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Machine-To-Machine (M2M) Communications Architecture, Performance and Applications Woodhead Publishing

This book highlights recent research on intelligent systems and nature-inspired computing. It presents 62 selected papers from the 19th International Conference on Intelligent Systems Design and Applications (ISDA 2019), which was held online. The ISDA is a premier conference in the field of computational intelligence, and the latest installment brought together researchers, engineers and practitioners whose work involves intelligent systems and their applications in industry. Including contributions by authors from 33 countries, the book offers a valuable reference guide for all researchers, students and practitioners in the fields of Computer Science and Engineering.

Anyone who has ever shopped for a new smart phone, laptop, or other tech

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gadget knows that staying connected is crucial. There is a lot of discussion over which service provider offers the best coverage—enabling devices to work anywhere and at any time—with 4G and LTE becoming a pervasive part of our everyday language. The Handbook of Research on Next Generation Mobile Communication Systems offers solutions for optimal connection of mobile devices. From satellite signals to cloud technologies, this handbook focuses on the ways communication is being revolutionized, providing a crucial reference source for consumers, researchers, and business professionals who want to be on the frontline of the next big development in wireless technologies. This publication features a wide variety of research-based articles that discuss the future of topics such as bandwidth, energy-efficient power, device-to-device communication, network security and privacy, predictions for 5G communication systems, spectrum sharing and connectivity, and many other relevant issues that will influence our everyday use of technology.

This book constitutes the thoroughly refereed post-conference proceedings of the 13th International Conference on Wired/Wireless Internet Communications, WWIC 2015, held in Malaga, Spain, in May 2015. The 31 papers presented in this volume were carefully reviewed and selected from 43 submissions. They focus on the efficient integration of new network approaches with the traditional

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wired infrastructure. The topics addressed are: design and evaluation of protocols, dynamics of the integration, performance tradeoffs, and the need for new performance metrics and cross-layer interactions.

Electrical energy usage is increasing every year due to population growth and new forms of consumption. As such, it is increasingly imperative to research methods of energy control and safe use. *Security Solutions and Applied Cryptography in Smart Grid Communications* is a pivotal reference source for the latest research on the development of smart grid technology and best practices of utilization. Featuring extensive coverage across a range of relevant perspectives and topics, such as threat detection, authentication, and intrusion detection, this book is ideally designed for academicians, researchers, engineers and students seeking current research on ways in which to implement smart grid platforms all over the globe.

This one-stop reference provides the state-of-the-art theory, key strategies, protocols, deployment aspects, standardization activities and experimental studies of communication and networking technologies for the smart grid. Expert authors provide all the essential information researchers need to progress in the field and to allow power systems engineers to optimize their communication systems.

Machine-to-Machine (M2M) communications refers to the automate exchange of information between devices for control and monitoring applications. This type of communication is not new since automated systems have been present for more than three decades. However, miniaturization of device's size, reduction of production costs and drop in communication fees (altogether with the massive adoption of real-time access of information in current society) are expanding the set of applications and solutions currently under consideration. The real complexity relies on the fact that M2M is not only an add-on communication solution, like the case of traditional human-centric broadband communications. M2M usually entails a change in the core business of an industry, since the relationship with external partners and the internal tasks can be radically modified. In this paper, we analyse the players involved in M2M communications and how they position themselves in a market which requires them to adjust their traditional business approach. The main question addressed in this work refers to "which players are investing in M2M, which is their view and how could their approach affect the current ICT sector?" We highlight the dominance and relationship between different actors and also look at barriers that prevent investments, regulations in the area and standardization efforts ...

Energy efficiency issues for green internet of things (IoT) are investigated in this

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book, from the perspectives of device-to-device (D2D) communications, machine-to-machine (M2M) communications, and air-ground networks. Specifically, critical green IoT techniques from D2D communications in the cellular network to M2M communications in industrial IoT (IIoT), (from single physical-layer optimization to cross-layer optimization, and from single-layer ground networks to stereoscopic air-ground networks) are discussed in both theoretical problem formulation and simulation result analysis in this book. Internet of Things (IoT) offers a platform that enables sensors and devices to connect seamlessly in an intelligent environment, thus providing intelligence services including monitoring systems, industrial automation, and ultimately smart cities. However, the huge potentials of IoT are constrained by high energy consumption, limited battery capacity, and the slow progress of battery technology. The high energy consumption of IoT device causes communication interruption, information loss, and short network lifetime. Moreover, once deployed, the batteries inside IoT devices cannot be replaced in time. Therefore, energy efficient resource allocation is urgent to be investigated to improve the energy efficiency of IoT, facilitate green IoT, and extend the network lifetime. This book provides readers with a comprehensive overview of the state-of-the-art key technologies, frameworks, related optimization algorithms, and corresponding integrated designs on green IoT. It also presents

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an easy-to-understand style in a professional manner, making the book suitable for a wider range of readers from students to professionals interested in the green IoT.

