STATISTICS, OPTIMIZATION AND INFORMATION COMPUTING
Stat., Optim. Inf. Comput., Vol. **10**, February 2022, pp 1–3.
Published online in International Academic Press (www.IAPress.org)

Preface for the Special Issue of International Conference on Electronics, Control, Optimization and Computer Science ICECOCS20

Salma Azzouzi[1,*], Saoussen Cheikhrouhou [2], Abdessalam Ait Madi[3], and Mohammed Talibi Alaoui[4]

[1] *Faculty of sciences, Ibn Tofail University, Kenitra, Morocco*
[2] *University of Sfax, Tunisia*
[3] *National School of Applied Science, Ibn Tofail University, Kenitra, Morocco*
[4] *Sidi Mohamed Ben Abdellah University, FEZ, Morocco*

Abstract The main contributions of [Stat. Optim. Inf. Comput. Vol. 10, No. 1 (2022)], consisting of nineteen papers selected and revised from the international conference ICECOCS2020, are highlighted.

Keywords Electronics, Control, Optimization, Computer Science

DOI: 10.19139/soic-2310-5070-1482

Nowadays, design and planning functions become particularly complex and a wide range of optimization methodologies are used to minimize risks, achieve better decisions or improve the performance of existing systems. In this context, the interplay between optimization and machine learning remains one of the most important developments in modern computational science. Thus, optimization methods represent key factors in designing algorithms to extract essential knowledge from huge volumes of data. Moreover, a large amount of data comes today from different devices connected in billions to constitute the Internet of Things. Indeed, the availability of such large amount of data is leading toward the definition of new optimization problems. The aim of this special issue is to highlight some of these specific problems by combining theoretical results and computational techniques. Therefore, the works presented in this special issue cover optimization methodologies related to different fields such as: Traffic Management, E-learning, Electronics and IoT, Decision and Markov models as well as Distribution theory and Distribution network optimization. Thereafter, we present a brief review of the various works published in this special issue:

In the domain of Traffic management, Y. Ben Youssef et al. proposed to optimize the performance of multi-label model based on convolutional neural network for remote sensing images of aircraft types. To prove the effectiveness of the proposed method, they used a recent public image dataset called Multi-Type Aircraft Remote Sensing Images (MTARSI). In O. Idrissi et al., the air traffic congestion is considered. They proposed to optimize the use of the available ground network by acting on the taxiing speed in order to reduce departures delays, fuel consumption and gas emissions. In the urban context, L. Terrada et al. considered Urban Traffic Management (UTM) in the Green Supply Chain Management (GrSCM). For an efficient smart city and optimal air quality performance, the authors use IoT technologies for data collection and a deep learning-based approach for urban traffic control.

In the field of E-learning, E. M. Smaili et al. suggested using optimal personalized learning paths to prevent Learners dropout from MOOCs. They combined particle swarm optimization and machine learning methods to

*Correspondence to: Salma Azzouzi (Email: salma.azzouzi@uit.ac.ma). Laboratory of Computer Science, Faculty of sciences, Ibn Tofail University, Kenitra, Morocco.

ISSN 2310-5070 (online) ISSN 2311-004X (print)

build their system. Their approach takes into account the heterogeneity of the learners profiles by suggesting an adapted path according to their personalized needs. Still in the context of E-learning, M. Daoudi et al. used machine learning algorithms to process data collected from three Moodle distance-learning platforms. The aim is to investigate the impact of using mobile technologies to encourage the students to be more involved in the online learning process. Another paper, Z. Sabri et al. suggests to simplify and improve the learning process using gamification in education. They firstly conceived a classification of journals dealing with learning theories, game theory design and game development process by collecting and handling hundreds of papers from multiple research databases. Then, they show how applying gamification to eLearning courses can ease and succeed the integration of future learners into companies.

