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   Disciplina   003.54

   Soggetti   Computer science
                        Algorithms
                        Computer science - Mathematics
                        Discrete mathematics
                        Mathematical optimization
                        Calculus of variations
                        Theory of Computation
                        Discrete Mathematics in Computer Science
                        Discrete Mathematics
                        Calculus of Variations and Optimization

   Lingua di pubblicazione   Inglese

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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.