A General Theory of Multi-stratum Factorial Design

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Abstract

Multi-stratum factorial designs are quite common in scientific and industrial investigations; a simple example is the so-called split-plot design. Multiple sources of errors with different variances, called *strata*, arise from complicated structures of the experimental units. Despite plenty of applications, most relevant research in the literature was built on a case-by-case basis even though a general and elegant theory of multi-stratum factorial design has been well-developed for half a century. This theory is to be introduced in this talk. Several criteria for selecting multi-stratum factorial designs, including those up-to-date, are presented and discussed.

Keywords: block structure, mixed-effect model, stratum variance, Gaussian functional prior, minimum aberration.