In the Electronics domain, A. Zannou et al. suggested a new approach to optimize data flow in IoT networks. They aim to overcome the high consumption of energy as well as data delay. In this context, their approach allows nodes to select the efficient path to transmit data from source nodes to base stations. Moreover, deploying base stations with a massive number of antennas give birth to massive multi-input multi-output technology, which can boost the quality of the wireless communication. Thus, A. Belhabib et al. analyzed the problem of pilot contamination (PC) in MIMO systems and suggested to optimize the PC problem by classifying the users using the large-scale fading coefficients of the users equipment. In addition, supercapacitors have become an optimal storage alternative for several applications. For this purpose, Z. Bououchma et al. proposed a real-time estimator of supercapacitor state-of-health. They provided then a comparison between Recursive Least Squares method and Kalman Filter for online identification of supercapacitor' state of health. Furthermore, the authors A. Lberni et al. discuss the application of a new optimization algorithm called Whale Optimization Algorithm (WOA), to the resolution and optimization of single- and multi-objective problems in microelectronic design field.

As for Aid decision making and Markov models, M. A. Tajouie et al. proposed an adaptive approach to optimize the test of probabilistic distributed systems. They suggested a new architecture based on Markov decision processes with an adaptive controller to control and optimize coordination between the various components of the system. They particularly focus on the implementation of the stochastic behavior in the distributed testing architecture. In E. A. Monir et al., the authors proposed a Variable Neighborhood Search (VNS) combined with Baum-Welch Algorithm to optimize Hidden Markov Models parameters. The idea is to use VNS to escape from local minima and enable greater exploration of the search space to enhance the learning capability of HMMs models. On the other hand, the authors in M. C. Abounaima et al. extended the ELECTRE III method to a decision problem where the decision-maker preferences are imprecise and uncertain. In this case, the authors used an uncertainty interval to express inaccuracies and uncertainties. In L. Lamrini et al., the authors suggest a Multi-Criteria Decision-Making filter with Pareto parallel implementation in shared memory environment. The aim is to provide a parallel filtering process to run on a short response time. Furthermore, the authors K.O. Touhami et al. carried out a simulation to analyze the voluntary departure decision launched in Morocco and its impact on the state of the Moroccan pension funds for the period 2005-2025. Finally, M. Bounabi et al. suggest a method for unstructured data classification by selecting optimal inference rules. The method uses an automated and optimal inference rules (IR) selection in order to strengthens the Fuzzy Inference process.

In the field of Distribution theory and network optimization, the authors in T. Moakofi et al. investigated a new generalized family of distributions called the Topp-Leone Odd Burr III-G (TL-OBIII-G) family of distributions. Properties of the new family of distributions including sub-models, quantile function, moments, incomplete and probability weighted moments, distribution of the order statistics, and Renyi entropy are derived. The Maximum likelihood estimation technique is used to estimate the model parameters, and a Monte Carlo simulation study is employed to examine the performance of the model. The authors use then two real data sets to prove the importance of the TL-OBIII-G family of distributions. Besides, S. Hammouda et al. provide a solution method based on an adaptive large neighborhood search algorithm (ALNS) to stretch the neighborhood of a solution, which optimizes and gives the best search space exploration. Finally, a swarm-based optimization heuristic was proposed in D. Zeghida et al. to deal with the Traveling Salesman Problem (TSP). In this context, the authors present and assess two new basic Ant System (AS) variants: the Ant-Step-Quantity and the Ant-Step-Density algorithms in respect

to the three existing ones through an experimental study on various symmetric TSP benchmarks.

The Guest Editors would like to thank all the authors for submitting their manuscripts in this special issue. We would want to acknowledge the reviewers for their contributions in providing constructive and useful comments to the authors. Finally, the Guest Editors would like to specially thank the Coordinating Editor of the Statistics, Optimization & Information Computing (SOIC) journal, Prof David G. Yu (Hangzhou Dianzi University, China) for his great help and support in organizing and coordinating the publication of this special issue.

Guest Editors:

Salma Azzouzi,Ibn Tofail University, Kenitra, Morocco
Saoussen Cheikhrouhou,University of Sfax, Tunisia
Abdessalam Ait Madi,Ibn Tofail University, Kenitra, Morocco
Mohammed Talibi Alaoui,Sidi Mohamed Ben Abdellah University, FEZ, Morocco