Problem Solution About Wireless Communication

Solving problems in parallel and distributed computing through the use of bioinspired techniques. Recent years have seen a surge of interest in computational methods patterned after natural phenomena, with biologically inspired techniques such as fuzzy logic, neural networks, simulated annealing, genetic algorithms, or evolutionary computer models increasingly being harnessed for problem solving in parallel and distributed computing. Solutions to Parallel and Distributed Computing Problems presents a comprehensive review of the state of the art in the field, providing researchers and practitioners with critical information on the use of bio-inspired techniques for improving software and hardware design in high-performance computing. Through contributions from top leaders in the field, this important book brings together current research results, exploring some of the most intriguing and cutting-edge topics from the world of biocomputing, including: Parallel and distributed computing of cellular automata and evolutionary algorithms How the speedup of bio-inspired algorithms will help their applicability in a wide range of problems Solving problems in parallel simulation through such techniques as simulated annealing algorithms and genetic algorithms Techniques for solving scheduling and load-balancing problems in parallel and distributed computers Applying neural networks for problem solving in wireless communication systems

In Time Division Multiple Access (TDMA), within a given time frame a particular user is allowed to transmit within a given time slot. This technique is used in most of the second-generation digital mobile communication systems. In Europe the system is known as GSM, in USA as DAMPS and in Japan as MPT. In Code Division Multiple Access (CDMA) every user is using a distinct code so that it can occupy the same frequency bandwidth at the same time with other users and still can be separated on the basis of low correlation between the codes. These systems like IS-95 in the USA are also developed and standardized within the second generation of the mobile communication systems. CDMA systems within a cellular network can provide higher capacity and for this reason they become more and more attractive. At this moment it seems that both TDMA and CDMA remain viable candidates for application in future systems. Wireless Communications: TDMA versus CDMA provides enough information for correct understanding of the arguments in favour of one or other multiple access technique. The final decision about which of the two techniques should be employed will depend not only on technical arguments but also on the amount of new investments needed and compatibility with previous systems and their infrastructures. Wireless Communications: TDMA versus CDMA comprises a collection of specially written contributions from the most prominent specialists in wireless communications in the world today and presents the major, up to date, issues in this field. The material is grouped into four chapters: Communication theory, covering coding and modulation, Wireless communications, Antenna & Propagation and Advanced Systems & Technology. The book describes clearly the issues and presents the information in such a way that informed decisions about third generation wireless systems can be taken. It is essential reading for all researchers, engineers and managers working in the field of Wireless Communications.

For courses in wireless communication networks and systems A Comprehensive Overview of Wireless Communications Wireless Communication Networks and Systems covers all types of wireless communications, from satellite and cellular to local and personal area networks. Organized into four easily comprehensible, reader-friendly parts, it presents a clear and comprehensive overview of the field of wireless communications. For those who are new to the topic, the book explains basic principles and fundamental topics concerning the technology and architecture of the field. Numerous figures and tables help clarify discussions, and each chapter includes a list of keywords, review questions, homework problems, and suggestions for further reading. The book includes an extensive online glossary, a list of frequently used acronyms, and a reference list. A diverse set of projects and other student exercises enables instructors to use the book as a component in a varied learning experience, tailoring courses to meet their specific needs.

Optical Wireless Communications for Broadband Global Internet Connectivity: Fundamental and Potential Applications provides a comprehensive overview for readers who require information about the fundamental science behind optical wireless communications, as well as up-to-date advanced knowledge of the state-of-the-art technologies available today. The book is a useful resource for scientists, researchers, engineers and students interested in understanding optical, wireless communication systems for global channels. Readers will find beneficial knowledge on how related technologies of optical wireless communications can be integrated into achieving worldwide Internet connectivity. Presents an in-depth coverage of information on optical wireless communication in a single source Combines the fundamentals with the most recent advanced technology of achieving global Internet access and connectivity Provides derivations of the mathematical equations Includes between chapter sections where information and learning from one chapter is connected to other chapters

This practically-oriented, all-inclusive guide covers all the major enabling techniques for current and next-generation cellular communications and wireless networking systems. Technologies covered include CDMA, OFDM, UWB, turbo and LDPC coding, smart antennas, wireless ad hoc and sensor networks, MIMO, and cognitive radios, providing readers with everything they need to master wireless systems design in a single volume. Uniquely, a detailed introduction to the properties, design, and selection of RF subsystems and antennas is provided, giving readers a clear overview of the whole wireless system. It is also the first textbook to include a complete introduction to speech coders and video coders used in wireless systems. Richly illustrated with over 400 figures, and with a unique emphasis on practical and state-of-the-art techniques in system design, rather than on the mathematical foundations, this book is ideal for graduate students and researchers in wireless communications, as well as for wireless and telecom engineers.

