
Contents

Part I Complex system modelling and methodology

A Passage to Complex Systems <i>Michel Cotsaftis</i>	3
Holistic Metrics, a Trial on Interpreting Complex Systems <i>J. Manuel Feliz-Teixeira and António E. S. Carvalho Brito</i>	21
Different Goals in Multiscale Simulations and How to Reach Them <i>Pierrick Tranouez and Antoine Dutot</i>	29
Invariant Manifolds of Complex Systems <i>Jean-Marc Ginoux and Bruno Rosseto</i>	41
Application of Homotopy Perturbation Method for Ecosystems Modelling <i>Zaid Odibat and Cyrille Bertelle</i>	51

Part II Swarm intelligence and neuronal learning

Multi Objective Optimization Using Ant Colonies <i>Feiza Ghezail, Henri Pierreval, and Sonia Hajri-Gabouj</i>	65
Self-Organization in an Artificial Immune Network System <i>Julien Franzolini and Damien Olivier</i>	71
On Adapting Neural Network to Cellular Manufacturing <i>Dania A. El-Kebbe and Christoph Danne</i>	83

Part III Socio-environmental complex modelling and territorial intelligence

The Evolution Process of Geographical Database within Self-Organized Topological Propagation Area <i>Hakima Kadri-Dahmani, Cyrille Bertelle, Gérard H.E. Duchamp, and Aomar Osmani</i>	97
Self-Organization Simulation over Geographical Information Systems Based on Multi-Agent Platform <i>Rawan Ghnemat, Cyrille Bertelle, and Gérard H.E. Duchamp</i>	107
Cliff Collapse Hazards Spatio-Temporal Modelling through GIS: from Parameters Determination to Multi-scale Approach <i>Anne Duperret, Cyrille Bertelle, and Pierre Laville</i>	117
Structural and Dynamical Complexities of Risk and Catastrophe Systems: an Approach by System Dynamics Modelling <i>Damienne Provitolo</i>	129
Detection and Reification of Emerging Dynamical Ecosystems from Interaction Networks <i>Guillaume Prévost and Cyrille Bertelle</i>	139

Part IV Emotion and cognition modelling

Simulation of Emotional Processes in Decision Making <i>Karim Mahboub and Véronique Jay</i>	165
Emotions: Theoretical Models and Clinical Implications <i>Sophie Baudic and Gérard H. E. Duchamp</i>	177

Part V Production systems and simulation

Complex Systems Dynamics in an Economic Model with Mean Field Interactions <i>Gianfranco Giulioni</i>	189
Complexity of Traffic Interactions: Improving Behavioural Intelligence in Driving Simulation Scenarios <i>Abs Dumbuya, Anna Booth, Nick Reed, Andrew Kirkham, Toby Philpott, John Zhao, and Robert Wood</i>	201

An Integrative Simulation Model for Project Management in Chemical Process Engineering	
<i>Bernhard Kausch, Nicole Schneider, Morten Grandt, and Christopher Schlick</i>	211
Index	233