

Design selection for 2-level supersaturated designs

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Abstract

The commonly used design optimality criteria are inadequate for selecting supersaturated designs. As a result, there is extensive literature on alternative optimality criteria within this context. Most of these criteria are rather ad hoc and are not directly related to the primary goal of experiments that use supersaturated designs, which is factor screening. Especially, unlike almost any other optimal design problem, the criteria are not directly related to the method of analysis.

An assumption needed for the analysis of supersaturated designs is the assumption of effect sparsity. Under this assumption, a popular method of analysis for 2-level supersaturated designs is the Gauss-Dantzig Selector (GDS), which shrinks many estimates to 0. We develop new design selection criteria inspired by the GDS and establish that designs that are better under these criteria tend to perform better as screening designs than designs obtained using existing criteria.

This presentation is based on joint work with John Stufken, University of North Carolina at Greensboro.