"This book examines the current scope of theoretical and practical applications on the security of mobile and wireless communications, covering fundamental concepts of current issues, challenges, and solutions in wireless and mobile networks"--Provided by publisher.

The popularity of smart phones and other mobile devices has brought about major expansion in the realm of wireless communications. With this growth comes the need to improve upon network capacity and overall user experience, and game-based methods can offer further enhancements in this area. Game Theory Framework Applied to Wireless Communication Networks is a pivotal reference source for the latest scholarly research on the application of game-theoretic approaches to enhance wireless networking. Featuring prevailing coverage on a range of topics relating to the advanced game model, mechanism designs, and effective equilibrium concepts, this publication is an essential reference source for researchers, students, technology developers, and engineers. This publication features extensive, research-based chapters across a broad scope of relevant topics, including potential games, coalition formation game, heterogeneous networks, radio resource allocation, coverage optimization, distributed dynamic resource allocation, dynamic spectrum access, physical layer security, and cooperative video transmission.

This book provides a unified view on the state-of-the-art of cognitive radio technology. It includes a set of research and survey articles featuring the recent advances in theory and applications of cognitive radio technology for the next generation (e.g., fourth generation) wireless communication networks. The contributed articles cover both the theoretical concepts (e.g., information-theoretic analysis) and system-level implementation issues.

Owing to the rapid developments and growth in the telecommunications industry, the need to develop relevant skills in this field are in high demand. Wireless technology helps to exchange the information between portable devices situated globally. In order to fulfil the demands of this developing field, a unified approach between fundamental concepts and advanced topics is required. The book bridges the gap with a focus on key concepts along with the latest developments including turbo coding, smart antennas, multiple input multiple output (MIMO) system, and software defined radio. It also

underpins the design requirements of wireless systems and provides comprehensive coverage of the cellular system and its generations: 3G and 4G (Long Term Evolution). With numerous solved examples, numerical questions, open book exam questions, and illustrations, undergraduates and graduate students will find this to be a readable and highly useful text.

This book applies novel theories to improve algorithms in complex data analysis in various fields, including object detection, remote sensing, data transmission, data fusion, gesture recognition, and medical image processing and analysis. It is intended for Ph.D. students, academics, researchers, and software developers working in the areas of digital video processing and computer vision technologies.

This book focuses on optical wireless communications (OWC), an emerging technology with huge potential for the provision of pervasive and reliable next-generation communications networks. It shows how the development of novel and efficient wireless technologies can contribute to a range of transmission links essential for the heterogeneous networks of the future to support various communications services and traffic patterns with ever-increasing demands for higher data-transfer rates. The book starts with a chapter reviewing the OWC field, which explains different sub-technologies (visible-light, ultraviolet (UV) and infrared (IR) communications) and introduces the spectrum of application areas (indoor, vehicular, terrestrial, underwater, intersatellite, deep space, etc.). This provides readers with the necessary background information to understand the specialist material in the main body of the book, which is in four parts. The first of these deals with propagation modelling and channel characterization of OWC channels at different spectral bands and with different applications. The second starts by providing a unified information-theoretic treatment of OWC and then discusses advanced physical-layer methodologies (including, but not limited to: advanced coding, modulation diversity, cooperation and multi-carrier techniques) and the ultimate limitations imposed by practical constraints. On top of the physical layer come the upper-layer protocols and cross-layer designs that are the subject of the third part of the book. The last part of the book features a chapter-by-chapter assessment of selected OWC applications. Optical Wireless Communications is a valuable reference guide for academic researchers and practitioners concerned with the future development of the world's communication networks. It succinctly but comprehensively presents the latest advances in the field.

