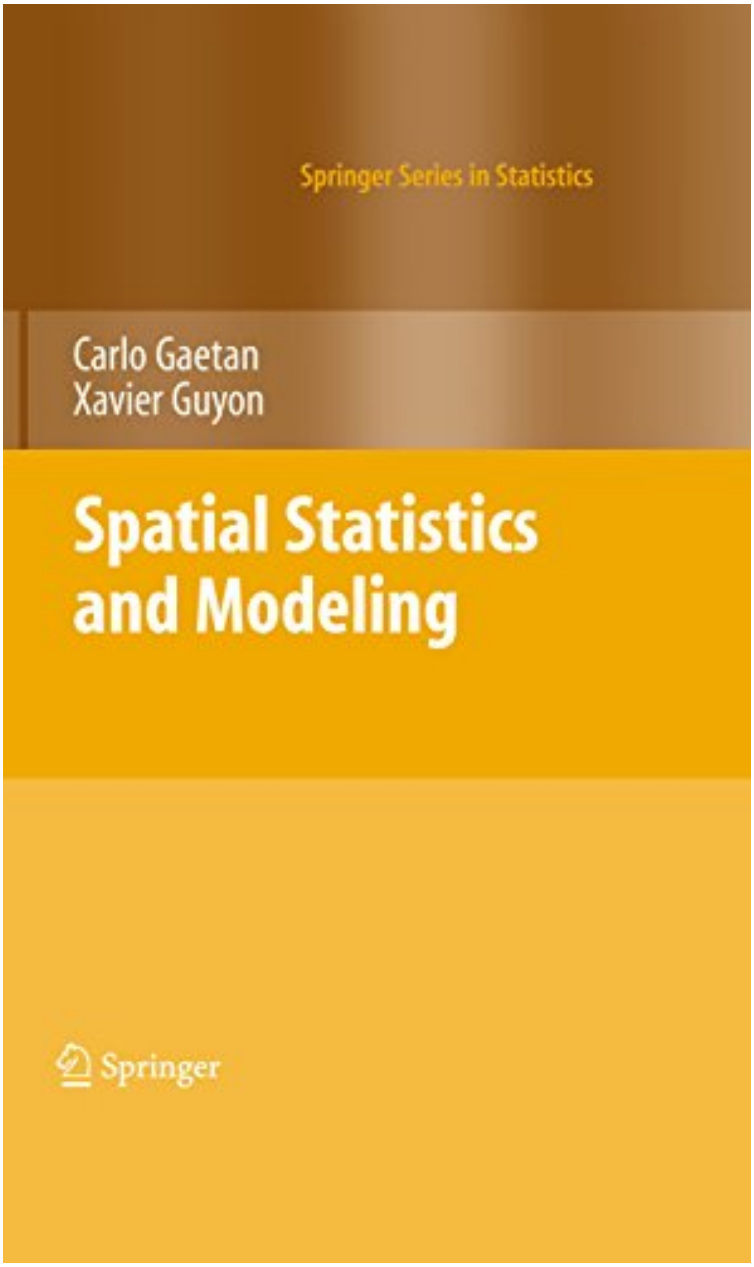
Spatial Statistics and Modeling (Springer Series in Statistics)

Carlo Gaetan, Xavier Guyon



#3652176 in eBooks 2009-11-10 2009-11-10File Name: B00FB3HMQQ | File size: 19.Mb

Carlo Gaetan, Xavier Guyon : Spatial Statistics and Modeling (Springer Series in Statistics) before purchasing it in order to gage whether or not it would be worth my time, and all praised Spatial Statistics and Modeling (Springer Series in Statistics):

