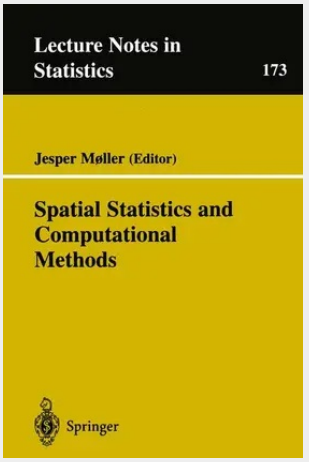
Møller

Spatial Statistics and Computational Methods



Spatial statistics and Markov Chain Monte Carlo (MCMC) techniques have each undergone major developments in the last decade. Also, these two areas are mutually reinforcing, because MCMC methods are often necessary for the practical implementation of spatial statistical inference, while new spatial stochastic models in turn motivate the development of improved MCMC algorithms. This volume shows how sophisticated spatial statistical and computational methods apply to a range of problems of increasing importance for applications in science and technology. It consists of four chapters: 1. Petros Dellaportas and Gareth O. Roberts give a tutorial on MCMC methods, the computational methodology which is essential for virtually all the complex spatial models to be considered in subsequent chapters. 2. Peter J. Diggle, Paulo J, Ribeiro Jr., and Ole F. Christensen introduce the reader to the model- based approach to geostatistics, i.e. the application of general statistical principles to the formulation of explicit stochastic models for geostatistical data, and to inference within a declared class of models. 3. Merrilee A. Hurn, Oddvar K. Husby, and H?vard Rue discuss various aspects of image analysis, ranging from low to high level tasks, and illustrated with different examples of applications. 4. Jesper Moller and Rasmus P. Waggepetersen collect recent theoretical advances in simulation-based inference for spatial point processes, and discuss some examples of applications. The volume introduces topics of current interest in spatial and computational statistics, which should be accessible to postgraduate students as well as to experienced statistical researchers. It is partly based on the course material for the "TMR and MaPhySto Summer School on Spatial Statistics and Computational Methods," held at Aalborg University, Denmark, August 19-22, 2001.

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106,99 €
99,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9780387001364
Medium: Buch
ISBN: 978-0-387-00136-4
Verlag: Springer
Erscheinungstermin: 05.03.2003
Sprache(n): Englisch
Auflage: 2003
Serie: Lecture Notes in Statistics
Produktform: Kartoniert
Gewicht: 347 g
Seiten: 205
Format (B x H): 155 x 235 mm

Kundenservice Verlag Dr. Otto Schmidt KG
Neumannstraße 10, 40235 Düsseldorf | kundenservice@otto-schmidt.de | 0221-93738-997 (Inland)