Hindawi Publishing Corporation
Journal of Applied Mathematics
Volume 2013, Article ID 508176, 2 pages
http://dx.doi.org/10.1155/2013/508176

Editorial
Complex Systems Modelling, Analysis, and Control

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Received 24 October 2013; Accepted 24 October 2013

Complexity pertains to the structure of many real-world systems, shaping their behaviour and dynamics. Over the last few years, there has been an increasing interest in studying the emergent complex dynamics of processes ranging from fluid mechanics and materials science to the internet and social networks and from biological and neural systems to epidemic and ecological systems. Due to the strongly heterogeneous character of such systems as well as the stochastic and nonlinear very large scale interactions over complex networks, the emergent (macroscopic) behavior is most of the times far from trivial to predict. Self-organization, sustained oscillations, travelling waves, multiplicity of stationary states, and spatiotemporal chaos are paradigms of the rich nonlinear behavior at the coarse-grained systems level.

Hence, the quest for developing new modelling, computational-assisted, and control methodologies to analyze and design the behaviour of complex systems appears to be a major and timely challenge of our times. Finding and developing such methodologies would enable a better understanding, prediction, and design of complex systems with important health, social, and economic impact. In this special issue, we invited authors to contribute with original research and review articles with a strong focus on these topics including materials science, fluid mechanics, stochastic modelling of complex problems, multiscale computational methods, topology of complex networks and their dynamics, control and optimization methods for multiscale/complex systems, bifurcation analysis of microscopic and large scale systems, computational epidemiology, and computational neuroscience.

We received a total of 59 paper. All papers underwent a very careful peer review process and were revised to accommodate the comments made by the reviewers. We gave a lot of attention to the selection of the appropriate reviewers. We based our choice on strict academic criteria including the expertise in the field of each submitted paper and international reputation. In a very small number of manuscripts for which we received conflicting pieces of advice we chose to submit the corresponding manuscript to other referees and finally we made our decision taking into account all the reports and the strength of the arguments therein on the basis of academic merit and subject appropriateness. Finally, 14 manuscripts were accepted, that is, the acceptance rate was slightly less than 24%. The special issue is freely available online to all interested readers.

In what follows we briefly describe the published contributions.

M. Liu et al. develop a deadlock prevention system with resources reallocation and supervisor reconfiguration for designing near-optimal supervising controllers for automated flexible manufacturing systems. Their methodology is mainly focused on manufacturing-oriented Petri nets.

L. Chai and S. Fei address the problem of stabilization of a class of linear time-delayed systems for which the delay parameter appears in both the control and system matrices and is unknown. The authors show how one can