Indoor Wireless Communications: From Theory to Implementation provides an in-depth reference for design engineers, system planners and post graduate students interested in the vastly popular field of indoor wireless communications. It contains wireless applications and services for in-building scenarios and knowledge of key elements in the design and implementation of these systems. Technologies such as Wireless Local Area Networks, Bluetooth, ZigBee, Indoor Optical Communications, WiMAX, UMTS and GSM for indoor environments are fully explained and illustrated with examples. Antennas and propagation issues for in-building scenarios are also discussed, emphasizing models and antenna types specifically developed for indoor communications. An exhaustive survey on indoor wireless communication equipment is also presented, covering all available technologies including antennas, distribution systems, transceivers and base stations.

This textbook takes a unified view of the fundamentals of wireless communication and explains cutting-edge concepts in a simple and intuitive way. An abundant supply of exercises make it ideal for graduate courses in electrical and computer engineering and it will also be of great interest to practising engineers.

Enabling Technologies for Next Generation Wireless Communications provides up-to-date information on emerging trends in wireless systems, their enabling technologies and their evolving application paradigms. This book includes the latest trends and developments toward next generation wireless communications. It highlights the requirements of next generation wireless systems, limitations of existing technologies in delivering those requirements and the need to develop radical new technologies. It focuses on bringing together information on various technological developments that are enablers vital to fulfilling the requirements of future wireless communication systems and their applications. Topics discussed include spectrum issues, network planning, signal processing, transmitter, receiver, antenna technologies, channel coding, security and application of machine learning and deep learning for wireless communication systems. The book also provides information on enabling business models for future wireless systems. This book is useful as a resource for researchers and practitioners worldwide, including industry practitioners, technologists, policy decision-makers, academicians, and graduate students.

The move toward worldwide wireless communications continues at a remarkable pace, and the antenna element of the technology is crucial to its success. With contributions from more than 30 international experts, the Handbook of Antennas in Wireless Communications brings together all of the latest research and results to provide engineering professionals and students with a one-stop reference on the theory, technologies, and applications for indoor, hand-held, mobile, and satellite systems. Beginning with an introduction to wireless communications systems, it offers an in-depth treatment of propagation prediction and fading channels. It then explores antenna technology with discussion of antenna design methods and the various antennas in current use or development for base stations, hand held devices, satellite communications, and shaping beams. The discussions then move to smart antennas and phased array technology, including details on array theory and beamforming techniques. Space diversity, direction-of-arrival estimation, source tracking, and blind source separation methods are addressed, as are the implementation of smart antennas and the results of field trials of systems using smart antennas implemented. Finally, the hot media topic of the safety of mobile phones receives due attention, including details of how the human body interacts with the electromagnetic fields of these devices. Its logical development and extensive range of diagrams, figures, and photographs make this handbook easy to follow and provide a clear understanding of design techniques and the performance of finished products. Its unique, comprehensive coverage written by top experts in their fields promises to make the Handbook of Antennas in Wireless

Communications the standard reference for the field.

Lectori Salutem! This is another book – among the myriads – dealing with wireless communications. The reader might be aware: this topic is really among bestsellers in technology – bestsellers in technology itself and that in technical literature. Communications is one of the leading techniques in information society and mobile/wireless communications is one among the (maybe not more than two with optics the second) leading techniques in communications. Development of wireless communications was and is really spec- cular in the last decade of the 20th and first decade of the 21st century. Such topics as MIMO, wireless networking, security in the technological field, new business models in the service providing field, various applications in the users' side, to mention a few only, were undergoing an unprecedented evolution. So it is not surprising that the number of conferences and the number of books in this field grows and grows, in a nearly unbounded way.

Mobile Ad hoc NETworks (MANETs) has attracted great research interest in recent years. A Mobile Ad Hoc Network is a self-organizing multi-hop wireless network where all hosts (often called nodes) participate in the routing and data forwarding process. The dependence on nodes to relay data packets for others makes mobile ad hoc networks extremely susceptible to various malicious and selfish behaviors. This point is largely overlooked during the early stage of MANET research. Many works simply assume nodes are inherently cooperative and benign. However, experiences from the wired world manifest that the reverse is usually true; and many works [3] [10] [9] [8] [12] [19] have pointed out that the impact of malicious and selfish users must be carefully investigated. The goal of this research is to address the cooperation problem and related security issues in wireless ad hoc networks. As a rule of thumb, it is more desirable to include security mechanisms in the design phase rather than continually patching the system for security breaches. As pointed out in [2] [1], there can be both selfish and malicious nodes in a mobile ad hoc network. Selfish nodes are most concerned about their energy consumption and intentionally drop packets to save power. The purpose of malicious nodes, on the other hand, is to attack the network using various intrusive techniques. In general, nodes in an ad hoc network can exhibit Byzantine behaviors.

