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Titolo	Memristor-Based Nanoelectronic Computing Circuits and Architectures : Foreword by Leon Chua / / by Ioannis Vourkas, Georgios Ch. Sirakoulis
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ISBN	3-319-22647-9
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Descrizione fisica	1 online resource (263 p.)
Collana	Emergence, Complexity and Computation, , 2194-7287 ; ; 19
Disciplina	620.5
Soggetti	Computational complexity Electronic circuits Nanotechnology Complexity Circuits and Systems Nanotechnology and Microengineering Electronic Circuits and Devices
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 at the end of each chapters.
Nota di contenuto	Memristor Fundamentals -- Memristor Modeling -- Dynamic Response of Multiple Interconnected Memristors -- Memristor-based Logic Circuits -- Memristive Crossbar-based Nonvolatile Memory -- High-radix Arithmetic-Logic Unit (ALU) Based on Memristors -- Networks of Memristors and Memristive Components -- Memristive Computing for NP-Hard AI Problems.
Sommario/riassunto	This book considers the design and development of nanoelectronic computing circuits, systems and architectures focusing particularly on memristors, which represent one of today’s latest technology breakthroughs in nanoelectronics. The book studies, explores, and addresses the related challenges and proposes solutions for the smooth transition from conventional circuit technologies to emerging computing memristive nanotechnologies. Its content spans from fundamental device modeling to emerging storage system architectures and novel circuit design methodologies, targeting advanced non-

conventional analog/digital massively parallel computational structures. Several new results on memristor modeling, memristive interconnections, logic circuit design, memory circuit architectures, computer arithmetic systems, simulation software tools, and applications of memristors in computing are presented. High-density memristive data storage combined with memristive circuit-design paradigms and computational tools applied to solve NP-hard artificial intelligence problems, as well as memristive arithmetic-logic units, certainly pave the way for a very promising memristive era in future electronic systems. Furthermore, these graph-based NP-hard problems are solved on memristive networks, and coupled with Cellular Automata (CA)-inspired computational schemes that enable computation within memory. All chapters are written in an accessible manner and are lavishly illustrated. The book constitutes an informative cornerstone for young scientists and a comprehensive reference to the experienced reader, hoping to stimulate further research on memristive devices, circuits, and systems.