Spatial statistics are useful in subjects as diverse as climatology, ecology, economics, environmental and earth sciences, epidemiology, image analysis and more. This book covers the best-known spatial models for three types of spatial data: geostatistical datanbsp; (stationarity, intrinsic models, variograms, spatial regression and space-time models), areal datanbsp; (Gibbs-Markov fields and spatial auto-regression) and point pattern data (Poisson, Cox, Gibbs and Markov point processes). The level is relatively advanced, and the presentation concise but complete.nbsp;The most important statistical methods and their asymptoticnbsp; properties are described, including estimation in geostatistics, autocorrelation and second-order statistics, maximum likelihood methods, approximate inference using the pseudo-likelihood or Monte-Carlo simulations, statistics for point processes and Bayesian hierarchical models. A chapter is devoted to Markov Chain Monte Carlo simulation (Gibbs sampler, Metropolis-Hastings algorithms and exact simulation).A large number of real examples are studied with R, and each chapter ends with a set of theoretical and applied exercises. While a foundation innbsp; probability and mathematical statistics is assumed,nbsp; three appendices introduce some necessary background. The book is accessible to senior undergraduate students with a solid math backgroundnbsp; and Ph.D. students in statistics. Furthermore, experienced statisticians and researchers in the above-mentioned fields will find the book valuable as a mathematically sound reference.This book is the English translation of Modeacute;lisation et Statistique Spatiales published by Springer in the series Matheacute;matiques Applications, a series established by Socieacute;teacute; de Matheacute;matiques Appliqueacute;es et Industrielles (SMAI).

From the reviews:ldquo;Spatial statistics aims to develop models and statistical inference methods for observations that have a distinct spatial location component. hellip; The book under review presents theory simulation and statistical applications in a well-structured manner and even covers some modern topics from the very recent journal literature. hellip; To summarise this book is a welcome addition to the literature on spatial statistics and is perfectly suitable for designing a lecture course in this area.rdquo; (Ilya S. Molchanov, Mathematical s, Issue 2011 a)ldquo;Students and researchers in statistics, geology, image processing, spatial economics, earth sciences, epidemiology, and other areas. hellip; authors of the current book do an excellent job in selecting hellip; the most relevant topics for a new investigator just venturing into this exciting area. hellip; well structured, accessible, and easy to read without compromising the theoretical rigor of the subject. hellip; Any researcher interested in statistical methodologies for brain imaging will find the book quite engaging. This book will have a permanent place in my bookshelf.rdquo; (Rajesh Ranjan Nandy, International Statistical , Vol. 78 (3), 2010)ldquo;This book is the English translation of Modeacute;lisation et Statistique Spatiales, published by Springer in the series Matheacute;matiques Applications hellip; . it is intended as a text for a graduate level course.rdquo;shy;shy;shy; (Donald E. Myers, Mathematical Geosciences, Vol. 42, July, 2010)From the Back CoverSpatial statistics are useful in subjects as diverse as climatology, ecology, economics, environmental and earth sciences, epidemiology, image analysis and more. This book covers the best-known spatial models for three types of spatial data: geostatistical datanbsp; (stationarity, intrinsic models, variograms, spatial regression and space-time models), areal datanbsp; (Gibbs-Markov fields and spatial auto-regression) and point pattern data (Poisson, Cox, Gibbs and Markov point processes). The level is relatively advanced, and the presentation concise but complete. nbsp;The most important statistical methods and their asymptoticnbsp; properties are described, including estimation in geostatistics, autocorrelation and second-order statistics, maximum likelihood methods, approximate inference using the pseudo-likelihood or Monte-Carlo simulations, statistics for point processes and Bayesian hierarchical models. A chapter is devoted to Markov Chain Monte Carlo simulation (Gibbs sampler, Metropolis-Hastings algorithms and exact simulation).A large number of real examples are studied with R, and each chapter ends with a set of theoretical and applied exercises. While a foundation innbsp; probability and mathematical statistics is assumed,nbsp; three appendices introduce some necessary background. The book is accessible to senior undergraduate students with a solid math backgroundnbsp; and Ph.D. students in statistics. Furthermore, experienced statisticians and researchers in the above-mentioned fields will find the book valuable as a mathematically sound reference. This book is the English translation of Modeacute;lisation et Statistique Spatiales published by Springer in the series Matheacute;matiques Applications, a series established by Socieacute;teacute; de Matheacute;matiques Appliqueacute;es et Industrielles (SMAI). Carlo Gaetan is Associate Professor of Statistics in the Department of Statistics at the Ca' Foscari University of Venice. Xavier Guyon is Professornbsp; Emeritus at the University of Paris 1 Pantheacute;on-Sorbonne. He is author of a Springer monograph on random fields.