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| Autore | Grimal, Pierre |
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| Autore | Haupt Randy L |
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Edition; List of Symbols; 1 Introduction to Optimization; 1.1 Finding the Best Solution; 1.1.1 What Is Optimization?; 1.1.2 Root Finding versus Optimization; 1.1.3 Categories of Optimization; 1.2 Minimum-Seeking Algorithms; 1.2.1 Exhaustive Search; 1.2.2 Analytical Optimization; 1.2.3 Nelder-Mead Downhill Simplex Method; 1.2.4 Optimization Based on Line Minimization; 1.3 Natural Optimization Methods; 1.4 Biological Optimization: Natural Selection; 1.5 The Genetic Algorithm; Bibliography; Exercises
 2 The Binary Genetic Algorithm 2.1 Genetic Algorithms: Natural Selection on a Computer; 2.2 Components of a Binary Genetic Algorithm; 2.2.1 Selecting the Variables and the Cost Function; 2.2.2 Variable Encoding and Decoding; 2.2.3 The Population; 2.2.4 Natural Selection; 2.2.5 Selection; 2.2.6 Mating; 2.2.7 Mutations; 2.2.8 The Next Generation; 2.2.9 Convergence; 2.3 A Parting Look; Bibliography; Exercises; 3 The Continuous Genetic Algorithm; 3.1 Components of a Continuous Genetic Algorithm; 3.1.1 The Example Variables and Cost Function; 3.1.2 Variable Encoding, Precision, and Bounds; 3.1.3 Initial Population; 3.1.4 Natural Selection; 3.1.5 Pairing; 3.1.6 Mating; 3.1.7 Mutations; 3.1.8 The Next Generation; 3.1.9 Convergence; 3.2 A Parting Look; Bibliography; Exercises; 4 Basic Applications; 4.1 "Mary Had a Little Lamb"; 4.2 Algorithmic Creativity-Genetic Art; 4.3 Word Guess; 4.4 Locating an Emergency Response Unit; 4.5 Antenna Array Design; 4.6 The Evolution of Horses; 4.5 Summary; Bibliography; 5 An Added Level of Sophistication; 5.1 Handling Expensive Cost Functions; 5.2 Multiple Objective Optimization; 5.2.1 Sum of Weighted Cost Functions; 5.2.2 Pareto Optimization; 5.3 Hybrid GA; 5.4 Gray Codes; 5.5 Gene Size; 5.6 Convergence; 5.7 Alternative Crossovers for Binary GAs; 5.8 Population; 5.9 Mutation; 5.10 Permutation Problems; 5.11 Selecting GA Parameters; 5.12 Continuous versus Binary GA; 5.13 Messy Genetic Algorithms; 5.14 Parallel Genetic Algorithms; 5.14.1 Advantages of Parallel GAs; 5.14.2 Strategies for Parallel GAs; 5.14.3 Expected Speedup; 5.14.4 An Example Parallel GA; 5.14.5 How Parallel GAs Are Being Used; Bibliography; Exercises; 6 Advanced Applications; 6.1 Traveling Salesperson Problem; 6.2 Locating an Emergency Response Unit Revisited; 6.3 Decoding a Secret Message; 6.4 Robot Trajectory Planning; 6.5 Stealth Design; 6.6 Building Dynamic Inverse Models-The Linear Case; 6.7 Building Dynamic Inverse Models-The Nonlinear Case; 6.8 Combining GAs with Simulations-Air Pollution Receptor Modeling; 6.9 Optimizing Artificial Neural Nets with GAs; 6.10 Solving High-Order Nonlinear Partial Differential Equations; Bibliography; 7 More Natural Optimization Algorithms; 7.1 Simulated Annealing; 7.2 Particle Swarm Optimization (PSO); 7.3 Ant Colony Optimization (ACO); 7.4 Genetic Programming (GP); 7.5 Cultural Algorithms; 7.6 Evolutionary Strategies

Sommario/riassunto

* This book deals with the fundamentals of genetic algorithms and their applications in a variety of different areas of engineering and science* Most significant update to the second edition is the MATLAB codes that accompany the text* Provides a thorough discussion of hybrid genetic algorithms* Features more examples than first edition