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Titolo	Analysis and Approximation of Rare Events : Representations and Weak Convergence Methods / / by Amarjit Budhiraja, Paul Dupuis
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ISBN	1-4939-9579-0
Edizione	[1st ed. 2019.]
Descrizione fisica	1 online resource (577 pages)
Collana	Probability Theory and Stochastic Modelling, , 2199-3149 ; ; 94
Disciplina	511.4
Soggetti	Probabilities Engineering mathematics Engineering - Data processing Numerical analysis Probability Theory Mathematical and Computational Engineering Applications Numerical Analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Preliminaries and elementary examples -- Discrete time processes -- Continuous time processes -- Monte Carlo approximation.
Sommario/riassunto	This book presents broadly applicable methods for the large deviation and moderate deviation analysis of discrete and continuous time stochastic systems. A feature of the book is the systematic use of variational representations for quantities of interest such as normalized logarithms of probabilities and expected values. By characterizing a large deviation principle in terms of Laplace asymptotics, one converts the proof of large deviation limits into the convergence of variational representations. These features are illustrated though their application to a broad range of discrete and continuous time models, including stochastic partial differential equations, processes with discontinuous statistics, occupancy models, and many others. The tools used in the large deviation analysis also turn out to be useful in understanding Monte Carlo schemes for the numerical approximation of the same probabilities and expected values. This connection is illustrated through the design and analysis of importance sampling and splitting

schemes for rare event estimation. The book assumes a solid background in weak convergence of probability measures and stochastic analysis, and is suitable for advanced graduate students, postdocs and researchers.