

Green Networking and Communications

ICT for Sustainability

Shafiqul Khan
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Green Networking And Communications Ict For Sustainability

Kayhan Erciyes



Green Networking And Communications Ict For Sustainability:

Green Networking and Communications Shafiullah Khan,Jaime Lloret Mauri,2013-10-29 Although the information and communication technology ICT industry accounted for only 2 percent of global greenhouse gas emissions in 2007 the explosive increase in data traffic brought about by a rapidly growing user base of more than a billion wireless subscribers is expected to nearly double that number by 2020 It is clear that now is the time to rethink how we design and build our networks Green Networking and Communications ICT for Sustainability brings together leading academic and industrial researchers from around the world to discuss emerging developments in energy efficient networking and communications It covers the spectrum of research subjects including methodologies and architectures for energy efficiency energy efficient protocols and networks energy management smart grid communications and communication technologies for green solutions Examines foraging inspired radio communication energy management for green multi radio networks Considers a cross layer approach to the design of energy efficient wireless access networks Investigates the interplay between cooperative device to device communications and green LTE cellular networks Considers smart grid energy procurement for green LTE cellular networks Details smart grid networking protocols and standards Considering the spectrum of energy efficient network components and approaches for reducing power consumption the book is organized into three sections Energy Efficiency and Management in Wireless Networks Cellular Networks and Smart Grids It addresses many open research challenges regarding energy efficiency for IT and for wireless sensor networks including mobile and wireless access networks broadband access networks home networks vehicular networks intelligent future wireless networks and smart grids It also examines emerging standards for energy efficient protocols Since ICT technologies touch on nearly all sectors of the economy the concepts presented in this text offer you the opportunity to make a substantial contribution to the reduction of global greenhouse gas emissions

Simulation Technologies in Networking and Communications Al-Sakib Khan Pathan,Muhammad Mostafa Monowar,Shafiullah Khan,2014-11-06 Simulation is a widely used mechanism for validating the theoretical model of networking or communication systems Although the claims made based on simulations are considered to be reliable how reliable they really are is best determined with real world implementation trials This book addresses various issues covering different mechanisms related to simulation technologies in networking and communications fields Focusing on the practice of simulation testing instead of the theory it reviews and evaluates popular simulation modeling tools and recommends the best tools for specific tests

Green Networking Francine Krief,2012-12-13 This book focuses on green networking which is an important topic for the scientific community composed of engineers academics researchers and industrialists working in the networking field Reducing the environmental impact of the communications infrastructure has become essential with the ever increasing cost of energy and the need for reducing global CO2 emissions to protect our environment Recent advances and future directions in green networking are presented in this book including energy efficient

networks wired networks wireless networks mobile networks adaptive networks cognitive radio networks green autonomic networking green terminals and industrial research into green networking smart city etc **Artificial Intelligence**

Applications in Information and Communication Technologies Yacine Laalaoui, Nizar Bouguila, 2015-07-04 This book presents various recent applications of Artificial Intelligence in Information and Communication Technologies such as Search and Optimization methods Machine Learning Data Representation and Ontologies and Multi agent Systems The main aim of this book is to help Information and Communication Technologies ICT practitioners in managing efficiently their platforms using AI tools and methods and to provide them with sufficient Artificial Intelligence background to deal with real life problems *ZigBee Network Protocols and Applications* Chonggang Wang, Tao Jiang, Qian Zhang, 2016-04-19 Compared with

other wireless communication technologies such as Bluetooth WiFi and UWB ZigBee is a far more reliable affordable and energy efficient option It is also the only global wireless communication standard for easily deployed low power consumption products ZigBee Network Protocols and Applications provides detailed descriptions of **Energy Efficient Cooperative**

