

Principles Of Wireless Networks A Unified Approach Prentice Hall Communications Engineering And Emerging Technologies Series

We live in a wireless society, one where convenience and accessibility determine the efficacy of the latest electronic gadgets and mobile devices. Making the most of these technologies—and ensuring their security against potential attackers—requires increased diligence in mobile technology research and development. *Mobile Computing and Wireless Networks: Concepts, Methodologies, Tools, and Applications* brings together a comprehensive range of voices and research in the area of mobile and wireless technologies, exploring the successes and failures, advantages and drawbacks, and benefits and limitations of the technology. With applications in a plethora of different research and topic areas, this multi-volume reference work benefits researchers, service providers, end-users, and information technology professionals. This four-volume reference work includes a diverse array of chapters and authors covering topics such as m-commerce, network ethics, mobile agent systems, mobile learning, communications infrastructure, and applications in fields such as business,

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healthcare, government, tourism, and more.

In this book; Chapter 1 introduces about the field of Mobile Computing, presents a short history and challenges for research, and concludes with a market vision, which shows the potential of mobile technology. Chapter 2 follows mobile IP, the extension of the Internet Protocol (IP) into the mobile domain. Ad-hoc networks with their requirements for specific routing protocols are also covered. The subsequent layer, the transport layer, is covered in Chapter 2. This chapter discusses several approaches of adapting the current transmission control protocol (TCP), which is well known from the Internet, to the special requirements of mobile communication systems. Chapter 3 comprises the global system for mobile communications (GSM) as today's most successful public mobile phone system, cordless phone technology, trunked radios, and the future development with the universal mobile telecommunications system (UMTS). Chapter 4 follows the classical layers of communication systems and explains the basics of wireless technology from a computer science point of view. Topics in this chapter are signal propagation, multiplexing, and modulation. Profound electrical engineering knowledge is not required; however, it is necessary to comprehend the basic principles of wireless transmission to understand the design decisions of higher layer communication protocols and applications. Chapter 5 and 6

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depicts that Ad hoc networks are a key to the evolution of wireless networks. They are typically composed of equal nodes that communicate over wireless links without any central control. Ad hoc wireless networks inherit the traditional problems of wireless and mobile communications, such as bandwidth optimization, power control, and transmission quality enhancement. Chapter 7 discusses handoff, which is the mechanism for transferring an ongoing call from one base station to another as a user moves through the coverage area of a cellular system. It must be fast and efficient to prevent the quality of service from degenerating to an unacceptable level. Chapter 8 reviews existing solutions to the location management problem. Chapter 9 introduces mobile number portability. We describe and analyze number portability routing mechanisms and their implementation costs. We first describe the Signaling Relay Function based solution for call-related and non-call-related routing. Chapter 10 surveys data management schemes in wireless mobile environments. Mobile computing can possibly be viewed as a variation of traditional distributed computing from the data management point of view. In general, there are two possible scenarios. Application of the concepts and principles of Network Engineering Development Lifecycle (NEDL) has been restricted to wired-network engineering development before. The work presented in this research has pioneered application of these

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concepts and principles to wireless network engineering. The author's preliminary results have shown that NEDL can provide a systematic way in wireless network development so as to enable engineers focusing on important issues in different NEDL phases. In other words, NEDL is applicable both to wired and wireless network development engineering even if there many differences between the two types of network. Another preliminary conclusion that can be drawn from this work is that wireless networks can play much more important roles in areas like Archipelago and Bay, where cabling is difficult. In other words, wireless networks are not only access means for mobility or auxiliary means as in main cities along the coast, but also the "backbone" network technology since wired network technologies are no longer applicable.

