An Introduction to Optimal Designs for Social and Biomedical Research

By Martijn P.F. Berger, Weng-Kee Wong

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The increasing cost of research means that scientists are in more urgent need of optimal design theory to increase the efficiency of parameter estimators and the statistical power of their tests.

The objectives of a good design are to provide interpretable and accurate inference at minimal costs. Optimal design theory can help to identify a design with maximum power and maximum information for a statistical model and, at the same time, enable researchers to check on the model assumptions.

This Book:

- Introduces optimal experimental design in an accessible format.
- Provides guidelines for practitioners to increase the efficiency of their designs, and demonstrates how optimal designs can reduce a study's costs.
- Discusses the merits of optimal designs and compares them with commonly used designs.
- Takes the reader from simple linear regression models to advanced designs for multiple linear regression and nonlinear models in a systematic manner.
- Illustrates design techniques with practical examples from social and biomedical research to enhance the reader's understanding.

Researchers and students studying social, behavioural and biomedical sciences will find this book useful for understanding design issues and in putting optimal design ideas to practice.

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