Research on design of experiments has contributed, and continues to contribute, to the development of Statistical Sciences and to a myriad of data-based physical sciences. CSDA has long been at the forefront of publishing work in these areas. To this end a 2014 Special Issue (eds. Gilmour and Payne) was dedicated to ‘algorithms for design of experiments’, acknowledging that computational methods play a central role in the construction and validation of designs. For the current Special Issue, contributions were invited in a wide range of topics, covering a broad spectrum of design philosophies, methodologies and applications.

Some of the published papers are devoted to problems related to model uncertainty and discrimination. Dette et al. (2017a) focus on Fourier regression models. McGree (2017) uses the total entropy utility function for model discrimination and parameter estimation in Bayesian design. Designs considerations when making model selection for generalised linear models are studied by Woods et al. (2017).

Central to the study of model uncertainty is the issue of design robustness. Konstantinou et al. (2017) propose robust designs for survival trials. The robustness of various designs to missing observations is studied by Smucker et al. (2017) and by da Silva et al. (2017).

Dette et al. (2017b) consider further implications brought by dealing with correlated observations, and Rodríguez-Díaz (2017) proposes methods for constructing c-optimal designs in such situations. Atkinson and Biswas (2017) present novel ideas for adaptive designs for clinical trials with multivariate or longitudinal responses.

The work of Kobilinsky et al. (2017) provides solutions for computer generation for generalised regular factorial designs. The competitive algorithm of Masoudi et al. (2017) helps to find minimax and standardised maximin optimal designs. Gauthier and Pronzato (2016) propose improved methods for construction of designs for estimating random-field interpolation models. Designing combined physical and computer experiments to maximise prediction accuracy is studied by Leatherman et al. (2017). An application of optimal design theory in a reliability industrial experiment is described by Rivas-López et al. (2017).

All papers present valuable contributions to the statistical theory and practice of design. They illustrate the continuing role to be played by thoughtful experimentation, at a time when mere scattershot sampling of ‘big data’ is becoming all too fashionable.

References


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Further Reading


The Special Issue Editors

Alexander N. Donev *
School of Mathematics, University of Manchester, Oxford Road, Manchester M13 9PL, UK
E-mail address: a.n.donev@manchester.ac.uk.

Jesús López-Fidalgo
Institute for Culture and Society (ICS), University of Navarre, Spain
E-mail address: fidalgo@unav.es.

Douglas P. Wiens
Department of Mathematical and Statistical Sciences, University of Alberta, Edmonton, Alberta, T6E 2Z2, Canada
E-mail address: doug.wiens@ualberta.ca.

* Corresponding editor.