

Bacnet The Global Standard For Building Automation And Control Networks

Ambient intelligence (Aml) is an element of pervasive computing that brings smartness to living and business environments to make them more sensitive, adaptive, autonomous and personalized to human needs. It refers to intelligent interfaces that recognise human presence and preferences, and adjust smart environments to suit their immediate needs and requirements. The key factor is the presence of intelligence and decision-making capabilities in IoT environments. The underlying technologies include pervasive computing, ubiquitous communication, seamless connectivity of smart devices, sensor networks, artificial intelligence (AI), machine learning (ML) and context-aware human-computer interaction (HCI). Aml applications and scenarios include smart homes, autonomous self-driving vehicles, healthcare systems, smart roads, the industry sector, smart facilities management, the education sector, emergency services, and many more. The advantages of Aml in the IoT environment are extensive. However, as for any new technological paradigm, there are also many open issues and limitations. This book discusses the Aml element of the IoT and the relevant principles, frameworks, and technologies in particular, as well as the benefits and inherent limitations. It reviews the state of the art of current developments relating

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to smart spaces and Aml-based IoT environments. Written by leading international researchers and practitioners, the majority of the contributions focus on device connectivity, pervasive computing and context modelling (including communication, security, interoperability, scalability, and adaptability). The book presents cutting-edge research, current trends, and case studies, as well as suggestions to further our understanding and the development and enhancement of the Aml-IoT vision.

A fully comprehensive introduction to smart grid standards and their applications for developers, consumers and service providers The critical role of standards for smart grid has already been realized by world-wide governments and industrial organizations. There are hundreds of standards for Smart Grid which have been developed in parallel by different organizations. It is therefore necessary to arrange those standards in such a way that it is easier for readers to easily understand and select a particular standard according to their requirements without going into the depth of each standard, which often spans from hundreds to thousands of pages. The book will allow people in the smart grid areas and in the related industries to easily understand the fundamental standards of smart grid, and quickly find the building-block standards they need from hundreds of standards for implementing a smart grid system. The authors highlight the most advanced works and efforts now under way to realize an integrated and interoperable smart grid, such as the “NIST Framework and Roadmap for Smart Grid Interoperability Standards Release 2.0”, the” IEC Smart Grid Standardization

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Roadmap”, the ISO/IEC’s “Smart Grid Standards for Residential Customers”, the ZigBee/HomePlug’s “Smart Energy Profile Specification 2.0”, IEEE’s P2030 “Draft Guide for Smart Grid Interoperability of Energy Technology and Information Technology Operation with the Electric Power System (EPS), and End-Use Applications and Loads”, and the latest joint research project results between the world’s two largest economies, US and China. The book enables readers to fully understand the latest achievements and ongoing technical works of smart grid standards, and assist industry utilities, vendors, academia, regulators, and other smart grid stakeholders in future decision making. The book begins with an overview of the smart grid, and introduces the opportunities in both developed and developing countries. It then examines the standards for power grid domain of the smart grid, including standards for blackout prevention and energy management, smart transmission, advanced distribution management and automation, smart substation automation, and condition monitoring. Communication and security standards as a whole are the backbone of smart grid and their standards, including those for wired and wireless communications, are then assessed. Finally the authors consider the standards and on-going work and efforts for interoperability and integration between different standards and networks, including the latest joint research effort between the world’s two largest economies, US and China. A fully comprehensive introduction to smart grid standards and their applications for developers, consumers and service providers Covers all up-to-date standards of smart

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grid, including the key standards from NIST, IEC, ISO ZigBee, IEEE, HomePlug, SAE, and other international and regional standardization organizations. The Appendix summarizes all of the standards mentioned in the book Presents standards for renewable energy and smart generation, covering wind energy, solar voltaic, fuel cells, pumped storage, distributed generation, and nuclear generation standards. Standards for other alternative sources of energy such as geothermal energy, and bioenergy are briefly introduced Introduces the standards for smart storage and plug-in electric vehicles, including standards for distributed energy resources (DER), electric storage, and E-mobility/plug-in vehicles The book is written in an accessible style, ideal as an introduction to the topic, yet contains sufficient detail and research to appeal to the more advanced and specialist reader.

