Contents

Preface v

About Editors vii

Contributors ix

Acknowledgments xxi

I 1

Chapter 1. Architectures and Cross-Layer Design for Cognitive Networks 3
Dzmitry Kliazovich, Fabrizio Granelli, and Nelson L. S. da Fonseca

Jisu Oh, Kyoung-Don Kang, Jang Young Kim and Mikhail I. Gofman

II Medium Access Control 41

Prasan Kumar Sahoo, and Jang-Ping Sheu

Chapter 4. Toward Efficient Wireless Medium Access Control 69
Shiwen Mao, Yihan Li, Prathima Agrawal, and Scott F. Midkiff
Contents

III Network Formation, Topology Discovery, and Routing 97

Chapter 5. QoS Aware Routing in Wireless Sensor Networks
Feng Zou, Donghyun Kim, Xiaofeng Gao, and Dingzhu Du

Chih-Yung Chang and Jang-Ping Sheu

Chapter 7. Cooperative Geographical Routing in Wireless Sensor Networks
Min Chen, Victor C.M. Leung and Shiwen Mao

Chapter 8. The Impact of Node Heterogeneity on ZigBee Network Routing
Ling-Jyh Chen, Li-Ping Tung, Tony Sun, and Nia-Chiang Liang

Lun-Wu Yeh, Meng-Shiuan Pan and Yu-Chee Tseng

Chapter 10. The Latest Researches on Dominating Problems in Wireless Sensor Network
Xiaofeng Gao, Feng Zou, Donghyun Kim, and Ding-Zhu Du

IV Architecture, Design and Testbed 227

Chapter 11. Elements of Sensornet Testbed Design
Divya Sakamuri, and Hongwei Zhang

Chapter 12. Time Reversal for Ultra-Wideband Communications: Architecture and Test-Bed
N. Guo, R. C. Qiu, Q. Zhang, B. M. Sadler, Z. Hu, P. Zhang, Y. Song, and C. Zhou

Chapter 13. Design of Self-Organizing Sensor Networks Using Percolation Theory
R. R. Brooks
Chapter 14. Performance of Bridging Algorithms in IEEE 802.15.3 Multi-Piconet Networks  
Jelena Mišić, Muhi Ahmed Ibne Khair, and Vojislav B. Mišić  

S. A. V. Satya Murty, P. Gireesan Namboothiri and Krishna M. Sivalingam  

Chapter 16. CBKE: Chord-Based Key Establishment Schemes for Wireless Sensor Networks  
Zhijie Jerry Shi, Bing Wang and Fan Zhang  

Chapter 17. Key Management in Wireless Sensor Networks with Multiple Base Stations  
Yong Wang, Byrav Ramamarthy and Yuyan Xue  

Chapter 18. Performances of Key Management Schemes in Wireless Sensor Networks  
Boushra Maala, Hatem Bettahar and Abdelmadjid Bouabdallah  

Chapter 19. Trust Establishment in Wireless Sensor Networks  
Chun-Fai Law and Yu-Kwong Kwok  

Chapter 20. Detection of Compromised Wireless Sensor Nodes  
Min Song, Gregory E. Patrick, and George Hsieh  

Chonho Lee and Junichi Suzuki  

Chapter 22. Node Localization in Wireless Sensor Networks  
Ziguo Zhong, Jaehoon Jeong, Ting Zhu, Shuo Guo and Tian He  

V Security  

Chapter 22. Node Localization in Wireless Sensor Networks  
Ziguo Zhong, Jaehoon Jeong, Ting Zhu, Shuo Guo and Tian He  

VI Localization and Location Discovery
Chapter 23. Distributed Location Service by Using Quorum Methods

\textit{Dandan Liu, Xiaohua Jia, and Ivan Stojmenovic}

VII Energy Efficiency


\textit{Feng Shu, Taka Sakurai, Hai L. Vu and Moshe Zukerman}


\textit{Rahul Khanna, Huaping Liu, and Hsiao-Hwa Chen}

VIII Multimedia Sensor Networks


\textit{Yuehhuai Lee, Kui Wu and Jiming Chen}

Chapter 27. Secure Image Transmissions in Wireless Multimedia Sensor Networks

\textit{Wei Wang, Dongming Peng, Honggang Wang, Hamid Sharif and Hsiao-Hwa Chen}

IX Monitoring and Detection

Chapter 28. Environmental Monitoring Sensor Network Design and Deployment

\textit{R. R. Brooks and Sampada Karundikar}

\textit{C. Post and S. Esswein}

Chapter 29. Distributed Edge Detection with Error Resilience for Wireless Sensor Networks

\textit{S. Selvakennedy}


\textit{Miguel A. Erazo, Yi Qian, Kejie Lu and Domingo Rodriguez}
Contents

Chapter 31. Deadline-Driven Data Gathering in Periodic Monitoring Sensor Networks 765
S. Selvakennedy

X Various Good Things 785

Chapter 32. Wireless Passive Sensor Networks: Research Challenges 787
Ozgur B. Akan and M. Talha Isik

Chapter 33. Location Management in Multi-Hop Wireless Sensor Networks 805
Stefano Basagni and Maurizio A. Nanni

Chapter 34. Sensor Network Economics 835
S. Buchegger and S. Krishnamurthy

Chapter 35. Low-Power Circuit Design for Cardiac Data Mining in Medical Sensor Networks 853
Fei Hu, Alexandru Samachisa, Marcin Lukowiak, Daniel Philips and Yang Xiao