This book covers issues related to 5G network security. The authors start by providing details on network architecture and key requirements. They then outline the issues concerning security policies and various solutions that can handle these policies. Use of SDN-NFV technologies for security enhancement is also covered. The book includes intelligent solutions by utilizing the features of artificial intelligence and machine learning to improve the performance of the 5G security protocols and models. Optimization of security models is covered as a separate section with a detailed information on the security of 5G-based edge, fog, and osmotic computing. This book provides detailed guidance and reference material for academicians, professionals, and researchers. Presents extensive information and data on research and challenges in 5G networks; Covers basic architectures, models, security frameworks, and software-defined solutions for security issues in 5G networks; Provides solutions that can help in the growth of new startups as well as research directions concerning the future of 5G networks.

MobiSec 2009 was the first ICST conference on security and privacy in mobile information and communication systems. With the the vast area of mobile technology research and application, the intention behind the creation of MobiSec was to make a small, but unique contribution to build a bridge between top-level research and large scale application of novel kinds of information security for mobile devices and communication. The papers at MobiSec 2009 dealt

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with a broad variety of subjects ranging from issues of trust in and security of mobile devices and embedded hardware security, over efficient cryptography for resource-restricted platforms, to advanced applications such as wireless sensor networks, user authentication, and privacy in an environment of autonomously communicating objects. With hindsight a leitmotif emerged from these contributions, which corroborated the idea behind MobiSec; a set of powerful tools have been created in various branches of the security discipline, which await combined application to build trust and security into mobile (that is, all future) networks, autonomous and personal devices, and pervasive applications

As we entered the 21st century, the rapid growth of information technology has changed our lives more conveniently than we have ever speculated. Recently in all fields of the industry, heterogeneous technologies have converged with information technology resulting in a new paradigm, information technology convergence. In the process of information technology convergence, the latest issues in the structure of data, system, network, and infrastructure have become the most challenging task. Proceedings of the International Conference on IT Convergence and Security 2011 approaches the subject matter with problems in technical convergence and convergences of security technology by looking at new issues that arise from techniques converging. The general scope is convergence security and the latest information technology with the following most important features and benefits: 1. Introduction of the most recent information technology and its related ideas 2. Applications and problems related to technology convergence, and its case studies 3. Introduction of converging existing security techniques through convergence security Overall, after reading Proceedings of the International Conference on IT Convergence and Security 2011, readers will understand the

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most state of the art information strategies and technologies of convergence security.

The ubiquity of modern technologies has allowed for increased connectivity between people and devices across the globe. This connected infrastructure of networks creates numerous opportunities for applications and uses. The Internet of Things: Breakthroughs in Research and Practice is an authoritative reference source for the latest academic material on the interconnectivity of networks and devices in the digital era and examines best practices for integrating this advanced connectivity across multiple fields. Featuring extensive coverage on innovative perspectives, such as secure computing, regulatory standards, and trust management, this book is ideally designed for engineers, researchers, professionals, graduate students, and practitioners seeking scholarly insights on the Internet of Things.

Part one of Machine-to-Machine (M2M) Communications covers machine-to-machine systems, architecture and components. Part two assesses performance management techniques for M2M communications. Part three looks at M2M applications, services, and standardization. Machine-to-machine communications refers to autonomous communication between devices or machines. This book serves as a key resource in M2M, which is set to grow significantly and is expected to generate a huge amount of additional data traffic and new revenue streams, underpinning key areas of the economy such as the smart grid, networked homes, healthcare and transportation. Examines the opportunities in M2M for businesses Analyses the optimisation and development of M2M communications Chapters cover aspects of access, scheduling, mobility and security protocols within M2M communications.

Currently significant research publications in machine to machine communications, Internet of things, distributed and ubiquitous computing are spread across many disciplines and journals

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with each one focusing on a narrow aspect of the field of Machine to Machine Intelligence. Consequently finding a single point of focus which makes it easy for researchers and in particular early career researchers to latch onto new publications in this field in one place has been difficult. The objective of TMMI is to provide such a focus for state of the art research findings and development is machine to machine systems. The Journal will receive contributions which deal with all aspects of machine to machine (M2M) communications, Internet of things (IoT), distributed and ubiquitous computing, communications and sensing. Towards that end the team of international editors and advisory board is formed to include individuals with extensive expertise in at least one aspect of the Journal spread. At inception we will periodically publish the Journal quarterly. The Journal is published by the Association of International Scientists (AIS).

