# Table of Contents

Foreword

Preface

Acknowledgment

## Section 1

### Mobility Research Models, Issues, and Findings in MANET

#### Chapter 1
Mobility Prediction and Mobile-aware Routing Protocols in MANETs

*Lamiaa Khalid, WINCORE Laboratory, Ryerson University, Canada*

*Muhammad Jaseemmuddin, WINCORE Laboratory, Ryerson University, Canada*

*Alagan Anpalagan, WINCORE Laboratory, Ryerson University, Canada*

#### Chapter 2
Multicast Routing Protocols in MANET

*Javad Akbari Torkestani, Islamic Azad University, Iran*

*Mohammad Reza Meybodi, Amirkabir University of Technology, Iran*

#### Chapter 3
Mobility Models for Ad-Hoc Networks:A Performance Analysis Perspective

*Shrirang Ambaji Kulkarni, National Institute of Ecology, India*

*G. Raghavendra Rao, National Institute of Ecology, India*

#### Chapter 4
Broadcasting in Wireless Ad hoc Networks:Approaches and Challenges

*Niranjan Kumar Ray, NIT Rourkela, India*

*Ashok Kumar Turuk, NIT Rourkela, India*

#### Chapter 5
Connectivity as a Fundamental Characteristic of Mobile Ad Hoc Networks

*Jiwa Abdullah, Universiti Tun Hussein Onn Malaysia, Malaysia*
Chapter 6
Overview of Temporally Ordered Routing Algorithm and QOS Components in MANETS .......... 104
Jahangir Khan, Sarhad University of Science and Information Technology Peshawar, Pakistan
Abou Bakar Nauman, Sarhad University of Science and Information Technology Peshawar, Pakistan

Section 2
MANET Protocols

Chapter 7
Topology-based Classification of Multicast Routing Protocols for Mobile Ad hoc Networks .......... 116
Natarajan Meghanathan, Jackson State University, USA

Chapter 8
Performance Comparison of AODV and DSDV Routing Protocols of MANET ....................... 144
Bhaskar N. Patel, B.S. Patel Polytechnic, India
S.G. Prajapati, B.S. Patel Polytechnic, India

Chapter 9
Analyzing Performance of Ad hoc Routing Protocols under Various Constraints ..................... 152
Lalitsen Sharma, University of Jammu, India
Supriya Gupta, University of Jammu, India

Chapter 10
Overview and Performance Analysis of Ad-Hoc on-Demand Distance Vector Routing Protocol ..... 167
Jahangir Khan, Sarhad University of Science and Information Technology Peshawar, Pakistan

Chapter 11
Environment Design Architecture of MANET: Analyzing Parameters, Deviations and Considerations .......................................................................................................................... 190
Krunal D. Trivedi, A.M. Patel Institute of Computer Studies, Ganpat University, India
Narendra J. Patel, Ganpat University, India
Palak. R. Shah, A.M. Patel Institute of computer Studies, Ganpat University, India

Section 3
MANET Threat and Security

Chapter 12
Key Generation for Wireless Sensor Networks Using Symmetric Balanced Incomplete Block Design.......................................................................................................................... 202
K. G. Srinivasa, MS Ramaiah Institute of Technology, India
V. Archana, MS Ramaiah Institute of Technology, India
V. Poornima, MS Ramaiah Institute of Technology, India
C. Reshma, MS Ramaiah Institute of Technology, India
Chapter 13
Security Issues and Models in Mobile ad hoc Networks

Revathi Venkataraman, SRM University, India
T. Rama Rao, SRM University, India

Chapter 14
Incorporating Security and Energy Efficiency for Multimedia Communications in WANets: A Cross-Layer Design

Lamia Kaddar, University of Versailles/PRiSM, France

Chapter 15
Security Threats and Issues with MANET

Sudha Singh, Bengal College of Engineering and Technology, India

Chapter 16
Security Aware Routing Protocols for Mobile Ad hoc Networks

M.S. Ali, Prof Ram Meghe College of Engineering & Management, India
P.M. Jawandhiya, Jawaharlal Darda Institute of Engineering & Technology, India

Section 4
Emerging Trends of Research in MANET

Chapter 17
Energy Conservation Issues and Challenges in MANETs

Niranjan Kumar Ray, NIT Rourkela, India
Ashok Kumar Turuk, NIT Rourkela, India

Chapter 18
Modelling WSNs Using OMNeT++

Erwin Anggadjaja, Earth Observatory of Singapore, Nanyang Technological University, Singapore
Ian V. McLoughlin, Nanyang Technological University, Singapore

Chapter 19
Data Fusion in Wireless Sensor Networks: Classification, Techniques, and Models

Lalit Agrawal, Indian Institute of Information Technology Allahabad, India
Alok Kumar; Indian Institute of Information Technology Allahabad, India
Jaya Nagori, Indian Institute of Information Technology Allahabad, India
Shirshu Varma, Indian Institute of Information Technology Allahabad, India

Chapter 20
Agility Improvement in Cognitive Radio under Bluetooth Paradigm Using Ant Colony Metaphor

Ashraf Darwish, Helwan University, Egypt
Chapter 21
Potential Area of Research in MANET.............................................................................................................. 391
  Sudha Singh, Bengal College of Engineering and Technology, India
  D. K. Singh, Birsa Institute of Technology Sindri, India.
  Mr. Sudipta Mondal, Bengal College of Engineering and Technology, India

Chapter 22
SimuMANET: An Open-Source Based Remote Tool in the Lab............................................................. 408
  Ana Vázquez Alejos, University of Vigo, Spain
  Paula Gómez Pérez, University of Vigo, Spain
  Manuel García Sánchez, University of Vigo, Spain
  Muhammad Dawood, New Mexico State University, USA

Compilation of References .......................................................................................................................... 444

About the Contributors ............................................................................................................................. 473

Index.......................................................................................................................................................... 482