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Descrizione fisica	1 online resource (185 p.)
Disciplina	519 519.2 530.12 570 571.4 572.6 591.5
Soggetti	Proteins Biophysics Probabilities Behavioral sciences Quantum theory Neural networks (Computer science) Protein Science Biological and Medical Physics, Biophysics Probability Theory and Stochastic Processes Behavioral Sciences Quantum Physics Mathematical Models of Cognitive Processes and Neural Networks
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	Preface.- Introduction -- Fundamentals of classical probability and quantum probability Theory -- Fundamentals of molecular biology. - Adaptive dynamics and general approach to non-Kolmogorov

probability theory.- Application of adaptive dynamics to Biology -- Application to decision making theory and cognitive science -- Operational Approach to Modern Theory of Evolution.- Epigenetic Evolution and Theory of Open Quantum Systems -- Foundational Problems of Quantum Mechanics -- Decision and Intention Operators as Generalized Quantum Observables.

Sommario/riassunto

This book examines information processing performed by bio-systems at all scales: from genomes, cells, and proteins to cognitive and even social systems. It introduces a theoretical/conceptual principle based on quantum information and non-Kolmogorov probability theory to explain information processing phenomena in biology as a whole. The book begins with an introduction followed by two chapters devoted to fundamentals, one covering classical and quantum probability, which also contains a brief introduction to quantum formalism, and another on an information approach to molecular biology, genetics, and epigenetics. It then goes on to examine adaptive dynamics, including applications to biology, and non-Kolmogorov probability theory. Next, the book discusses the possibility to apply the quantum formalism to model biological evolution, especially at the cellular level: genetic and epigenetic evolutions. It also presents a model of the epigenetic cellular evolution based on the mathematical formalism of open quantum systems. The last two chapters of the book explore foundational problems of quantum mechanics and demonstrate the power of usage of positive operator valued measures (POVMs) in biological science. This book will appeal to a diverse group of readers including experts in biology, cognitive science, decision making, sociology, psychology, and physics; mathematicians working on problems of quantum probability and information; and researchers in quantum foundations.