Ad hoc networking is a new area in wireless communications that is going to prevail in the next few decades. Understanding the full potential of this technology will lead to new applications both civilian and military, such as military ad hoc wireless networks, environmental sensor networks, car-based ad hoc networks, biomedical networks and many more. This text takes a "bottom-up" perspective. The physical layer performance of ad hoc wireless networks is studied in detail showing the strong dependence of higher layer performance on physical layer capabilities and limitations. A communication-theoretic perspective

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on the design of ad hoc wireless networks is presented. The interaction between physical layer and higher layers is discussed providing a new perspective in the practical design of ad hoc wireless networks. Topics in the book range from the basic principles of networking and communication systems through to applications making it ideal for practicing and R&D engineers in the wireless communications and networking industries looking to understand this new area. The inclusion of problems and solutions at the end of each chapter furthers understanding and makes it a highly relevant text for post-graduate and senior undergraduates on communication systems and computer science courses. This book advocates the idea of breaking up the cellular communication architecture by introducing cooperative strategies among wireless devices through cognitive wireless networking. It details the cooperative and cognitive aspects for future wireless communication networks. Coverage includes social and biological inspired behavior applied to wireless networks, peer-to-peer networking, cooperative networks, and spectrum sensing and management. Learn all about satellite parameters and configuration, principles of cellular networks, wireless local loops, message authentication, transmission fundamentals, antennas and propagation, signal encoding techniques, spread spectrum, coding and error control, and related topics.

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This book systematically summarizes the fundamentals and various technologies in both terrestrial radio wireless networks and underwater acoustic networks (UWANs). It addresses the basic issues frequently investigated in terrestrial radio wireless networks and the key technologies suitable for the newly developing research area of UWANs. Starting with a review of our current understanding of wireless networks, it then introduces the principles of the main technologies, including error control, medium access control (MAC) protocols, routing protocols, end-to-end transmission control and mobility issues as well as network security for terrestrial radio wireless networks, and offers detailed surveys of these technologies for UWANs. Providing readers with the basic knowledge of terrestrial radio wireless networking technologies and raising readers' awareness of the developing topic of UWANs in ocean, it is a valuable resource for researchers and practitioners in terrestrial radio wireless networks and UWANs. Ensuring secure transmission and good quality of service (QoS) in ad hoc wireless networks are key commercial concerns. Focusing on practical potential solutions, this text covers security and QoS in these networks. Starting with a review of the basic principles of ad hoc wireless networking, coverage progresses to vulnerabilities, and the requirements and solutions necessary to tackle them. QoS in relation to ad hoc networks is covered in detail, with specific attention to routing, QoS support in unicast

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communication, and recent developments in the area. Secure routing, intrusion detection, security in WiMax networks and trust management are also covered, the latter being based on principles and practice of key management and authentication in distributed networks. Representing the state-of-the-art in ad hoc wireless network security, this book is a valuable resource for researchers in electrical and computer engineering, as well as practitioners in the wireless communications industry.

A relative newcomer to the field of wireless communications, ad hoc networking is growing quickly, both in its importance and its applications. With rapid advances in hardware, software, and protocols, ad hoc networks are now coming of age, and the time has come to bring together into one reference their principles, technologies, and techniques. The Handbook of Ad Hoc Wireless Networks does exactly that. Experts from around the world have joined forces to create the definitive reference for the field. From the basic concepts, techniques, systems, and protocols of wireless communication to the particulars of ad hoc network routing methods, power, connections, traffic management, and security, this handbook covers virtually every aspect of ad hoc wireless networking. It includes a section that explores several routing methods and protocols directly related to implementing ad hoc networks in a variety of applications. The benefits of ad hoc wireless networks are many, but several challenges remain. Organized for easy reference, The Handbook of Ad Hoc Wireless Networks is your opportunity to gain quick familiarity with the state of the art, have at

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your disposal the only complete reference on the subject available, and prepare to meet the technological and implementation challenges you'll encounter in practice.

