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Nota di contenuto	Frontmatter -- Preface -- Introduction -- Table of contents -- 1. Continuous optimization -- Introduction -- 1.1 Formulation -- 1.2 Numerical derivatives -- 1.3 Problem reduction -- 1.4 Global optimum -- 1.5 Local optimum -- 1.6 Conclusion -- 2. Gradient-free optimization -- Introduction -- 2.1 Difficult optimization -- 2.2 One-dimensional optimization -- 2.3 DIRECT method -- 2.4 Nelder-Mead method -- 2.5 Affine shaker -- 2.6 CMAES -- 2.7 Simulated annealing -- 2.8 Research with tabu -- 2.9 Particle swarms -- 2.10 Ant colonies -- 2.11 Evolutionary algorithms -- 2.12 Conclusion -- 3. Unconstrained optimization -- Introduction -- 3.1 Newton’s method -- 3.2 Quasi-Newton methods -- 3.3 Line search -- 3.4 Trust region -- 3.5 Proximal methods -- 3.6 Convergence -- 3.7 Conclusion -- 4. Constrained optimization -- Introduction -- 4.1 Classification of methods -- 4.2 Penalization -- 4.3 Reduced gradient -- 4.4 Sequential quadratic programming -- 4.5 Interior point -- 4.6 Augmented Lagrangian -- 4.7 Conclusion -- 5. Linear programming -- Introduction -- 5.1 Simplex -- 5.2 Interior point -- 5.3 Conclusion -- Index -- Bibliography
Sommario/riassunto	This book in two volumes provides an overview of continuous, discrete and functional optimization techniques. This first volume is devoted to continuous optimization, which deals with problems with real variables, without or with constraints. After a reminder of the optimality conditions and their geometrical interpretation, the topics covered are:

-gradient-free algorithms that can be applied to any type of function;-unconstrained algorithms based on Newton-type descent methods;-algorithms with constraints: penalization, primal, dual and primal-dual methods;-linear programming with the simplex method and interior point methods. The emphasis is on understanding the principles rather than on mathematical rigor. Each concept or algorithm is accompanied by a detailed example to help you grasp the main ideas. This book is the result of 30 years of experience and is intended for students, researchers and engineers wishing to acquire a general knowledge in the field of optimization.