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| Livello bibliografico   | Monografia  |
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| Nota di contenuto       | Metaphysical and scientific accounts of emergence : varieties of fundamentality and theoretical completeness / John Symons -- Emergence : what does it mean and how is it relevant to computer engineering? / Wesley J. Wildman and F. LeRon Shults -- System theoretic foundations for emergent behavior modeling : the case of emergence of human language in a resource-constrained complex intelligent dynamical system / Bernard P. Zeigler and Saurabh Mittal -- : generative parallax simulation : creative cognition models of emergence for simulation-driven model discovery / Levent Yilmaz -- Complex systems engineering and the challenge of emergence / Andreas Tolk, Saikou Diallo and Saurabh Mittal -- Emergence in complex enterprises / William Rouse -- Emergence in information economies : an agent-based modeling perspective / Erika Frydenlund and David C. Earnest -- Modeling emergence in system of systems using thermodynamic concepts / John J. Johnson IV, Jose J. Padilla and Andres Sousa-Poza -- Induced emergence in computational social systems engineering : multimodels and dynamic couplings as methodological basis / Tuncer Oren, Saurabh Mittal and Umut Durak -- Applied complexity science : enabling emergence through heuristics and simulations / Michael D. Norman, Matthew T. K. Koehler and Rob Pitsko -- Towards the automated detection of emergent behavior / |

Claudia Szabo and Lachlan Birdsey -- Isolating the causes of emergent failures in computer software / Ross Gore -- From modularity to complexity : a cross-disciplinary framework for characterizing systems / Chih-Chun Chen and Nathan Crilly -- The emergence of social schemas and lossy conceptual information networks : how information transmission can lead to the apparent 'emergence' of culture / Justin E. Lane -- Modeling and simulation of emergence behavior in transportation infrastructure restoration / Akhilesh Ojha, Steven Corns, Thomas Shoberg, Ruwen Qin and Suzanna Long -- Research agenda for next generation complex systems engineering / Saikou Diallo, Saurabh Mittal and Andreas Tolk.

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## Sommario/riassunto

A comprehensive text that reviews the methods and technologies that explore emergent behavior in complex systems engineering in multidisciplinary fields. In *Emergent Behavior in Complex Systems Engineering*, the authors present the theoretical considerations and the tools required to enable the study of emergent behaviors in manmade systems. Information Technology is key to today's modern world. Scientific theories introduced in the last five decades can now be realized with the latest computational infrastructure. Modeling and simulation, along with Big Data technologies are at the forefront of such exploration and investigation. The text offers a number of simulation-based methods, technologies, and approaches that are designed to encourage the reader to incorporate simulation technologies to further their understanding of emergent behavior in complex systems. The authors present a resource for those designing, developing, managing, operating, and maintaining systems, including system of systems. The guide is designed to help better detect, analyse, understand, and manage the emergent behaviour inherent in complex systems engineering in order to reap the benefits of innovations and avoid the dangers of unforeseen consequences. This vital resource: Presents coverage of a wide range of simulation technologies Explores the subject of emergence through the lens of Modeling and Simulation (M&S) Offers contributions from authors at the forefront of various related disciplines such as philosophy, science, engineering, sociology, and economics Contains information on the next generation of complex systems engineering Written for researchers, lecturers, and students, *Emergent Behavior in Complex Systems Engineering* provides an overview of the current discussions on complexity and emergence, and shows how systems engineering methods in general and simulation methods in particular can help in gaining new insights in complex systems engineering.

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