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LPWAN Technologies for IoT and M2M Applications
IoT Platforms, Use Cases, Privacy, and Business Models
Design Guide
Cooperation and Resource Allocation in Wireless Networking towards the IoT
25th International Conference on the Theory and Application of Cryptology and Information Security, Kobe, Japan, December 8–12, 2019, Proceedings, Part II
Principles and Applications of Narrowband Internet of Things (NBIoT)
Handbook of Research on Business Models in Modern Competitive Scenarios
How Blockchain Connects Global Businesses
Computational Intelligence, Cyber Security and Computational Models. Models and Techniques for Intelligent Systems and Automation
Architecture, Technology, Implementation, and Operation of 3GPP New Radio Standards
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5G for the Connected World
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The Impact of New Technologies and Entrepreneurship on Business Development
14th International Joint Conference, ICETE 2017, Madrid, Spain, July 24-26, 2017, Revised Selected Paper
Hospitality Management and Digital Transformation
Intelligent IoT for the Digital World
Computer Engineering in Automation
The Development of the Energy Internet of Things in Energy Infrastructure

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LPWAN Technologies for IoT and M2M Applications
Springer Nature
This document brings together a set of latest data points and publicly available information relevant for Hybrid Cloud Infrastructure. We are very excited to share this content and believe that readers will benefit immensely from this periodic publication immensely.

IoT Platforms, Use Cases, Privacy, and Business Models
Springer Nature
Discover how the Internet of Things will change the information and communication technology industry in the

next decade The Intelligent Internet of Things explores a unique type of Internet of Things (IoT) architecture, for example, the Web of Things (WoT) with its open character that breaks the barriers among various IoT vertical applications. The authors—noted experts on the topic—examine and compare key technologies from physical to platform level, especially the Narrow Band Internet of Things (NB-IoT) technology. They discuss applications with different data transmission requirements that are typical to IoT. The text also describes the requirements of WoT applications on 5G and includes detailed information on WoT technologies. The Intelligent Internet of Things examines three typical WoT applications: the monitoring application of south-to-north water diversion projects; smart driving applications; and network optimization applications. In addition, the text explores testing and authentication of IoT key technologies, with the required equipment, platform, and outdoor environment development. This important book: Provides information on what IoT/WoT is, when to use it, how to provide IoT services with certain technologies, and more Discusses restful architecture, main protocols (ZigBee, 6lowpan, CoAP, HTML5) Explores key technologies on different layers (sensing, gathering, application) Examines

how IoT will change the information and communication technology industry Written for professionals working in IoT development, management and big data analytics, Intelligent Internet of Things offers an overview of IoT architecture, key technology, current applications and future development of the technology.

Design Guide Springer Nature

This book shows how blockchain technology can transform the Internet, connecting global businesses in disruptive ways. It offers a comprehensive and multi-faceted examination of the potential of distributed ledger technology (DLT) from a new perspective: as an enabler of the Internet of Value (IoV). The authors discuss applications of blockchain technology to the financial services domain, e.g. in real estate, insurance and the emerging Decentralised Finance (DeFi) movement. They also cover applications to the media and e-commerce domains. DLT's impacts on the circular economy, marketplace, Internet of Things (IoT) and oracle business models are also investigated. In closing, the book provides outlooks on the evolution of DLT, as well as the systemic governance and privacy risks of the IoV. The book is intended for a broad readership, including students, researchers and industry practitioners.

Cooperation and Resource Allocation in Wireless

Networking towards the IoT Springer Nature This one-of-a-kind book gives you an exclusive look into how the “Industrial Internet of Things” (IIoT) convergence with the 5G end-to-end network is driving the 4th industrial revolution and bringing about game-changing developments in multiple industries. The book shows you how 5G-driven IIoT networks can deliver optimal performance for all industrial applications using key LTE and 5G NR features, and helps you understand how IIoT with 5G can be used to automate factories and make them more cost efficient. Detailed chapters take you through the current knowledge available on this breakthrough technology and give you access to expert discussions on: key use cases and corresponding target requirements; IIoT standards and alliances; end-to-end architecture for IIoT; IIoT enablers for 5G new radio; performance of select IIoT use cases; and machine learning enabled IIoT networks. The book pulls together in one resource key cases and knowledge you need to fully understand how 5G enabled IIoT is transforming global industries. You will be conversant with the end-to-end technology enablers for IIoT, learn how 5G new radio features enhance the system performance of IIoT networks, and gain a deeper understanding of the role of machine learning in the IIoT revolution. With its