BACnet is a set of data communication protocols, developed jointly by ASHRAE, ANSI and ISO, for how the automatic control systems in a building--from heating, to ventilation to lighting to fire control and alarm systems - can communicate with one another and, in turn, offer a centralized way for controlling all systems in a building. The author of this book H. Michael Newman presided as the chairman of the first effort to create this standard, and has been involved with updates and improvements ever since. The BACnet protocols are made use of in central control systems manufactured by companies like Honeywell, Siemens, and Johnson Controls, among many others. BACnet is widely used throughout the world today for commercial and institutional

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buildings with complex mechanical and electrical systems. Contractors, architects, building systems engineers, and facilities managers must all be cognizant of it and its applications. This book will offer those readers the 'inside wisdom' from the person who actually helped to create this standard specification...making it easier to understand the intent and use of each of the data sharing protocols, the controller requirements, and the opportunities for inter-operability between different proprietary controllers and systems. Readers will appreciate: The review of history of BACnet and its essential features, including the 'object model,' data links, network layers, and BACnet systems Coverage such services as alarm and event services, file access services, and remote device management services Insight into future directions for BACnet, including wireless networking and network security

This book offers all important industrial communication systems for buildings in one single book! It stimulates a basic understanding of network and bus systems for the automation of buildings. After an introduction to EIB/KNX, LON und BACnet technologies, the authors illustrate how these systems can be utilized for specific applications, like air conditioning or illumination. This book assumes only a basic knowledge of mathematics and thanks to its simple explanations and many examples is ideal for students and professional engineers who require practical solutions. Numerous practical examples explain basic concepts of industrial communication technology as well as the procedure for the transmission of digital data. All chapters have been

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thoroughly revised for the 2nd edition and the book includes the latest technical developments and standards.

Im Namen der DFN-CERT Services GmbH und des Programm-Komitees präsentieren wir Ihnen den Konferenzband zur 24. DFN-Konferenz "Sicherheit in vernetzten Systemen" in Hamburg. Seit 1994 jährlich stattfindend, hat er sich mit seiner betont technischen und wissenschaftlichen Ausrichtung als eine der größten deutschen Sicherheitstagungen etabliert. In diesem Band finden Sie die Langfassungen der ausgewählten Beiträge bzw. der Redner auf der Tagung. Die Beiträge befassen sich u.a. mit den Risikomanagement, Sensibilisierung, sicheres Identity-Management und Angriffe auf Gebäudeautomatisierungen.

Advanced building automation technologies include a decision-making ability within the individual control devices, which are linked by a common data communication protocol that governs the electronic signals passed between devices to ensure that they are all speaking the same language. If the structure of the protocol language is available to all manufacturers so that they can produce and market compatible control devices, then it is known as an open protocol. Building Automation: System Integration with Open Protocols is the second book in a two-book series on building automation. The first book, Building Automation: Control Devices and Applications, addresses the basic functions of building systems and how devices are used to monitor and control these systems. This second book introduces the concepts of intelligent devices, automated

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control, and network communication using open protocols. The two primary protocols for wired networks, LonWorks® and BACnet®, are described in detail, including information about their communication methods, information architecture, configuration, operation, and troubleshooting. Building Automation: System Integration with Open Protocols provides a foundation of control concepts and network data communication in the first three chapters. After the LonWorks and BACnet sections, the final three chapters offer capstone coverage of previous chapter concepts and their relationships. The System Integration chapter includes a series of applications that illustrate the design, installation, and configuration of each protocol in various scenarios. Applications highlight the implementation differences between the protocols in different situations. The Cross-Protocol Integration chapter discusses the future of building automation, such as greater capabilities in system control and new technologies in network communication and protocol languages.

