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Strategies for Supersaturated Screening: Group Orthogonal and Constrained Var(s) Designs

Tuesday, 14 September 2021 16:00 (30 minutes)

Despite the vast amount of literature on supersaturated designs (SSDs), there is a scant record of their use in practice. We contend this imbalance is due to conflicting recommendations regarding SSD use in the literature as well as the designs' inabilities to meet practitioners' analysis expectations. To address these issues, we first summarize practitioner concerns and expectations of SSDs as determined via an informal questionnaire. Next, we discuss and compare two recent SSDs that pair a design construction method with a particular analysis method. The choice of a design/analysis pairing is shown to depend on the screening objective. Group orthogonal supersaturated designs, when paired with our new, modified analysis, are demonstrated to have high power even with many active factors. Constrained positive Var(s)-optimal designs, when paired with the Dantzig selector, are recommended when effect directions can be reasonably specified in advance; this strategy reasonably controls type 1 error rates while still identifying a high proportion of active factors.

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Dantzig Selector, Orthogonality, Power

Special/invited session

ASQ session

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