Wireless Communication and Networks Zhengguo Sheng, Chi Harold Liu, 2014-11-11 Compared with conventional communications cooperative communication allows multiple users in a wireless network to coordinate their packet transmissions and share each other's resources thus achieving high performance gain and better service coverage and reliability Energy Efficient Cooperative Wireless Communication and Networks provides a comprehensive look at energy efficiency and system design of cooperative wireless communication Introducing effective cooperative wireless communication schemes the book supplies the understanding and methods required to improve energy efficiency reliability and end to end protocol designs for wireless communication systems It explains the practical benefits and limitations of cooperative transmissions along with the associated designs of upper layer protocols including MAC routing and transport protocol The book considers power efficiency as a main objective in cooperative communication to ensure quality of service QoS requirements It explains how to bring the performance gain at the physical layer up to the network layer and how to allocate network resources dynamically through MAC scheduling and routing to trade off the performance benefits of given transmissions against network costs Because the techniques detailed in each chapter can help readers achieve energy efficiency and reliability in wireless networks they have the potential to impact a range of industry areas including wireless communication wireless sensor networks and ad hoc networks The book includes numerous examples best practices and models that capture key issues in real world applications Along with algorithms and tips for effective design the book supplies the understanding you will need to achieve high performing and energy efficient wireless networks with improved service coverage and reliability **Mobile Networks and Management** Ramón Agüero, Thomas Zinner, Mario

García-Lozano, Bernd-Ludwig Wenning, Andreas Timm-Giel, 2016-01-08 This book constitutes the post proceedings of the 7th International Conference on Mobile Networks and Management MONAMI 2015 held in Santander Spain in September 2015

The 16 full papers were carefully reviewed and selected from 24 submissions. In addition, there appears one short and 5 invited papers. These are organized thematically in five parts starting with Cellular Network Management and Self Organizing Networks in Part I. Radio Resource Management in LTE and 5G Networks aspects are discussed in Part II. Part III presents novel Techniques and Algorithms for Wireless Networks while Part IV deals with Video Streaming over Wireless Networks. Part V includes papers presenting avant garde research on applications and services and finally Part VI features two papers introducing novel architectural approaches for Wireless Sensor Networks.

Network Innovation through OpenFlow and SDN Fei Hu, 2014-02-18 This book explains how to use software defined networking SDN technologies powered by the OpenFlow protocol to build networks that are easy to design, less expensive to build and operate and more agile and customizable. Among the first books to systematically address the design aspects in SDN, OpenFlow it presents the insights of expert contributors from around the world. Focused on OpenFlow engineering design and basic principles, it includes coverage of system architectures, language and programming issues, switches, multimedia support and network operating systems.

Cognitive Networks Jaime Lloret Mauri, Kayhan Zrar Ghafoor, Danda B. Rawat, Javier Manuel Aguiar Perez, 2014-12-09 A cognitive network makes use of the information gathered from the network in order to sense the environment, plan actions according to the input and make appropriate decisions using a reasoning engine. The ability of cognitive networks to learn from the past and use that knowledge to improve future decisions makes them a key area of interest for.

Machine-to-Machine Communications Vojislav B. Misić, Jelena Misić, 2014-06-25 With the number of machine to machine M2M enabled devices projected to reach 20 to 50 billion by 2020, there is a critical need to understand the demands imposed by such systems. Machine to Machine Communications Architectures, Technology Standards and Applications offers rigorous treatment of the many facets of M2M communication, including its integration with current technology. Presenting the work of a different group of international experts in each chapter, the book begins by supplying an overview of M2M technology. It considers proposed standards, cutting edge applications, architectures and traffic modeling and includes case studies that highlight the differences between traditional and M2M communications technology. Details a practical scheme for the forward error correction code design. Investigates the effectiveness of the IEEE 802.15.4 low data rate wireless personal area network standard for use in M2M communications. Identifies algorithms that will ensure functionality, performance, reliability and security of M2M systems. Illustrates the relationship between M2M systems and the smart power grid. Presents techniques to ensure integration with and adaptation of existing communication systems to carry M2M traffic. Providing authoritative insights into the technologies that enable M2M communications, the book discusses the challenges posed by the use of M2M communications in the smart grid from the aspect of security and proposes an efficient intrusion detection system to deal with a number of possible attacks. After reading this book, you will develop the understanding required to solve problems related to the design, deployment and operation of M2M communications networks.