in other words, can we track that any Machine-to-Machine M2M Communications project is implemented as planned, and is it working? Does our organization need more Machine-to-Machine M2M Communications education? Does Machine-to-Machine M2M Communications systematically track and analyze outcomes for accountability and quality improvement? How does Machine-to-Machine M2M Communications integrate with other business initiatives? What problems are you facing and how do you consider Machine-to-Machine M2M Communications will circumvent those obstacles? Defining, designing, creating, and implementing a process to solve a challenge or meet an objective is the most valuable role... In EVERY group, company, organization and department. Unless you are talking a one-time, single-use project, there should be a process. Whether that process is managed and implemented by humans, AI, or a combination of the two, it needs to be designed by someone

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with a complex enough perspective to ask the right questions. Someone capable of asking the right questions and step back and say, 'What are we really trying to accomplish here? And is there a different way to look at it?' This Self-Assessment empowers people to do just that - whether their title is entrepreneur, manager, consultant, (Vice-)President, CxO etc... - they are the people who rule the future. They are the person who asks the right questions to make Machine-to-Machine M2M Communications investments work better. This Machine-to-Machine M2M Communications All-Inclusive Self-Assessment enables You to be that person. All the tools you need to an in-depth Machine-to-Machine M2M Communications Self-Assessment. Featuring 693 new and updated case-based questions, organized into seven core areas of process design, this Self-Assessment will help you identify areas in which Machine-to-Machine M2M Communications improvements can be made. In using the questions you will be better able to: - diagnose Machine-to-Machine M2M Communications projects, initiatives, organizations, businesses and processes using accepted diagnostic standards and practices - implement evidence-based best practice strategies aligned with overall goals - integrate recent advances in Machine-to-Machine M2M Communications and process design strategies into practice according to best practice guidelines Using a Self-Assessment tool known as the Machine-to-Machine M2M Communications Scorecard, you will develop a clear picture of which Machine-to-Machine M2M Communications areas need attention. Your purchase includes access details to the Machine-to-Machine M2M Communications self-assessment dashboard download which gives you your dynamically prioritized projects-ready tool and shows your organization exactly what to do next. You will receive the following contents with New and Updated specific criteria: - The latest quick edition of the book in PDF - The latest

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complete edition of the book in PDF, which criteria correspond to the criteria in... - The Self-Assessment Excel Dashboard, and... - Example pre-filled Self-Assessment Excel Dashboard to get familiar with results generation ...plus an extra, special, resource that helps you with project managing. INCLUDES LIFETIME SELF ASSESSMENT UPDATES Every self assessment comes with Lifetime Updates and Lifetime Free Updated Books. Lifetime Updates is an industry-first feature which allows you to receive verified self assessment updates, ensuring you always have the most accurate information at your fingertips.

This book is the essence of a scientific research endeavour aspired to tackle the challenges of ever-growing data traffic in mobile networks. The contemporary mobile communication systems offer efficient services to broadband applications. However, narrowband Machine-to-Machine (M2M) data traffic handling remains still a concern. This book advocates a set of protocols for aggregation and multiplexing of M2M data traffic at an intermediate node before transmission to the core network. The devised framework is realised by two independent methods: the simulation approach and the analytical approach. The outcomes obtained through both methods are compared to validate the results. The statistical significance of simulation results is established by the determination of confidence intervals. The findings suggest significant improvements in radio resource utilisation when serving M2M traffic. With advances in technology, a mobile device today is like a mini PC that provides voice and data services in the form of smart-phones. Phenomenal increase in data services which enable mobile communication access to critical aspects of human society/life has led to standardization of SAE/LTE (System Architecture Evolution/Long Term Evolution) by 3GPP and IEEE 802.16e/WiMAX. SAE/LTE is also known as Evolved Packet System (EPS). This

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book addresses the newer security issues that have arisen as a result of penetration of mobile communications and standardization. In particular, the book focuses on the latest security developments in 3GPP SAE/LTE and WiMAX. The intended audience for this book are mobile network and device architects, designers, researchers and students. The goal of the authors, who have a combined experience of more than 25 years in mobile security standardization, architecture, research, and education, is to provide the book's readers with up-to-date information about the architecture and challenges of EPS and WiMAX security. The book has six chapters; the first three chapters are intended to be introductory ones, and the remaining three chapters provide an in-depth assessment of security provisions. Chapter 1 provides a background to the Next Generation Mobile Networks (NGMN) activity and requirements. Chapter 2 provides an overview of security, telecommunication systems and their requirements. Chapter 3 provides some background information on standardization. Chapter 4 discusses the EPS (or SAE/LTE) security architecture developed by 3GPP, in particular, the authentication and key agreement method for SAE/LTE together with newly defined key hierarchy. This chapter also addresses the challenging aspects of SAE/LTE interworking and mobility with UMTS together with the necessary key-exchange technologies. The focus of Chapter 5 is WiMAX (IEEE 802.16) security and provides an in-depth discussion of the WiMAX security requirements, the authentication aspects of PKMv2, and the overall WiMAX network security aspects. Chapter 6 briefly covers security for (i) Home(evolved)NodeB [H(e)NB is the Femto solution from 3GPP], (ii) Machine-to-Machine (M2M) security and (iii) Multimedia Broadcast and Multicast Service (MBMS) and Group Key Management. This book provides readers with a 360-degree perspective on the Internet of Things (IoT)