Featuring contributions from major technology vendors, industry consortia, and government and private research establishments, the Industrial Communication Technology Handbook, Second Edition provides comprehensive and authoritative coverage of wire- and wireless-based specialized communication networks used in plant and factory automation, automotive applications, avionics, building automation, energy and power systems, train applications, and more. New to the Second Edition: 46 brand-new chapters and 21 substantially revised chapters Inclusion of the latest, most

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significant developments in specialized communication technologies and systems
Addition of new application domains for specialized networks
The Industrial Communication Technology Handbook, Second Edition supplies readers with a thorough understanding of the application-specific requirements for communication services and their supporting technologies. It is useful to a broad spectrum of professionals involved in the conception, design, development, standardization, and use of specialized communication networks as well as academic institutions engaged in engineering education and vocational training.

Now in this fourth edition, the Facilities Management Handbook has been fully updated from the acclaimed previous editions, continuing its status as an invaluable resource to those working in facilities management, whether just starting out or as seasoned campaigners and practitioners. Information is presented in a clear and logical way, offering easy-to-find advice and best practice information that's essential in guaranteeing the safe, efficient and cost-effective running of any facilities function. Many sections have been completely revised, such as the chapters on complying with health and safety and property law. Other information on workplace facilities has been brought completely up to date in line with legal compliance and strategic policies to create a reliable and accurate overview of the role of today's facilities manager. This up-to-date and revised handbook will be a key guide for the changing times that are ahead.

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A comprehensive overview of the Internet of Things' core concepts, technologies, and applications Internet of Things A to Z offers a holistic approach to the Internet of Things (IoT) model. The Internet of Things refers to uniquely identifiable objects and their virtual representations in an Internet-like structure. Recently, there has been a rapid growth in research on IoT communications and networks, that confirms the scalability and broad reach of the core concepts. With contributions from a panel of international experts, the text offers insight into the ideas, technologies, and applications of this subject. The authors discuss recent developments in the field and the most current and emerging trends in IoT. In addition, the text is filled with examples of innovative applications and real-world case studies. Internet of Things A to Z fills the need for an up-to-date volume on the topic. This important book: Covers in great detail the core concepts, enabling technologies, and implications of the Internet of Things Addresses the business, social, and legal aspects of the Internet of Things Explores the critical topic of security and privacy challenges for both individuals and organizations Includes a discussion of advanced topics such as the need for standards and interoperability Contains contributions from an international group of experts in academia, industry, and research Written for ICT researchers, industry professionals, and lifetime IT learners as well as academics and students, Internet of Things A to Z

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provides a much-needed and comprehensive resource to this burgeoning field. 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 ZigBee network protocols and explains how to set up and develop your own ZigBee-based customized applications with step-by-step instructions. Starting with a brief introduction to near-field communications, low-power communications, and related protocols, it discusses ZigBee architectures, standards, and protocols. It also addresses potential issues such as power management, security, reliability, quality of service, topology control, MAC routing, and transport protocols. Emphasizing development tools that are based on readily available commercial kits, the book illustrates ZigBee applications across a wide range of fields. Each chapter presents the contributions of a different group of experts from around the world. The book is organized into five major parts: Introduces near-field communications (NFC), low-power communications, and ZigBee along with related protocols such as Bluetooth, WiFi, UWB, and Wireless USB Describes ZigBee architectures, standards, and protocols Examines ZigBee performance improvement and

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addresses potential issues Illustrates ZigBee applications across a range of fields—explaining how to develop ZigBee applications that are based on commercially available kits and hardware Compares and contrasts ZigBee with 6LoWPAN, Z-Wave, Wireless Hart, and RFID Providing step-by-step instruction on how to set up and develop ZigBee-based applications, this book is a must-read for researchers and engineers. Supplying the required foundation and network protocols, it is also suitable for use as a textbook for senior undergraduate and graduate courses in electrical or computer engineering programs.

