Record Nr.	UNINA9910141347803321
Autore	Rashvand Habib F.
Titolo	Distributed sensor systems : practice and applications / / Habib F. Rashvand, Jose M. Alcaraz Calero
Pubbl/distr/stampa	Chichester, West Sussex : , : Wiley, , c2012 [Piscataqay, New Jersey] : , : IEEE Xplore, , [2012]
ISBN	1-119-94198-9 1-280-58909-4 9786613618924 1-119-94135-0 1-119-94134-2
Edizione	[1st edition]
Descrizione fisica	1 online resource (379 p.)
Altri autori (Persone)	Alcaraz CaleroJose M
Disciplina	681/.2
Soggetti	Sensor networks - Design and construction Sensor networks - Industrial applications
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	List of Figures xi List of Tables xxi Preface xxiii Acknowledgements xxvii List of Abbreviations xxix 1 Distributed Sensors 1 1.1 Primary Objectives 1 1.1.1 User-Based Category 2 1.1.2 Sector-Based Category 5 1.1.3 Primary Objectives 5 1.2 Historical Development 8 1.2.1 Sensing 8 1.2.2 Historical Sensor Generations 8 1.3 Trends and Technology 10 1.3.1 Market Development Trends 10 1.3.2 Technological Developments 12 1.4 Distributed Intelligence 15 1.4.1 Innovation 16 1.4.2 Dis- Invention 19 1.4.3 Intelligent Agent 19 1.4.4 Deployment Factor 20 1.4.5 Overlay Network 21 1.4.6 Deployment Algorithm 21 1.5 Classifying Application Areas 25 1.5.1 Domain-Based Classification 26 1.5.2 Mobility-Based Classification 26 1.5.3 Intelligence-Based Classification 27 2 Smart Sensing Devices 31 2.1 Specification and Classification 31 2.2 Elementary Sensing Circuits and Devices 36 2.2.1 Elementary Electrical Sensors 37 2.2.2 Low Energy Integration 39 2.3 Actuator Interface Structures 41 2.4 Physical Phenomena Sensing Devices 45 2.4.1 Optical Sensors

1.

	45 2.4.2 Image Sensing 46 2.5 Biological and Chemical Phenomena Sensing Devices 48 2.6 Other Sensors and Actuators 54 3 Smart Sensing Architectures 59 3.1 Smart Sensor Nodes 60 3.1.1 Hardware 62 3.1.2 Software 62 3.2 Embedded Operating Systems 67 3.3 Network Formation 70 3.3.1 Node Placement 76 3.4 Networking Protocols 77 3.4.1 Location-Based Protocols 79 3.4.2 Data-Centric Protocols 83 3.4.3 Hierarchical Routing 86 3.4.4 Mobility-Based Routing Protocols 90 3.4.5 Other Routing Protocols 93 3.5 Cross-Layer Optimisation 95 3.6 Inference and Aggregation 99 3.7 Case Study: Smart Camera Networks 103 3.8 Case Study: Collaborative Beamforming 107 4 Monitoring Well Being 115 4.1 Measuring Health 116 4.2 Managing Chronic Diseases 125 4.3 Case Study: Smart Shirts 132 4.4 Case Study: Geriatric
	<ul> <li>4.5 Case Study: Outpatient Care 141 5 Clinical Applications 149</li> <li>5.1 Surgical Applications 165 5.4 Post-Operative Applications 161 5.3 Scalp Applications 165 5.4 Post-Operative Applications 171 5.5 Emergency Case Studies 181 6 Smart Home, Smart Office 189 6.1 Application Requirements 190 6.2 Energy and Resource</li> <li>Optimisation 198 6.3 Smart Home Case Studies 203 6.4 Smart</li> <li>Office Case Studies 212 7 Public Safety Applications 221 7.1</li> <li>Monitoring Airborne Toxins 223 7.2 Monitoring Forest Fires 228</li> <li>7.3 Monitoring Structural Health 233 7.4 Monitoring Traffic 242</li> <li>7.5 Case Study: Sink Location 250 7.6 Case Study: Congestion</li> <li>Avoidance 254 7.7 Case Study: Target Tracking and Surveillance 257</li> <li> 8 Geographical Applications 261 8.1 Farming Industry 261 8.2</li> <li>Mining Industry 270 8.3 Transportation 274 8.4 Remote Sensing</li> <li>and Imaging 279 8.5 Earth Resources Observation 282 8.6</li> <li>Underwater Sensing 287 Appendix A Further Details on Potential</li> <li>Devices and Systems 293 A.1 Accelerometers 293 A.2 Equipment</li> <li>295 A.2.1 Tomography 296 A.2.2 Gadgets 300 A.3 Smart</li> <li>Sensors Devices 302 A.3.1 Mica2 and Mica2Dot 302 A.3.2 MicaZ</li> <li>307 A.3.3 Telos and TMote Sky 308 A.3.4 Fleck3 and FleckNano</li> <li>310 A.3.5 3Mate! 312 A.3.6 IMote 2 312 A.3.7 System-on-</li> <li>Chip CC2510 313 A.3.8 System-on-Chip CC2530 314 A.4</li> <li>Networks and Protocols 315 A.4.1 ZigBee 315 A.4.2 RFID and</li> <li>Wireless Sensor Integration 318 A.4.3 Wireless Sensors for Industrial</li> <li>Environments 319 A.5 Systems 321 References 325 Index</li> </ul>
Sommario/riassunto	This book focuses on the distinct but tightly inter-related areas of development for distributed sensing systems In this book, the authors discuss the technological developments lead by sensor technology, addressing viable new applications to inspire a technological evolution. Under the advanced and visionary approach of distributed intelligence, the authors focus on three distinct but tightly inter-related areas of developments for distributed sensing systems (DSS): firstly, the sensor technology embracing the conversion of the phenomena of interest into desirable form of signal such as electric, secondly, the interaction process between sensing points which requires immense intelligence loosely called networking, and finally, the adoption of useful maturing systems through potential applications for right impacts for a better life and a brighter economy. Furthermore, the book contains a number of case studies and typical applications illustrating the technical details, features and functions of the systems, as well as demonstrating their benefits and limitations. Key Features: . Discusses the technological developments lead by sensor technology. Addresses viable new applications illustrating the technical details, features inductions a number of case studies and typical applications for a studies and typical applications and typical applications. Addresses viable new applications. Contains a number of case studies and typical applications and typical applications and typical applications.

the systems. Demonstrates the benefits and limitations of distributed sensing. Written by experts with vast experience in the field (both in academia and industry) This book will be an invaluable reference for postgraduates studying related courses (communication engineering, engineering management, computer systems, industrial process, automation, design, environmental, urban, surveillance), R&D engineers, system and application designers, researchers, industrial project managers and engineers, and technical and strategic managers planning new products.