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Nota di contenuto	METAHEURISTICS; CONTENTS; Preface; Acknowledgments; Glossary; 1 Common Concepts for Metaheuristics; 1.1 Optimization Models; 1.1.1 Classical Optimization Models; 1.1.2 Complexity Theory; 1.1.2.1 Complexity of Algorithms; 1.1.2.2 Complexity of Problems; 1.2 Other Models for Optimization; 1.2.1 Optimization Under Uncertainty; 1.2.2 Dynamic Optimization; 1.2.2.1 Multiperiodic Optimization; 1.2.3 Robust Optimization; 1.3 Optimization Methods; 1.3.1 Exact Methods; 1.3.2 Approximate Algorithms; 1.3.2.1 Approximation Algorithms; 1.3.3 Metaheuristics; 1.3.4 Greedy Algorithms 1.3.5 When Using Metaheuristics?1.4 Main Common Concepts for Metaheuristics; 1.4.1 Representation; 1.4.1.1 Linear Representations; 1.4.1.2 Nonlinear Representations; 1.4.1.3 Representation-Solution Mapping; 1.4.1.4 Direct Versus Indirect Encodings; 1.4.2 Objective Function; 1.4.2.1 Self-Sufficient Objective Functions; 1.4.2.2 Guiding

Objective Functions; 1.4.2.3 Representation Decoding; 1.4.2.4 Interactive Optimization; 1.4.2.5 Relative and Competitive Objective Functions; 1.4.2.6 Meta-Modeling; 1.5 Constraint Handling; 1.5.1 Reject Strategies; 1.5.2 Penalizing Strategies
1.5.3 Repairing Strategies1.5.4 Decoding Strategies; 1.5.5 Preserving Strategies; 1.6 Parameter Tuning; 1.6.1 Off-Line Parameter Initialization; 1.6.2 Online Parameter Initialization; 1.7 Performance Analysis of Metaheuristics; 1.7.1 Experimental Design; 1.7.2 Measurement; 1.7.2.1 Quality of Solutions; 1.7.2.2 Computational Effort; 1.7.2.3 Robustness; 1.7.2.4 Statistical Analysis; 1.7.2.5 Ordinal Data Analysis; 1.7.3 Reporting; 1.8 Software Frameworks for Metaheuristics; 1.8.1 Why a Software Framework for Metaheuristics?; 1.8.2 Main Characteristics of Software Frameworks
1.8.3 ParadisEO Framework1.8.3.1 ParadisEO Architecture; 1.9 Conclusions; 1.10 Exercises; 2 Single-Solution Based Metaheuristics; 2.1 Common Concepts for Single-Solution Based Metaheuristics; 2.1.1 Neighborhood; 2.1.2 Very Large Neighborhoods; 2.1.2.1 Heuristic Search in Large Neighborhoods; 2.1.2.2 Exact Search in Large Neighborhoods; 2.1.2.3 Polynomial-Specific Neighborhoods; 2.1.3 Initial Solution; 2.1.4 Incremental Evaluation of the Neighborhood; 2.2 Fitness Landscape Analysis; 2.2.1 Distances in the Search Space; 2.2.2 Landscape Properties; 2.2.2.1 Distribution Measures
2.2.2.2 Correlation Measures2.2.3 Breaking Plateaus in a Flat Landscape; 2.3 Local Search; 2.3.1 Selection of the Neighbor; 2.3.2 Escaping from Local Optima; 2.4 Simulated Annealing; 2.4.1 Move Acceptance; 2.4.2 Cooling Schedule; 2.4.2.1 Initial Temperature; 2.4.2.2 Equilibrium State; 2.4.2.3 Cooling; 2.4.2.4 Stopping Condition; 2.4.3 Other Similar Methods; 2.4.3.1 Threshold Accepting; 2.4.3.2 Record-to-Record Travel; 2.4.3.3 Great Deluge Algorithm; 2.4.3.4 Demon Algorithms; 2.5 Tabu Search; 2.5.1 Short-Term Memory; 2.5.2 Medium-Term Memory; 2.5.3 Long-Term Memory; 2.6 Iterated Local Search
2.6.1 Perturbation Method

Sommario/riassunto

A unified view of metaheuristics This book provides a complete background on metaheuristics and shows readers how to design and implement efficient algorithms to solve complex optimization problems across a diverse range of applications, from networking and bioinformatics to engineering design, routing, and scheduling. It presents the main design questions for all families of metaheuristics and clearly illustrates how to implement the algorithms under a software framework to reuse both the design and code. Throughout the book, the key search components of metaheuristics are considered as a