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Special Issue on

Metaheuristics in Optimization: A Solution to Multi-Objective Engineering Problems

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FOREWORD

Optimization techniques are used in our daily lives. The optimization algorithms solve a great variety of applied problems in diverse areas: medicine, manufacturing, transportation, supply chain, finance, government, physics, economics, artificial intelligence, etc. In an optimization model, the goal can be to minimize cost in a production system (i.e. oil refinery) where the resources are labor, raw materials, etc. and production targets must be achieved. In a hospital, the goal can be to minimize the wait time for patients in the emergency room before they are seen by a doctor. In marketing, the goal can be to maximize the profit obtained by targeting the right customers under budget and operational conditions. Shipping companies delivering packages to our homes, GPS systems, financial companies, airline reservations systems, etc. use optimization algorithms. Most real-world optimizations are highly nonlinear and multimodal, under various complex constraints. Different objectives are often conflicting. There is a need to overcome the trade-off between exact methods, which may guarantee an optimal solution with more computing time and greedy methods which require less computing time but provide a low-quality or unsatisfactory solution. The solution is obtained in an approximate or statistical way, by combining constructive methods with local and population-based search strategies.

Metaheuristic algorithms have attracted a great deal of attention in artificial intelligence, software engineering, data mining, planning and scheduling, logistics and supply chains, etc. The international conference entitled, “*Metaheuristics in Software Engineering and Its Application*”, (METASOFT-2022) was organized by the Department of Computer Science and Engineering, Institute of Technical Education and Research, Siksha ‘O’ Anusandhan (Deemed to be University), Bhubaneswar, Odisha, India, on

10–12 March 2022. The conference has focused in the direction of numerous advanced concepts in modern metaheuristic techniques that help the global leaders in fast decision making. This special issue “Metaheuristic Optimization: A Guide to Search Process” focuses on a detailed work on metaheuristic algorithms, their applications, the related issues and recent trends that provide the researchers with the skills needed to apply these algorithms to their research work towards optimizing problems. The key concepts and techniques of widely used search-based techniques and their applications are discussed in the field of networking, software engineering, electrical and mechanical engineering, etc. The good quality extended versions of some articles are covered in this special issue. The discussion on foundations of optimization and algorithms gives the idea to beginners to apply the common approaches to optimization problem. Various algorithms are applied by researchers in software testing not only for test case generation and optimization but also for test sequence generation. This is a new research area to apply metaheuristic algorithms for test sequence generation at the design phase.

The accepted manuscripts have been well organized to emphasize the cutting-edge technologies applied in electrical, electronics and computer science domains. We appreciate the authors’ contribution for disseminating the output of their research findings. We are also grateful for the help received from each individual reviewer and the programme committee members regarding peer-review process. The guest editors are highly thankful to the Chief Editor for the support to bring forward the research works to publish in *Journal of Statistics & Management System (JSMS)*, published by Taru Publications, New Delhi.

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