international scope and focus on 5G IIoT networks and performance, this is an important read for global technology leaders in telecom and manufacturing industries, analysts and technical writers for various industry magazines and newspapers, telecom researchers, and anyone needing to understand the current state of the art in this rapidly developing technology. 25th International Conference on the Theory and Application of Cryptology and Information Security, Kobe, Japan, December 8–12, 2019, Proceedings, Part II Academic Press This open access book explores the collision between the sustainable energy transition and the Internet of Things (IoT). In that regard, this book's arrival is timely. Not only is the Internet of Things for energy applications, herein called the energy Internet of Things (eIoT), rapidly developing but also the transition towards sustainable energy to abate global climate is very much at the forefront of public discourse. It is within the context of these two dynamic thrusts, digitization and global climate change, that the energy industry sees itself undergoing significant change in how it is operated and managed. This book recognizes that they impose five fundamental energy management change drivers: 1.) the growing demand for electricity, 2.) the emergence of renewable energy resources, 3.) the emergence of electrified

transportation, 4.) the deregulation of electric power markets, 5.) and innovations in smart grid technology. Together, they challenge many of the assumptions upon which the electric grid was first built. The goal of this book is to provide a single integrated picture of how eIoT can come to transform our energy infrastructure. This book links the energy management change drivers mentioned above to the need for a technical energy management solution. It, then, describes how eIoT meets many of the criteria required for such a technical solution. In that regard, the book stresses the ability of eIoT to add sensing, decision-making, and actuation capabilities to millions or perhaps even billions of interacting “smart" devices. With such a large scale transformation composed of so many independent actions, the book also organizes the discussion into a single multi-layer energy management control loop structure. Consequently, much attention is given to not just network-enabled physical devices but also communication networks, distributed control & decision making, and finally technical architectures and standards. Having gone into the detail of these many simultaneously developing technologies, the book returns to how these technologies when integrated form new applications for transactive energy. In that regard, it highlights several eIoT-enabled energy management use

cases that fundamentally change the relationship between end users, utilities, and grid operators. Consequently, the book discusses some of the emerging applications for utilities, industry, commerce, and residences. The book concludes that these eIoT applications will transform today's grid into one that is much more responsive, dynamic, adaptive and flexible. It also concludes that this transformation will bring about new challenges and opportunities for the cyber-physical-economic performance of the grid and the business models of its increasingly growing number of participants and stakeholders.

Principles and Applications of Narrowband Internet of Things (NBIoT)

Academic Press

Business models are regarded as a main emerging topic in the management area for opportune science-driven practical conceptions and applications. They represent how organizations are proposed and planned, as well as how they establish a market and social relations, manage strategic resources, and make decisions. However, companies must produce new solutions for strategic sustainability, performance measurement, and overall managerial conditions for these business models to be implemented effectively. The Handbook of Research on Business Models in Modern Competitive Scenarios depicts how business models contribute to

strategic competition in this new era of technological and social changes as well as how they are conceptualized, studied, designed, implemented, and in the end, how they can be improved. Featuring research on topics such as creating shared value, global scenarios, and organizational intelligence, this book provides pivotal information for scientific researchers, business decision makers, strategic planners, consultants, managers, and academicians. Handbook of Research on Business Models in Modern Competitive Scenarios Springer Nature Essential reference providing best practice of LTE-A, VoLTE, and IoT Design/deployment/Performance and evolution towards 5G This book is a practical guide to the design, deployment, and performance of LTE-A, VoLTE/IMS and IoT. A comprehensive practical performance analysis for VoLTE is conducted based on field measurement results from live LTE networks. Also, it provides a comprehensive introduction to IoT and 5G evolutions. Practical aspects and best practice of LTE-A/IMS/VoLTE/IoT are presented. Practical aspects of LTE-Advanced features are presented. In addition, LTE/LTE-A network capacity dimensioning and analysis are demonstrated based on live LTE/LTE-A networks KPIs. A comprehensive foundation for 5G technologies is provided including massive MIMO, eMBB, URLLC, mMTC,

NGCN and network slicing, cloudification, virtualization and SDN. Practical Guide to LTE-A, VoLTE and IoT: Paving the Way Towards 5G can be used as a practical comprehensive guide for best practices in LTE/LTE-A/VoLTE/IoT design, deployment, performance analysis and network architecture and dimensioning. It offers tutorial introduction on LTE-A/IoT/5G networks, enabling the reader to use this advanced book without the need to refer to more introductory texts. Offers a complete overview of LTE and LTE-A, IMS, VoLTE and IoT and 5G Introduces readers to IP Multimedia Subsystems (IMS)Performs a comprehensive evaluation of VoLTE/CSFB Provides LTE/LTE-A network capacity and dimensioning Examines IoT and 5G evolutions towards a super connected world Introduce 3GPP NB-IoT evolution for low power wide area (LPWA) network Provide a comprehensive introduction for 5G evolution including eMBB, URLLC, mMTC, network slicing, cloudification, virtualization, SDN and orchestration Practical Guide to LTE-A, VoLTE and IoT will appeal to all deployment and service engineers, network designers, and planning and optimization engineers working in mobile communications. Also, it is a practical guide for R&D and standardization experts to evolve the LTE/LTE-A, VoLTE and IoT towards 5G evolution.

