

1. Record Nr.	UNINA9910141601603321
Titolo	Mobile ad hoc networking : the cutting edge directions // edited by Stefano Basagni, Marco Conti, Silvia Giordano, Ivan Stojmenovic
Pubbl/distr/stampa	Hoboken, New Jersey : , : John Wiley & Sons Inc., , [2012] [Piscataway, New Jersey] : , : IEEE Xplore, , [2013]
ISBN	1-118-51127-1 1-299-24198-0 1-118-51124-7 1-118-51123-9
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (887 p.)
Collana	IEEE series on digital & mobile communication ; ; 35
Classificazione	TEC041000
Disciplina	004.6 167
Soggetti	Ad hoc networks (Computer networks) Wireless LANs Mobile computing
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 xiii -- ACKNOWLEDGMENTS xv -- CONTRIBUTORS xvii -- PART I GENERAL ISSUES -- 1 Multihop Ad Hoc Networking: The Evolutionary Path 3 -- Marco Conti and Silvia Giordano -- 1.1 Introduction, 3 -- 1.2 MANET Research: Major Achievements and Lessons Learned, 5 -- 1.3 Multihop Ad Hoc Networks: From Theory to Reality, 16 -- 1.4 Summary and Conclusions, 25 -- 2 Enabling Technologies and Standards for Mobile Multihop Wireless Networking 34 -- Enzo Mingozzi and Claudio Cicconetti -- 2.1 Introduction, 35 -- 2.2 Broadband Wireless Access Technologies, 37 -- 2.3 Wireless Local Area Networks Technologies, 43 -- 2.4 Personal Area Networks Technologies, 53 -- 2.5 Mobility Support in Heterogeneous Scenarios, 65 -- 2.6 Conclusions, 67 -- 3 Application Scenarios 77 -- Ilias Leontiadis, Ettore Ferranti, Cecilia Mascolo, Liam McNamara, Bence Pasztor, Niki Trigoni, and Sonia Waharte -- 3.1 Introduction, 78 -- 3.2 Military Applications, 79 -- 3.3 Network Connectivity, 81 -- 3.4 Wireless Sensor Networks, 84 -- 3.5 Search and Rescue, 89 -- 3.6 Vehicular Networks, 93 -- 3.7 Personal Content Dissemination, 96 --

