

1. Record Nr.	UNINA9910823201703321
Titolo	Stochastic simulation optimization for discrete event systems : perturbation analysis, ordinal optimization and beyond // editors, Chun-Hung Chen, George Mason University, USA, Qing-Shan Jia, Tsinghua University, China, Loo Hay Lee, National University of Singapore, Singapore
Pubbl/distr/stampa	Hackensack, NJ, : World Scientific, c2013 New Jersey : , : World Scientific, , [2013] 2013
ISBN	981-4513-01-6
Descrizione fisica	1 online resource (xxviii, 245 pages) : illustrations
Collana	Gale eBooks
Disciplina	003/.83
Soggetti	Discrete-time systems - Mathematical models Perturbation (Mathematics) Systems engineering - Computer simulaton
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.
Nota di contenuto	Preface; Foreword: A Tribute to a Great Leader in Perturbation Analysis and Ordinal Optimization; Foreword: The Being and Becoming of Perturbation Analysis; Foreword: Remembrance of Things Past; Contents; Part I: Perturbation Analysis; Chapter 1. The IPA Calculus for Hybrid Systems; 1.1. Introduction; 1.2. Perturbation Analysis of Hybrid Systems; 1.2.1. Infinitesimal Perturbation Analysis (IPA): The IPA calculus; 1.3. IPA Properties; 1.4. General Scheme for Abstracting DES to SFM; 1.5. Conclusions and FutureWork; References Chapter 2. Smoothed Perturbation Analysis: A Retrospective and Prospective Look 2.1. Introduction; 2.2. Brief History of SPA; 2.3. Another Example; 2.4. Overview of a General SPA Framework; 2.5. Applications; 2.5.1. Queueing; 2.5.2. Inventory; 2.5.3. Finance; 2.5.4. Stochastic Activity Networks (SANs); 2.5.5. Others; 2.6. Random Retrospective and Prospective Concluding Remarks; Acknowledgements; References; Chapter 3. Perturbation Analysis and Variance Reduction in Monte Carlo Simulation; 3.1. Introduction; 3.2.

Systematic and Generic Control Variate Selection

3.2.1. Control variate technique: a brief review 3.2.2. Parametrized estimation problems; 3.2.3. Deterministic function approximation and generic CV selection; 3.3. Control Variates for Sensitivity Estimation; 3.3.1. A parameterized estimation formulation of sensitivity estimation; 3.3.2. Finite difference based controls; 3.3.3. Illustrating example; 3.4. Database Monte Carlo (DBMC) Implementation; 3.5. Conclusions; Acknowledgements; References; Chapter 4. Adjoints and Averaging; 4.1. Introduction; 4.2. Adjoints: Classical Setting; 4.3. Adjoints: Waiting Times; 4.4. Adjoints: Vector Recursions 4.5. Averaging 4.6. Concluding Remarks; References; Chapter 5. Infinitesimal Perturbation Analysis and Optimization Algorithms; 5.1. Preliminary Remarks; 5.2. Motivation; 5.3. Single-server Queues; 5.3.1. Controlled single-server queue; 5.3.2. Infinitesimal perturbation analysis; 5.3.3. Optimization algorithm; 5.4. Convergence; 5.4.1. Stochastic approximation convergence theorem; 5.4.2. Updating after every busy period; 5.4.3. Updating after every service time; 5.4.4. Example; 5.5. Final Remarks; References; Chapter 6. Simulation-based Optimization of Failure-prone Continuous Flow Lines 6.1. Introduction 6.2. Two-machine Continuous Flow Lines; 6.3. Gradient Estimation of a Two-machine Line; 6.4. Modeling Assembly/Disassembly Networks Subject to TDF Failures with Stochastic Fluid Event Graphs; 6.5. Evolution Equations and Sample Path Gradients; 6.6. Optimization of Stochastic Fluid Event Graphs; 6.7. Conclusion; References; Chapter 7. Perturbation Analysis, Dynamic Programming, and Beyond; 7.1. Introduction; 7.2. Perturbation Analysis of Queueing Systems Based on Perturbation Realization Factors; 7.2.1. Performance gradient; 7.2.2. Policy iteration 7.3. Performance Optimization of Markov Systems Based on Performance Potentials

Sommario/riassunto

Discrete event systems (DES) have become pervasive in our daily lives. Examples include (but are not restricted to) manufacturing and supply chains, transportation, healthcare, call centers, and financial engineering. However, due to their complexities that often involve millions or even billions of events with many variables and constraints, modeling these stochastic simulations has long been a "hard nut to crack". The advance in available computer technology, especially of cluster and cloud computing, has paved the way for the realization of a number of stochastic simulation optimization f
