Preface

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Abstract Meta-heuristics are one of the most significant decision-making methods concerning especially in the fields of computer and electrical engineering. Most of the real-world optimizations are highly multimodal and nonlinear, under various complex constraints. Different objectives are often conflicting. Even for a single objective, sometimes, optimal solutions may not exist at all. In general, finding an optimal solution or even sub-optimal solutions is not an easy task.

Keywords Optimization · Meta-heuristics · Bio-inspired algorithms · Computer and electrical systems

Optimization techniques are one of the most important decision-making areas concerning industrial, economics, business, and financial systems. Most real-world optimizations are highly multimodal and nonlinear, under various complex constraints. Different objectives are often conflicting. Even for a single objective, sometimes, optimal solutions may not exist at all. In general, finding an optimal solution or even sub-optimal solutions is not an easy task. Metaheuristic methods are a crucial aspect of any complex algorithm, and a very active area of research is the design of nature-inspired metaheuristics. Many recent metaheuristics, especially evolutionary algorithms, are inspired by natural systems to solve complex engineering problems in a reasonable amount of time. Computer and electrical systems analysis and operation are no exception to this. Whoever has implemented a complex engineering system, knows well that the selection of the initial guess and the convergence criterion are based on heuristics. The objective of the book is to explore the emerging meta-heuristics optimization algorithms and methods in computer and electrical engineering applications. The prospective audience of the book is engineers, researchers, scientists, as well as industrialists. Chapters 1–15 are each devoted to a separate algorithm—and they each start with a brief literature review of the development of the algorithm, and then explain how it has been used for a real-life problem.

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