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design and M2M communication process. It is intended to be used as a design guide for the development of IoT solutions, covering architecture, design, and development methods. This book examines applications such as industry automation for Industry 4.0, Internet of Medical Things (IoMT), and Internet of Services (IoS) as it is unfolding. Discussions on engineering fundamentals are limited to what is required for the realization of IoT solutions. Internet of Things and M2M Communication Technologies: Architecture and Practical Design Approach to IoT in Industry 4.0 is written by an industry veteran with more than 30 years of hands-on experience. It is an invaluable guide for electrical, electronic, computer science, and information science engineers who aspire to be IoT designers and an authoritative reference for practicing designers working on IoT device development. Provides complete design approach to develop IoT solutions; Includes reference designs and guidance on relevant standards compliance; Addresses design for manufacturability and business models. This book outlines the background and overall vision for the Internet of Things (IoT) and Machine-to-Machine (M2M) communications and services, including major standards. Key technologies are described, and include everything from physical instrumentation of devices to the cloud infrastructures used to collect data. Also included is how to derive information and knowledge, and how to integrate it into enterprise processes, as well as system architectures and regulatory requirements. Real-world service use case studies provide the hands-on knowledge needed to successfully develop and implement M2M and IoT technologies sustainably and profitably. Finally, the future vision for M2M technologies is described, including prospective changes in relevant standards. This book is written by experts in the technology and business aspects of Machine-to-Machine and Internet of Things, and who have

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experience in implementing solutions. Standards included: ETSI M2M, IEEE 802.15.4, 3GPP (GPRS, 3G, 4G), Bluetooth Low Energy/Smart, IETF 6LoWPAN, IETF CoAP, IETF RPL, Power Line Communication, Open Geospatial Consortium (OGC) Sensor Web Enablement (SWE), ZigBee, 802.11, Broadband Forum TR-069, Open Mobile Alliance (OMA) Device Management (DM), ISA100.11a, WirelessHART, M-BUS, Wireless M-BUS, KNX, RFID, Object Management Group (OMG) Business Process Modelling Notation (BPMN) Key technologies for M2M and IoT covered: Embedded systems hardware and software, devices and gateways, capillary and M2M area networks, local and wide area networking, M2M Service Enablement, IoT data management and data warehousing, data analytics and big data, complex event processing and stream analytics, knowledge discovery and management, business process and enterprise integration, Software as a Service and cloud computing Combines both technical explanations together with design features of M2M/IoT and use cases. Together, these descriptions will assist you to develop solutions that will work in the real world Detailed description of the network architectures and technologies that form the basis of M2M and IoT Clear guidelines and examples of M2M and IoT use cases from real-world implementations such as Smart Grid, Smart Buildings, Smart Cities, Participatory Sensing, and Industrial Automation A description of the vision for M2M and its evolution towards IoT

The Internet of Things (IoT) is the emerging technology that interconnects smart objects using wireless communications. After having been extensively studied in academic labs, the IoT is now widely applied in the industrial world (e.g. domestic automation, smart metering, and smart cities). Internet of Things and M2M Communications presents the key concepts used in the IoT. In particular, machine to machine (M2M) communications have to be energy efficient

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so that all the smart objects may operate for years on a single battery. Besides, whilst constructing an efficient global digital world that combines personal/private and external/general data, security and privacy issues also have to be adequately covered. The two-volume set LNICST 209-210 constitutes the post-conference proceedings of the 11th EAI International Conference on Communications and Networking, ChinaCom 2016, held in Chongqing, China, in September 2016. The total of 107 contributions presented in these volumes are carefully reviewed and selected from 181 submissions. The book is organized in topical sections on MAC schemes, traffic algorithms and routing algorithms, security, coding schemes, relay systems, optical systems and networks, signal detection and estimation, energy harvesting systems, resource allocation schemes, network architecture and SDM, heterogeneous networks, IoT (Internet of Things), hardware design and implementation, mobility management, SDN and clouds, navigation, tracking and localization, future mobile networks.