Building Automation Systems A to Z. Teaches you everything you need to know to work on or with building automation systems. Written in a conversational style, the author shares his extensive experience with building automation systems. The book covers a broad list of topics and is designed to be your go-to manual for building automation questions. This reference guide consists of 16 chapters jam-packed with knowledge! Chapter 1: HVAC Fundamentals Chapter 2: Intro to BAS Chapter 3: Smart Building Systems Chapter 4: Intro to Information Technology Chapter 5: Electrical Fundamentals Chapter 6: Standards and Organizations Chapter 7: Procurement Chapter 8: The Construction Process Chapter 9: Upgrading the BAS Chapter 10: Managing a BAS Chapter 11:

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Managing Service Providers Chapter 12: Advanced Maintenance Management Chapter 13: Analytics Chapter 14: The Internet of Things Chapter 15: Systems Integration Chapter 16: Next Steps Not only do you get all of this great knowledge but the book also includes a website where the author regularly adds checklists and other content for the books readers. So if you are ready to take your knowledge of building automation systems to the next level, then purchase Building Automation Systems A to Z.

A complete handbook for BACnet field technicians and the beginners. This guide takes a practical approach to BACnet, discussing issues that affect installation, design and trouble shooting. Emphasis is on BACnet/IP and BACnet/MSTP with some special attention to RS485 issues. Additional articles and useful resources are available at www.chipkin.com

This two volume set constitutes the refereed proceedings of the 6th International Conference on Distributed, Ambient and Pervasive Interactions, DAPI 2018, held as part of the 20th International Conference on Human-Computer Interaction, HCII 2018, held in Las Vegas, NV, USA in July 2018. The total of 1171 papers and 160 posters presented at the 14 colocated HCII 2018 conferences. The papers were carefully reviewed and selected from 4346 submissions. These papers address the latest research and development efforts and highlight the

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human aspects of design and use of computing systems. The papers thoroughly cover the entire field of Human-Computer Interaction, addressing major advances in knowledge and effective use of computers in a variety of application areas.. The LNCS 10921 and LNCS 10922 contains papers addressing the following major topics: Technologies and Contexts (Part I) and Understanding Humans (Part I?)

May 1945 In the dying days of WW II on the American occupied side of Germany's Elbe River, US Army Medical Corps Colonel Samuel Singer comes upon the shot-up wreck of a smouldering SS Staff car, with a badly injured driver, nearby a dead German Army officer carrying the ID of a Nazi war criminal, and a young blonde woman, also dead in the back seat. July 1988 Art curator Daniel Singer, the adopted son of Colonel Singer receives a mysterious package—a large brown envelope, sealed with security tape—from West Berlin. He can't help but think that there's something important within the envelope. But what? Daniel's quest to learn about the package's contents leads him on a surprising voyage of discovery about his own roots, including an encounter with the Mossad, Israel's top secret spy agency. As he searches, he unlocks the history and secrets of three families—one American and two German—following them through tumultuous times, from the dying days of WWI to the rise of Adolf Hitler,

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WWII, the Holocaust, the birth of the State of Israel and three Middle East wars. As Daniel learns about duty, honour, sacrifice, and the familial ties that bind us all, he will be faced with a life-altering choice—and the opportunity to right the most heinous of wrongs.

Internet of Things Applications aims to provide a broad overview of various topics of Internet of Things (IoT) from the research, innovation, and development priorities to enabling technologies, nanoelectronics, cyber physical systems, architecture, interoperability, and industrial applications. It is intended to be a standalone book in a series that covers the IoT activities of the Internet of Things European Research Cluster (IERC) from technology to international cooperation and the global "state of play." The book builds on the ideas put forward by the IERC Strategic Research Agenda and presents global views and state-of-the-art results on the challenges the research, development, and deployment of IoT face at the global level. IoT is creating a revolutionary new paradigm with opportunities in every industry, including Health Care, Pharmaceuticals, Food and Beverage, Agriculture, Computer, Electronics Telecommunications, Automotive, Aeronautics, Transportation Energy, and Retail, to apply the massive potential of the IoT to achieving real-world solutions. The beneficiaries will include semiconductor companies, device and product companies, infrastructure

