

Department of Systems Engineering and Engineering Management

Seminar Series

1. The Analysis of Means in the Presence of Covariate (ANOMC)

Mr. Tahir Mahmood

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2. An Unpunctual Preventive Maintenance Policy for Items Sold with a Two-Dimensional Warranty

Mr. Xiaolin Wang

PhD candidate

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3. Reliability Tests, Maintenance and Warranty under Dynamic Environments

Mr. Xiujie Zhao

PhD candidate

Department of Systems Engineering and Engineering Management
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Date	22 June 2018 (Friday)
Time	2:00pm - 3:40pm
Venue	B6619, 6/F, Yeung Kin Man Academic Building

1. Abstract

The analysis of means (ANOM) is a graphical method used to test whether the treatment means are different from grand mean as well as enables to declare exact treatment having significant mean. This technique is often used as an alternative to analysis of variance (ANOVA), for testing the significance of two or

more treatment means. In practice, there might exist a linearly associated uncontrollable variable known as covariate or concomitant variable, along with the study variable. In such situations, it is important to incorporate the role of concomitant variable in our analysis, as otherwise ANOM will lead to misleading results. In this study, we have extended the ANOM in the presence of covariate named as ANOMC. It operates the same way as ANOM using adjusted means. We have investigated the effects normality, linearity, homogeneity, sample sizes (equal versus unequal) on ANOM and ANOMC. We have used type I error and power as performance measures. The findings reveal that ANOMC outperforms the ANOM technique under the above stated conditions. Finally, two illustrative examples are also presented using the data sets related to industry and medical.

1. About the Speaker

Tahir Mahmood was born in Sargodha, Punjab, Pakistan in 1990. He got his degree of BS (4 years) in Statistics with distinction (Gold Medalist) from the Department of Statistics, University of Sargodha, Sargodha, Pakistan, in 2012 and then he served as Teaching Assistant from September, 2012 to January, 2015 in the Department of Statistics, University of Sargodha, Sargodha, Pakistan. In 2015, he secured the scholarship from Deanship of Graduate studies, King Fahd University of Petroleum and Minerals (KFUPM), Dhahran, Saudi Arabia. In April 2017, he received his MS (Applied Statistics) degree from Department of Mathematics and Statistics, KFUPM. Now, he is Ph.D. student in the Department of System Engineering and Engineering Management, City University of Hong Kong. His current research interests include statistical process control, nonparametric techniques and linear profile monitoring.

2. Abstract

The optimization of preventive maintenance (PM) policies for repairable items sold with warranty contracts has received much attention in the literature. However, the existing research implicitly assumes that maintenance actions within the warranty period are punctual. In practice, it is not uncommon that the actual maintenance instants deviate from the scheduled instants. This research investigates an unpunctual PM policy, which allows customers to advance or postpone the scheduled PM actions in a tolerable range, for repairable items sold with a two-dimensional warranty. The optimal unpunctual PM policy under given warranty period is determined to minimize the total expected warranty servicing cost. It is shown that the unpunctual PM policy contains its punctual counterpart as a special case. The extent of warranty cost growth of the unpunctual policy in comparison to the punctual policy is also discussed.

2. About the Speaker

Xiaolin Wang received his B.S. and M.S. degrees in Industrial Engineering from Southeast University, Nanjing, in 2013 and 2016, respectively. He is currently a Ph.D. student in the Department of Systems Engineering and Engineering Management at the City University of Hong Kong. His research interests include maintenance optimization, warranty management, and their applications to aircraft systems. He was a recipient of the Hong Kong PhD Fellowship in 2017.

3. Abstract

For both lifetime and degradation models, the influence of environmental covariates has been intensely investigated in the literature to address various reliability-related topics, such as reliability assessment, prognostics, maintenance and warranty management. With the development in modern sensor and monitoring technologies, environmental covariates can be precisely measured and fully utilized to overcome typical issues in reliability studies. By investigating the reliability testing, maintenance and warranty issues for highly reliable products with environmental covariates, the study aims to bridge several gaps that are of interest to researchers and practitioners. Several practical examples are used to illustrate the proposed method in the study.

3. About the Speaker

Xiujie Zhao is a Ph.D. candidate with the Department of Systems Engineering and Engineering Management at City University of Hong Kong. His supervisor is Professor Min Xie. He received the B.E. degree from Tsinghua University, China, in 2013 and the M.S. degree from Pennsylvania State University, USA, in 2015, both in industrial engineering. His research interests include accelerated reliability testing, degradation modeling, maintenance modeling and design of experiments.

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All are Welcome!