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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction to Synchronization in Nature and Physics and Cooperative Control for Multi-agent Systems on Graphs -- Algebraic Graph Theory and Cooperative Control Consensus -- Part I Distributed Optimal Design for Cooperative Control in Multi-agent Systems on Graphs -- Local Optimal Design for Cooperative Control in Multi-agent Systems on Graphs -- Riccati Design for Synchronization of Discrete-Time Systems -- Cooperative Globally Optimal Control for Multi-agent Systems on Directed Graph Topologies -- Graphical Games: Distributed Multi-player Games on Graphs -- Part II Distributed Adaptive Control for Multi-agent Cooperative Systems -- Graph Laplacian Potential and Lyapunov Functions for Multi-agent Systems -- Cooperative Adaptive Control for Systems with First-Order Nonlinear Dynamics -- Cooperative Adaptive Control for Systems with Second-Order Nonlinear Dynamics -- Cooperative Adaptive Control for Higher-Order Nonlinear Systems.
Sommario/riassunto	Task complexity, communication constraints, flexibility and energy-saving concerns are all factors that may require a group of autonomous agents to work together in a cooperative manner. Applications involving such complications include mobile robots, wireless sensor networks, unmanned aerial vehicles (UAVs), spacecraft, and so on. In such networked multi-agent scenarios, the restrictions imposed by the communication graph topology can pose severe problems in the design of cooperative feedback control systems. Cooperative control of multi-

agent systems is a challenging topic for both control theorists and practitioners and has been the subject of significant recent research. Cooperative Control of Multi-Agent Systems extends optimal control and adaptive control design methods to multi-agent systems on communication graphs. It develops Riccati design techniques for general linear dynamics for cooperative state feedback design, cooperative observer design, and cooperative dynamic output feedback design. Both continuous-time and discrete-time dynamical multi-agent systems are treated. Optimal cooperative control is introduced and neural adaptive design techniques for multi-agent nonlinear systems with unknown dynamics, which are rarely treated in literature are developed. Results spanning systems with first-, second- and on up to general high-order nonlinear dynamics are presented. Each control methodology proposed is developed by rigorous proofs. All algorithms are justified by simulation examples. The text is self-contained and will serve as an excellent comprehensive source of information for researchers and graduate students working with multi-agent systems. The Communications and Control Engineering series reports major technological advances which have potential for great impact in the fields of communication and control. It reflects research in industrial and academic institutions around the world so that the readership can exploit new possibilities as they become available.