This book constitutes the refereed proceedings of the 11th International Conference on Ad-hoc, Mobile, and Wireless Networks, ADHOC-NOW 2012 held in Belgrade, Serbia, July 9-11, 2012. The 36 revised full papers presented were carefully reviewed and selected from 76 submissions. The accepted papers cover a wide spectrum of traditional networking topics ranging from routing to the application layer, to localization in various networking environments such as wireless sensor and ad-hoc networks, and give insights in a variety of application areas.

This volume constitutes the refereed proceedings of the International Conferences, FGCM and DCA 2012, held as part of the Future Generation Information Technology Conference, FGIT

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2012, Kangwondo, Korea, in December 2012. The papers presented were carefully reviewed and selected from numerous submissions and focus on the various aspects of future generation communication and networking, and digital contents and applications.

This Three-Volume-Set constitutes the refereed proceedings of the Second International Conference on Software Engineering and Computer Systems, ICSECS 2011, held in Kuantan, Malaysia, in June 2011. The 190 revised full papers presented together with invited papers in the three volumes were carefully reviewed and selected from numerous submissions. The papers are organized in topical sections on software engineering; network; bioinformatics and e-health; biometrics technologies; Web engineering; neural network; parallel and distributed; e-learning; ontology; image processing; information and data management; engineering; software security; graphics and multimedia; databases; algorithms; signal processing; software design/testing; e- technology; ad hoc networks; social networks; software process modeling; miscellaneous topics in software engineering and computer systems.

This two volume set constitutes the refereed proceedings of the 14th EAI International Conference on Communications and Networking, ChinaCom 2019, held in November/December 2019 in Shanghai, China. The 81 papers presented were carefully selected from 162 submissions. The papers are organized in topical sections on Internet of Things (IoT), antenna, microwave and cellular communication, wireless communications and networking, network and information security, communication QoS, reliability and modeling, pattern recognition and image signal processing, and information processing.

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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

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design, deployment, and operation of M2M communications networks and systems. The 16 chapters in this book discuss new architectures, networking paradigms, trustworthiness structures, and platforms for the integration of applications across various business and industrial domains which are needed for the emergence of 'intelligent things' (static or mobile) in collaborative autonomous fleets. These new apps speed up the progress of paradigms of autonomous system design and the proliferation of the Internet of Robotic Things (IoRT). Collaborative robotic things can communicate with other things in IoRT, learn independently, interact securely with the world, people and other things, and acquire characteristics such as self-maintenance, self-awareness, self-healing and fail-operational, due to their ubiquitous nature, the "Internet of Robotic Things" which binds together the sensors and the objects of robotic things is gaining popularity.

A comprehensive introduction to M2M Standards and systems architecture, from concept to implementation Focusing on the latest technological developments, M2M Communications: A Systems Approach is an advanced introduction to this important and rapidly evolving topic. It provides a systems perspective on machine-to-machine services and the major telecommunications relevant technologies. It provides a focus on the latest standards currently in progress by ETSI and 3GPP, the leading standards entities in telecommunication networks and solutions. The structure of the book is inspired by ongoing standards developments and uses a systems-based approach for

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describing the problems which may be encountered when considering M2M, as well as offering proposed solutions from the latest developments in industry and standardization. The authors provide comprehensive technical information on M2M architecture, protocols and applications, especially examining M2M service architecture, access and core network optimizations, and M2M area networks technologies. It also considers dominant M2M application domains such as Smart Metering, Smart Grid, and eHealth. Aimed as an advanced introduction to this complex technical field, the book will provide an essential end-to-end overview of M2M for professionals working in the industry and advanced students. Key features: First technical book emerging from a standards perspective to respond to this highly specific technology/business segment Covers the main challenges facing the M2M industry today, and proposes early roll-out scenarios and potential optimization solutions Examines the system level architecture and clearly defines the methodology and interfaces to be considered Includes important information presented in a logical manner essential for any engineer or business manager involved in the field of M2M and Internet of Things Provides a cross-over between vertical and horizontal M2M concepts and a possible evolution path between the two Written by experts involved at the cutting edge of M2M developments

Transformations in wireless connectivity and location-aware technologies hold the promise of bringing a sea-change in the way transportation information is generated

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and used in the future. Sensors in the transportation system, when integrated with those in other sectors (for example, energy, utility and health) have the potential to foster novel new ways of improving livability and sustainability. The end-result of these developments has been somewhat contradictory. Although automation in the transportation environment has become increasingly widespread, the level of involvement and active participation by people, in terms of co-creation and contribution of information, has also increased. As a result, the following two major trends have been observed: (1) increases in Machine-to- Machine (M2M) communications; and (2) increases in the variety and volume of User-Generated Content. In this transportation paradigm, the pervasive use of Information and Communication Technologies will serve as the foundation for mobility intelligence towards an “ubiquitous information-centered mobility environment”. However, many technical and operational questions, as well as social, management and legal challenges present themselves in the transformation to this vision. The book presents a non-technical review of research and initiatives and a discussion of such opportunities and challenges.