This book offers a technical background to the design and optimization of wireless communication systems, covering optimization algorithms for wireless and 5G communication systems design. The book introduces the design and optimization systems which target capacity, latency, and connection density; including Enhanced Mobile Broadband Communication (eMBB), Ultra-Reliable and Low Latency Communication (URLL), and Massive Machine Type Communication (mMTC). The book is organized into two distinct parts: Part I, mathematical methods and optimization algorithms for wireless communications are introduced, providing the reader with the required mathematical background. In Part II, 5G communication systems are designed and optimized using the mathematical methods and optimization algorithms.

Wireless technologies continue to evolve to address the insatiable demand for faster response times, larger bandwidth, and reliable transmission. Yet as the industry moves toward the development of post 3G systems, engineers have consumed all the affordable physical layer technologies discovered to date. This has necessitated more intelligent and optimized utilization of available wireless resources. Wireless Communications Resource Managem ent, Lee, Park, and Seo cover all aspects of this critical topic, from the preliminary concepts and mathematical tools to detailed descriptions of all the resource management techniques. Readers will be able to more effectively leverage limited spectrum and maximize device battery power, as well as address channel loss, shadowing, and multipath fading phenomena. Presents the latest resource allocation techniques for new and next generation air interface technologies Arms readers with the necessary fundamentals and mathematical tools Illustrates theoretical concepts in a concrete manner Gives detailed coverage on scheduling, power management, and MIMO techniques Written by an author team working in both academia and industry Wireless Communications Resource Managementis geared for engineers in the wireless industry and graduate students specializing in wireless communications. Professionals in wireless service and device manufacturing industries will find the book to be a clear, up-to-date overview of the topic. Readers will benefit from a basic, undergraduate-level understanding of networks and communications. Course instructors can access lecture materials at the companion website:(www.wiley.com/go/bglee)

Wireless communication has emerged as an independent discipline in the past decades. Everything from cellular voice telephony to wireless data transmission using wireless sensor networks has profoundly impacted the safety, production, and productivity of industries and our lifestyle as well. After a decade of exponential growth, the wireless industry is one of the largest industries in the world. Therefore, it would be an injustice if the wireless communication is not explored for mining industry. Underground mines, which are characterized by their tough working conditions and hazardous environments, require fool-proof mine-wide communication systems for smooth functioning of mine workings and ensuring better safety. Proper and re- able communication systems not only save the machine breakdown time but also help in immediate passing of messages from the vicinity of underground working area to the surface for day-to-day normal mining operations as well as for speedy rescue operations in case of disaster. Therefore, a reliable and effective commu- cation system is an essential requisite for safe working, and maintaining requisite production and productivity of underground mines. Most of the existing systems generally available in underground mines are based on line (wired) communication principle, hence these are unable to withstand in the disaster conditions and dif?cult to deploy in inaccessible places. Therefore, wireless communication is an indispe- able, reliable, and convenient system and essential in case of day-to-day normal duty or disaster situations.

The proceedings of SocProS 2013 serve as an academic bonanza for scientists and researchers working in the field of Soft Computing. This book contains theoretical as well as practical aspects of Soft Computing, an umbrella term for techniques like fuzzy logic, neural networks and evolutionary algorithms, swarm intelligence algorithms etc. This book will be beneficial for the young as well as experienced researchers dealing with complex and intricate real world problems for which finding a solution by traditional methods is very difficult. The different areas covered in the proceedings are: Image Processing, Cryptanalysis, Supply Chain Management, Newly Proposed Nature Inspired Algorithms, Optimization, Problems related to Medical and Health Care, Networking etc.

