

1. Record Nr.	UNINA9910830187403321
Titolo	Wireless sensor and actuator networks : algorithms and protocols for scalable coordination and data communication // edited by Amiya Nayak and Ivan Stojmenovic
Pubbl/distr/stampa	Hoboken, New Jersey : , : John Wiley & Sons, , c2010 [Piscataway, New Jersey] : , : IEEE Xplore, , [2010]
ISBN	1-282-55171-X 9786612551710 0-470-57051-2 1-61583-658-6 0-470-57050-4
Descrizione fisica	1 online resource (318 p.)
Altri autori (Persone)	StojmenoviacIvan NayakAmiya
Disciplina	621.3821 681/.2
Soggetti	Wireless sensor networks Computer algorithms Computer network protocols
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	Preface -- Contributors -- 1. Applications, Models, Problems, and Solution Strategies (Hai Liu, Amiya Nayak, and Ivan Stojmenovic) -- 1.1. Wireless Sensors -- 1.2. Single-Hop Wireless Sensor Networks -- 1.3. Multihop Wireless Sensor Networks -- 1.4. Event-Driven, Periodic, and On-Demand Reporting -- 1.5. Unit Disk Graph Modeling, Hop Count Metric, and Probabilistic Reception -- 1.6. Adjustable Transmission Range and Power Metric -- 1.7. Cost Metrics -- 1.8. Sleep and Active State Modeling -- 1.9. Architectures for Wireless Sensor and Actuator Networks -- 1.10. Simple Models and Application of Wireless Sensor and Actuator Networks -- 1.11. Generating Connected Wireless Sensor and Actuator Networks -- 1.12. Generating Mobile Wireless Sensor and Actuator Networks -- 1.13. Problems at Physical, MAC, and Transport

