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	Nota di bibliografia	Includes bibliographical references at the end of each chapters.
	Nota di contenuto	Intro; Preface; Contents; Contributors; 1 Review and Applications of Metaheuristic Algorithms in Civil Engineering; 2 Application of the Flower Pollination Algorithm in Structural Engineering; 3 Use of Swarm Intelligence in Structural Steel Design Optimization; 4 Metaheuristic Optimization in Structural Engineering; 5 Performance-Based Optimum Seismic Design of Steel Dual Braced Frames by Bat Algorithm; 6 Genetic Algorithms for Optimization of 3D Truss Structures; 7 Hybrid Meta-heuristic Application in the Asphalt Pavement Management System 8 Optimum Reinforced Concrete Design by Harmony Search Algorithm9 Reactive Power Optimization in Wind Power Plants Using Cuckoo Search Algorithm; 10 A DSS-Based Honeybee Mating Optimization (HBMO)

Algorithm for Single- and Multi-objective Design of Water Distribution Networks; 11 Application of the Simulated Annealing Algorithm for Transport Infrastructure Planning; 12 A Hybrid Bat Algorithm with Path Relinking for the Capacitated Vehicle Routing Problem; 13 Hybrid Metaheuristic Algorithms in Geotechnical Engineering; Abstract; 1 Introduction; 2 Metaheuristic Algorithms

3 Optimum Design Examples4 Conclusion; References; Abstract; 1 Introduction; 2 Flower Pollination Algorithm; 3 Numerical Examples; 4 Conclusion; References; Abstract; 1 Introduction; 2 Discrete Optimum Design of Steel Space Frames to LRFD-AISC; 3 Swarm Intelligence-Based Metaheuristic Optimization Algorithms; 4 Design Examples; 5 Summary and Conclusions; References; Abstract; 1 Introduction; 2 Formulation of Optimum Design Problem; 3 Self-Adaptive Harmony Search Algorithm (SAHS); 4 Teaching--Learning-Based Optimization; 5 Design Examples; 6 Conclusions; References; Abstract; 1 Introduction

2 Performance-Based Optimum Seismic Design3 Meta-Heuristic Algorithms; 4 Numerical Results; 5 Conclusions; References; Abstract; 1 Introduction; 2 Mathematical Formulations of Optimization Problems; 3 Genetic Algorithms; 4 Strategies Based on the Adaptive Concept; 5 Innovative Approaches in Genetic Algorithms; 6 Examples; 7 Conclusion; References; Abstract; 1 Introduction; 2 Pavement Condition Index (PCI); 3 Data Collection; 4 Empirical Method; 5 Problem Definitions; 6 PSO Arranger; 7 GA Arranger; 8 Hybrid PSO and GA Arrangers; 9 Results and Discussion; 10 Conclusions; References; Abstract

1 Introduction2 Harmony Search Algorithm; 3 Optimum Design Examples; 4 Conclusion; References; Abstract; 1 Introduction and Literature Survey; 2 Wind Power Plant System; 3 Problem Formulation; 4 Step-by-Step Procedure for ORPD Using CSA for a 41-Bus Wind Power Plant System; 5 Simulation Results and Discussion; 6 Conclusion; References; Abstract; 1 Introduction; 2 Main DSS Planning Goal: Dynamic Design of Water Distribution Networks; 3 The Optimization Problem; 4 Mathematical Statement of the Optimization Problem; 5 Single-/Multi-objective HBMO Algorithm; 6 DSS Application; 7 Conclusion

References

Sommario/riassunto

This timely book deals with a current topic, i.e. the applications of metaheuristic algorithms, with a primary focus on optimization problems in civil engineering. The first chapter offers a concise overview of different kinds of metaheuristic algorithms, explaining their advantages in solving complex engineering problems that cannot be effectively tackled by traditional methods, and citing the most important works for further reading. The remaining chapters report on advanced studies on the applications of certain metaheuristic algorithms to specific engineering problems. Genetic algorithm, bat algorithm, cuckoo search, harmony search and simulated annealing are just some of the methods presented and discussed step by step in real-application contexts, in which they are often used in combination with each other. Thanks to its synthetic yet meticulous and practice-oriented approach, the book is a perfect guide for graduate students, researchers and professionals willing to applying metaheuristic algorithms in civil engineering and other related engineering fields, such as mechanical, transport and geotechnical engineering. It is also a valuable aid for both lectures and advanced engineering students.