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	Nota di contenuto	Preface -- 1 Introduction to the Geometric Theory of ODEs with Applications to Chemical Processes, Dietrich Flockerzi -- 2 Mathematical Modeling and Analysis of Nonlinear Time-Invariant RLC Circuits, Timo Reis -- 3 Interacting with Networks of Mobile Agents, Magnus Egerstedt, Jean-Pierre de la Croix, Hiroaki Kawashima, and Peter Kingston -- 4 Combinatorial optimization: the interplay of graph theory, linear and integer programming illustrated on network flow, Annegret K. Wagler -- 5 Stoichiometric and Constraint-based Analysis of Biochemical Reaction Networks, Steffen Klamt, Oliver Hädicke and Axel von Kamp -- 6 A Petri Net based Framework for Biomodel Engineering, Mary Ann Blätke, Christian Rohr, Monika Heiner and Wolfgang Marwan -- 7 Hybrid Modeling for Systems Biology: Theory and Practice, Moritz von Stosch, Nuno Carinhas and Rui Oliveira.
	Sommario/riassunto	This edited volume provides insights into and tools for the modeling, analysis, optimization, and control of large-scale networks in the life

sciences and in engineering. Large-scale systems are often the result of networked interactions between a large number of subsystems, and their analysis and control are becoming increasingly important. The chapters of this book present the basic concepts and theoretical foundations of network theory and discuss its applications in different scientific areas such as biochemical reactions, chemical production processes, systems biology, electrical circuits, and mobile agents. The aim is to identify common concepts, to understand the underlying mathematical ideas, and to inspire discussions across the borders of the various disciplines. The book originates from the interdisciplinary summer school "Large Scale Networks in Engineering and Life Sciences" hosted by the International Max Planck Research School Magdeburg, September 26-30, 2011, and will therefore be of interest to mathematicians, engineers, physicists, biologists, chemists, and anyone involved in the network sciences. In particular, due to their introductory nature the chapters can serve individually or as a whole as the basis of graduate courses and seminars, future summer schools, or as reference material for practitioners in the network sciences. .