Preface

As mobile communications and software capabilities quickly rise to meet a growing wireless infrastructure, hardware technology is adapting and changing at a rapid pace. Though wireless technologies have been around for decades in the form of radio, cellular communications, GPS, et cetera, the rising tide of the industry has changed the outlook of many other sectors and the way they communicate, interact, and do business. The major strength of the volumes comes from the diversity of opinions, subjects, and geographic distribution of chapter authors, allowing for a broad survey of the latest research available.

As the landscape of wireless technologies is constantly changing, it is always challenging for experts and practitioners to stay informed of the field's most up-to-date research. That is why Information Science Reference is pleased to offer this four-volume reference collection that will empower students, researchers, and academicians with a strong understanding of critical issues within wireless technologies by providing both broad and detailed perspectives on cutting-edge theories and developments. This reference is designed to act as a single reference source on conceptual, methodological, technical, and managerial issues, as well as provide insight into emerging trends and future opportunities within the discipline.

Wireless Technologies: Concepts, Methodologies, Tools and Applications is organized into eight distinct sections that provide comprehensive coverage of important topics. The sections are: (1) Fundamental Concepts and Theories, (2) Development and Design Methodologies, (3) Tools and Technologies, (4) Utilization and Application, (5) Organizational and Social Implications, (6) Managerial Impact, (7) Critical Issues, and (8) Emerging Trends. The following paragraphs provide a summary of what to expect from this invaluable reference tool.

Section 1, Fundamental Concepts and Theories, serves as a foundation for this extensive reference tool by addressing crucial theories essential to the understanding of wireless technologies. Introducing the book are a handful of chapters breaking down the fundamentals of wireless technologies. The book opens with a chapter titled *4G Wireless Networks* by Dimitrios G. Stratogiannis, Georgios I. Tsiropoulos, John D. Kanellopoulos, and Panayotis G. Cottis. The chapter introduces the fourth generation of wireless networks as they relate to various industries, focusing generally on wireless communications, with a survey of the implications of new research and development. Other chapters of note in section one include *Video Delivery in Wireless Sensor Networks* by S. Guo and T.D.C. Little, as well as *Using Mobile Technologies as Research Tools* by Ria Hanewald. The section concludes with a look at network security and privacy issues, entitled *Security Assessment of Networks* by Aftab Ahmad.

Section 2, Development and Design Methodologies, presents in-depth coverage of the conceptual design and architecture of wireless technologies, focusing on aspects including privacy preserving, energy conservation, admission control, and system architecture. The section opens with a chapter by Sohail Anwar and Chongming Zhang, titled *Event Detection in Wireless Sensor Networks*. Section two

continues through a variety of topics related to how development and design have created nuanced change in the field of wireless technologies, including work on cooperating schemes and video delivery. Section 2 contains the widest array of chapters in the book, and should provide an excellent resource to practitioners looking for a practical resource in the development of their field.

Section 3, Tools and Technologies, presents extensive coverage of new techniques and their implementation within the field. The section opens with a broad look at a technical perspective on the field in *A Technological Perspective of Mobile and Electronic Commerce Systems* by Wen-Chen Hu, Yanjun Zuo, Naima Kaabouch, and Lei Chen. Throughout the section, which contains some of the more technical and intensive subject matter and material in the book, topics include tools and technologies such as secure multipath, delay based admission control, and low resource devices. More among the twenty-plus excellent chapters include *A Novel Application of Information Communication Technology to Assist Visually Impaired People* by Tee Zhi Heng, Ang Li Minn, and Seng Kah Phooi; another great example is *Increasing Spatial Awareness by Integrating Internet Geographic Information Services (GIServices) with Real Time Wireless Mobile GIS Applications* by Ming-Hsiang Tsou and Ick Hoi Kim. Section three concludes with *Data Communications Inside Vehicular Environments*, a look at ZigBee, an energy saving, low-cost technology applied within the auto industry, authored by Cheng-Min Lin and Tzong-Jye Liu.

Section 4, Utilization and Application, describes how wireless technologies have been utilized and offers insight on important lessons for their continued use and evolution. The section begins with a discussion of security methods in MANETs and WSNs in the chapter *A Survey on Applied Cryptography in Secure Mobile Ad Hoc Networks and Wireless Sensor Networks* by Jie Wu and Jianmin Chen. As section four is the broadest and most general of all sections, the chapters within it follow many applications from various industries and technologies. A great example of the breadth of information covered within this section is *Adoption of Wearable Systems in Modern Patient Telemonitoring Systems* by Antoniadou Eleni and Ilias Maglogiannis.

