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Nota di contenuto Theoretical Considerations -- Tutorial: Graphical Calculus for Quantum Circuits -- One-Way Reversible Multi-head Finite Automata -- A Deterministic Two-Way Multi-head Finite Automaton Can Be Converted into a Reversible One with the Same Number of Heads -- Undecidability of the Surjectivity of the Subshift Associated to a Turing Machine -- Reversible Software and Languages Isomorphic Interpreters from Logically Reversible Abstract Machines -- Synthesizing Loops for Program Inversion -- Frugal Encoding in Reversible MOQA: A Case Study for Quicksort -- Towards a General-Purpose, Reversible Language for Controlling Self-reconfigurable Robots -- Reversible and Quantum Circuits -- Reversible and Quantum Circuit Optimization: A Functional Approach -- Properties of Quantum Templates -- Optimal

4-bit Reversible Mixed-Polarity Toffoli Circuits -- Design of an Online Testable Ternary Circuit from the Truth Table -- Physical Realizations and Design Garbageless Reversible Implementation of Integer Linear Transformations -- Garbage-Free Reversible Integer Multiplication with Constants of the Form $2k \pm 2l \pm 1$ -- Property Checking of Quantum Circuits Using Quantum Multiple-Valued Decision Diagrams -- Using DDs in the Design of Reversible Circuits (Work-In-Progress) -- Distributed Systems -- A Verification Technique for Reversible Process Algebra -- A Reversible Process Calculus and the Modelling of the ERK Signalling Pathway -- Controlled Reversibility and Compensations.

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| Sommario/riassunto | This book constitutes the refereed proceedings of the 4th International Workshop on Reversible Computation, RC 2012, held in Copenhagen, Denmark, in July 2012. The 19 contributions presented in this volume were carefully reviewed and selected from 46 submissions. The papers cover theoretical considerations, reversible software and reversible hardware, and physical realizations and applications in quantum computing. |