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2020 輔大數學

中華民國 數學年會

TMS Annual Meeting

12.05^六 - 12.06^日

大會手冊

Conference Program

主辦單位



中華民國數學會

承辦單位

輔仁大學數學系

協辦單位

科技部自然司數學研究推動中心、輔仁大學

統計

STATISTICS

Organizer：黃禮珊 國立清華大學統計所

地點：PH118 耕莘樓(1F)

2020 年 12 月 5 日 (星期六)		Speaker
11:20-12:05	Causal Mediation of Semi-Competing Risks Chair：黃禮珊	黃彥棕
13:40-14:25	Statistical Learning for AI Assisted Clinics Chair：黃禮珊	盧鴻興
14:25-14:50	A Generalized Information Criterion for High-Dimensional PCA Rank Selection Chair：黃禮珊	洪弘

2020 年 12 月 6 日 (星期日)		Speaker
10:10-11:30	Optimal Design for Accelerated-Stress Acceptance Test Chair：洪弘	蔡志群
	Testing Independence Between Two Spatial Random Fields Chair：洪弘	黃世豪
	A Bayesian Variable Selection Approach to Genome-Wide Association Studies with Survival Outcome Chair：洪弘	簡立欣
11:50-12:15	Detection of Change Points for Weibull Distributed Time Series Data Chair：洪弘	楊子賢

Optimal Design for Accelerated-Stress Acceptance Test

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Abstract

Acceptance test is widely used to assess whether a product meets the expectations of customers. Yet, traditional acceptance tests based on time-to-failure data will not be practical, because today's highly reliable products may take a long time to fail. It may be good in this case to base a test on a suitable quality characteristic (QC) whose degradation over time is related to the reliability of the product. Motivated by resistor data, we first propose a degradation model to describe the degradation paths of the resistors. Next, we present an accelerated-stress acceptance test to cut down the acceptance testing time, and then derive the optimal accelerated-stress acceptance testing time for a product, and the probability of acceptance of the batch. A model incorporating cost is also used to determine the optimal design for an accelerated-stress acceptance experiment, and a motivating example is then presented to illustrate the proposed procedure. Finally, we examine the performance of the estimators, and the effect of misspecification of the parameters on the optimal test plan through a Monte Carlo simulation study, and a detailed sensitivity analysis.

Keywords— Quality characteristic, optimal accelerated-stress acceptance testing time, optimal test plan, parameter misspecification, cost function, sensitivity analysis.