Optimal Covariate Designs: Theory and Applications

Premadhis Das, Ganesh Dutta, Nripes Kumar Mandal, Bikas Kumar Sinha
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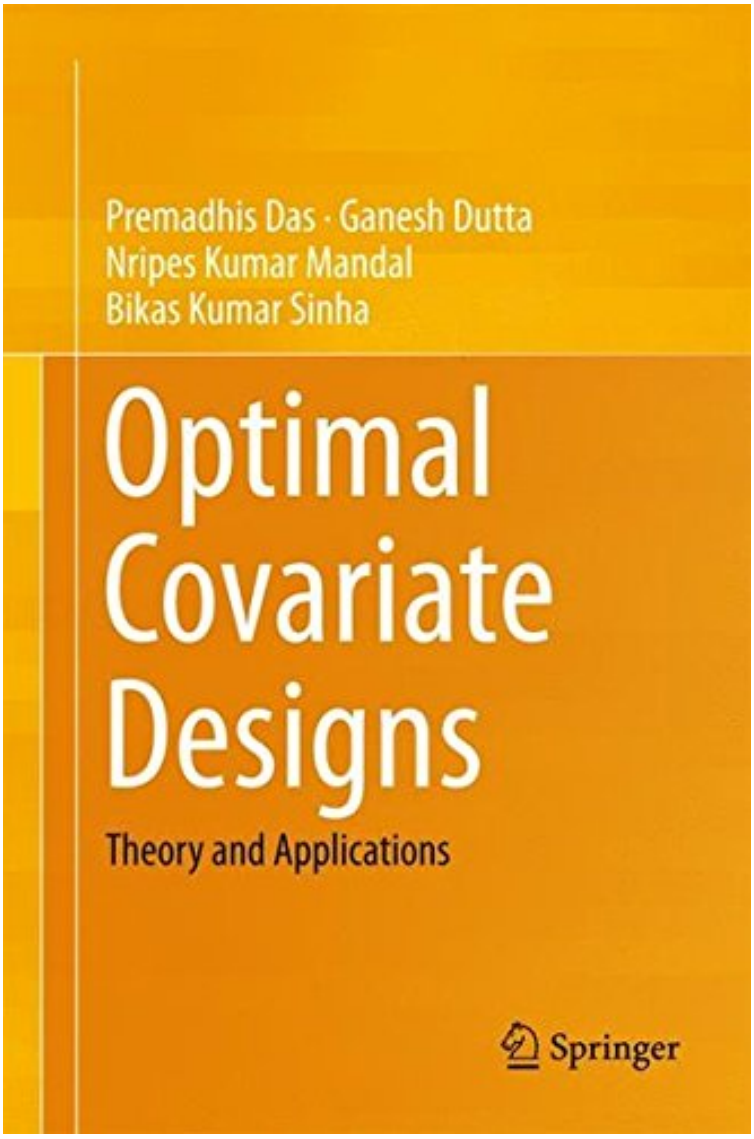

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Premadhis Das, Ganesh Dutta, Nripes Kumar Mandal, Bikas Kumar Sinha : Optimal Covariate Designs: Theory and Applications before purchasing it in order to gage whether or not it would be worth my time, and all praised Optimal Covariate Designs: Theory and Applications:

This book primarily addresses the optimality aspects of covariate designs. A covariate model is a combination of

ANOVA and regression models. Optimal estimation of the parameters of the model using a suitable choice of designs is of great importance; as such choices allow experimenters to extract maximum information for the unknown model parameters. The main emphasis of this monograph is to start with an assumed covariate model in combination with some standard ANOVA set-ups such as CRD, RBD, BIBD, GDD, BTIBD, BPEBD, cross-over, multi-factor, split-plot and strip-plot designs, treatment control designs, etc. and discuss the nature and availability of optimal covariate designs. In some situations, optimal estimations of both ANOVA and the regression parameters are provided. Global optimality and D-optimality criteria are mainly used in selecting the design. The standard optimality results of both discrete and continuous set-ups have been adapted, and several novel combinatorial techniques have been applied for the construction of optimum designs using Hadamard matrices, the Kronecker product, Rao-Khatri product, mixed orthogonal arrays to name a few.

From the Back CoverThis book primarily addresses the optimality aspects of covariate designs. A covariate model is a combination of ANOVA and regression models. Optimal estimation of the parameters of the model using a suitable choice of designs is of great importance; as such choices allow experimenters to extract maximum information for the unknown model parameters. The main emphasis of this monograph is to start with an assumed covariate model in combination with some standard ANOVA set-ups such as CRD, RBD, BIBD, GDD, BTIBD, BPEBD, cross-over, multi-factor, split-plot and strip-plot designs, treatment control designs, etc. and discuss the nature and availability of optimal covariate designs. In some situations, optimal estimations of both ANOVA and the regression parameters are provided. Global optimality and D-optimality criteria are mainly used in selecting the design. The standard optimality results of both discrete and continuous set-ups have been adapted, and several novel combinatorial techniques have been applied for the construction of optimum designs using Hadamard matrices, the Kronecker product, Rao-Khatri product, mixed orthogonal arrays to name a few.About the AuthorPremadhis Das is a Senior Professor in the Department of Statistics, University of Kalyani, India. He has been working in the area of Design of Experiments for more than 30 years, and has published research articles in many national and international journals of repute. Prof. Das has co-authored a Springer-Verlag Lecture Notes Series in Statistics monograph on optimal mixture experiments, Vol. 1028, 2014.Ganesh Dutta is an Assistant Professor, Department of Statistics, Basanti Devi College, affiliated to the University of Calcutta, India. He has completed his Ph.D. degree in the area of design of experiments from the University of Calcutta in the year 2009 and has published 11 research articles in the area of optimum covariate designs in all reputed peer-reviewed journals.Nripes Kumar Mandal is a senior faculty member of the Department of Statistics, University of Calcutta, India. He has visited many countries for collaborative research and has published about 70 research articles in peer-reviewed journals. He has been associated with many international statistical journals of repute as a reviewer. Professor Mandal has co-authored two Springer-Verlag Lecture Notes Series in Statistics monograph on optimal designs,Vol. 163, 2002 and monograph on optimal mixture experiments, Vol. 1028, 2014.Bikas Kumar Sinha was attached to the Indian Statistical Institute [ISI], Kolkata, India for more than 30 years until his retirement on March 31, 2011. He has travelled extensively within USA and Europe for collaborative research and with teaching assignments. He has more than 120 research articles published in peer-reviewed journals and has acted as a referee for many international journals. Professor Sinha has served in the Editorial Board of statistical journals including Sankhya, Journal of Statistical Planning and Inference and Calcutta Statistical Association Bulletin. He has co-authored three Springer-Verlag Lecture Notes Series in Statistics monographs on optimal designs [Vol. 54, 1989, Vol. 163, 2002 and Vol. 1028, 2014].