1. Record Nr. UNINA9910816716403321

Autore	Mesbahi Mehran
Titolo	Graph theoretic methods in multiagent networks / / Mehran Mesbahi and Magnus Egerstedt
Pubbl/distr/stampa	Princeton : , : Princeton University Press, , [2010] ©2010
ISBN	9781400835355 (electronic book) 1-282-97910-8 9786612979101 1-4008-3535-6
Edizione	[STU student edition]
Descrizione fisica	1 online resource (424 pages)
Collana	Princeton series in applied mathematics
Disciplina	006.3
Soggetti	Network analysis (Planning) - Graphic methods Multiagent systems - Mathematical models
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Front matter -- Contents -- Preface -- Notation -- PART 1. FOUNDATIONS -- Chapter 1. Introduction -- Chapter 2. Graph Theory -- Chapter 3. The Agreement Protocol: Part I-The Static Case -- Chapter 4. The Agreement Protocol: Part II-Lyapunov and LaSalle -- Chapter 5. Probabilistic Analysis of Networks and Protocols -- PART 2. MULTIAGENT NETWORKS -- Chapter 6. Formation Control -- Chapter 7. Mobile Robots -- Chapter 8. Distributed Estimation -- Chapter 9. Social Networks, Epidemics, and Games -- PART 3. NETWORKS AS SYSTEMS -- Chapter 10. Agreement with Inputs and Outputs -- Chapter 11. Synthesis of Networks -- Chapter 12. Dynamic Graph Processes -- Chapter 13. Higher-order Networks -- Appendix A. -- Bibliography -- Index
Sommario/riassunto	This accessible book provides an introduction to the analysis and design of dynamic multiagent networks. Such networks are of great interest in a wide range of areas in science and engineering, including: mobile sensor networks, distributed robotics such as formation flying and swarming, quantum networks, networked economics, biological synchronization, and social networks. Focusing on graph theoretic

methods for the analysis and synthesis of dynamic multiagent networks, the book presents a powerful new formalism and set of tools for networked systems. The book's three sections look at foundations, multiagent networks, and networks as systems. The authors give an overview of important ideas from graph theory, followed by a detailed account of the agreement protocol and its various extensions, including the behavior of the protocol over undirected, directed, switching, and random networks. They cover topics such as formation control, coverage, distributed estimation, social networks, and games over networks. And they explore intriguing aspects of viewing networks as systems, by making these networks amenable to control-theoretic analysis and automatic synthesis, by monitoring their dynamic evolution, and by examining higher-order interaction models in terms of simplicial complexes and their applications. The book will interest graduate students working in systems and control, as well as in computer science and robotics. It will be a standard reference for researchers seeking a self-contained account of system-theoretic aspects of multiagent networks and their wide-ranging applications. This book has been adopted as a textbook at the following universities: ? University of Stuttgart, Germany Royal Institute of Technology, Sweden Johannes Kepler University, Austria Georgia Tech, USA University of Washington, USA Ohio University, USA