Section 5, Organizational and Social Implications, focuses on the behavioral, sociological, and interpersonal aspects of wireless technologies and their applications. Within businesses and between people, organizational and social skills are greatly aided and complicated by the growing use of wireless technologies, making this section especially important to a huge portion of today's world. The section opens with a practical look at how mobile technologies are changing the workplace, in a chapter titled *A Practice Perspective on Transforming Mobile Work* by Riikka Vuokko. Section five contains more than twenty chapters with a range from generalizing and surveying to specific and technical in their scope and focus. The section concludes with *Security Across Disparate Management Domains in Coalition MANETs* by Dakshi Agrawal, Andrew D. McDonald, and Mudhakar Srivatsa; this chapter looks at a variety of security techniques within organizations, and provides an excellent transition into the next section of the book, which focuses specifically on managerial implications in the field.

Section 6, Managerial Impact, presents focused coverage of wireless technologies with regards to improvements and considerations in the workplace. The section opens with *Reality Mining, Location Based Services, and E-Business Opportunities* by José Antonio Ariza Montes, Alfonso Carlos Morales Gutiérrez, Emilio Morales Fernández, and Alfredo Romeo. Focusing more specifically on how managers can utilize wireless technologies, *Mobile Technology Adoption in the Supply Chain*, by Bill Doolin and Eman Ibrahim Al Haj Ali presents a look at how employee resource management and supply chain forecasting can be greatly aided by the opportunities afforded with utility and speed of mobile phones. Section six concludes with at how governments have taken up the mantle of mobile technologies, and

provides a look at how managers and businessmen can model the way they run their business after an industry/political standard, in a chapter titled *M-Government* by Mubarak S. Almutairi.

Section 7, Critical Issues, addresses academic, analytical, and technical perspectives in the field of wireless technologies. Though the chapters in this section are certainly within the realm of vital new perspectives, the term "critical" refers instead to critiques and analyses, and a great example is offered in the first chapter in the section, *The Critical Mass of Wireless Communications* by Lauri Frank, Kaisu Puumalainen, Sanna Sundqvist, and Anni Tuppura.

Section 8, Emerging Trends, highlights areas for future research within the field of wireless technologies, while exploring new avenues for the advancement of the discipline. Perhaps more so than any other sector of technology growth, wireless technologies seem to have taken a large portion of the industry's focus over the past decade, and they seem to be growing at an unstoppable, exponential rate. Keeping up with trends and the future of the field is a difficult task, which makes this section perhaps the most vital and consuming of the book. It begins with a survey of the near future of the field in *Evolution in Broadband Technology and Future of Wireless Broadband* by Ganesh Subramaniam and Banani Nandi. The section continues with *The Future of WiMAX* by Dennis Viehland and Sheenu Chawla, as well as *The Next Generation CDMA Technology for Futuristic Wireless Communications* by Hsiao-Hwa Chen.

Although the primary organization of the contents in this multi-volume work is based on its eight sections, offering a progression of coverage of the important concepts, methodologies, technologies, applications, social issues, and emerging trends, the reader can also identify specific contents by utilizing the extensive indexing system listed at the end of each volume. Furthermore to ensure that the scholar, researcher and educator have access to the entire contents of this multi volume set as well as additional coverage that could not be included in the print version of this publication, the publisher will provide unlimited multi-user electronic access to the online aggregated database of this collection for the life of the edition, free of charge when a library purchases a print copy. This aggregated database provides far more contents than what can be included in the print version in addition to continual updates. This unlimited access, coupled with the continuous updates to the database ensures that the most current research is accessible to knowledge seekers.

As a comprehensive collection of research on the latest findings related to using technology to providing various services, *Wireless Technologies: Concepts, Methodologies, Tools and Applications*, provides researchers, administrators and all audiences with a complete understanding of the development of applications and concepts in Wireless Technologies. Given the vast number of issues concerning usage, failure, success, policies, strategies, and applications of Wireless Technologies in organizations, *Wireless Technologies: Concepts, Methodologies, Tools and Applications* addresses the demand for a resource that encompasses the most pertinent research in Wireless Technologies development, deployment, and impact.