How Blockchain Connects Global Businesses NB-IoT

Use Cases and DevicesDesign Guide Industry 4.0 is based on the cyber-physical transformation of processes, systems and methods applied in the manufacturing sector, and on its autonomous and decentralized operation. Industry 4.0 reflects that the industrial world is at the beginning of the so-called Fourth Industrial Revolution, characterized by a massive interconnection of assets and the integration of human operators with the manufacturing environment. In this regard, data analytics and, specifically, the artificial intelligence is the vehicular technology towards the next generation of smart factories.Chapters in this book cover a diversity of current and new developments in the use of artificial intelligence on the industrial sector seen from the fourth industrial revolution point of view, namely, cyber-physical applications, artificial intelligence technologies and tools, Industrial Internet of Things and data analytics. This book contains high-quality chapters containing original research results and literature review of exceptional merit. Thus, it is in the aim of the book to contribute to the literature of the topic in this regard and let the readers know current and new trends in the use of artificial intelligence for the Industry 4.0.

Computational Intelligence, Cyber Security and Computational Models. Models and Techniques for Intelligent Systems

and Automation IGI Global
Cyber-Physical Systems (CPS) integrate computing and communication capabilities by monitoring and controlling the physical systems via embedded hardware and computers. This book brings together new and futuristic findings on IoT, Cyber Physical Systems and Robotics leading towards Automation and solving issues of various critical applications in Real-time. The book initially overviews the concepts of IoT, IIoT and Cyber Physical Systems followed by various critical applications and discusses the latest designs and developments that provide common solutions for the convergence of technologies. In addition, the book specifies methodologies, algorithms and other relevant architectures in various fields that include Automation, Robotics, Smart Agriculture and Industry 4.0. The book is intended for practitioners, enterprise representatives, scientists, students and Ph.D Scholars in hopes of steering research further towards cyber physical systems design and development and implementation across various domains. Additionally, this book can be used as a secondary reference, or rather one-stop guide, by professionals for real-life implementation of cyber physical systems. The book highlights: • A Critical Coverage of various domains: IoT, Cyber Physical Systems, Industry 4.0, Smart

Automation and related critical applications. • Advanced elaborations for target audiences to understand the conceptual methodology and future directions of cyber physical systems and IoT. • An approach towards Research Orientations to enable researchers to point out areas and scope for implementation of Cyber Physical Systems in several domains for better productivity.

Architecture, Technology, Implementation, and Operation of 3GPP New Radio Standards

Academic Press

The Cloud in IoT-enabled Spaces addresses major issues and challenges in IoT-based solutions proposed for the Cloud. It paves the way for IoT-enabled spaces in the next generation cloud computing paradigm and opens the door for further innovative ideas. Topics include Cloud-based optimization in the IoT era, scheduling and routing, medium access, data caching, secure access, uncertainty, home automation, machine learning in wearable devices, energy monitoring, and plant phenotyping in farming. Smart spaces are solutions where Internet of Things (IoT)-enabling technologies have been employed towards further advances in the lifestyle. It tightly integrates with the existing Cloud infrastructure to impact several fields in academia and industry. The Cloud in IoT-enabled Spaces provides an overview of the issues around small spaces and proposes the most up-to-date

alternatives and solutions. The objective is to pave the way for IoT-enabled spaces in the next-generation Cloud computing and open the door for further innovative ideas.

The Importance of New Technologies and Entrepreneurship in Business Development: In The Context of Economic Diversity in Developing Countries CRC Press

With the rise of mobile and wireless technologies, more sustainable networks are necessary to support such communications. These next generation networks can now be utilized to strengthen the growing era of the Internet of Things. Powering the Internet of Things With 5G Networks is a comprehensive reference source for the latest scholarly research on the progression and design of fifth generation networks and their role in supporting the Internet of Things. Including a range of perspectives on topics such as privacy and security, large scale monitoring, and scalable architectures, this book is ideally designed for technology developers, academics, researchers, and practitioners interested in the convergence of the Internet of Things and 5G networks.