Acquire the tools to address emerging challenges in modern computer networks with this multidisciplinary review of the fundamentals.

Which customers cant participate in our Machine-to-Machine M2M Communications domain because they lack skills, wealth, or convenient access to existing solutions?

How do the Machine-to-Machine M2M Communications results compare with the

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performance of your competitors and other organizations with similar offerings? ask yourself: are the records needed as inputs to the Machine-to-Machine M2M Communications process available? How do we measure improved Machine-to-Machine M2M Communications service perception, and satisfaction? How did the Machine-to-Machine M2M Communications manager receive input to the development of a Machine-to-Machine M2M Communications improvement plan and the estimated completion dates/times of each activity? Defining, designing, creating, and implementing a process to solve a challenge or meet an objective is the most valuable role... In EVERY group, company, organization and department. Unless you are talking a one-time, single-use project, there should be a process. Whether that process is managed and implemented by humans, AI, or a combination of the two, it needs to be designed by someone with a complex enough perspective to ask the right questions. Someone capable of asking the right questions and step back and say, 'What are we really trying to accomplish here? And is there a different way to look at it?' This Self-Assessment empowers people to do just that - whether their title is entrepreneur, manager, consultant, (Vice-)President, CxO etc... - they are the people who rule the future. They are the person who asks the right questions to make Machine-to-Machine M2M Communications investments work better. This Machine-to-Machine M2M Communications All-Inclusive Self-Assessment enables You to be that person. All the tools you need to an in-depth Machine-to-Machine M2M Communications Self-

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Assessment. Featuring 486 new and updated case-based questions, organized into seven core areas of process design, this Self-Assessment will help you identify areas in which Machine-to-Machine M2M Communications improvements can be made. In using the questions you will be better able to: - diagnose Machine-to-Machine M2M Communications projects, initiatives, organizations, businesses and processes using accepted diagnostic standards and practices - implement evidence-based best practice strategies aligned with overall goals - integrate recent advances in Machine-to-Machine M2M Communications and process design strategies into practice according to best practice guidelines Using a Self-Assessment tool known as the Machine-to-Machine M2M Communications Scorecard, you will develop a clear picture of which Machine-to-Machine M2M Communications areas need attention. Your purchase includes access details to the Machine-to-Machine M2M Communications self-assessment dashboard download which gives you your dynamically prioritized projects-ready tool and shows your organization exactly what to do next. Your exclusive instant access details can be found in your book.

Machine-to-machine (M2M) communications is one of the enabling technologies for connecting massive number of devices to the Internet of Things (IoT). M2M communications have different characteristics than human-to-human (H2H) communications. In this work, we propose a scalable, hybrid MAC protocol that will satisfy user quality-of-service (QoS) requirements. We model both periodic and

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nonperiodic traffic. The proposed MAC protocol organizes transmissions into superframes consisting of a number of frames. A machine is assumed to generate a one or zero packet per its period. The machines have been divided into several types according to their packet generation probabilities. The generated packets are classified into different traffic classes according to their tolerance to packet losses and served by a subframe. Further, each subframe is divided into two sub-periods one serving contention and the other reserved traffic of that traffic class. We formulated an optimization problem that minimizes frame length subject to QoS user requirements. Then, we derived packet loss probability for each class as well as total packet loss probability for the optimization. Formulation resulted in a nonlinear optimization problem, but numerical results show that an LP approximation provides a nearly optimal solution. The work also considered the proposed protocol under user mobility. The packet arrival process under user mobility has been derived. Then the performance of the protocol has been evaluated with the contention service under this arrival process. The contention service with and without packet losses have been considered. A priority queueing mechanism also has been studied for M2M communication. The results of this thesis may be useful in the design of M2M communication system.

The book aim is to define the Internet of Things (IoT) in a global view, present the research agenda for Internet of Things technologies by addressing the new technological developments and providing a global balanced coverage of the

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challenges and the technical and industrial trends. Energy consumption by the data, communication and networking devices and global CO₂ emission is increasing exponentially. ICT has a dual role in this process: it accounts for about two percent of global CO₂ emissions and at the same the ICT including IoT technologies and applications have a direct effect on lowering CO₂ emissions, increasing energy efficiency, reducing power consumption, and achieving efficient waste recycling. The book builds on the ideas put forward by the European research Cluster on the Internet of Things Strategic Research Agenda and presents global views and state of the art results on the challenges facing the research, development and deployment of IoT at the global level. IoT together with the other emerging Internet developments such as Internet of Energy, Media, People, Services, Business/Enterprises are the backbone of the digital economy, the digital society and the foundation for the future knowledge based economy and innovation society. IoT developments show that we will have 16 billion connected devices by the year 2020 , which will average out to six devices per person on earth and to many more per person in digital societies. Devices like smart phones and machine to machine or thing to thing communication will be the main drivers for further IoT development. The first direct consequence of the IoT is the generation of huge quantities of data, where every physical or virtual object may have a digital twin in the cloud, which could be generating regular updates. The IoT contribution is in the increased value of information created by the number of

