Nonregular Designs: A Better Choice for Experiments

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Abstract

Fractional factorial designs are widely used experimental plans for cost reductions in scientific researches and investigations. Traditionally, Plackett-Burman and some Nonregular designs have been used in screening experiments for identifying important main effects. However, there are plenty of practical situations where some interactions are significant and cannot be ignored. In this talk, data are analyzed and compared using both regular and nonregular designs. With the consideration of interactions in nonregular designs, we identify important interactions in each experiment and confirm these results with both a frequentist and a Bayesian approach. We demonstrate that ignoring interactions in the analysis can both miss important factors and detect spurious factors.