Incorporating 5G Communications and Fog/Edge Computing Technologies John Wiley & Sons

This book is a compilation of peer-reviewed papers presented at the International Conference on Machine Intelligence

and Data Science Applications, organized by the School of Computer Science, University of Petroleum & Energy Studies, Dehradun, India, during 4–5 September 2020. The book addresses the algorithmic aspect of machine intelligence which includes the framework and optimization of various states of algorithms. Variety of papers related to wide applications in various fields like data-driven industrial IoT, bioinformatics, network and security, autonomous computing and various other aligned areas. The book concludes with interdisciplinary applications like legal, health care, smart society, cyber-physical system and smart agriculture. All papers have been carefully reviewed. The book is of interest to computer science engineers, lecturers/researchers in machine intelligence discipline and engineering graduates.

Powering the Internet of Things With 5G Networks

Springer Nature

5G NR: Architecture, Technology, Implementation, and Operation of 3GPP New Radio Standards is an in-depth, systematic, technical reference on 3GPP's New Radio standards (Release 15 and beyond), covering the underlying theory, functional descriptions, practical considerations and implementation of the 5G new radio access technology. The book describes the design and operation of individual components and shows how they are integrated

into the overall system and operate from a systems perspective. Uniquely, this book gives detailed information on RAN protocol layers, transport, network architecture and services, as well as practical implementation and deployment issues, making it suitable for researchers and engineers who are designing and developing 5G systems. Reflecting on the author's 30 plus years of experience in signal processing, microelectronics and wireless communication system design, this book is ideal for professional engineers, researchers and graduate students working and researching in cellular communication systems and protocols as well as mobile broadband wireless standards. Strong focus on practical considerations, implementation and deployment issues Takes a top-down approach to explain system operation and functional interconnection Covers all functional components, features, and interfaces based on clear protocol structure and block diagrams Describes RF and transceiver design considerations in sub-6 GHz and mmWave bands Covers network slicing, SDN/NFV/MEC networks and cloud and virtualized RAN architectures Comprehensive coverage of NR multi-antenna techniques and beamformed operation A consistent and integrated coverage reflecting the author’s decades of experience in developing 3G, 4G and 5G technologies and writing

two successful books in these areas
5G Explained Cambridge University Press
This book constitutes the proceedings of the Third International Conference on Computational Intelligence, Cyber Security, and Computational Models, ICC3 2017, which was held in Coimbatore, India, in December 2017. The 15 papers presented in this volume were carefully reviewed and selected from 63 submissions. They were organized in topical sections named: computational intelligence; cyber security; and computational models.
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New Trends in the Use of Artificial Intelligence for the Industry 4.0 Springer
Cellular Internet of Things: From Massive Deployments to Critical 5G Applications, Second Edition, gives insights into the recent and rapid work performed by the 3rd Generation Partnership Project (3GPP) and the Multefire Alliance (MFA) to develop systems for the Cellular IoT. Beyond the technologies, readers will learn what the mMTC and cMTC market segments look like, deployment options and expected performance in terms of system capacity, expected battery lifetime, data throughput, access delay time and device cost, regulations for operation in unlicensed frequency bands, and how

they impact system design and performance. This new edition contains updated content on the latest EC-GSM IoT, LTE-M and NB-IoT features in 3GPP Release 15, critical communication, i.e. URLLC, specified in 3GPP Release 15 for both LTE and NR, LTE-M and NB-IoT for unlicensed frequency bands specified in the Multefire Alliance (MFA), and an updated outlook of what the future holds in Industrial IoT and drone communications, amongst other topics. Provides ubiquitous wireless connectivity for a diverse range of services and applications, describing their performance and how their specifications were developed to meet the most demanding requirements Describes licensed and unlicensed technologies based on 2G, 4G and 5G technologies and how they have evolved towards the Cellular IoT Presents the Narrowband Internet of Things technology and how GSM, LTE and NR have been designed to provide Cellular Internet of Things services Provides use cases that cover ultra-low complex systems connecting billions of devices (massive MTC, mMTC), critical MTC and cMTC based on Ultra-Reliable and Low Latency Communications (URLLC) to meet strict latency and reliability requirements