Cooperative devices and mechanisms are increasingly important to enhance the performance of wireless communications and networks, with their ability to decrease power consumption and packet loss rate and increase system capacity, computation, and network resilience. Considering the wide range of applications, strategies, and benefits associated with cooperative wireless communications, researchers and product developers need a succinct understanding of relevant theory, fundamentals, and

techniques to navigate this challenging field. Cooperative Wireless Communications provides just that. Assesses Applications, Benefits, and Methods of Cooperative Strategies This comprehensive reference handbook contains useful background to develop and implement cooperative mechanisms for infrastructure-based wireless systems and self-organizing multi-hop wireless networks (e.g., ad hoc, mesh, peer-to-peer, and sensor networks). It introduces key cooperative strategies and details recent improvements to a variety of cooperative mechanisms and frameworks applicable in diverse scenarios. Addressing fundamentals and techniques, this invaluable reference: Offers comprehensive guidance on technical, practical, and deployment aspects of cooperative strategies and the latest IEEE standard specifications Explores key challenges and solutions in 3G, B3G, 4G WiMAX, and ad hoc, mesh, and sensor networks Covers cooperative diversity, virtual MIMO, cognitive radio networks, and resource and mobility management Discusses energy efficiency, relaying strategy, routing, MAC, topology control, and security Provides Guidance to Resolve Key Challenges A distinct introduction to different cooperative mechanisms, cooperation frameworks in diverse scenarios, and recent improvements to wireless network performance, this one-stop reference consolidates the essential information and guidance that readers will need to resolve key challenges in various protocol issues from a cooperation perspective.

The proceedings of SocProS 2015 will serve as an academic bonanza for scientists and researchers working in the field of Soft Computing. This book contains theoretical as well as practical aspects using fuzzy logic, neural networks, evolutionary algorithms, swarm intelligence algorithms, etc., with many applications under the umbrella of 'Soft Computing'. The book will be beneficial for young as well as experienced researchers dealing across complex and intricate real world problems for which finding a solution by traditional methods is a difficult task. The different application areas covered in the proceedings are: Image Processing, Cryptanalysis, Industrial Optimization, Supply Chain Management, Newly Proposed Nature Inspired Algorithms, Signal Processing, Problems related to Medical and Health Care, Networking Optimization Problems, etc.

This book is a valuable resource for researchers, professionals and graduate students interested in solar power system design. The objective is to provide the latest developments in the area of soft computing. These are the cutting edge technologies that have immense application in various fields. All the papers will undergo the peer review process to maintain the quality of work.

The IFIP TC-6 9th International Conference on Personal Wireless Communi- tions, PWC 2004 is the main conference of the IFIP Working Group 6. 8, Mobile and Wireless Communications. The ?eld of personal wireless communications is steadily growing in imp- tance,fromanacademic,industrialandsocietalpointofview. Thedroppingcost of WLAN and short-range technologies such as Bluetooth and Zigbee is causing the proliferation of personal devices and appliances equipped with radio int- faces. Together with the gradual deployment of powerful wireless infrastructure networks, such as 3G cellular systems and WLAN hotspots, the conditions are being created for a?ordable ubiquitous communication involving virtually any artifact. This enables new application areas such as ambient intelligence where a world of devices, sensors and actuators surrounding us use wireless technology to create systems that assist us in an unobtrusive way. It also allows the - velopment of personal and personalized environments that accompany a person whereverheorshegoes. ExamplesarePersonalAreaNetworks(PAN)physically surrounding a person, and personal networks with a potentially global reach. PWC 2004 re?ects these developments, which are happening on a global scale. Researchers from all over the world, and in particular a large number from Asia, made contributions to the conference. There were 100 submissions. After a thorough reviewing process, 25 full papers and 13 short papers were retained for presentation in the technical sessions. The papers cover the whole range of wireless and mobile technologies: cellular systems, WLAN, ad hoc and sensor networks, host and network mobility, transport protocols for wireless systems, and the physical layer.

"This book contains case studies, theories, and empirical research aimed to assist individuals and organizations in understanding the critical concepts of data networking and communications"--Provided by publisher.