and systems **Anonymous Communication Networks** Kun Peng,2014-04-10 In today's interactive network environment where various types of organizations are eager to monitor and track Internet use anonymity is one of the most powerful resources available to counterbalance the threat of unknown spectators and to ensure Internet privacy Addressing the demand for authoritative information on anonymous Internet usage *Anonymous Communication Networks Protecting Privacy on the Web* examines anonymous communication networks as a solution to Internet privacy concerns It explains how anonymous communication networks make it possible for participants to communicate with each other without revealing their identities The book explores various anonymous communication networks as possible solutions to Internet privacy concerns making it ideal for network researchers and anyone interested in protecting their privacy or the privacy of their users Identifying specific scenarios where it is best to be anonymous it details the two main approaches to anonymous communication networks onion routing and mixed networks Details helpful tips for optimizing onion routing Defines and classifies mixed networks Illustrates the application of a mixed network to e voting with a case study Considers the application of symmetric cipher and Diffie Hellman key exchange in Tor Supplies detailed guidance on how to download and install Tor I2P JAP JonDo and QuickSilver Using examples and case studies the book illustrates the usefulness of anonymous communication networks for web browsing email e banking and e voting It explains how to obtain anonymous usage permits for cloud software and analyzes the spectrum of existing techniques for anonymous cyber surfing The text concludes by examining future directions to supply you with the understanding required to ensure anonymous Internet browsing

Multimedia over Cognitive Radio Networks Fei Hu,Sunil Kumar,2014-12-04 With nearly 7 billion mobile phone subscriptions worldwide mobility and computing have become pervasive in our society and business Moreover new mobile multimedia communication services are challenging telecommunication operators To support the significant increase in multimedia traffic especially video over wireless networks new technological infrastructure must be created Cognitive Radio Networks CRNs are widely regarded as one of the most promising technologies for future wireless communications This book explains how to efficiently deliver video audio and other data over CRNs Covering advanced algorithms protocols and hardware software based experiments this book describes how to encode video in a prioritized way to send to dynamic radio links It discusses different FEC codes for video reliability and explains how different machine learning algorithms can be used for video quality control It also explains how to use readily available software tools to build a CRN simulation model This book explains both theoretical and experimental designs It describes how universal software radio peripheral USRP boards can be used for real time high resolution video transmission It also discusses how a USRP board can sense the spectrum dynamics and how it can be controlled by GNU Radio software A separate chapter discusses how the network simulator ns 2 can be used to build a simulated CRN platform *Power Efficiency in Broadband Wireless Communications* Pooria Varahram,Somayeh Mohammady,Borhanuddin Mohd Ali,Nasri Sulaiman,2014-08-29 Power Efficiency in Broadband

Wireless Communications focuses on the improvement of power efficiency in wireless communication systems especially of mobile devices. Reviewing cutting edge techniques for conserving power and boosting power efficiency the book examines various technologies and their impact on consumer devices. It considers each technology. *Fading and Interference Mitigation in Wireless Communications* Stefan Panig, Mihajlo Stefanovic, Jelena Anastasovic, Petar Spalevic, 2013-12-11. Fading and Interference Mitigation in Wireless Communications will help readers stay up to date with recent developments in the performance analysis of space diversity reception over fading channels in the presence of cochannel interference. It presents a unified method for computing the performance of digital communication systems characterized by a variety of modulation and detection types and channel models. The book includes coverage of multichannel reception in various fading environments, influence of cochannel interference and macrodiversity reception when channels are simultaneously affected by various types of fading and shadowing.

Security for Multihop Wireless Networks Shafiullah Khan, Jaime Lloret Mauri, 2014-04-15. Security for Multihop Wireless Networks provides broad coverage of the security issues facing multihop wireless networks. Presenting the work of a different group of expert contributors in each chapter it explores security in mobile ad hoc networks, wireless sensor networks, wireless mesh networks and personal area networks. Detailing technologies and processes that can help you secure your wireless networks the book covers cryptographic coprocessors, encryption, authentication, key management, attacks and countermeasures, secure routing, secure medium access control, intrusion detection, epidemics, security performance analysis and security issues in applications. It identifies vulnerabilities in the physical, MAC, network, transport and application layers and details proven methods for strengthening security mechanisms in each layer. The text explains how to deal with black hole attacks in mobile ad hoc networks and describes how to detect misbehaving nodes in vehicular ad hoc networks. It identifies a pragmatic and energy efficient security layer for wireless sensor networks and covers the taxonomy of security protocols for wireless sensor communications. Exploring recent trends in the research and development of multihop network security the book outlines possible defenses against packet dropping attacks in wireless multihop ad hoc networks. Complete with expectations for the future in related areas this is an ideal reference for researchers, industry professionals and academics. Its comprehensive coverage also makes it suitable for use as a textbook in graduate level electrical engineering programs.

Complex Networks Kayhan Erciyes, 2014-09-06. Complex Networks: An Algorithmic Perspective supplies the basic theoretical, algorithmic and graph theoretic knowledge needed by every researcher and student of complex networks. This book is about specifying, classifying, designing and implementing mostly sequential and also parallel and distributed algorithms that can be used to analyze the static properties of complex networks. Providing a focused scope which consists of graph theory and algorithms for complex networks the book identifies and describes a repertoire of algorithms that may be useful for any complex network.