Going beyond classic networking principles and architectures for better wireless performance Written by authors with vast experience in academia and industry, Wireless Mesh Networks provides its readers with a thorough overview and in-depth understanding of the state-of-the-art in wireless mesh networking. It offers guidance on how to develop new ideas to advance this technology, and how to support emerging applications and services. The contents of the book follow the TCP/IP protocol stack, starting from the physical layer. Functionalities and existing protocols and algorithms for each protocol layer are covered in depth. The book is written in an accessible textbook style, and contains supporting materials such as problems and exercises to assist learning. Key Features: Presents an in-depth explanation of recent advances and open research issues in wireless mesh networking, and offers concrete and comprehensive material to guide deployment and product development Describes system architectures and applications of wireless mesh networks (WMNs), and discusses the critical factors influencing protocol design Explores theoretical network capacity and the state-of-the-art protocols related to WMNs Surveys standards that have been specified and standard drafts that are being specified for WMNs, in particular the latest standardization results in IEEE 802.11s, 802.15.5, 802.16 mesh mode, and 802.16 relay mode Includes an accompanying website with PPT-slides, further reading, tutorial

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material, exercises, and solutions Advanced students on networking, computer science, and electrical engineering courses will find Wireless Mesh Networks an essential read. It will also be of interest to wireless networking academics, researchers, and engineers at universities and in industry.

Wireless Cellular Communication is the biggest opportunity ever for our industry. With capabilities much greater than today's networks, opportunities beyond our imagination will appear. With 5G, we will be able to digitalize industries and realize the full potential of a networked society. So far, cellular innovation has focused on driving data rates. With 5G, in addition we see the advent of low-latency Tactile Internet and massive IoT generating new opportunities for society. 5G brings new technology solutions to the 5G mobile networks including new spectrum options, new antenna structures, new physical layer and protocols designs and new network architectures. The authors review the deployment aspects such as Millimeter Wave Communication and transport network and explore the 5G performance aspects including speed and coverage and latency. The book also looks at all the sub-systems of the network, focusing on both the practical and theoretical issues. This text book "Wireless Cellular Communications" is organized into Nine Chapters. Chapter-1: Introduction of Wireless Cellular Communications Chapter-2: GSM - System Overview Chapter-3: General Packet Radio Service (GPRS) Chapter- 4: GSM EDGE Chapter-5: IS-95 CDMA Chapter-6: UMB- Ultra-Mobile Broadband Chapter-7: HSPA and LTE Features Chapter-8: Introduction to 5G

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Wireless Communication Chapter-9: 6G Mobile Communications Technology Salient Features-Comprehensive Coverage of Basics of Wireless Cellular Communications, 2G Wireless Networks, Wireless Systems and Standards of 1g to 6G Wireless Communications, Architecture of Wireless Communications, Modulation and Multiple Access Techniques for 1G to 6G.-New elements in book include Channels for 5G Wireless Communication and 6G Mobile Communications Technology.-Clear perception of the various problems with a large number of neat, well drawn and illustrative diagrams. -Simple Language, easy- to- understand manner. Our sincere thanks are due to all Scientists, Engineers, Authors and Publishers, whose works and text have been the source of enlightenment, inspiration and guidance to us in presenting this small book. I will appreciate any suggestions from students and faculty members alike so that we can strive to make the text book more useful in the edition to come.

For cellular radio engineers and technicians. The leading book on wireless communications offers a wealth of practical information on the implementation realities of wireless communications. This book also contains up-to-date information on the major wireless communications standards from around the world. Covers every fundamental aspect of wireless communications, from cellular system design to networking, plus world-wide standards, including ETACS, GSM, and PDC. .

