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Titolo	Stochastic Biomathematical Models [[electronic resource]] : with Applications to Neuronal Modeling / / edited by Mostafa Bachar, Jerry J. Batzel, Susanne Ditlevsen
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Soggetti	Probabilities Mathematical models Statistics Neurobiology Probability Theory and Stochastic Processes Mathematical Modeling and Industrial Mathematics Statistics for Life Sciences, Medicine, Health Sciences
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1 Introduction to stochastic models in biology -- 2 One-dimensional homogeneous diffusions -- 3 A brief introduction to large deviations theory -- 4 Some numerical methods for rare events simulation and analysis -- 5 Stochastic Integrate and Fire models: a review on mathematical methods and their applications -- 6 Stochastic partial differential equations in Neurobiology: linear and nonlinear models for spiking neurons -- 7 Deterministic and stochastic FitzHugh-Nagumo systems -- 8 Stochastic modeling of spreading cortical depression.
Sommario/riassunto	Stochastic biomathematical models are becoming increasingly important as new light is shed on the role of noise in living systems. In certain biological systems, stochastic effects may even enhance a signal, thus providing a biological motivation for the noise observed in living systems. Recent advances in stochastic analysis and increasing computing power facilitate the analysis of more biophysically realistic models, and this book provides researchers in computational

neuroscience and stochastic systems with an overview of recent developments. Key concepts are developed in chapters written by experts in their respective fields. Topics include: one-dimensional homogeneous diffusions and their boundary behavior, large deviation theory and its application in stochastic neurobiological models, a review of mathematical methods for stochastic neuronal integrate-and-fire models, stochastic partial differential equation models in neurobiology, and stochastic modeling of spreading cortical depression.
