

# Preface

Computer-based modelling and simulation have become useful tools to facilitate understanding of systems in diverse domains such as physics, astrophysics, chemistry, biology, economics, engineering, and social science. A complex system is characterized by a large number of interacting components (e.g. agents and processes) whose aggregate activities are nonlinear and self-organized. Complex systems are hard to simulate or model using traditional computational approaches because of the complex relationships of components and distributed features of resources and dynamic work environments. Meanwhile, smart systems such as multi-agent systems have demonstrated advantages and great potential in modelling and simulating complex systems.

The International Workshop on Smart Simulation and Modelling for Complex Systems (SSMCS'15) was held in Buenos Aires, Argentina, in July 2015, and the International Joint Agents Workshop and Symposium (IJAWS'15) was convened in Ishikawa, Japan, in October 2015. The aims of SSMCS'15 and IJAWS'15 were to bring together researchers in artificial intelligence (AI), agent and multi-agent systems, and system modelling/simulation to discuss research challenges and cutting-edge techniques in smart simulation and modelling. This book contains the extended versions of selected papers from the SSMCS'15 and IJAWS'15 workshops. For those workshops we solicited papers on all aspects of smart simulation and modelling of complex systems through the use of agent and other AI technologies. They are, for instance, being studied in network modelling, microsimulation modelling, social influence modelling, disaster modelling, environment modelling, power market modelling and idea-discovery-process modelling. The goal of the workshops was to gather researchers from these communities to learn from one another, form long-term collaborations and cross-fertilize the various disciplines to accelerate progress toward more complex and realistic applications.

Finally, we would like to extend our sincere thanks to all authors. This book would not have been possible without the valuable support and contributions of those who cooperated with us.

Auckland, New Zealand  
Wollongong, Australia  
Koganei, Japan  
Wollongong, Australia  
Nagoya, Japan  
May 2016

Quan Bai  
Fenghui Ren  
Katsuhide Fujita  
Minjie Zhang  
Takayuki Ito

Multi-agent and Complex Systems

Bai, Q.; Ren, F.; Fujita, K.; Zhang, M.; Ito, T. (Eds.)

2017, VIII, 210 p. 73 illus., 43 illus. in color., Hardcover

ISBN: 978-981-10-2563-1