In the Age of Enlightenment the German philosopher Immanuel Kant encouraged

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people to use their own mind as the basis for reasoning instead of following dogmatic religious rules - Sapere aude! (dare to know!) - Today wireless communication networks are increasingly becoming aware of the conditions of its their component parts and surrounding environment. Cognition, a continuous process involving sensing, reasoning, understanding and reacting, can be applied to wireless networks in order to adapt the system to the highly dynamic wireless ecosystem. The ultimate goals are to enhance the efficiency in the use of radio resources as well as to improve both link and network performance. This book presents a detailed overview of a rapidly emerging topic in modern communications: cognitive wireless networks. The key aspects of cognitive and cooperative principles in wireless networks are discussed in this book. Furthermore, Cognitive Wireless Networks advocates the concept of breaking up the cellular communication architecture by introducing cooperative strategies among wireless devices. Cognitive wireless networking is the key to success in handling the upcoming dynamic network configurations and exploiting this cross-over to the fullest extent. As wireless networks become pervasive, highly populated and increasingly complex, the essential preconditions for exploiting rich interactions among mobile devices are better fulfilled. Today, these trends are giving rise to new communications paradigms making use of cooperation and cognition as the main underlying principles. Cognition, together with its complementary principle cooperation, confer to the wireless networks some degree of consciousness or understanding about their own existence,

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such as internal structure, capabilities, relationships to the outside world, limitations, current use of radio resources and many more. Current wireless networks are aware of their surrounding environment to a very limited extent, but in future wireless networks this capability will be highly developed, as a consequence of exploiting jointly cooperative and cognitive principles. Especially for cooperative wireless networks, where the communication scenario is highly dynamic, the mobile devices need to adapt their capabilities in a flexible manner, taking advantage of cognitive principles.

From entertainment to telephony, emerging wireless systems will make possible a new generation of wireless multimedia applications. "Multimedia Wireless Networks" is the first book to help network professionals systematically address QoS in today's most important wireless networks -- and tomorrow's.

A unified foundation for understanding and building any wireless network. A true systems approach to wireless networking Air interference design and network operation Planning, mobility management, radio resources, power management, and security 3G, WLANs, HIPERLAN, WATM, Bluetooth, WPAN, OFDM, UWB, wireless geolocation, and more This is the first book to present a unified common foundation for understanding and building any contemporary wireless network, voice or data-- from PCS to wireless LANs, Bluetooth to IMT-2000 3G. Using extensive practical examples, Kaveh Pahlavan and Prashant Krishnamurthy present a true systems approach, illuminating the principles, commonalities, key differences, and specific implementation issues associated with virtually every leading wireless system. Coverage includes: Air interference design: wireless medium characteristics,

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media access, and an exceptionally thorough discussion of physical layer issues
Wireless network operation: planning, mobility management, radio resources, power management, and security
Implementation of cellular telephone and mobile data networks based on CDMA, TDMA, and GSM
Key wideband local access technologies: IEEE 802.11 WLANs, HIPERLAN, and connection-based voice-oriented WATM
Emerging OFDM and Ultrawideband (UWB) technologies
Ad hoc networking, Bluetooth, and WPAN
Wireless geolocation and indoor positioning techniques and systems
The most detailed discussions of channel characteristics and deployment tools available in any book
Whether you're an electrical engineer, telecommunications/networking specialist, or software professional, "Principles of Wireless Networks" brings together the insights and techniques you need to begin building any wireless system.

This unique and practical text introduces the principles of WLANs based upon the IEEE 802.11 standards, demonstrating how to configure equipment in order to implement various network solutions. The text is supported by examples and detailed instructions.

Assuming only a basic knowledge of communication networks, Principles of Mobile Computing and Communications provides an understanding of wireless networks and relevant standards, highlighting issues that are unique to the mobile computing environment and exploring the differences between conventional and mobile applications. This book covers wireless network standards for cellular networks, WLAN, WPANs, wireless sensor networks, MANETs, and mobile IPs. It discusses location identification techniques as well as location systems. It also explores the issue of security in wireless networks and presents case studies to illustrate the requirements for developing mobile applications. A Web site provides ancillary material for

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classroom use.

