Step-Stress ADT (SSADT) is one of the most commonly used stress loadings for shortening test duration and reducing the required sample size. Recently, optimum design of a SSADT has been studied and empirical results have suggested that the optimum SSADT plan is actually a simple SSADT plan using only two stress levels. However, most of these results were obtained numerically on a case-by-case basis and lack theoretical justifications. In this paper, we provide proofs to show that, under the Wiener process model and a time constraint, a multi-level SSADT plan would degenerate to a simple SSADT plan for many commonly used optimization criteria. A numerical example is presented for comparing efficiencies between the proposed optimum simple SSADT plans and an existing SSADT plan in the literature. In addition, a simulation study is conducted for investigating the efficiencies of proposed SSADT plans when the sample size is small.

Keywords: Accelerated Degradation Test, Step-Stress ADT, Wiener Process, Inverse Gaussian Distribution.

(2) 3:00pm-3:30pm Tea Break

(3) 3:30pm-5:00pm

Speaker: Prof. N. Balakrishnan
(McMaster University, Canada)

Topic: Signatures of Coherent Systems and Joint Systems

Abstract:

In this talk, I will first introduce the concept of signatures of coherent systems and give some examples. Next, I will describe some of its properties such as stochastic orderings and comparison of different reliability systems. Then, I will present an extended signature of a system that would facilitate comparisons of systems of different sizes. Following this, I will introduce a new notion of dynamic signatures and describe some of its properties. Finally, I will consider a situation wherein there are two systems with some shared components and introduce the concept of bivariate signatures and establish some of its structural properties as well as associated stochastic orderings.

Place:

***Lecture Room A of National Center for Theoretical Sciences,
4th Floor, The 3rd General Building, National Tsing Hua University***