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interconnections among things and the transformation of the processed information into knowledge for the benefit of mankind and society. The Internet of Things market is connected to industrial machine to machine (M2M) systems, smart meters and enabling technologies such as nanoelectronics, communications, sensors, smart phones, embedded systems, cloud computing and software technologies that will create new products, new services, new interfaces by creating smart environments and smart spaces with applications ranging from smart transport, cities, buildings, energy, grid, to smart health and life. Technical topics discussed in the book include:- The Internet of Things: The Way Ahead Internet of Things Strategic Research Agenda Challenges of a Sustainable Roadmap for the Internet of Things Technologies behind Internet of Things: From Nanoelectronics and Embedded Systems to Cloud Computing and Cognitive Systems Machine to machine (M2M) communication and the emerging Internet of Things applications The "Internet of Things" based on IPv6. Paving the way to Smart IPv6 Buildings "Internet of Things - from Ubiquitous Computing to Ubiquitous Intelligence Applications" Virtualization of network resources and Physical devices in Internet of Things applications Validation and Interoperability challenges for IoT Mobile devices enable IoT evolution from industrial applications to mass consumer applications Interoperability, Standardisation and Governance in the era of Internet of Things (IoT) Technologies, Applications, and Governance in the Internet of Things Opportunities, Challenges for Internet of Things Technologies

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The proliferation of wireless communications has led to mobile computing, a new era in data communication and processing allowing people to access information anywhere and anytime using lightweight computer devices. Aligned with this phenomenon, a vast number of mobile solutions, systems, and applications have been continuously developed. However, despite the opportunities, there exist constraints, challenges, and complexities in realizing the full potential of mobile computing, requiring research and experimentation. Algorithms, Methods, and Applications in Mobile Computing and Communications is a critical scholarly publication that examines the various aspects of mobile computing and communications from engineering, business, and organizational perspectives. The book details current research involving mobility challenges that hinder service applicability, mobile money transfer services and anomaly detection, and mobile fog environments. As a resource rich in information about mobile devices, wireless broadcast databases, and machine communications, it is an ideal source for computer scientists, IT specialists, service providers, information technology professionals, academicians, and researchers interested in the field of mobile computing.

The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. A thing in the internet of things can be a

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person with a heart monitor implant, a farm animal with a biochip transponder, an automobile that has built-in sensors to alert the driver when tire pressure is low or any other natural or man-made object that can be assigned an IP address and is able to transfer data over a network. Increasingly, organizations in a variety of industries are using IoT to operate more efficiently, better understand customers to deliver enhanced customer service, improve decision-making and increase the value of the business. History of IoT Kevin Ashton, co-founder of the Auto-ID Center at MIT, first mentioned the internet of things in a presentation he made to Procter & Gamble (P&G) in 1999. Wanting to bring radio frequency ID (RFID) to the attention of P&G's senior management, Ashton called his presentation "Internet of Things" to incorporate the cool new trend of 1999: the internet. MIT professor Neil Gershenfeld's book, *When Things Start to Think*, also appearing in 1999, didn't use the exact term but provided a clear vision of where IoT was headed. IoT has evolved from the convergence of wireless technologies, microelectromechanical systems (MEMS), micro services and the internet. The convergence has helped tear down the silos between operational technology (OT) and information technology (IT), enabling unstructured machine-generated data to be analysed for insights to drive improvements. Although Ashton's was the first mention of the internet of things, the idea of connected devices has been around since the 1970s, under the monikers embedded internet and pervasive computing. The first internet appliance, for example, was a Coke machine at Carnegie

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Mellon University in the early 1980s. Using the web, programmers could check the status of the machine and determine whether there would be a cold drink awaiting them, should they decide to make the trip to the machine. IoT evolved from machine-to-machine (M2M) communication, i.e., machines connecting to each other via a network without human interaction. M2M refers to connecting a device to the cloud, managing it and collecting data. Taking M2M to the next level, IoT is a sensor network of billions of smart devices that connect people, systems and other applications to collect and share data. As its foundation, M2M offers the connectivity that enables IoT. The internet of things is also a natural extension of SCADA (supervisory control and data acquisition), a category of software application program for process control, the gathering of data in real time from remote locations to control equipment and conditions. SCADA systems include hardware and software components. The hardware gathers and feeds data into a computer that has SCADA software installed, where it is then processed and presented it in a timely manner. The evolution of SCADA is such that late-generation SCADA systems developed into first-generation IoT systems. The concept of the IoT ecosystem, however, didn't really come into its own until the middle of 2010 when, in part, the government of China said it would make IoT a strategic priority in its five-year plan. How IoT works An IoT ecosystem consists of web-enabled smart devices that use embedded processors, sensors and communication hardware to collect, send and act on data they acquire from their environments. IoT devices share the sensor data they

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collect by connecting to an IoT gateway or other edge device where data is either sent to the cloud to be analyzed or analyzed locally. Thus, these devices communicate with other related devices and act on the information they get from one another driving business intelligence.