As the demand for higher bandwidth has led to the development of increasingly complex wireless technologies, an understanding of both wireless networking technologies and radio frequency (RF) principles is essential for implementing high performance and cost effective wireless networks. *Wireless Networking Technology* clearly explains the latest wireless technologies, covering all scales of wireless networking from personal (PAN) through local area (LAN) to metropolitan (MAN). Building on a comprehensive review of the underlying technologies, this practical guide contains 'how to' implementation information, including a case study that looks at the specific requirements for a voice over wireless LAN application. This invaluable resource will give engineers and managers all the necessary knowledge to design, implement and operate high performance wireless networks. - Explore in detail wireless networking technologies and understand the concepts behind RF propagation. - Gain the knowledge and skills required to install, use and troubleshoot wireless networks. - Learn how to address the problems involved in implementing a wireless network, including the impact of signal propagation on operating range, equipment inter-operability problems and many more. - Maximise the efficiency and security of your wireless network.

This book examines two main topics, namely, *Wireless Networking* and *Mobile Data Management*. It is designed around a course the author began teaching to senior undergraduate and master's students at the Department of Computer Science & Engineering of the Indian Institute of Technology Kanpur. The first part of the book, consisting of eight chapters, including the introduction, focuses exclusively on wireless networking aspects. It begins with cellular communication systems, which provided the foundation of wireless

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networking principles. Three subsequent chapters are devoted to the Global System for Mobile communication (GSM), Wireless Local Area Network (WLAN), Bluetooth, infrared (IR), ZigBee and 6LoWPAN protocols. There is also a chapter on routings in ad hoc networks, an area that is currently being intensively researched due to its potential applications in areas of vehicular network, traffic management, tactical and military systems. Furthermore, the book discusses mobile operating systems and wireless network application level protocols such as Wireless Application Protocols (WAP), Mobile IP and Mosh. The second part highlights mobile data management. It addresses the issues like location management, the importance of replication and caching in mobile environments, the concept of broadcast disk and indexing in air, storage systems for sharing data in mobile environments, and building smart environments. Given that the design of algorithms is the key to applications in data management; this part begins with a chapter on the type of paradigm shift that has been introduced in the design of algorithms, especially due to asymmetry in mobile environments. Lastly, the closing chapter of the book explores smart environments, showing the readers how wireless technology and mobile data management can be combined to provide optimum comfort for human life. Though the book has been structured as a monograph, it can be used both as a textbook and as a reference material for researchers and developers working in the area.

Data Communication Principles for Fixed and Wireless Networks focuses on the physical and data link layers. Included are examples that apply to a diversified range of higher level protocols such as TCP/IP, OSI and packet based wireless networks. Performance modeling is introduced for beginners requiring basic mathematics. Separate discussion has been included on wireless cellular networks performance and on the simulation of networks. Throughout the

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book, wireless LANs has been given the same level of treatment as fixed network protocols. It is assumed that readers would be familiar with basic mathematics and have some knowledge of binary number systems. Data Communication Principles for Fixed and Wireless Networks is for students at the senior undergraduate and first year graduate levels. It can also be used as a reference work for professionals working in the areas of data networks, computer networks and internet protocols.

Ad hoc mobile wireless networks have seen increased adaptation in a variety of disciplines because they can be deployed with simple infrastructures and virtually no central administration. In particular, the development of ad hoc wireless and sensor networks provides tremendous opportunities in areas including disaster recovery, defense, health care
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This textbook provides the reader with a basic understanding of the design and analysis of wireless and mobile communication systems. It deals with the most important techniques, models and tools used today in the design of mobile wireless links and gives an introduction to the design of wireless networks. Topics covered include: fundamentals of radio propagation and antennas; transmission schemes, including modulation, coding and equalising schemes for broadband wireless communications; diversity systems; wireless data transmission; introduction to Wireless Network design and resource management. The fundamentals are illustrated by examples from state-of-the-art technologies such as OFDM, WCDMA, WLANs and others. The book contains a significant number of worked examples and more than 160 problems with answers. It is intended for use in a first graduate course in Wireless Communications and the reader should be familiar with the fundamentals of probability and

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communication theory.