This book constitutes the refereed proceedings of the IFIP-TC6 11th International Conference on Personal Wireless Communications, PWC 2006. The book presents 25 revised full papers and 13 revised short papers, carefully reviewed and selected from 100 submissions. The papers are organized in topical sections on mobile and wireless networking, QoS, ad-hoc, security, wireless LAN, cross-layer design, wireless sensor networks, physical layer, and mobile and wireless applications.

The Institute of Electrical and Electronics Engineers (IEEE) Communications Society designed the IEEE wireless communication engineering technologies (WCET) certification program to address the wireless industry's growing need for communications professionals with practical problem-solving skills in real-world situations. Individuals who achieve this prestigious certification are recognized as possessing the required knowledge, skill, and abilities to meet wireless challenges in various industry, business, corporate, and organizational settings. Presenting contributions from 50 wireless communications experts from all corners of the world, Get Certified: A Guide to Wireless Communication Engineering Technologies provides an authoritative review of the seven areas of expertise covered on WCET exam. It supplies cutting-edge coverage of the broad range of topics related to wireless communications to facilitate the technical competency required to achieve certification. The text outlines industry agreements, standards, policies, and regulations including licenses and permits, health and safety, and compliance. With coverage ranging from basic concepts to research-grade material and future directions, the book provides a general overview of the evolution of wireless technologies, their impact on the profession, and common professional best practices. The book's well-structured presentation along with suggestions for further information and study, make it an indispensable guide for attaining WCET certification and a comprehensive source of reference for wireless professionals to keep pace with ever-evolving technology and standards in the field.

In response to a request from the Defense Advanced Research Projects Agency, the committee studied a range of issues to help identify what strategies the Department of Defense might follow to meet its need for flexible, rapidly deployable communications systems. Taking into account the military's particular requirements for security,

interoperability, and other capabilities as well as the extent to which commercial technology development can be expected to support these and related needs, the book recommends systems and component research as well as organizational changes to help the DOD field state-of-the-art, cost-effective untethered communications systems. In addition to advising DARPA on where its investment in information technology for mobile wireless communications systems can have the greatest impact, the book explores the evolution of wireless technology, the often fruitful synergy between commercial and military research and development efforts, and the technical challenges still to be overcome in making the dream of "anytime, anywhere" communications a reality.

A comprehensive review to the theory, application and research of machine learning for future wireless communications In one single volume, Machine Learning for Future Wireless Communications provides a comprehensive and highly accessible treatment to the theory, applications and current research developments to the technology aspects related to machine learning for wireless communications and networks. The technology development of machine learning for wireless communications has grown explosively and is one of the biggest trends in related academic, research and industry communities. Deep neural networks-based machine learning technology is a promising tool to attack the big challenge in wireless communications and networks imposed by the increasing demands in terms of capacity, coverage, latency, efficiency flexibility, compatibility, quality of experience and silicon convergence. The author – a noted expert on the topic – covers a wide range of topics including system architecture and optimization, physical-layer and cross-layer processing, air interface and protocol design, beamforming and antenna configuration, network coding and slicing, cell acquisition and handover, scheduling and rate adaption, radio access control, smart proactive caching and adaptive resource allocations. Uniquely organized into three categories: Spectrum Intelligence, Transmission Intelligence and Network Intelligence, this important resource: Offers a comprehensive review of the theory, applications and current developments of machine learning for wireless communications and networks Covers a range of topics from architecture and optimization to adaptive resource allocations Reviews state-of-the-art machine learning based solutions for network coverage Includes an overview of the applications of machine learning algorithms in future wireless networks Explores flexible backhaul and front-haul, cross-layer optimization and coding, full-duplex radio, digital front-end (DFE) and radio-frequency (RF) processing Written for professional engineers, researchers, scientists, manufacturers, network operators, software developers and graduate students, Machine Learning for Future Wireless Communications presents in 21 chapters a comprehensive review of the topic authored by an expert in the field.

This two-volume book presents outcomes of the 7th International Conference on Soft Computing for Problem Solving, SocProS 2017. This conference is a joint technical collaboration between the Soft Computing Research Society, Liverpool Hope University (UK), the Indian Institute of Technology Roorkee, the South Asian University New Delhi and the National Institute of Technology Silchar, and brings together researchers, engineers and practitioners to discuss thought-provoking developments and challenges in order to select potential future directions The book presents the latest advances and innovations in the interdisciplinary areas of soft computing, including original research papers in the areas including, but not limited to, algorithms (artificial immune systems, artificial neural networks, genetic algorithms, genetic programming, and particle swarm optimization) and applications (control systems, data mining and clustering, finance, weather forecasting, game theory, business and forecasting applications). It is a valuable resource for both young and experienced researchers dealing with complex and intricate real-world problems for which finding a solution by traditional methods is a difficult task.