3.8 Conclusions, 98 -- 4 Security in Wireless Ad Hoc Networks 106 -- Roberto Di Pietro and Josep Domingo-Ferrer -- 4.1 Introduction, 106 -- 4.2 Wireless Sensor Networks, 110 -- 4.3 Unattended WSN, 125 -- 4.4 Wireless Mesh Networks, 130 -- 4.5 Delay-Tolerant Networks, 134 -- 4.6 Vehicular Ad Hoc Networks (VANETs), 137 -- 4.7 Conclusions and Open Research Issues, 144 -- 5 Architectural Solutions for End-User Mobility 154 -- Salvatore Vanini and Anna Forster -- 5.1 Introduction, 154 -- 5.2 Mesh Networks, 155 -- 5.3 Wireless Sensor Networks, 182 -- 5.4 Conclusion, 188 -- 6 Experimental Work Versus Simulation in the Study of Mobile Ad Hoc Networks 191 -- Carlo Vallati, Victor Omwando, and Prasant Mohapatra -- 6.1 Introduction, 191 -- 6.2 Overview of Mobile Ad Hoc Network Simulation Tools and Experimental Platforms, 192 -- 6.3 Gap Between Simulations and Experiments: Issues and Factors, 199. 6.4 Good Simulations: Validation, Verification, and Calibration, 220 -- 6.5 Simulators and Testbeds: Future Prospects, 226 -- 6.6 Conclusion, 228 -- PART II MESH NETWORKING -- 7 Resource Optimization in Multiradio Multichannel Wireless Mesh Networks 241 -- Antonio Capone, Ilario Filippini, Stefano Gualandi, and Di Yuan -- 7.1 Introduction, 242 -- 7.2 Network and Interference Models, 244 -- 7.3 Maximum Link Activation Under the SINR Model, 245 -- 7.4 Optimal Link Scheduling, 247 -- 7.5 Joint Routing and Scheduling, 254 -- 7.6 Dealing with Channel Assignment and Directional Antennas, 257 -- 7.7 Cooperative Networking, 263 -- 7.8 Concluding Remarks and Future Issues, 269 -- 8 Quality of Service in Mesh Networks 275 -- Raffaele Bruno -- 8.1 Introduction, 275 -- 8.2 QoS Definition, 277 -- 8.3 A Taxonomy of Existing QoS Routing Approaches, 278 -- 8.4 Routing Protocols with Optimization-Based Path Selection, 280 -- 8.5 Routing Metrics for Minimum-Weight Path Selection, 291 -- 8.6 Feedback-Based Path Selection, 307 -- 8.7 Conclusions, 308 -- PART III OPPORTUNISTIC NETWORKING -- 9 Applications in Delay-Tolerant and Opportunistic Networks 317 -- Teemu Karkkainen, Mikko Pitkanen, and Joerg Ott -- 9.1 Application Scenarios, 318 -- 9.2 Challenges for Applications Over DTN, 322 -- 9.3 Critical Mechanisms for DTN Applications, 328 -- 9.4 DTN Applications (Case Studies), 336 -- 9.5 Conclusion: Rethinking Applications for DTNs, 357 -- 10 Mobility Models in Opportunistic Networks 360 -- Kyunghan Lee, Pan Hui, and Song Chong -- 10.1 Introduction, 360 -- 10.2 Contact-Based Measurement, Analysis, and Modeling, 361 -- 10.3 Trajectory Models, 376 -- 10.4 Implications for Network Protocol Design, 399 -- 10.5 New Paradigm: Delay-Resource Tradeoffs, 406 -- 11 Opportunistic Routing 419 -- Thrasyvoulos Spyropoulos and Andreea Picu -- 11.1 Introduction, 420 -- 11.2 Cornerstones of Opportunistic Networks, 422 -- 11.3 Dealing with Uncertainty: Redundancy-Based Routing, 428 -- 11.4 Capitalizing on Structure: Utility-Based Forwarding, 435. 11.5 Hybrid Solutions: Combining Redundancy and Utility, 444 -- 11.6 Conclusion, 447 -- 12 Data Dissemination in Opportunistic Networks 453 -- Chiara Boldrini and Andrea Passarella -- 12.1 Introduction, 454 -- 12.2 Initial Ideas: PodNet, 456 -- 12.3 Social-Aware Schemes, 460 -- 12.4 Publish/Subscribe Schemes, 464 -- 12.5 Global Optimization, 469 -- 12.6 Infrastructure-Based Approaches, 474 -- 12.7 Approaches Inspired by Unstructured p2p Systems, 478 -- 12.8 Further Readings, 482 -- 13 Task Farming in Crowd Computing 491 -- Derek G. Murray, Karthik Nilakant, J. Crowcroft, and E. Yoneki -- 13.1 Introduction, 491 -- 13.2 Ideal Parallelism Model, 494 -- 13.3 Task Farming, 498 -- 13.4 Socially Aware Task Farming, 500 -- 13.5 Related Work, 510 -- 13.6 Conclusions and Future Work, 510 -- PART IV VANET -- 14 A