A comprehensive, encompassing and accessible text examining a wide range of key Wireless Networking and Localization technologies This book provides a unified treatment of issues related to all wireless access and wireless localization techniques. The book reflects principles of design and deployment of infrastructure for wireless access and localization for wide, local, and personal networking. Description of wireless access methods includes design and deployment of traditional TDMA and CDMA technologies and emerging Long Term Evolution (LTE) techniques for wide area cellular networks, the IEEE 802.11/WiFi wireless local area networks as well as IEEE 802.15 Bluetooth, ZigBee, Ultra Wideband (UWB), RF Microwave and body area networks used for sensor and ad hoc networks. The principles of wireless localization techniques using time-of-arrival and received-signal-strength of the wireless signal used in military and commercial applications in smart devices operating in urban, indoor and inside the human body localization are explained and compared. Questions, problem sets and hands-on projects enhances the learning experience for students to understand and appreciate the subject. These include analytical and practical examples with software projects to challenge students in practically important simulation problems, and problem sets that use MatLab. Key features: Provides a broad coverage of main wireless technologies including emerging technical developments such as body area networking and cyber physical systems Written in a tutorial form that can be used by students and researchers in the field Includes practical examples and software projects to challenge students in practically important simulation problems

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Cooperation in Wireless Networks: Principles and Applications covers the underlying principles of cooperative techniques as well as several applications demonstrating the use of such techniques in practical systems. The book is written in a collaborative manner by several authors from Asia, America, and Europe. This book puts into one volume a comprehensive and technically rich appraisal of the wireless communications scene from a cooperation point of view.

A concise and clear guide to the concepts and applications of wireless sensor networks, ideal for students, practitioners and researchers.

Enable enterprise-wide information access using Cisco wireless networks Wireless networks are rapidly becoming a viable alternative to traditional wired LANs (Local Area Networks), mainly because of the convenience they provide. By implementing a wireless network, companies eliminate the need and expense of installing fixed cables, outlet ports or patch panels. Building a Cisco Wireless LAN is for individuals designing and supporting a Cisco wireless LAN. The book contains detailed information on the process for the thorough and accurate network design for the Cisco 340, 350, and UBR 7200 series. The contains detailed information on the configuration and troubleshooting of a Cisco WLAN installation. The book offers an introduction to wireless technology from the fundamental principles to the actual implementation. The first book for Cisco LAN users looking to upgrade to a wireless network Ideal for Network administrators looking into wireless network technology for the first time This SpringerBrief discusses the applications of sparse representation in wireless communications, with a particular focus on the most recent developed compressive sensing (CS) enabled approaches. With the help of sparsity property, sub-Nyquist

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sampling can be achieved in wideband cognitive radio networks by adopting compressive sensing, which is illustrated in this brief, and it starts with a comprehensive overview of compressive sensing principles. Subsequently, the authors present a complete framework for data-driven compressive spectrum sensing in cognitive radio networks, which guarantees robustness, low-complexity, and security. Particularly, robust compressive spectrum sensing, low-complexity compressive spectrum sensing, and secure compressive sensing based malicious user detection are proposed to address the various issues in wideband cognitive radio networks. Correspondingly, the real-world signals and data collected by experiments carried out during TV white space pilot trial enables data-driven compressive spectrum sensing. The collected data are analysed and used to verify our designs and provide significant insights on the potential of applying compressive sensing to wideband spectrum sensing. This SpringerBrief provides readers a clear picture on how to exploit the compressive sensing to process wireless signals in wideband cognitive radio networks. Students, professors, researchers, scientists, practitioners, and engineers working in the fields of compressive sensing in wireless communications will find this SpringerBrief very useful as a short reference or study guide book. Industry managers, and government research agency employees also working in the fields of compressive sensing in wireless communications will find this SpringerBrief useful as well.

