

Optimal Two-Level Blocked and Split-Plot Designs

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We propose a general and unified approach to the selection of fractional factorial designs which can be applied to experiments that are unblocked, blocked (with random or fixed block effects) or have a split-plot structure. Our criterion is derived as a good surrogate for the model-robustness criterion of information capacity. In the case of random block effects, it takes r , the ratio of intra- and interblock variances, into account. In most of the cases (up to 32 runs) we have examined, there exist designs that are optimal for all r values. Examples of optimal designs that depend on r are provided. We also demonstrate that our criterion can further discriminate designs that cannot be distinguished by the existing minimum aberration type criteria. This is a joint work with Professor Ching-Shui Cheng at University of California, Berkeley, USA.

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