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Descrizione fisica	1 online resource (297 pages)
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Soggetti	Quantum computers Computer science
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Note generali	Includes index.
Nota di contenuto	Introduction -- Fundamentals -- Binary Numbers, Vectors, Matrices, Tensor Products -- Classical Gates and Algorithms -- Principles of Quantum Mechanics -- Quantum Superposition and Entanglement -- Binary Degrees of Freedom and Qubits -- Quantum Gates and Circuits -- Phase Estimation and quantum Fourier Transform (qFT) -- Quantum Algorithms -- Deutsch Algorithm -- Deutsch-Josza Algorithm -- Grover's Algorithm -- Simon's Algorithm -- Shor's Algorithm -- Applications -- Quantum Algorithm for Option Pricing -- Solving Linear Equations -- Quantum-Classical Hybrid Algorithms -- Quantum Error Correction -- One-Way Quantum Computer -- Summary -- Efficiency of a Quantum Computer.
Sommario/riassunto	This book presents various theories and algorithms to create a quantum computer. The concept of the classical and quantum computers, and the concept of circuits and gates are reviewed. The example of the Deutsch and the Deutsch-Josca algorithm is discussed to illustrate some key features of quantum computing. The Grover algorithm, considered to be of major milestone of the subject, is discussed in detail to exemplify the techniques used in computer algorithms. The role of quantum superposition (also called quantum parallelism) and of quantum entanglement is discussed in order to understand the key advantages of a quantum over a classical computer.