Part one of Machine-to-Machine (M2M) Communications covers machine-to-machine systems, architecture and components. Part two assesses performance management techniques for M2M communications. Part three looks at M2M applications, services, and standardization. Machine-to-machine communications refers to autonomous communication between devices or machines. This book serves as a key resource in M2M, which is set to grow significantly and is expected to generate a huge amount of additional data traffic and new revenue streams, underpinning key areas of the economy such as the smart grid, networked homes, healthcare and transportation. Examines the opportunities in M2M for businesses Analyses the optimisation and development of M2M communications Chapters cover aspects of access, scheduling, mobility and security protocols within M2M communications

Will team members regularly document their Machine-to-Machine M2M Communications work? How do you manage and improve your Machine-to-Machine M2M Communications work systems to deliver customer value and achieve organizational success and sustainability? How would one define Machine-to-Machine M2M Communications leadership? Which customers cant participate in our Machine-to-

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Machine M2M Communications domain because they lack skills, wealth, or convenient access to existing solutions? How can we improve Machine-to-Machine M2M Communications? Defining, designing, creating, and implementing a process to solve a business challenge or meet a business objective is the most valuable role... In EVERY company, organization and department. Unless you are talking a one-time, single-use project within a business, there should be a process. Whether that process is managed and implemented by humans, AI, or a combination of the two, it needs to be designed by someone with a complex enough perspective to ask the right questions. Someone capable of asking the right questions and step back and say, 'What are we really trying to accomplish here? And is there a different way to look at it?' For more than twenty years, The Art of Service's Self-Assessments empower people who can do just that - whether their title is marketer, entrepreneur, manager, salesperson, consultant, business process manager, executive assistant, IT Manager, CxO etc... - they are the people who rule the future. They are people who watch the process as it happens, and ask the right questions to make the process work better. This book is for managers, advisors, consultants, specialists, professionals and anyone interested in Machine-to-Machine M2M Communications assessment. All the tools you need to an in-depth Machine-to-Machine M2M Communications Self-Assessment. Featuring 486 new and updated case-based questions, organized into seven core areas of process design, this Self-Assessment will help you identify areas in which Machine-to-Machine M2M

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Communications improvements can be made. In using the questions you will be better able to: - diagnose Machine-to-Machine M2M Communications projects, initiatives, organizations, businesses and processes using accepted diagnostic standards and practices - implement evidence-based best practice strategies aligned with overall goals - integrate recent advances in Machine-to-Machine M2M Communications and process design strategies into practice according to best practice guidelines Using a Self-Assessment tool known as the Machine-to-Machine M2M Communications Scorecard, you will develop a clear picture of which Machine-to-Machine M2M Communications areas need attention. Included with your purchase of the book is the Machine-to-Machine M2M Communications Self-Assessment downloadable resource, which contains all questions and Self-Assessment areas of this book in a ready to use Excel dashboard, including the self-assessment, graphic insights, and project planning automation - all with examples to get you started with the assessment right away. Access instructions can be found in the book. You are free to use the Self-Assessment contents in your presentations and materials for customers without asking us - we are here to help.

Enables engineers and researchers to understand the fundamentals and applications of device-to-device communications and its optimization in wireless networking.

This book constitutes the refereed proceedings of the 8th International Conference on Grid and Pervasive Computing, GPC 2013, held in Seoul, Korea, in May 2013 and the

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following colocated workshops: International Workshop on Ubiquitous and Multimedia Application Systems, UMAS 2013; International Workshop DATICS-GPC 2013: Design, Analysis and Tools for Integrated Circuits and Systems; and International Workshop on Future Science Technologies and Applications, FSTA 2013. The 111 revised papers were carefully reviewed and selected from numerous submissions. They have been organized in the following topical sections: cloud, cluster and grid; middleware resource management; mobile peer-to-peer and pervasive computing; multi-core and high-performance computing; parallel and distributed systems; security and privacy; ubiquitous communications, sensor networking, and RFID; ubiquitous and multimedia application systems; design, analysis and tools for integrated circuits and systems; future science technologies and applications; and green and human information technology.

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