Blockchain for 5G-Enabled IoT Routledge

The Internet of Things (IoT) should be able to react with minimal human intervention and contribute to the Artificial Intelligence (AI) era requiring real-time and

scalable operation under heterogeneous network infrastructures. This thesis investigates how cooperation and allocation of resources can contribute to the evolution of future wireless networks supporting the IoT. First, we examine how to allocate resources to IoT services which run on devices equipped with multiple network interfaces. The resources are heterogeneous and not interchangeable, and their allocation to a service can be split among different interfaces. We formulate an optimization model for this allocation problem, prove its complexity, and derive two heuristic algorithms to approximate the solution in large instances of the problem. The concept of virtualization is promising towards addressing the heterogeneity of IoT resources by providing an abstraction layer between software and hardware. Network function virtualization (NFV) decouples traditional network operations such a routing from proprietary hardware platforms and implements them as software entities known as virtualized network functions (VNFs). In the second paper, we study how VNF demands can be allocated to Virtual Machines (VMs) by considering the completion-time tolerance of the VNFs. We prove that the problem is NP-complete and devise a subgradient optimization algorithm to provide near-optimal solutions. Our numerical results demonstrate the

effectiveness of our algorithm compared to two benchmark algorithms. Furthermore, we explore the potential of using intermediate nodes, the so-called relays, in IoT networks. In the third paper, we study a multi-user random-access network with a relay node assisting users in transmitting their packets to a destination node. We provide analytical expressions for the performance of the relay's queue and the system throughput. We optimize the relay’s operation parameters to maximize the network-wide throughput while maintaining the relay's queue stability. A stable queue at relay guarantees finite delay for the packets. Furthermore, we study the effect of the wireless links' signal-to-interference-plusnoise ratio (SINR) threshold and the self-interference (SI) cancellation on the per-user and network-wide throughput. Additionally, caching at the network edge has recently emerged as an encouraging solution to offload cellular traffic and improve several performance metrics of the network such as throughput, delay and energy efficiency. In the fourth paper, we study a wireless network that serves two types of traffic: cacheable and non-cacheable traffic. In the considered system, a wireless user with cache storage requests cacheable content from a data center connected with a wireless base station. The user can be assisted by a pair of wireless helpers that

exchange non-cacheable content as well. We devise the system throughput and the delay experienced by the user and provide numerical results that demonstrate how they are affected by the non-cacheable packet arrivals, the availability of caching helpers, the parameters of the caches, and the request rate of the user. Finally, in the last paper, we consider a time-slotted wireless system that serves both cacheable and non-cacheable traffic with the assistance of a relay node. The latter has storage capabilities to serve both types of traffic. We investigate how allocating the storage capacity to cacheable and non-cacheable traffic affects the system throughput. Our numerical results provide useful insights into the system throughput e.g., that it is not necessarily beneficial to increase the storage capacity for the non-cacheable traffic to realize better throughput at the non-cacheable destination node.

Recent Trends and Advances in Wireless and IoT-enabled Networks Springer

This book addresses one of the most overlooked practical, methodological, and moral questions in the journey to secure and handle the massive amount of data being generated from smart devices interactions: the integration of Blockchain with 5G-enabled IoT. After an overview, this book discusses open issues and challenges, which may hinder the growth of Blockchain technology. Then, this book presents a

variety of perspectives on the most pressing questions in the field, such as: how IoT can connect billions of objects together; how the access control mechanisms in 5G-enabled industrial environment works; how to address the real-time and quality-of-service requirements for industrial applications; and how to ensure scalability and computing efficiency. Also, it includes a detailed discussions on the complexity of adoption of Blockchain for 5G-Enabled IoT and presents comparative case studies with respect to various performance evaluation metrics such as scalability, data management, standardization, interoperability and regulations, accessibility, human-factors engineering and interfaces, reliability, heterogeneity, and QoS requirements. This book acts as a professional guide for the practitioners in information security and related topics.

Fog-Enabled Intelligent IoT Systems Wiley

The internet of things (IoT) has emerged as a trending technology that is continually being implemented into various practices within the field of engineering and science due to its versatility and various benefits. Despite the levels of innovation that IoT provides, researchers continue to search for networks that maintain levels of sustainability and require fewer resources. A network that measures up to these expectations is Narrowband IoT (NBIoT), which is a low power wide

area version of IoT networks and is suitable for larger projects. Engineers and other industry professionals are in need of in-depth knowledge on this growing technology and its various applications. Principles and Applications of Narrowband Internet of Things (NBIoT) is an essential reference source that provides an in-depth understanding on the recent advancements of NBIoT as well as the crucial roles of emerging low power IoT networks in various regions of the world. Featuring research on topics such as security monitoring, sustainability, and cloud infrastructure, this book is ideally designed for developers, engineers, practitioners, researchers, students, managers, and policymakers seeking coverage on the large-scale deployment and modern applications of NBIoT.

Design Guide John Wiley & Sons

This document brings together a set of latest data points and publicly available information relevant for Hybrid Cloud Infrastructure. We are very excited to share this content and believe that readers will benefit immensely from this periodic publication immensely.

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