The Hong Kong Polytechnic University
Department of Applied Mathematics

Seminar
On

A Method to Analyze Three-Level Orthogonal Saturated Designs

by

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Abstract The three-level factorial designs with quantitative factors are not the most efficient way to fit a second-order polynomial model. When the factors are qualitative, however, the three-level designs often find some application. It is practically inescapable that we have to keep the number of experiments as small as possible and to consider the effect of many factors simultaneously so that all degrees of freedom are consumed by the estimation of parameters in modelling the response. The graphical method for analyzing such saturated designs can not investigate the statistical significance of the considered factors and interactions. In this paper, we present two formal tests, which are based on the change-point detection methodology, for analyzing three-level orthogonal saturated designs. Critical values used in the proposed procedures are tabulated. Using the proposed methods, not only the main effects but also the interactions can be analyzed at the same time. Some examples show that the proposed test procedures are practicable and powerful. Even if a three-level design is not saturated, the proposed methods still can be used to analyze the design with more power than ANOVA.

A Robust-Likelihood Cumulative Sum Chart

by

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Abstract In practice, the cumulative sum (CUSUM) control chart is often used to detect the small shifts in a process mean while its performs poorly for large shifts or under non-normal process. This article provides a robust-likelihood CUSUM chart (RLCUSUM) to detect large shifts quickly. The average run length (ARL) performance for this chart is compared to the conventional CUSUM chart and the result is the RLCUSUM is much better than conventional CUSUM especially for large shift cases. Then we study the properties of the conditional limiting distribution. At last an application to RLCUSUM in assessing livestock diseases proves that the method is applicable in process control.

Date : **1 December, 2008 (Monday)**

Time : **3:00 – 4:00 p.m.**

Venue : **Departmental Conference Room HJ610**
The Hong Kong Polytechnic University

*** * * ALL ARE WELCOME * * ***