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software companies, application software companies, consulting companies, and telecommunication and cloud service providers. IoT will create new revenues annually for these stakeholders and potentially create substantial market share shakeups due to increased technology competition. The IoT will fuel technology innovation by creating the means for machines to communicate several different types of information with one another. At the same time, it will contribute to the increased value of information created by the number of interconnections among things and the transformation of the processed information into knowledge shared in the Internet of Everything. The success of IoT depends strongly on enabling technology development, market acceptance, and standardization, which provides interoperability, compatibility, reliability, and effective operations on a global scale. The connected devices are part of ecosystems connecting people, processes, data, and things which are communicating in the cloud, using the increased storage and computing power and pushing for standardization of communication and metadata. In this context, product manufacturers have to address security, privacy, safety, and trust through the life cycle of their products, from design to the support processes. The IoT developments address the whole IoT spectrum - from devices at the edge to cloud and datacentres on the backend and everything in between - through ecosystems created by industry, research,

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and application stakeholders that enable real-world use cases to accelerate the IoT and establish open interoperability standards and common architectures for IoT solutions. Enabling technologies such as nanoelectronics, sensors/actuators, cyber-physical systems, intelligent device management, smart gateways, telematics, smart network infrastructure, cloud computing, and software technologies will create new products, services, and interfaces by creating smart environments and smart spaces with applications ranging from Smart Cities, smart transport, buildings, energy, and grid to smart health and life. Technical topics discussed in the book include: * Introduction * Internet of Things Strategic Research and Innovation Agenda * Internet of Things in the industrial context: Time for deployment. * Integration of heterogeneous smart objects, applications and services * Evolution from device to semantic and business interoperability * Software define and virtualization of network resources * Innovation through interoperability and standardisation when everything is connected anytime at anyplace * Dynamic context-aware scalable and trust-based IoT Security, Privacy framework * Federated Cloud service management and the Internet of Things * Internet of Things Applications

Planning construction of a new library facility or renovation of an existing one can be a daunting task. With the new fifth edition of his Checklist of Library Building

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Design Considerations, veteran library administrator and construction consultant William Sannwald guides librarians and other members of a building design team through the stages of the design process.

A comprehensive resource that covers all the key areas of smart grid communication infrastructures Smart grid is a transformational upgrade to the traditional power grid that adds communication capabilities, intelligence and modern control. Smart Grid Communication Infrastructures is a comprehensive guide that addresses communication infrastructures, related applications and other issues related to the smart grid. The text shows how smart grid departs from the traditional power grid technology. Fundamentally, smart grid has advanced communication infrastructures to achieve two-way information exchange between service providers and customers. Grid operations in smart grid have proven to be more efficient and more secure because of the communication infrastructures and modern control. Smart Grid Communication Infrastructures examines and summarizes the recent advances in smart grid communications, big data analytics and network security. The authors – noted experts in the field – review the technologies, applications and issues in smart grid communication infrastructure. This important resource: Offers a comprehensive review of all areas of smart grid communication infrastructures

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Includes an ICT framework for smart grid Contains a review of self-sustaining wireless neighborhood that are network designed Presents design and analysis of a wireless monitoring network for transmission lines in smart grid Written for graduate students, professors, researchers, scientists, practitioners and engineers, Smart Grid Communication Infrastructures is the comprehensive resource that explores all aspects of the topic.

Facilities management is a broad-based discipline that calls into play architectural, construction, engineering, and management and human skills-- particularly for running and maintaining commercial, institutional, academic, and industrial buildings. This book will cover the essential role and responsibilities of the facilities manager as it pertains to building maintenance. If you're a newcomer to facilities management you will find this book an excellent introduction to managing maintenance. Already an established professional? You'll be able to brush up on the latest technological and regulatory trends affecting how complex facilities should be successfully maintained by way of risk assessment. The book contains ample, ready-to-use assessment forms and resources for extended practical information. Highlights include: • Coverage of key components of facilities maintenance management including risk management , building safety, operations and purchasing, staffing, and more •

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Guidance on new trends including “lean building maintenance” and Green Building specs (Green Spec) like LEED • Guidance on legal contracts, safety regulations, energy efficiency, and more • Specific management guidance by building type including apartments, office buildings, hotels and resorts, government buildings, schools, transport facilities and many others.

