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| Nota di contenuto | Applied Optimal Designs; Contents; List of Contributors; Editors' Foreword; 1 Optimal Design in Educational Testing; 1.1 Introduction; 1.1.1 Paper-and-pencil or computerized adaptive testing; 1.1.2 Dichotomous response; 1.1.3 Polytomous response; 1.1.4 Information functions; 1.1.5 Design problems; 1.2 Test Design; 1.2.1 Fixed-form test design; 1.2.2 Test design for CAT; 1.3 Sampling Design; 1.3.1 Paper-and-pencil calibration; 1.3.2 CAT calibration; 1.4 Future Directions; Acknowledgements; References; 2 Optimal On-line Calibration of Testlets; 2.1 Introduction; 2.2 Background<br>2.2.1 Item response functions2.2.2 D-optimal design criterion; 2.3 Solution for Optimal Designs; 2.3.1 Mathematical programming model; 2.3.2 Unconstrained conjugate-gradient method; 2.3.3 Constrained conjugate-gradient method; 2.3.4 Gradient of log det M(B;  Q, x); 2.3.5 MCMC sequential estimation of item parameters; 2.3.6 Note on performance measures; 2.4 Simulation Results; 2.5 Discussion; Appendix A Derivation of the Gradient of log det M(B;  Q, x); Appendix |

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3 On the Empirical Relevance of Optimal Designs for the Measurement of Preferences3.1 Introduction; 3.2 Conjoint Analysis; 3.3 Paired Comparison Models in Conjoint Analysis; 3.4 Design Issues; 3.5 Experiments; 3.5.1 Experiment 1; 3.5.2 Experiment 2; 3.6 Discussion; Acknowledgements; References; 4 Designing Optimal Two-stage Epidemiological Studies; 4.1 Introduction; 4.2 Illustrative Examples; 4.2.1 Example 1; 4.2.2 Example 2; 4.2.3 Example 3; 4.3 Meanscore; 4.3.1 Example of meanscore; 4.4 Optimal Design and Meanscore; 4.4.1 Optimal design derivation for fixed second stage sample size
4.4.2 Optimal design derivation for fixed budget4.4.3 Optimal design derivation for fixed precision; 4.4.4 Computational issues; 4.5 Deriving Optimal Designs in Practice; 4.5.1 Data needed to compute optimal designs; 4.5.2 Examples of optimal design; 4.5.3 The optimal sampling package; 4.5.4 Sensitivity of design to sampling variation in pilot data; 4.6 Summary; 4.7 Appendix 1 Brief Description of Software Used; 4.7.1 R language; 4.7.2 S-PLUS; 4.7.3 STATA; 4.8 Appendix 2 The Optimal Sampling Package; 4.8.1 Illustrative data sets; 4.9 Appendix 3 Using the Optimal Package in R
4.9.1 Syntax and features of optimal sampling command 'budget' in R4.9.2 Example; 4.10 Appendix 4 Using the Optimal Package in S-Plus; 4.11 Appendix 5 Using the Optimal Package in STATA; 4.11.1 Syntax and features of 'optbud' function in STATA; 4.11.2 Analysis with categorical variables; 4.11.3 Illustrative example; References; 5 Response-Driven Designs in Drug Development; 5.1 Introduction; 5.2 Motivating Example: Quantal Models for Dose Response; 5.2.1 Optimality criteria; 5.3 Continuous Models; 5.3.1 Example 3.1; 5.3.2 Example 3.2
5.4 Variance Depending on Unknown Parameters and Multi-response Models

Sommario/riassunto

There is an increasing need to rein in the cost of scientific study without sacrificing accuracy in statistical inference. Optimal design is the judicious allocation of resources to achieve the objectives of studies using minimal cost via careful statistical planning. Researchers and practitioners in various fields of applied science are now beginning to recognize the advantages and potential of optimal experimental design. Applied Optimal Designs is the first book to catalogue the application of optimal design to real problems, documenting its widespread use across disciplines as diver