Scalable Level-wise Screening Experiments

using Locating Arrays

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Abstract

A locating array of strength t ensures that all t-way level combinations are present in the design with the property that the set of rows covering any t-way level combination is uniquely determined. Thus, any two distinct t-way level combinations can be distinguished through the collection of rows covering them. In combinatorial testing, the locating array identifies the presence of a fault and the t-way level combination responsible for it. Locating arrays have an expected number of rows that grows logarithmically based on the number of columns, making it practical for screening experiments to consider a large number of categorical factors with many levels. We will discuss the construction and analysis of locating arrays. Under the assumption of effect sparsity, our screening algorithm focuses on level combinations in identifying important factors. This talk is based on joint work with Ms. Fan Zhang, Prof. Charles J. Colbourn, Prof. John Stufken, and Prof. Violet R. Syrotiuk.