Telecommunication Networks Mohammad Abdul Matin, 2019-02-27. The demand for advance telecommunication services has increased dramatically over

the last few years This has led to technological changes with revolutionized engineering strategies to optimize network construction and operation Telecommunication networks integrate with a wide range of technologies including optical amplifiers software architectures for network control and management abstract algebra required to design error correction codes and network modeling This book presents research contributions towards new techniques concepts analysis of the telecom market s evolving trends and infrastructure to provide integrated voice data and video communications services that are critical to the operation and competitiveness of companies governments and other organizations **Communication**

Technologies, Information Security and Sustainable Development Faisal Karim Shaikh,Bhawani Shankar

Chowdhry,Sherali Zeadally,Dil Muhammad Akbar Hussain,Aftab Ahmed Memon,Muhammad Aslam Uqaili,2014-09-10 This book constitutes the thoroughly refereed proceedings of the Third International Multi topic Conference on Communications Technologies Information Security and Sustainable Development IMTIC 2013 held in Jamshoro Pakistan in December 2013 The 27 revised papers presented in this volume were carefully reviewed and selected from 140 submissions The topics presented had a reasonable balance between theory and practice in multi disciplined topics including wireless sensor networks cloud computing wireless communication antenna design signal processing software engineering image processing bioinformatics and telemedicine neural networks automation and control and green renewable energy **Sustainable**

Practices: Concepts, Methodologies, Tools, and Applications Management Association, Information

Resources,2013-12-31 This reference explores some of the most recent developments in sustainability delving into topics beyond environmental science to cover issues of sustainable economic political and social development Provided by publisher

Green Blockchain and Improvement of Sustainability in Smart Cities Anonym,2023-03-24 Bachelor Thesis from the year 2022 in the subject Computer Science Commercial Information Technology grade 2 1 University of Duisburg Essen language English abstract This thesis addresses the research question of what impact the use of blockchain technology has on improving sustainability in a smart city For this purpose first an insight into the emergence of blockchain technology as well as its structure characteristics and various consensus mechanisms is given This is followed by insights into the different types of blockchain and the advantages and disadvantages of blockchain technology in order to create as comprehensive an understanding as possible Due to the continuous progress of urbanization and the associated environmental pollution and destruction it is becoming increasingly important to find innovative solutions to these problems The United Nation s 17 Sustainable Development Goals SDG offer countries and cities a basis for improving their sustainability SDG 11 addresses the development of sustainable smart cities and communities Smart cities use innovative technologies that are interconnected with each other across all areas of a city to drive sustainable and resource saving urban development and provide citizens with a high quality of life These technologies use sensors and other devices to collect data from their immediate environment which is then analyzed to identify problems in their early stages and make improvements However

the large amount of sensitive and personal data also increases the risk of security vulnerabilities One of these technologies that could help improve sustainability in smart cities and also reduce risks is blockchain technology

The book delves into Green Networking And Communications Ict For Sustainability. Green Networking And Communications Ict For Sustainability is a vital topic that needs to be grasped by everyone, ranging from students and scholars to the general public. The book will furnish comprehensive and in-depth insights into Green Networking And Communications Ict For Sustainability, encompassing both the fundamentals and more intricate discussions.

1. This book is structured into several chapters, namely:
 - Chapter 1: Introduction to Green Networking And Communications Ict For Sustainability
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 - Chapter 3: Green Networking And Communications Ict For Sustainability in Everyday Life
 - Chapter 4: Green Networking And Communications Ict For Sustainability in Specific Contexts
 - Chapter 5: Conclusion
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 5. In chapter 4, this book will scrutinize the relevance of Green Networking And Communications Ict For Sustainability in specific contexts. This chapter will explore how Green Networking And Communications Ict For Sustainability is applied in specialized fields, such as education, business, and technology.
 6. In chapter 5, this book will draw a conclusion about Green Networking And Communications Ict For Sustainability. This chapter will summarize the key points that have been discussed throughout the book.
- This book is crafted in an easy-to-understand language and is complemented by engaging illustrations. This book is highly recommended for anyone seeking to gain a comprehensive understanding of Green Networking And Communications Ict For Sustainability.

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