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Nota di contenuto	Background -- Part I: Can One Hear the Shape of Coordination? -- Network Identification via Node Knock-out -- A Sieve Method for Consensus-Type Network Tomography -- Network Identification via Graph Realization -- Part II: Controllability over Networks -- Controllability and Observability of Circulant Networks -- Controllability Gramian, Symmetry Structures and Application of Circulant Networks.- Controllability and Observability of Path Networks -- Part III: System Properties of Stochastic Networks -- System Properties of Stochastic Networks: Controllability and Optimality -- Coordinated Decentralized Estimation over Random Networks -- Online Coordinated Decentralized Localization of the Seaglider with Intermittent Observations -- Social Control and Optimal Marketing --

Concluding Remarks and Future Directions.

Sommario/riassunto

This interdisciplinary thesis involves the design and analysis of coordination algorithms on networks, identification of dynamic networks, and estimation on networks with random geometries with implications for networks that support the operation of dynamic systems, e.g., formations of robotic vehicles, distributed estimation via sensor networks. The results have ramifications for fault detection and isolation of large-scale networked systems and optimization models and algorithms for next generation aircraft power systems. The author finds novel applications of the methodology in energy systems, such as residential and industrial smart energy management systems.