Editorial

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Biographical notes: Imed Kacem received his Diploma of 'INGENIEUR' from ENSAIT (French High School) and his MS from Lille 1 University, both in 2000, his PhD in Computer Science from the Ecole Centrale de Lille in 2003, and his HDR from Paris-Dauphine University in 2007. He is Full Professor at Paul Verlaine University of Metz (UPVM) and Head of its Computer Science Department. His research interests include combinatorial optimisation and scheduling. He is the author of more than 100 publications in refereed journals, conferences, books and chapters of books. He is Area Editor for *Computers and Industrial Engineering*. He is on the editorial boards of *European Journal of Industrial Engineering*, *International Journal of Advanced Operations Management*, *Advances in OR*, *IJPS*, *IJAMC*, *JSCI*, *JPAM* and *JISE*. He was the Organisation Chairman of CIE39, ICSSSM06 and WAC/ISIAC06. He is listed in *Who's Who In the World*.

This special issue aims to share some new trends on modelling, simulation and optimisation for industrial systems. Methodological and applicative aspects are both considered. This project has been motivated by their significant impact in several industrial systems. Especially, such an impact can be related to production performance, robustness, reliability and security of systems. For all these reasons, the design of innovative modelling approaches, simulation tools and optimisation techniques becomes a challenging scientific objective leading to intensive research activities and important projects in many well-known laboratories.

This issue is composed of six papers that focus on industrial systems and their modelling, simulation and optimisation.

In the first paper, Montoya-Torres, González-Solano and Soto-Ferrari study the problem of scheduling a set of jobs on both a single machine and identical parallel machines with the aim of minimising the completion time of the last job (makespan). Release dates are associated with jobs and one assumes the existence of sequence-dependent setup times. Motivated by the fact that this problem is strongly NP-hard even for the single machine case, this paper presents heuristics to solve it. The proposed method exploits the advantages of random generators as a strategy for diversifying the execution sequences, and then selects the best one of them. The numerical experiments are carried out on random-generated data taken from the literature. The obtained results show the effectiveness of the heuristics compared to the optimal solution and its fastness (short computational time).

The second paper, by Ayadi, Cheikhrouhou and Masmoudi, focuses on the two dimensional rectangular non-oriented guillotine cutting stock problem (TDRCSP). In this problem, many pieces with different dimensions need to be cut with different quantities

in order to satisfy customers' orders. In order to maximise the use of raw materials, make-to-order 'MTO' and make-to-stock 'MTS' production strategies are combined. In addition to the orders that need to be fulfilled, other quantities of pieces are considered when designing cutting patterns in order to satisfy the forecast plan over a fixed time horizon. The authors propose a new formulation of the optimisation problem by considering multi-period demand planning as well as inventory management constraints. Moreover, they propose a hybrid heuristic based on the combination of the Bottom Left and Shelf algorithms. Experimental results show that integrating forecast and inventory constraint is better to improve the raw material use than a real constraint. Finally, the authors report a discussion on the sensitivity and the robustness of their hybrid heuristic.

In the third article, Dai and Chen consider the collaborative transportation in which multiple carriers or shippers form a partnership to optimise their transportation operations by sharing vehicle capacities and transportation tasks. Their paper studies a carriers' collaborative transportation planning problem in less than truckload transportation (CTPLTL) with pickup and delivery tasks. They propose a two-step solution approach for solving the problem. First, a mixed integer programming model for the problem is proposed and a Lagrangian relaxation approach is developed to solve this model. Then, a set of feasible vehicle tours corresponding to the transportation plan of the carriers in collaborative transportation is constructed from the solution of the model. The performance of the proposed model and solution approach is evaluated on random instances.

In the fourth paper, Annebicque, Crévits, Poulain, Debernard and Millot reveal that the study of air traffic control of full or partial automation over the past years highlights the need for better tools to meet the challenges of modern air traffic management. They show the advantages of creating cooperative tools in concert with the conflict management process. The designing of conflict resolution tools in this way implies, however, detailed knowledge of air traffic controllers' decision-making processes. For this reason, they have developed a cooperative multi-criteria approach based on data taken from case study interviews. This practice shows how it is possible to extract criteria and preferences in the designing of bottom-up decision aiding tools. This work will allow them to create a decision support system.

In the fifth paper, Korytkowski and Wisniewski consider a multi-product production systems (MPPS) with in-line quality control. The problem of determining the optimal inspection strategy that results in lowest total inspection cost, while assuring required outgoing quality level is modelled discrete-event simulation is used to model the production system. The allocation is determined by using a tabu search algorithm.

In the last paper, Turki, Hennequin and Sauer consider a manufacturing system composed of a single machine, a buffer and a stochastic demand. They adopt a discrete flow model to describe the system and to take into account delivery times with the aim of evaluating the optimal buffer level, based on a hedging point policy. This optimal buffer allows minimising the total cost which is the sum of inventory, transportation and lost sales costs. Moreover, they propose infinitesimal perturbation for optimising the failure-prone manufacturing system. Indeed, based on discrete flow model, trajectories of all variables are studied and the perturbation analysis estimates are evaluated. These estimates are shown to be unbiased and then are implanted in an optimisation algorithm in order to determine the optimal buffer level in the presence of delivery time.

Finally, the guest editor would like to express his thanks to all the referees for their very helpful work, the authors for their contributions and the Editor-in-Chief Dr. Kannan Govindan for his help to the success of this special issue.