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	Nota di contenuto	to the theory of complexity and approximation algorithms -- to randomized algorithms -- Derandomization -- Proof checking and non-approximability -- Proving the PCP-Theorem -- Parallel repetition of MIP(2,1) systems -- Bounds for approximating MaxLinEq3-2 and MaxEkSat -- Deriving non-approximability results by reductions -- Optimal non-approximability of MaxClique -- The hardness of approximating set cover -- Semidefinite programming and its applications to approximation algorithms -- Dense instances of hard optimization problems -- Polynomial time approximation schemes for geometric optimization problems in euclidean metric spaces.
	Sommario/riassunto	During the last few years, we have seen quite spectacular progress in the area of approximation algorithms: for several fundamental optimization problems we now actually know matching upper and lower bounds for their approximability. This textbook-like tutorial is a coherent and essentially self-contained presentation of the enormous recent progress facilitated by the interplay between the theory of probabilistically checkable proofs and aproximation algorithms. The basic concepts, methods, and results are presented in a unified way to provide a smooth introduction for newcomers. These lectures are particularly useful for advanced courses or reading groups on the topic.