



Making optimum design of experiments more useful in practice

Luzia Trinca*

Unesp, Botucatu, Brazil - ltrinca@ibb.unesp.br

Marcelo Andrade da Silva

Inter-institutional Graduate Program in Statistics, USP/UFSCar, São Carlos, Brazil - silva.marcelo@usp.br

Steven Gilmour

University of Southampton, Southampton, UK - S.Gilmour@soton.ac.uk

For practical purposes a design should present several good properties as the list highlighted by Box and Draper in 1975, further emphasised and enlarged by many other authors. Optimum design theory allows the construction of very efficient and economical designs of experiments. However such designs are usually optimal for the specific property optimized and under the correctness of the statistical model supposed at the planning phase. Advances are possible by using multiple criteria or composite criteria of the type proposed by Gilmour and Trinca in 2012. In this talk a range of properties is explored in order to construct efficient and flexible factorial designs for response surface studies. The approach provides efficient designs for parameter estimation, under practical experimental restrictions, that allow inferences to be carried out while preserving good performances on several desired aspects. Illustrations are motivated from practical problems.

Keywords: compound design criteria; factorial; response surface; randomization restrictions; robustness.