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Soggetti	Neural networks (Computer science) Memristors
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Preface -- The Fourth Element -- Aftermath of Finding the Memristor -- Resistance Switching Memories are Memristors -- The Detectors Used in the First Radios were Memristors -- Memristor, Hodgkin-Huxley and Edge of Chaos -- Why are Memristor and Memistor Different Devices? -- Synapse as a Memristor -- Memristors and Memristive Devices for Neuromorphic Computing -- Bio-inspired Neural Networks -- Self-organization and Emergence of Dynamical Structures in Neuromorphic Atomic Switch Networks -- Spike-Timing-Dependent-Plasticity with Memristors -- Memristor Bridge-based Artificial Neural Weighting Circuit -- Cellular Nonlinear Networks with Memristor Synapses -- Evolving Memristive Neural Networks -- Behavior of Multiple Memristor Circuits -- Memristor-Based Chaotic System with Boundary Conditions -- Spiking in Memristor Networks -- Organic Memristive Devices and Neuromorphic Circuits -- Memristive in situ Computing -- Memory Effects in Multi-Terminal Solid State Devices and their Applications -- Memristor-Based Addition and Multiplication -- Memristor Emulators -- Modeling Memristor-based Circuit Networks on Crossbar Architectures -- Computing Shortest Paths in 2D and 3D Memristive Networks -- Computing Image and

Motion with 3-D Memristive Grids -- Solid-State Memcapacitors and their Applications -- Memristive Stateful Logic -- Reaction-Diffusion Media with Excitable Oregonators Coupled by Memristors -- Autowaves in a Lattice of Memristor-based Cells -- Memristor Cellular Automata and Memristor Discrete-Time Cellular Neural Networks -- Index.

Sommario/riassunto

Using memristors one can achieve circuit functionalities that are not possible to establish with resistors, capacitors and inductors, therefore the memristor is of great pragmatic usefulness. Potential unique applications of memristors are in spintronic devices, ultra-dense information storage, neuromorphic circuits, and programmable electronics. Memristor Networks focuses on the design, fabrication, modelling of and implementation of computation in spatially extended discrete media with many memristors. Top experts in computer science, mathematics, electronics, physics and computer engineering present foundations of the memristor theory and applications, demonstrate how to design neuromorphic network architectures based on memristor assembles, analyse varieties of the dynamic behaviour of memristive networks, and show how to realise computing devices from memristors. All aspects of memristor networks are presented in detail, in a fully accessible style. An indispensable source of information and an inspiring reference text, Memristor Networks is an invaluable resource for future generations of computer scientists, mathematicians, physicists and engineers.
