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| Nota di contenuto | Part I: General Sensor Characteristics -- Chapter 01: Introduction to Cell Phones and Wireless Technologies -- Chapter-02: Applications of Sensor Networks -- Chapter-03: Different Types of Transducers -- Chapter-04: Transducers Range Modeling -- Chapter-05: Clock Synchronization and Localization -- Chapter-06: Topology Discovery, Residual Energy and Energy Harvesting -- Chapter-07: TCP, Neighborhood formation, Reliable Transport and Simulators for WSNs -- Chapter-08: Sensor Nodes (SNs), Camera Sensor Nodes CSNs), and Remote Sensor Nodes (RSNs) -- Part II: Random Topology -- Chapter-09: Sensor Coverage and Connectivity for Random Deployment -- Chapter-10: Medium Access and Routing -- Chapter-11: Broadcasting, Data Aggregation, and Opportunistic Forwarding -- Chapter-12: Clustering and Energy Consumption Minimization -- Chapter-13: Intrusion Detection using WSNs -- Part III: Regular Topology -- Chapter-14: Coverage and Connectivity for Regular Deployments -- Chapter-15: Routing and Performance of Regular WSNs -- Chapter-16: Personal / Body Area Networks and Health-Care Applications -- Part IV: Security and Actuator issues -- Chapter-17: Authentication, Encryption, and Secured Communication -- Chapter-18: Interaction |

with Actuators and WSN Test-beds -- Part V: Research Directions -- Chapter-19: Application Specific Design Steps -- Chapter-20: Recent Advances -- Homework questions for each chapter -- Questions and Ideas for Design Projects.

Sommario/riassunto

This inspiring textbook provides an introduction to wireless technologies for sensors, explores potential use of sensors for numerous applications, and utilizes probability theory and mathematical methods as a means of embedding sensors in system design. It discusses the need for synchronization and underlying limitations, inter-relation between given coverage and connectivity to number of sensors needed, and the use of geometrical distance to determine location of the base station for data collection and explore use of anchor nodes for relative position determination of sensors. The book explores energy conservation, communication using TCP, the need for clustering and data aggregation, and residual energy determination and energy harvesting. It covers key topics of sensor communication like mobile base stations and relay nodes, delay-tolerant sensor networks, and remote sensing and possible applications. The book defines routing methods and do performance evaluation for random and regular sensor topology and covers intrusion detection using sensors. The book focuses on applications such as interaction with actuators, final design with respect to a given application, personal and body-area networks for health-care applications and sensor network as an integral part of IoT. Importance of both coverage and connectivity is examined thoroughly in both randomly deployed sensor networks for defense application and regularly placed sensors for an industrial set up. It goes on to cover security of systems, and strategies for secured communications. The content includes exercises as well as design based project ideas. The comprehensive coverage in the book will make it useful as a text for graduate as well as upper undergraduate courses. The book will also serve well as a course material for professional courses.