"A Guide to the Automation Body of Knowledge" provides you with comprehensive information about all major topics in the broad field of automation. Edited by Vernon Trevathan with contributions from over thirty leading experts from all aspects of automation, this book defines the most important automation concepts and processes, while also describing the technical skills professionals require to implement them in today's industrial environment. Whether you are an engineer, manager, control systems integrator, student, or educator, you will turn to this book again and again as the ultimate source on what is encompassed by automation.

Modern buildings are increasingly equipped with actuators and sensors, communication, visualization and control systems. This textbook provides an overview of industrial communication systems and stimulates a basic understanding of network and bus systems for the automation of buildings. After an introduction to EIB/KNX, LON und BACnet technologies, the authors illustrate

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how these systems can be utilized for specific applications, like air conditioning or illumination. This book assumes only a basic knowledge of mathematics and thanks to its simple explanations and many examples is ideal for students and professional engineers who require practical solutions.

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. As the applications of the internet of things continue to progress so do the security concerns for this technology. The study of threat prevention in the internet of things is necessary as security breaches in this field can ruin industries and lives. *Securing the Internet of Things: Concepts, Methodologies, Tools, and Applications* is a vital reference source that examines recent developments and emerging trends in security and privacy for the internet of things through new models, practical solutions, and technological advancements related to security. Highlighting a range of topics such as cloud security, threat detection, and open source software, this multi-volume book is ideally designed for engineers, IT consultants, ICT procurement managers, network system integrators, infrastructure service providers, researchers, academics, and professionals interested in current research on security practices pertaining to the internet of

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things.

This new book, by the original developer of the BACnet standards, explains how BACnet's protocols manage all basic building functions in a seamless, integrated way. BACnet is a data communication protocol for building automation and control systems, developed within ASHRAE in cooperation with ANSI and the ISO. This book explains how BACnet works with all major control systems--including those made by Honeywell, Siemens, and Johnson Controls--to manage everything from heating to ventilation to lighting to fire control and alarm systems. BACnet is used today throughout the world for commercial and institutional buildings with complex mechanical and electrical systems. Contractors, architects, building systems engineers, and facilities managers must all be cognizant of BACnet and its applications. With a real 'seat at the table,' you'll find it easier to understand the intent and use of each of the data sharing techniques, controller requirements, and opportunities for interoperability between different manufacturers' controllers and systems. Highlights include: * A review of the history of BACnet and its essential features, including the object model, data links, network technologies, and BACnet system configurations; * Comprehensive coverage of services including object access, file access, remote device management, and BACnet-2012's new alarm and

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event capabilities; * Insight into future directions for BACnet, including wireless networking, network security, the use of IPv6, extensions for lifts and escalators, and a new set of BACnet Web Services; * Extensive reference appendices for all objects and services; and * Acronyms and abbreviations

Internet of things (IoT) is an emerging research field that is rapidly becoming an important part of our everyday lives including home automation, smart buildings, smart things, and more. This is due to cheap, efficient, and wirelessly-enabled circuit boards that are enabling the functions of remote sensing/actuating, decentralization, autonomy, and other essential functions. Moreover, with the advancements in embedded artificial intelligence, these devices are becoming more self-aware and autonomous, hence making decisions themselves. Current research is devoted to the understanding of how decision support systems are integrated into industrial IoT. Decision Support Systems and Industrial IoT in Smart Grid, Factories, and Cities presents the internet of things and its place during the technological revolution, which is taking place now to bring us a better, sustainable, automated, and safer world. This book also covers the challenges being faced such as relations and implications of IoT with existing communication and networking technologies; applications like practical use-case scenarios from the real world including smart cities, buildings, and grids; and topics such as

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cyber security, user privacy, data ownership, and information handling related to IoT networks. Additionally, this book focuses on the future applications, trends, and potential benefits of this new discipline. This book is essential for electrical engineers, computer engineers, researchers in IoT, security, and smart cities, along with practitioners, researchers, academicians, and students interested in all aspects of industrial IoT and its applications.

