
Editorial

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Biographical notes: Antonio Padovano received his Master degree in Management Engineering Summa cum Laude at the University of Calabria (Italy) where he is currently Research and Teaching Assistant. His interests include simulation- and AI-based systems for supporting decision making as well as for education and training in the areas of industry, logistics, healthcare and defence modelling systems unpredictability, especially with a focus on the evaluation of human performance and reliability aspects. He participated to several conferences as speaker, peer-reviewed articles for conferences and journals and is a member of the Organizational Committee of the I3M Multiconference where he is also Track Chair. He cooperated (and actively cooperates) with several research institutions and companies worldwide, including Cal-Tek Srl, DIME University of Genoa, NASA KSC, NATO STO CMRE, Rutgers University.

Yongping Zhang is working toward her PhD degree at the School of Automation Science and Electrical Engineering in Beihang University, Beijing, China. Her main research interests are the areas of manufacturing service management, service-oriented manufacturing, and smart manufacturing, decision-making and scheduling of distributed resource services in the cloud.

Computing systems based on heterogeneous architectures are the backbone of embedded ICT and cyber-physical systems, delivering high-performance functionality. M&S is also gaining a primary role in many other fields and it is increasingly becoming a central methodology for the design of new systems (e.g., simulation based design) as well as for the analysis and improvement of existing systems (e.g., decision making, training, education, etc.).

This special issue follows the 13rd edition of the ‘International Multidisciplinary Modelling & Simulation Multi-conference’ (I3M 2016), which was held in Larnaca (Cyprus) from September 26 to 28, 2016. It is one of the biggest events of M&S worldwide hosting eight international conferences/workshops (EMSS, HMS, MAS, IMAACA, DHSS, IWISH, SESDE and FOODOPS) and three collocated events (McLeod

Workshop, Modelling and Simulation Network Workshop, New Simulation Project Workshop).

The special issue on advanced computing and simulation based manufacturing deals with the use of modelling and simulation (M&S) in an advanced computing perspective to support manufacturing (simulation-based manufacturing) and it will focus on integrating modelling and simulation tools and methodologies in real-world complex systems for solving multidisciplinary problems. It provides an overview of the current state of the art including theories, methodologies, applications and tools and features high-level original research articles on the latest research trends in the broad areas of modelling and simulation.

All the special issue papers, after their extensions (devoted to include latest results and scientific achievements) have undergone rigorous peer review and revision process to ensure high-quality scientific relevance. Final accepted six papers were based on further reviewing in this special issue, which are introduced as follows:

In the paper ‘Solving a real world steel stacking problem’, a real world steel slab stacking problem is investigated, which features continuous production and retrieval with non- instantaneous crane movements. A prioritisation heuristic for the possible crane movements is presents, finding that the greedy look-ahead heuristic outperforms the branch and bound approach when using realistic time limits.

In the paper ‘Analysis of cumulative energy demand and carbon footprint in residential building structures’, the impact of the arrangement of pillars and building height in residential building structures and its effect on the environmental impacts of the structural solution is assessed. The analysis provides the optimal arrangement for the pillars and the height of the building; the increase in separation of the pillars causes greater impacts, and the design of tall buildings also drives to an important increase of resource consumption.

In the paper ‘Development of an information fractal to optimise inventory in the supply network’, the authors develop a new conceptual framework for an information fractal with two levels named top and bottom level fractals to manage and optimise inventory including safety stock, cycle stock and prevent stock out at lowest logistics cost and further enhance integration within the network.

In the paper ‘Optimisation and simulation of an e-bike manufacturing system: the case of a small assembly factory’, the production and assembly processes of an e-bikes manufacturer are optimised by using a DES-based model, which solves the problem of the lack of theoretical tools for the design and implementation of electric bicycles’ manufacturing systems.

In the paper ‘A comparative study of hyperelastic constitutive models for an automotive shaft seal material’, a comparison of different constitutive models with experimental data for an automotive component made up of an elastomer thermoplastic material is presented. As a result, this study shows that a careful selection of the constitutive model must be made to obtain reliable results.

In the paper ‘A framework for multi-UAV software in the loop simulations’, the authors present a software-in-the-loop simulation framework for multi-UAV systems which allows test the implementation of single or multi-UAV applications, including different cooperation algorithms, sense and avoid algorithms, etc., without taking any risk.

This special issue has been made possible by the strong support of Prof. Fei Tao, the Editor-in-Chief of the journal, and the joint effort of the Journal Manager Mr. Alexandra Starkie. We would like to express our gratitude to the authors for their contributions, the referees for ensuring the quality of the accepted papers, and the staff of the Editorial Office and Production Department for their help in finalising this special issue.