GUEST EDITORIAL PREFACE

Special Issue on Applied Optimization and Computing

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Recent years have seen a significant increase in the complexity of managing industrial systems and processes, which have grown to be large-scale organizations with dynamic and stochastic entities. Decision making processes arising in industrial and service sectors are becoming extremely challenging, which has necessitated effective computer-aided tools based on quantitative methods. Recent years have seen considerable progress in applied optimization and computing from both academic and industrial perspectives. Operations research methods, computing power and computational techniques for designing and improving industrial systems are continuously evolving. Optimization has traditionally been a basic tool in applied research, engineering, business and sciences. However, in the last decade, remarkable algorithmic advances as well as hardware and software improvements have provided an excellent platform on which to build more efficient applied optimization and computing based decision support systems.

On one hand, optimization techniques are constantly benefiting from theoretical advances and practical experimentation. These techniques vary from pure exact methods, such as mixed integer programming, to approximation methods such as simulation and metaheuristics. Between both extremes, new hybrid algorithms and matheuristics are emerging as efficient methods for solving complex problems. On the other hand, computer power is still growing every year at an astonishing rate. Personal computers now have multi-core processors allowing the use of multi-threaded optimization techniques. Furthermore, parallel and distributed computing techniques and architectures offer different ways to accelerate the efficiency of optimization techniques realistic scenarios where results should be obtained in almost 'real time'. All in all, application of optimization techniques enhanced using novel computational strategies is a promising research area, the use of which is expected to lead to the design and development of better systems and process in fields, ranging

from industry and services to computer systems and telecommunication networks.

With the advances in applied optimization and computing, we felt it timely to bring together a collection of recent developments in this research area in a special issue. This IJORIS special issue on Applied Optimization and Computing is aimed at engineers, scientists, operations researchers, and other applications specialists who are looking for recent advances in optimization tools to solve particular problems. The special issue provides a broad spectrum of advances in applied optimization with a focus on the algorithmic and computational aspects of different decision making processes. This special issue aims at providing IJORIS readers a selection of original and high-quality articles from researchers and practitioners in the fields of applied optimization, computational issues in optimization, and optimization of complex systems.

This IJORIS special issue contains five articles which address different problems by using modern and hybrid optimization and computing tools. The problems described in these articles span research areas, such as supply-chain management, vehicle routing problems, airport management, green energy production systems, and expert systems.

In the first article titled "*Robust Optimization Model for Runway Configurations Management*", R. Zhang and R. Kincaid present two models to optimize the runway configuration in airports, considering limited arrival and departure capacities. They discuss scenarios with and without uncertainty, and present results of computational experiments that are based on real data obtained from the JFK international airport in New York.

The second article titled "*Efficient Multiple Attribute Group Decision Making Models with Correlation Coefficient of Vague Sets*", by J. Robinson and H. Amirtharaj, presents a new approach for multiple attribute group decision making problems. In their approach, both the attribute weights and the expert weights are real numbers, and the attribute values take the form of vague values. The authors describe a model in which linguistic quantifiers are used when the expert weights are completely unknown.

In the third article titled "*Solving Large Distribution Problems in Supply Chain Networks by a Column Generation Approach*", R. Dondo and C. Méndez propose a mathematical model for a problem combining supply-chain management with vehicle routing decisions. The problem concerns the shipment of multiple products from a number of supply-sites to a number of customers through a network, in order to meet a set of given demands. Small- and medium-size instances are solved using branch-and-cut techniques. In order to efficiently solve large-size instances, they also propose a decomposition method based on a column generation procedure.

The fourth article titled "*Wind-Thermal Integrated Power System Scheduling Problem Using Cuckoo Search Algorithm*", by K. Chandrasekaran and S.P. Simon, describes a nature-inspired metaheuristic known as the cuckoo search algorithm. This metaheuristic is used to solve the unit commitment problem in a hybrid power system combining wind energy with conventional thermal energy.

In the last article, "*Evaluating the Effectiveness of Pre-positioning Policies in Response to Natural Disasters*", Chapman et al. present a stochastic linear programming model to deal with planning, coordination and distribution of supplies under risky scenarios –like those associated with possible natural disasters.

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