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Nota di contenuto	Engineering Optimization: An Introduction with Metaheuristic Applications; CONTENTS; List of Figures; Preface; Acknowledgments; Introduction; PART I FOUNDATIONS OF OPTIMIZATION AND ALGORITHMS; 1 A Brief History of Optimization; 1.1 Before 1900; 1.2 Twentieth Century; 1.3 Heuristics and Metaheuristics; Exercises; 2 Engineering Optimization; 2.1 Optimization; 2.2 Type of Optimization; 2.3 Optimization Algorithms; 2.4 Metaheuristics; 2.5 Order Notation; 2.6 Algorithm Complexity; 2.7 No Free Lunch Theorems; Exercises; 3 Mathematical Foundations; 3.1 Upper and Lower Bounds; 3.2 Basic Calculus 3.3 Optimality 3.3.1 Continuity and Smoothness; 3.3.2 Stationary Points; 3.3.3 Optimality Criteria; 3.4 Vector and Matrix Norms; 3.5 Eigenvalues and Definiteness; 3.5.1 Eigenvalues; 3.5.2 Definiteness; 3.6 Linear and Affine Functions; 3.6.1 Linear Functions; 3.6.2 Affine Functions; 3.6.3 Quadratic Form; 3.7 Gradient and Hessian Matrices; 3.7.1 Gradient; 3.7.2 Hessian; 3.7.3 Function approximations; 3.7.4 Optimality of multivariate functions; 3.8 Convexity; 3.8.1 Convex Set; 3.8.2 Convex Functions; Exercises; 4 Classic Optimization Methods I;

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4.2 Gradient-Based Methods
4.2.1 Newton's Method; 4.2.2 Steepest Descent Method; 4.2.3 Line Search; 4.2.4 Conjugate Gradient Method;
4.3 Constrained Optimization; 4.4 Linear Programming; 4.5 Simplex Method; 4.5.1 Basic Procedure; 4.5.2 Augmented Form; 4.6 Nonlinear Optimization; 4.7 Penalty Method; 4.8 Lagrange Multipliers; 4.9 Karush-Kuhn-Tucker Conditions; Exercises; 5 Classic Optimization Methods II; 5.1 BFGS Method; 5.2 Nelder-Mead Method; 5.2.1 A Simplex; 5.2.2 Nelder-Mead Downhill Simplex; 5.3 Trust-Region Method; 5.4 Sequential Quadratic Programming; 5.4.1 Quadratic Programming
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PART II METAHEURISTIC ALGORITHMS

Sommario/riassunto

An accessible introduction to metaheuristics and optimization, featuring powerful and modern algorithms for application across engineering and the sciences. From engineering and computer science to economics and management science, optimization is a core component for problem solving. Highlighting the latest developments that have evolved in recent years, *Engineering Optimization: An Introduction with Metaheuristic Applications* outlines popular metaheuristic algorithms and equips readers with the skills needed to apply these techniques to their own optimization problems. With insights
