

1. Record Nr.	UNINA9910830059003321
Autore	Thompson James R (James Robert), <1938->
Titolo	Simulation [[electronic resource]] : a modeler's approach // James R. Thompson
Pubbl/distr/stampa	New York, : Wiley, 2000
ISBN	1-282-30763-0 9786612307638 0-470-31706-X 0-470-31790-6
Descrizione fisica	1 online resource (332 p.)
Collana	Wiley series in probability and statistics. Applied probability and statistics
Disciplina	003.3
Soggetti	Experimental design Mathematical models Mathematical statistics
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	Simulation A Modeler's Approach; Contents; Preface; 1 The Generation of Random Numbers; 1.1. Introduction; 1.2. The Generation of Random Uniform Variates; 1.3. Latticing and Other Problems; Problems; References; 2 Random Quadrature; 2.1. Introduction; 2.2. Hit-or-h.iiss Monte Carlo; 2.3. Sample Mean Monte Carlo; 2.4. Control Variate Sampling; 2.5. Importance Sampling; 2.6. Stratification; 2.7. Antithetic Variates; 2.8, Least Squares Est.imators; 2.9. Evaluation of Multidimensional Integrals; 2.10. Stratification in Multidimensional Integration; 2.11. Wiener Measure and Brownian Motion ProblemsReferences; 3 Monte Carlo Solutions of Differential Equations; 3.1. Introduction; 3.2. Gambler's Ruin; 3.3. Solution of Simple Differential Equations; 3.4. Solution of the Fokker-Planck Equation; 3.5. The Dirichlet Problem; 3.6. Solution of General Elliptic Differential Equations; 3.7. Conclusions; Problems; References; 4 Markov Chains, Poisson Processes, and Linear Equations; 4.1. Discrete Markov hfoodeling; 4.1.1. The Basic Model; 4.1.2. Saving the King; 4.1.3. Screening for Cancer; 4.2. Poisson Process Modeling; 4.3. Solving

Systems of Linear Equations

4.3.1. An Inefficient Procedure; 4.3.2. An Algorithm Based on Jacobi Iteration; Problems; References; 5 SIMEST, SIMDAT, and Pseudoreality; 5.1. Computers Si, Models No; 5.2. The Bootstrap: A Dirac-Comb Density Estimator; 5.3. SIM4DAT: A Smooth Resampling Algorithm; 5.3.1. The SIMDAT Algorithm; 5.3.2. An Empirical Justification of SIMDAT; 5.4. SIMEST: An Oncological Example; 5.4.1. An Exploratory Prelude; 5.4.2. Model and Algorithms; Problems; References; 6 Models for Stocks and Derivatives; 6.1. Introduction; 6.2. Ito's Lemma; 6.3. A Geometric Brownian Model for Stocks; 6.4. Diversification; 6.5. Negatively Correlated Portfolios; 6.6. Bear Jumps; 6.7. Options; 6.8. Getting Real: Simulation Analysis of Option Buying; 6.9. Conclusions; Problems; References; 7 Simulation Assessment of Multivariate and Robust Procedures in Statistical Process Control; 7.1. Introduction; 7.2. A Contamination Model for SPC; 7.3. A Compound Test for Higher-Dimensional SPC Data; 7.4. Rank Testing with Higher-Dimensional SPC Data; 7.5. A Robust Estimation Procedure for Location in Higher Dimensions; Problems; References; 8 Noise and Chaos; 8.1. Introduction; 8.2. The Discrete Logistic Model; 8.3. A Chaotic Convection Model; 8.4. Conclusions; Problems; References; 9 Bayesian Approaches; 9.1. Introduction; 9.2. The EM Algorithm; 9.3. The Data Augmentation Algorithm; 9.4. The Gibbs Sampler; 9.5. Conclusions; Problems; References; 10 Resampling-Based Tests; 10.1. Introduction; 10.2. Fisher's Analysis of Darwin's Data; 10.3. A Bootstrap Approximation to Fisher's Nonparametric Test; 10.4. The Classical Randomization Test; 10.5. A Resampling-Based Sign Test; 10.6. A Resampling Approach to Confidence Intervals; 10.7. Resampling for Regression Model Selection; 10.8. The Bootstrap as an All-Purpose Tool

Sommario/riassunto

A unique, integrated treatment of computer modeling and simulation
"The future of science belongs to those willing to make the shift to simulation-based modeling," predicts Rice Professor James Thompson, a leading modeler and computational statistician widely known for his original ideas and engaging style. He discusses methods, available to anyone with a fast desktop computer, for integrating simulation into the modeling process in order to create meaningful models of real phenomena. Drawing from a wealth of experience, he gives examples from trading markets, oncology, epidemiology, statist
