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Optimal experimental design when not all tests are equally expensive

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Industrial experiments often have a budget which directly translates into an upper limit on the number of tests that can be performed. However, in situations where the cost of the experimental tests is unequal, there is no one-to-one relation between the budget and the number of tests. In this presentation, we propose a design construction method to generate optimal experimental designs for situations in which not every test is equally expensive. Unlike most existing optimal design construction algorithms, for a given budget, our algorithm optimizes both the number of tests as well as the factor level combinations to be used at each test. Our algorithm belongs to the family of variable neighborhood search (VNS) algorithms, which are known to work well for complex optimization problems. We demonstrate the added value of our algorithm using a case study from the pharmaceutical industry.

Type of presentation

Talk

Classification

Both methodology and application

Keywords

optimal design; cost-constrained; VNS

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