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	Titolo	Metaheuristics for Finding Multiple Solutions / / edited by Mike Preuss, Michael G. Epitropakis, Xiaodong Li, Jonathan E. Fieldsend
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	Descrizione fisica	1 online resource (322 pages)
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	Disciplina	518.1
	Soggetti	Artificial intelligence Computer science Computational intelligence Operations research Mathematical optimization Artificial Intelligence Theory of Computation Computational Intelligence Operations Research and Decision Theory Optimization
	Lingua di pubblicazione	Inglese
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	Livello bibliografico	Monografia
	Nota di bibliografia	Includes bibliographical references and index.
	Nota di contenuto	Introduction -- Theoretical Studies and Analysis of Niching Methods -- Parameter Adaptation in Niching Methods -- Lowering Computational Cost -- Scalability -- Performance Metrics -- Comparative Studies -- Methods for Machine Learning and Clustering -- Real-World Applications.
	Sommario/riassunto	This book presents the latest trends and developments in multimodal optimization and niching techniques. Most existing optimization methods are designed for locating a single global solution. However, in real-world settings, many problems are "multimodal" by nature, i.e., multiple satisfactory solutions exist. It may be desirable to locate several such solutions before deciding which one to use. Multimodal optimization has been the subject of intense study in the field of population-based meta-heuristic algorithms, e.g., evolutionary

algorithms (EAs), for the past few decades. These multimodal optimization techniques are commonly referred to as "niching" methods, because of the nature-inspired "niching" effect that is induced to the solution population targeting at multiple optima. Many niching methods have been developed in the EA community. Some classic examples include crowding, fitness sharing, clearing, derating, restricted tournament selection, speciation, etc. Nevertheless, applying these niching methods to real-world multimodal problems often encounters significant challenges. To facilitate the advance of niching methods in facing these challenges, this edited book highlights the latest developments in niching methods. The included chapters touch on algorithmic improvements and developments, representation, and visualization issues, as well as new research directions, such as preference incorporation in decision making and new application areas. This edited book is a first of this kind specifically on the topic of niching techniques. This book will serve as a valuable reference book both for researchers and practitioners. Although chapters are written in a mutually independent way, Chapter 1 will help novice readers get an overview of the field. It describes the development of the field and its current state and provides a comparative analysis of the IEEE CEC and ACM GECCO niching competitions of recent years, followed by a collection of open research questions and possible research directions that may be tackled in the future.