

Robustness of Design: A Survey

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When an experiment is conducted for purposes which include fitting a particular model to the data, then the 'optimal' experimental design is highly dependent upon the model assumptions - linearity of the response function, independence and homoscedasticity of the errors, etc. When these assumptions are violated the design can be far from optimal, and so a more robust approach is called for. We should seek a design which behaves reasonably well over a large class of plausible models.

I will review the progress which has been made on such problems, in a variety of experimental and modelling scenarios - prediction, extrapolation, discrimination, survey sampling, dose-response, machine learning, etc.