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Descrizione fisica	1 online resource (390 p.)
Collana	Wiley series in computational statistics
Altri autori (Persone)	BieglerLorenz T
Disciplina	515/.357
Soggetti	Bayesian statistical decision theory Inverse problems (Differential equations) Mathematical optimization
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Large-Scale Inverse Problems and Quantification of Uncertainty; Index; Contents; List of Contributors; 1 Introduction; 2 A Primer of Frequentist and Bayesian Inference in Inverse Problems; 3 Subjective Knowledge or Objective Belief? An Oblique Look to Bayesian Methods; 4 Bayesian and Geostatistical Approaches to Inverse Problems; 5 Using the Bayesian Framework to Combine Simulations and Physical Observations for Statistical Inference; 6 Bayesian Partition Models for Subsurface Characterization 7 Surrogate and Reduced-Order Modeling: A Comparison of Approaches for Large-Scale Statistical Inverse Problems8 Reduced Basis Approximation and A Posteriori Error Estimation for Parametrized Parabolic PDEs: Application to Real-Time Bayesian Parameter

Estimation; 9 Calibration and Uncertainty Analysis for Computer Simulations with Multivariate Output; 10 Bayesian Calibration of Expensive Multivariate Computer Experiments; 11 The Ensemble Kalman Filter and Related Filters; 12 Using the Ensemble Kalman Filter for History Matching and Uncertainty Quantification of Complex Reservoir Models  
13 Optimal Experimental Design for the Large-Scale Nonlinear Ill-Posed Problem of Impedance Imaging  
14 Solving Stochastic Inverse Problems: A Sparse Grid Collocation Approach; 15 Uncertainty Analysis for Seismic Inverse Problems: Two Practical Examples; 16 Solution of Inverse Problems Using Discrete ODE Adjoint

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## Sommario/riassunto

This book focuses on computational methods for large-scale statistical inverse problems and provides an introduction to statistical Bayesian and frequentist methodologies. Recent research advances for approximation methods are discussed, along with Kalman filtering methods and optimization-based approaches to solving inverse problems. The aim is to cross-fertilize the perspectives of researchers in the areas of data assimilation, statistics, large-scale optimization, applied and computational mathematics, high performance computing, and cutting-edge applications. The solution to large-scale

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