The indispensable guide to wireless communications--now fully revised and updated!

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Wireless Communications: Principles and Practice, Second Edition is the definitive modern text for wireless communications technology and system design. Building on his classic first edition, Theodore S. Rappaport covers the fundamental issues impacting all wireless networks and reviews virtually every important new wireless standard and technological development, offering especially comprehensive coverage of the 3G systems and wireless local area networks (WLANs) that will transform communications in the coming years. Rappaport illustrates each key concept with practical examples, thoroughly explained and solved step by step. Coverage includes: An overview of key wireless technologies: voice, data, cordless, paging, fixed and mobile broadband wireless systems, and beyond Wireless system design fundamentals: channel assignment, handoffs, trunking efficiency, interference, frequency reuse, capacity planning, large-scale fading, and more Path loss, small-scale fading, multipath, reflection, diffraction, scattering, shadowing, spatial-temporal channel modeling, and microcell/indoor propagation Modulation, equalization, diversity, channel coding, and speech coding New wireless LAN technologies: IEEE 802.11a/b, HIPERLAN, BRAN, and other alternatives New 3G air interface standards, including W-CDMA, cdma2000, GPRS, UMTS, and EDGE Bluetooth wearable computers, fixed wireless and Local Multipoint Distribution Service (LMDS), and other advanced technologies Updated glossary of abbreviations and acronyms, and a thorough list of references Dozens of new examples and end-of-chapter problems Whether you're a

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communications/network professional, manager, researcher, or student, *Wireless Communications: Principles and Practice, Second Edition* gives you an in-depth understanding of the state of the art in wireless technology--today's and tomorrow's. A major, comprehensive professional text/reference for designing and maintaining security and reliability. From basic concepts to designing principles to deployment, all critical concepts and phases are clearly explained and presented. Includes coverage of wireless security testing techniques and prevention techniques for intrusion (attacks). An essential resource for wireless network administrators and developers. Presentation of background material of wireless communications, traffic modeling and traffic engineering techniques. Provides descriptions of upcoming features such as IP multimedia subsystems, multimedia broadcast/multicast services and Push-to-Talk over Cellular (PoC) for 3G networks Including problems at the end of each chapter Written for lecturers, graduate students and system designers

Focusing on the physical layer, *Networking Fundamentals* provides essential information on networking technologies that are used in both wired and wireless networks designed for local area networks (LANs) and wide-area networks (WANs). The book starts with an overview of telecommunications followed by four parts, each including several chapters. Part I explains the principles of design and analysis of information networks at the lowest layers. It concentrates on the characteristics of the transmission media, applied transmission and coding, and medium access control.

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Parts II and III are devoted to detailed descriptions of important WANs and LANs respectively with Part II describing the wired Ethernet and Internet as well as cellular networks while Part III covers popular wired LANs and wireless LANs (WLANs), as well as wireless personal area network (WPAN) technologies. Part IV concludes by examining security, localization and sensor networking. The partitioned structure of the book allows flexibility in teaching the material, encouraging the reader to grasp the more simple concepts and to build on these foundations when moving onto more complex information. Networking Fundamentals contains numerous illustrations, case studies and tables to supplement the text, as well as exercises with solutions at the end of each chapter. There is also a companion website with password protected solutions manual for instructors along with other useful resources. Provides a unique holistic approach covering wireless communication technologies, wired technologies and networking One of the first textbooks to integrate all aspects of information networks while placing an emphasis on the physical layer and systems engineering aspects Contains numerous illustrations, case studies and tables to supplement the text, as well as exercises with solutions at the end of each chapter Companion website with password protected solutions manual and other useful resources

The military, the research community, emergency services, and industrial environments all rely on ad hoc mobile wireless networks because of their simple infrastructure and minimal central administration. Now in its second edition, Ad Hoc Mobile Wireless

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Networks: Principles, Protocols, and Applications explains the concepts, mechanism, design, and

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