Taxonomy of Data Communication Protocols for Vehicular Ad Hoc Networks 517 -- Yousef-Awwad Daraghmi, Ivan Stojmenovic, and Chih-Wei Yi -- 14.1 Introduction, 517 -- 14.2 Taxonomy of VANET Communication Protocols, 520 -- 14.3 Reliability-Oriented Geocasting Protocols, 525 -- 14.4 Time-Critical Geocasting Protocols, 527 -- 14.5 Small-Scale Routing Protocols, 529 -- 14.6 Large-Scale Routing, 534 -- 14.7 Summary, 539 -- 14.8 Conclusion and Future Work, 539 -- 15 Mobility Models, Topology, and Simulations in VANET 545 -- Francisco J. Ros, Juan A. Martinez, and Pedro M. Ruiz -- 15.1 Introduction and Motivation, 545 -- 15.2 Mobility Models, 547 -- 15.3 Mobility Simulators, 551 -- 15.4 Integrated Simulators, 557 -- 15.5 Modeling Vehicular Communications, 560 -- 15.6 Analysis of Connectivity in Highways, 565 -- 15.7 Conclusion and Future Work, 572 -- 16 Experimental Work on VANET 577 -- Minglu Li and Hongzi Zhu -- 16.1 Introduction, 577 -- 16.2 MIT CarTel, 579 -- 16.3 UMass DieselNet, 581 -- 16.4 SJTU ShanghaiGrid, 584 -- 16.5 NCTU VANET Testbed, 587 -- 16.6 UCLA CVeT, 589 -- 16.7 GM DSRC Fleet, 590 -- 16.8 FleetNet Project, 591 -- 16.9 Network on Wheels (NOW) Project, 592. 16.10 Advanced Safety Vehicles (ASVs), 593 -- 16.11 Japan Automobile Research Institute (JARI), 594 -- 17 MAC Protocols for VANET 599 -- Mohammad S. Almalag, Michele C. Weigle, and Stephan Olariu -- 17.1 Introduction, 599 -- 17.2 MAC Metrics, 602 -- 17.3 IEEE Standards for MAC Protocols for VANETs, 602 -- 17.4 Alternate MAC Protocols for VANET, 606 -- 17.5 Conclusion, 616 -- 18 Cognitive Radio Vehicular Ad Hoc Networks: Design, Implementation, and Future Challenges 619 -- Marco Di Felice, Kaushik Roy Chowdhury, and Luciano Bononi -- 18.1 Introduction, 620 -- 18.2 Characteristics of Cognitive Radio Vehicular Networks, 622 -- 18.3 Applications of Cognitive Radio Vehicular Networks, 628 -- 18.4 CRV Network Architecture, 629 -- 18.5 Classification and Description of Existing Works on CRV Networks, 630 -- 18.6 Research Issues in CRVs, 636 -- 18.7 Conclusion, 640 -- 19 The Next Paradigm Shift: From Vehicular Networks to Vehicular Clouds 645 -- Stephan Olariu, Tihomir Hristov, and Gongjun Yan -- 19.1 By Way of Motivation, 646 -- 19.2 The Vehicular Model, 647 -- 19.3 Vehicular Networks, 649 -- 19.4 Cloud Computing, 650 -- 19.5 Vehicular Clouds, 652 -- 19.6 How are Vehicular Clouds Different?, 654 -- 19.7 Feasible Instances of Vehicular Clouds, 657 -- 19.8 More Application Scenarios, 660 -- 19.9 Security and Privacy in Vehicular Clouds, 666 -- 19.10 Key Management, 677 -- 19.11 Research Challenges, 680 -- 19.12 Architectures for Vehicular Clouds, 681 -- 19.13 Resource Aggregation in Vehicular Clouds, 683 -- 19.14 A Simulation Study of VC, 690 -- 19.15 Future Work, 691 -- 19.16 Where to From Here?, 693 -- PART V SENSOR NETWORKING -- 20 Wireless Sensor Networks with Energy Harvesting 703 -- Stefano Basagni, M. Yousof Naderi, Chiara Petrioli, and Dora Spenza -- 20.1 Introduction, 703 -- 20.2 Node Platforms, 704 -- 20.3 Techniques of Energy Harvesting, 709 -- 20.4 Prediction Models, 713 -- 20.5 Protocols for EHWSNs, 717 -- 21 Robot-Assisted Wireless Sensor Networks: Recent Applications and Future Challenges 737 -- Rafael Falcon, Amiya Nayak, and Ivan Stojmenovic. 21.1 Introduction, 737 -- 21.2 Robot-Assisted Sensor Placement, 740 -- 21.3 Robot-Assisted Sensor Relocation, 751 -- 21.4 Robot-Assisted Sensor Maintenance, 762 -- 21.5 Future Challenges, 763 -- 22 Underwater Networks with Limited Mobility: Algorithms, Systems, and Experiments 769 -- Carrick Detweiler, Elizabeth Basha, Marek Doniec, and Daniela Rus -- 22.1 Introduction, 770 -- 22.2 Related Work, 772 -- 22.3 Decentralized Control Algorithm, 775 -- 22.4 General System Architecture and Design, 779 -- 22.5 Application-Specific Architecture

and Design, 786 -- 22.6 Experiments and Results, 789 -- 22.7 Conclusions, 799 -- 23 Advances in Underwater Acoustic Networking 804 -- Tommaso Melodia, Hovannes Kulhandjian, Li-Chung Kuo, and Emrecan Demirors -- 23.1 Introduction, 805 -- 23.2 Communication Architecture, 806 -- 23.3 Basics of Underwater Communications, 807 -- 23.4 Physical Layer, 814 -- 23.5 Medium Access Control Layer, 822 -- 23.6 Network Layer, 829 -- 23.7 Cross-Layer Design, 833 -- 23.8 Experimental Platforms, 834 -- 23.9 UW-Buffalo: An Underwater Acoustic Testbed at the University at Buffalo, 842 -- 23.10 Conclusions, 842 -- References, 843 -- Index 853.

Sommario/riassunto

"This book provides up-to-date information on research and development in the rapidly growing area of networks based on the multi-hop ad hoc networking paradigm. It reviews all classes of networks that have successfully adopted this paradigm, pointing out how they penetrated the mass market and sparked breakthrough research. Covering both physical issues and applications, the book offers useful tools for professionals and researchers in diverse areas wishing to learn about the latest trends in sensor, actuator and robot networking, mesh networks, delay tolerant and opportunistic networking, and vehicular networks"--

"This book covers all those classes, ranging from physical issues up to applications aspects"--