"If we had computers that knew everything there was to know about things—using data they gathered without any help from us—we would be able to track and count everything, and greatly reduce waste, loss, and cost. We would know when things needed replacing, repairing or recalling, and whether they were fresh or past their best. The Internet of Things has the potential to change the world, just as the Internet did. Maybe even more so." —Kevin Ashton, originator of the term, Internet of Things

An examination of the concept and unimagined potential unleashed by the Internet of Things (IoT) with IPv6 and MIPv6

What is the Internet of Things?
How can it help my organization?
What is the cost of deploying such a system?
What are the security implications?

Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications answers these questions and many more. This essential book explains the concept and potential that the IoT presents, from mobile applications that allow home

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appliance to be programmed remotely, to solutions in manufacturing and energy conservation. It features a tutorial for implementing the IoT using IPv6 and Mobile IPv6 and offers complete chapter coverage that explains: What is the Internet of Things? Internet of Things definitions and frameworks Internet of Things application examples Fundamental IoT mechanisms and key technologies Evolving IoT standards Layer 1/2 connectivity: wireless technologies for the IoT Layer 3 connectivity: IPv6 technologies for the IoT IPv6 over low power WPAN (6lowpan) Easily accessible, applicable, and not overly technical, Building the Internet of Things with IPv6 and MIPv6 is an important resource for Internet and ISP providers, telecommunications companies, wireless providers, logistics professionals, and engineers in equipment development, as well as graduate students in computer science and computer engineering courses. This textbook explores all of the protocols and technologies essential to IoT communication mechanisms. Geared towards an upper-undergraduate or graduate level class, the book is presented from a perspective of the standard layered architecture with special focus on protocol interaction and functionality. The IoT protocols are presented and classified based on physical, link, network, transport and session/application layer functionality. The author also lets readers understand the impact of the IoT mechanisms on network and device performance with special

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emphasis on power consumption and computational complexity. Use cases provided throughout provide examples of IoT protocol stacks in action. The book is based on the author's popular class Fundamentals of IoT at Northeastern University. The book includes examples throughout and slides for classroom use. Also included is a "hands-on" section where the topics discussed as theoretical content are built as stacks in the context of an IoT network emulator so readers can experiment. Presents a comprehensive resource of the Internet of Things and its networking and protocols, intended for classroom use; Discusses the main families of networking architectures that rely on the IoT protocols (i.e. LWPAN vs WPAN); Introduces use cases and examples that focus on protocol interaction to build network stacks in addition to a suite of classroom materials including exercises and Q&A.

Written by a team of experts at the forefront of the cyber-physical systems (CPS) revolution, this book provides an in-depth look at security and privacy, two of the most critical challenges facing both the CPS research and development community and ICT professionals. It explores, in depth, the key technical, social, and legal issues at stake, and it provides readers with the information they need to advance research and development in this exciting area. Cyber-physical systems (CPS) are engineered systems that are built from, and depend upon the seamless integration of computational algorithms and physical components. Advances in CPS will enable capability, adaptability, scalability, resiliency, safety, security, and usability far in excess of what

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today's simple embedded systems can provide. Just as the Internet revolutionized the way we interact with information, CPS technology has already begun to transform the way people interact with engineered systems. In the years ahead, smart CPS will drive innovation and competition across industry sectors, from agriculture, energy, and transportation, to architecture, healthcare, and manufacturing. A priceless source of practical information and inspiration, *Security and Privacy in Cyber-Physical Systems: Foundations, Principles and Applications* is certain to have a profound impact on ongoing R&D and education at the confluence of security, privacy, and CPS.

ASN.1 Complete teaches you everything you need to know about ASN.1-whether you're specifying a new protocol or implementing an existing one in a software or hardware development project. Inside, the author begins with an overview of ASN.1's most commonly encountered features, detailing and illustrating standard techniques for using them. He then goes on to apply the same practice-oriented approach to all of the notation's other features, providing you with an easy-to-navigate, truly comprehensive tutorial. The book also includes thorough documentation of both the Basic and the Packed Encoding Rules-indispensable coverage for anyone doing hand-encoding, and a valuable resource for anyone wanting a deeper understanding of how ASN.1 and ASN.1 tools work. The concluding section takes up the history of ASN.1, in terms of both the evolution of the notation itself and the role it has played in hundreds of protocols and thousands of applications developed since its inception. Features Covers

