

# Optimum Design 2000

# Nonconvex Optimization and Its Applications

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Volume 51

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# Optimum Design 2000

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The volume is dedicated to Valeri Fedorov  
on the occasion of his 60th birthday

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# Preface

This volume contains many of the papers presented at the conference "Optimum Design 2000: Prospects for the New Millennium" held in Cardiff, UK on April 12th – 14th, 2000. The majority of the papers consider aspects of optimum experimental design from the theoretical to applications. Many of the optimisation problems arising in the optimum design theory in general and the articles in this volume in particular, fall into the category of nonconvex, including global, optimization.

The papers are organised in two sections. Since we are at the beginning of a new millennium the first paper starts by looking back at the beginnings of optimum experimental design in 1917 and sketches the development up to Kiefer's paper read to the Royal Statistical Society in 1959. This is the first in a group of papers which we have labelled "Theory", which cover the more general aspects, such as the properties and methods of construction of designs. In the "Applications" section there are papers on sequential design problems arising in the pharmaceutical industry and on the designs with discrete factors which occur in agriculture. There are also papers on training neural networks, on the efficient design of sampling methods, on design problems in mixtures, arising from a study of glass manufacturing, and on the resistance of Brazilian weeds to herbicides.

The number attending the meeting was deliberately limited to 50 in order to encourage a workshop atmosphere and the exchange of ideas. The international nature of the conference is shown by the presence of scientists from 15 countries. The attendance of people from so many countries, especially those of Central Europe, was made possible by the generosity of our sponsor SmithKline Beecham. The organisers are most grateful to this company and especially to Dr. Darryl Downing for the financial support. We are also grateful to the Royal Statistical Society for endorsing our conference, which was organised under their auspices. The University of Cardiff and the capital city of Wales provided an excellent environment not only for the formal sessions, but also for those informal discussions which are such an important part of any scientific conference. Photographs at the end of the book provide a glimpse of two evenings of technical and social interaction. We are grateful to Patrick Laycock of UMIST for making his photographs available.

The contributions to this volume have been selected by the editors from those submitted for publication. All have been refereed and, where necessary, Englished. Four papers have discussions. We thank the referees and discussants for their contributions to ensuring the quality of these proceedings.



We trust that this volume will be of interest to statisticians and the wider scientific community and will serve to provide them with a view of the breadth and excitement of work in what is currently a very active area.

Anthony Atkinson

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Anatoly Zhigljavsky