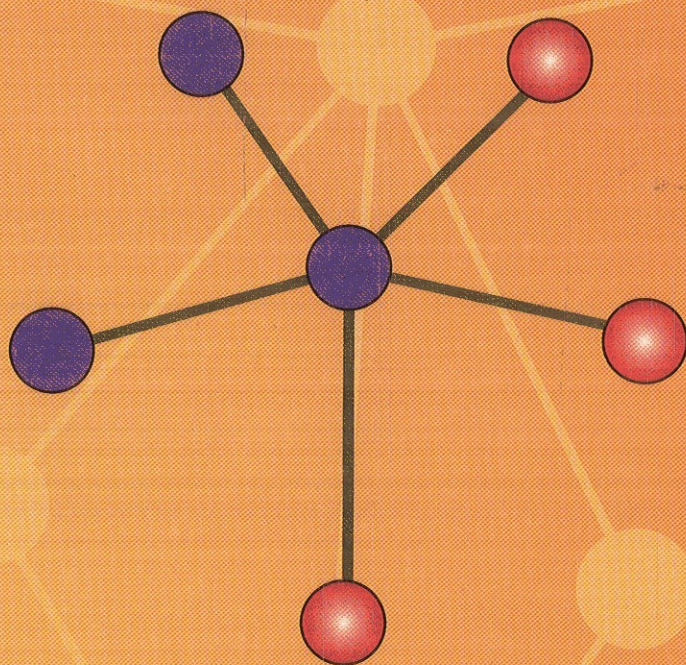


Wiley Series on Parallel and Distributed Computing • Series Editor, Albert Y. Zomaya

EMERGING WIRELESS LANs, WIRELESS PANs, AND WIRELESS MANs

IEEE 802.11, IEEE 802.15, 802.16 Wireless
Standard Family



EDITED BY

YANG XIAO • YI PAN

 WILEY

 IEEE
Celebrating 125 Years
of Engineering the Future

CONTENTS

PREFACE	ix
CONTRIBUTORS	xi
PART I IEEE 802.11 WIRELESS LANs	1
Chapter 1 IEEE 802.11 Medium Access Control and Physical Layers	3
<i>Kaveh Ghahboosi, Matti Latva-aho, and Yang Xiao</i>	
Chapter 2 Framework for Decentralized Wireless LAN Resource Management	27
<i>Jiang Xie, Ivan Howitt, and Anita Raja</i>	
Chapter 3 Incentive Issues in IEEE 802.11x Wireless Networks	65
<i>Yu-Kwong Kwok</i>	
Chapter 4 Capacity and Rate Adaptation in IEEE 802.11 Wireless LANs	81
<i>Ming Li and Yang Xiao</i>	
PART II IEEE 802.15.1 BLUETOOTH AND IEEE 802.15.2	105
Chapter 5 Overview of IEEE 802.15.1 Medium Access Control and Physical Layers	107
<i>Kaveh Ghahboosi, Yang Xiao, and Jeff J. Robertson</i>	
Chapter 6 Overview of IEEE 802.15.2: Coexistence of Wireless Personal Area Networks with Other Unlicensed Frequency Bands Operating Wireless Devices	135
<i>Kaveh Ghahboosi, Yang Xiao, Matti Latva-aho, and Babak H. Khalaj</i>	
Chapter 7 Coexistence of Bluetooth Piconets and Wireless LAN	151
<i>Jingli Li and Xiangqian Liu</i>	

PART III	IEEE 802.15.3 WIRELESS PANs	187
Chapter 8	Frame Format, Channel Access, and Piconet Operation of IEEE 802.15.3 Wireless PANs	189
	<i>Yang Xiao, Michael J. Plyler, Bo Sun, and Yi Pan</i>	
Chapter 9	Power Management and Security of IEEE 802.15.3 Wireless PANs	217
	<i>Yang Xiao, Michael J. Plyler, Bo Sun, and Yi Pan</i>	
Chapter 10	Performance Evaluation and Optimization of IEEE 802.15.3 Piconets	239
	<i>Zhanping Yin and Victor C. M. Leung</i>	
Chapter 11	Performance Analysis of MB-OFDM UWB Systems	261
	<i>Chris Snow, Lutz Lampe, and Robert Schoberg</i>	
Chapter 12	Distributed Solution for Resource Allocation in Ultra-Wideband Wireless PANs	299
	<i>Hai Jiang, Kuang-Hao Liu, Weihua Zhuang, and Xuemin (Sherman) Shen</i>	
PART IV	IEEE 802.15.4 AND 802.15.5 WIRELESS PANs	319
Chapter 13	IEEE 802.15.4 Medium Access Control and Physical Layers	321
	<i>Yang Xiao, Michael J. Plyler, Ming Li, and Fei Hu</i>	
Chapter 14	Performance Analysis for IEEE 802.15.4 Wireless Personal Area Networks	349
	<i>Hsueh-Wen Tseng, Yu-Kai Huang, and Ai-Chun Pang</i>	
Chapter 15	Data Transmission and Beacon Scheduling in Low Rate Wireless Mesh Personal Area Networks	373
	<i>Jianliang Zheng</i>	
Chapter 16	Impact of Reliable and Secure Sensing on Cluster Lifetime in IEEE 802.15.4 Networks	389
	<i>Jelena Mišić</i>	
Chapter 17	IEEE 802.15.5: Recommended Practice for WPAN Mesh Network (Low Data Rate)	415
	<i>Chunhui Zhu and Myung J. Lee</i>	
Chapter 18	Power-Saving Algorithms on IEEE 802.15.4 for Wireless Sensor Networks	439
	<i>Tae Rim Park and Myung J. Lee</i>	

PART V IEEE 802.16 WIRELESS MANs	473
Chapter 19 IEEE 802.16 Medium Access Control and Physical Layers	475
<i>Yang Xiao, Michael J. Plyler, Tianji Li, and Fei Hu</i>	
Chapter 20 QoS Support for WiMAX	497
<i>Usman A. Ali, Qiang Ni, Yang Xiao, Wenbing Yao, and Dionysios Skordoulis</i>	
Chapter 21 Subchannel Allocation and Connection Admission Control in OFDMA-Based IEEE 802.16/ WiMAX-Compliant Infrastructure Wireless Mesh Networks	515
<i>Dusit Niyato and Ekram Hossain</i>	
Chapter 22 Universal Authentication and Billing Architecture for Wireless MANs	555
<i>Xiaodong Lin, Haojin Zhu, Minghui Shi, Rongxing Lu, Pin-Han Ho, and Xuemin (Sherman) Shen</i>	
Chapter 23 Scheduling Algorithms for WiMAX Networks: Simulator Development and Performance Study	585
<i>Sai Suhas Kolukula, M. Sai Rupak, K. S. Sridharan, and Krishna M. Sivalingam</i>	
INDEX	613
ABOUT THE EDITORS	633