Layers -- 1.14. Problems at the Network Layer -- 1.15. Localized Protocols as the Solution Framework -- 1.16. Implementation of Sensor Motes -- 1.17. Experiments On Test Beds -- 1.18. Experiences with the Development of Sensor Network Systems -- References -- 2. Energy-Efficient Backbones and Broadcasting in Sensor and Actuator Networks (Hai Liu, Amiya Nayak, and Ivan Stojmenovic) -- 2.1. Backbones -- 2.2. Grid Partitioning-Based Backbones -- 2.3. Clustering-Based Backbones -- 2.4. Connected Dominating Sets as Backbones -- 2.5. Overview of Broadcasting Techniques -- 2.6. Physical Layer-Based Flooding, Neighbor Detection and Route Discovery -- 2.7. Parameterless Broadcasting for Delay Tolerant-Networks -- 2.8. Backbones and Broadcasting in Sensor-Actuator Networks -- 2.9. RNG and LMST -- 2.10. Minimal Energy Broadcasting -- References -- 3. Sensor Area Coverage (Hai Liu, Amiya Nayak, and Ivan Stojmenovic) -- 3.1. Problems, Models, and Assumptions -- 3.2. Coverage and Connectivity Criteria -- 3.3. Area-Dominating Set Based Sensor Area Coverage Algorithm -- 3.4. Asynchronous Sensor Area Coverage -- 3.5. Synchronous Sensor Area Coverage -- 3.6. Multicoverage By Sensors. 3.7. Physical Layer-Based Sensing, Protocols, and Case Studies -- 3.8. Operation Range Assignment in WSAWs -- References -- 4. Geographic Routing in Wireless Sensor and Actuator Networks (Hai Liu, Amiya Nayak, and Ivan Stojmenovic) -- 4.1. Flooding-Based Routing and Georouting in Sensor Networks -- 4.2. Greedy, Projection, and Direction-Based Routing -- 4.3. Applications of Cost to Progress Ratio Framework to Georouting -- 4.4. Memorization-Based Georouting with Guaranteed Delivery -- 4.5. Guaranteed Delivery without Memorization -- 4.6. Beaconless Georouting -- 4.7. Georouting with Virtual and Tree Coordinates -- 4.8. Georouting in Sensor and Actuator Networks -- 4.9. Link Quality Metric in Sensor and Actuator Networks -- 4.10. Physical Layer Aspects and Case Studies of Georouting -- References -- 5. Multicasting, Geocasting, and Anycasting in Sensor and Actuator Networks (Arnaud Casteigts, Amiya Nayak, and Ivan Stojmenovic) -- 5.1. Multicasting -- 5.2. Geocasting with Guaranteed Delivery -- 5.3. Rate-Based Multicasting -- 5.4. Anycasting with Guaranteed Delivery -- References -- 6. Sink Mobility in Wireless Sensor Networks (Xu Li, Amiya Nayak, and Ivan Stojmenovic) -- 6.1. Introduction -- 6.2. Energy Hole Problem -- 6.3. Energy Efficiency by Sink Mobility -- 6.4. Sink Mobility in Delay-Tolerant Networks -- 6.5. Sink Mobility in Real-Time Networks -- References -- 7. Topology Control in Sensor, Actuator, and Mobile Robot Networks (Arnaud Casteigts, Amiya Nayak, and Ivan Stojmenovic) -- 7.1. Introduction -- 7.2. General Approaches In Static Sensor Networks -- 7.3. The Minimum Spanning Tree -- 7.4. Data Aggregation -- 7.5. Spanning Trees in Uncontrolled Dynamic Topologies -- 7.6. Detection of Critical Nodes and Links -- 7.7. Biconnected Robot Team Movement for Sensor Deployment -- 7.8. Augmentation Algorithm for Robot Self Deployment -- 7.9. Biconnectivity From Connectivity without Additional Constraints -- 7.10. Biconnectivity from Connectivity with Additional Constraints. References -- 8. Location Service in Sensor and Mobile Actuator Networks (Xu Li, Amiya Nayak, and Ivan Stojmenovic) -- 8.1. Introduction -- 8.2. Classification of Location Services -- 8.3. Location Update Policies -- 8.4. Flooding-Based Algorithms -- 8.5. Quorum-Based Algorithms -- 8.6. Home-Based Approaches -- References -- 9. Coordination in Sensor, Actuator, and Robot Networks (Hai Liu, Veljko Malbasa, Ivan Mezei, Amiya Nayak, and Ivan Stojmenovic) -- 9.1. Sensor-Actuator Coordination -- 9.2. Task Assignment in Multirobot Systems -- 9.3. Selecting Best Robot(s) when Communication Cost is Negligible -- 9.4. Selecting Best Robot(s) with Nonnegligible

Communication Costs -- 9.5. Dynamic Task Assignment -- 9.6. Deploying Sensors to Improve Connectivity -- 9.7. Fault-Tolerant Semipassive Coordination Among Actuators -- 9.8. Dispersion of Autonomous Mobile Robots -- 9.9. Distributed Boundary Coverage by Robots -- 9.10. Clustering Robot Swarms -- 9.11. Robot Teams for Exploration and Mapping -- 9.12. Coordinated Actuator Movement for Energy-Efficient Sensor Reporting -- 9.13. Flying Robots -- References -- 10. Sensor Placement in Sensor and Actuator Networks (Xu Li, Amiya Nayak, David Simplot-Ryl, and Ivan Stojmenovic) -- 10.1. Introduction -- 10.2. Movement-Assisted Sensor Placement -- 10.3. Mobile Sensor Migration -- 10.4. Sensor Placement by Actuators -- 10.5. Coverage Maintenance by Actuators -- 10.6. Sensor Self-Deployment -- 10.7. Sensor Relocation -- References -- Index.

---

Sommario/riassunto

A mixture of theory, experiments, and simulations that provide qualitative and quantitative insights into the technology. The important new technology of wireless sensor and actuator networks provides radically new communication and networking paradigms with many new applications. Wireless Sensor and Actuator Networks is a timely text that presents a fault-tolerant, reliable, low-latency, and energy-aware framework for wireless sensor and actuator networks, enabling readers to fulfill the ultimate goals of the applications—such as protecting critical infrastructures, achieving t

---