Optimum Experimental Designs, with SAS
A. C. Atkinson, A. N. Donev and R. D. Tobias, 2007
Oxford, Oxford University Press
512 + xvi pp., $70.00
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This book, which is based on the first two authors' 1992 book, is more than a third longer, with completely new materials on computations using SAS among other insertions, and the addition of the third author. Like the 1992 book, this new edition successfully provides a very readable account of practical and algorithmic aspects of optimum experimental designs, and, now with SAS code spread over the book, it should provide a very enticing introduction for practising statisticians who may want to try out ideas of optimum experimental designs on their own problems. The choice of topics that are covered is almost flawless: part I with eight chapters covers many basic but important issues in experimental design, which I strongly recommend reading before jumping into the technical details of optimum design theory and applications in part II, which has 17 chapters, covering from basic theory of optimum designs (Chapter 9 on optimum design theory, Chapter 10 on optimality criteria and Chapters 10 and 11 on *D*-optimal designs and algorithms for reconstruction), to implementations and applications (Chapters 12–25 covering topics on SAS implementations, response surface, mixture experiments, Bayesian design and non-linear models, etc.). For readers who may be more familiar with classical or combinatorial designs, I think that the book can do better by giving more guidance or advice of when optimum experimental designs may be used in situations where classical designs do not have solutions or vice versa. Also for practitioners, there are clearly laid-out strategies of how optimum designs should be applied in a given problem, e.g. choice of criterion, and interpretation and sensibility of the optimum design results. Optimum experimental designs have more fruitful applications when the underlying model is clearly well defined and the goal is for prediction, for instance in computer experiments (e.g. Lu *et al.* (2000), Fang *et al.* (2005) and Uciński (2005)). In summary, this book provides the best potential textbook on this subject at the moment and may serve as a tantalizing guide to this still very underdeveloped area for practical workers.

References

Fang, K. T., Li, R. and Sudjianto, A. (2005) *Design and Modeling for Computer Experiments*. Boca Raton: Chapman and Hall.

Lu, Z. Q., Berliner, L. M. and Snyder, C. (2000) Experimental design for spatial and adaptive observations. *Lect. Notes Statist.*, **144**, 65–78.

Uciński, D. (2005) *Optimal Measurement Methods for Parameter Estimation in Distributed Parameter Systems Identification*. Boca Raton: CRC Press.

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Applied Asymptotics: Case Studies in Small-sample Statistics
A. R. Brazzale, A. C. Davison and N. Reid, 2007
Cambridge, Cambridge University Press
236 pp., £35
ISBN 978-0-521-84703-2

This is a very welcome book, on a very important topic. The authors demonstrate the use of applied asymptotics for estimation and inference on a wide range of case-studies. Overall the book is a solid and useful contribution to applied statistics. Students of statistics and practising statisticians will find much to study and learn here.

The book offers a very broad collection of data sets and problems, tackled with a view to demonstrating the usefulness and benefits of certain corrections to usual practice. The authors provide intriguing and educational notes about different paths that analyses took, and could have taken. These provide a substantial slice of the book's benefit; they are a window to the statistical thinking of the authors and exemplify creative statistical practice. Its diversity of applications is a real strength.

Furthermore, the authors provide a working Web site, with data and code. The reader can reproduce the authors' analyses with freely available software; this is very welcome.

The content structure is reasonably helpful. I found that I needed to read ahead and behind quite frequently, but that may not be true for everyone. Chapters 2 and 3 introduce the basic ideas, skim the surface of the theory and provide some simple examples as an introduction to the applications. Chapters 4, 5 and 7 demonstrate the breadth of application of higher order asymptotics for discrete and continuous response data, and more varied designs respectively. Data sets are used as exemplars of the techniques, so the analyses can seem cursory or idiosyncratic. Chapter 6 focuses more heavily on some specific applications, tracing the development of three case-studies. Chapter 8 provides a more detailed examination of the motivating theory and is quite heavy going. Chapter 9 is a tonic; it focuses on the development and deploy-