Problem Solving for Wireless Sensor Networks delivers a comprehensive review of the state of the art in the most important technological issues related to Wireless Sensor Networks (WSN). It covers topics such as hardware platforms, radio technologies, software technologies (including middleware), and network and deployment aspects. This book discusses the main open issues inside each of these categories and identifies innovations considered most interesting for future research. Features: - Hardware Platforms in WSN, - Software Technologies in SWN, - Network Aspects and Deployment in WSN, - Standards and Safety Regulation for WSN, - European Projects Related to WSN, - WSN Application Scenarios at both utility and technical levels. Complete, cutting-edge and resulting from the work of many recognized researchers, Problem Solving for Wireless Sensor Networks is an invaluable reference for graduates and researchers, as well as practitioners.

Wireless communication is one of the fastest growing industry segments today. Many types of wireless networks are now being used for applications such as personal communication, entertainment, rural and urban healthcare, smart home building, inventory control, and surveillance. This book introduces the basic concepts of wireless networks and mobile computing to give engineering students at the undergraduate/graduate level a solid background in the field. It also looks at the latest research and challenging problems in the field to serve as a reference for advanced-level researchers. Wireless Networks and Mobile Computing begins with an introduction to the different types of wireless networks, including Wi-Fi, ZigBee, cellular mobile, ad hoc, cognitive radio, wireless mesh, and wireless sensor. Subsequent chapters address more advanced topics such as: Mobility, bandwidth, and node location management issues in mobile networks Message communication techniques and protocols in ad hoc networks Recent research and future direction of wireless local area networks (WLANs) Deployment of sensor nodes in wireless sensor networks (WSNs) Energy-efficient communication in wireless networks Security aspects of wireless communication The book includes exercises at the end of every chapter to help give students a better insight into the topics presented. It includes a number of advanced-level exercises, which are research problems that may be taken up by researchers in the respective areas. This book provides a valuable reference for classroom study/teaching as well as for technology development and research in the relevant areas.

This thesis investigates several issues in data and computation modeling for scientific problem solving environments (PSEs). A PSE is viewed as a software system that provides (i) a library of simulation components, (ii) experiment management, (iii) reasoning about simulations and data, and (iv) problem solving abstractions. Three specific ideas, in functionalities (ii)-(iv), form the contributions of this thesis. These include the EMDAG system for experiment management, the BSML markup language for data interchange, and the use of data mining for conducting non-trivial parameter studies. This work emphasizes data modeling

and management, two important aspects that have been largely neglected in modern PSE research. All studies are performed in the context of S4W, a sophisticated PSE for wireless system design.

Solving Urban Infrastructure Problems Using Smart City Technologies is the most complete guide for integrating next generation smart city technologies into the very foundation of urban areas worldwide, showing how to make urban areas more efficient, more sustainable, and safer. Smart cities are complex systems of systems that encompass all aspects of modern urban life. A key component of their success is creating an ecosystem of smart infrastructures that can work together to enable dynamic, real-time interactions between urban subsystems such as transportation, energy, healthcare, housing, food, entertainment, work, social interactions, and governance. Solving Urban Infrastructure Problems Using Smart City Technologies is a complete reference for building a holistic, system-level perspective on smart and sustainable cities, leveraging big data analytics and strategies for planning, zoning, and public policy. It offers in-depth coverage and practical solutions for how smart cities can utilize resident's intellectual and social capital, press environmental sustainability, increase personalization, mobility, and higher quality of life. Brings together experts from academia, government and industry to offer state-of- the-art solutions for urban system problems, showing how smart technologies can be used to improve the lives of the billions of people living in cities across the globe Demonstrates practical implementation solutions through real-life case studies Enhances reader comprehension with learning aid such as hands-on exercises, questions and answers, checklists, chapter summaries, chapter review questions, exercise problems, and more