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all the features-common and not so common-available to you when writing a protocol specification using ASN.1. Teaches you to read, understand, and implement a specification written using ASN.1. Explains how ASN.1 tools work and how to use them. Contains hundreds of detailed examples, all verified using OSS's ASN.1 Tools package. Considers ASN.1 in relation to other protocol specification standards. The Facilities Management book gives a complete and comprehensive guide to the different aspects of the Facility Manager's role, from compliance with health and safety law through risk management to getting the most out of building and space. It enables managers to keep abreast of all key facts required in the day-to-day running of a business and offers a concise encyclopedia on all facilities management issues, combining best practice tips with proactive advice.

IoT is empowered by various technologies used to detect, gather, store, act, process, transmit, oversee, and examine information. The combination of emergent technologies for information processing and distributed security, such as Cloud computing, Artificial intelligence, and Blockchain, brings new challenges in addressing distributed security methods that form the foundation of improved and eventually entirely new products and services. As systems interact with each other, it is essential to have an agreed interoperability standard, which is safe and valid. This book aims at providing an introduction by illustrating state-of-the-art security challenges and threats in IoT and the latest developments in IoT with Cloud, AI, and Blockchain security challenges. Various

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application case studies from domains such as science, engineering, and healthcare are introduced, along with their architecture and how they leverage various technologies Cloud, AI, and Blockchain. This book provides a comprehensive guide to researchers and students to design IoT integrated AI, Cloud, and Blockchain projects and to have an overview of the next generation challenges that may arise in the coming years.

Handbook of Energy Efficiency in Buildings: A Life Cycle Approach offers a comprehensive and in-depth coverage of the subject with a further focus on the Life Cycle. The editors, renowned academics, invited a diverse group of researchers to develop original chapters for the book and managed to well integrate all contributions in a consistent volume. Sections cover the role of the building sector on energy consumption and greenhouse gas emissions, international technical standards, laws and regulations, building energy efficiency and zero energy consumption buildings, the life cycle assessment of buildings, from construction to decommissioning, and other timely topics. The multidisciplinary approach to the subject makes it valuable for researchers and industry based Civil, Construction, and Architectural Engineers.

Researchers in related fields as built environment, energy and sustainability at an urban scale will also benefit from the books integrated perspective. Presents a complete and thorough coverage of energy efficiency in buildings Provides an integrated approach to all the different elements that impact energy efficiency Contains coverage of worldwide

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regulation

This definitive handbook demystifies personal-area networking technologies and protocols and explores their application potential in a unique real-world context. First published in 2005. *Advanced Lighting Controls* is edited by Craig DiLouie and written for engineers, architects, lighting designers, electrical contractors, distributors, and building owners and managers. Advanced lighting controls, indicated by research as the "next big thing," are now mandated by the ASHRAE/IES 91.1-1999 energy standard, the basis for all state energy codes in the U.S., and are becoming the norm rather than the exception in new construction. This book provides in-depth information about the major trends, technologies, codes, and design techniques shaping the use of today's lighting control systems, including dimming, automatic switching, and global as well as personal control.

Library catalogs are doorways to accessing the information treasures available within. To provide excellent service for all who wish to enter, especially children, this classic cataloging reference has provided the key for almost two decades. Since 1998, when the third edition of *Cataloging Correctly for Kids* was published, library cataloging has experienced explosive changes in practices, technological tools, scope of services, and available materials. The new fourth edition, again published in conjunction with the Association for Library Collections and Technical Services (ALCTS), addresses those changes and continues to make catalog data accessible to children while following consistent and universal standards. Starting with updated *Guidelines for Standardized Cataloging of Children's Materials*, this definitive edition calls on

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the foremost experts in cataloging to: explain the unique ways children search so catalog information is accessible to them; identify ways to incorporate AACR-2 and MARC standards; show how to use standard heading forms including LC's children's headings; and illuminate the challenges of cataloging nonprint materials and automating the process. school, and academic librarians responsible for children's cataloging will find a comprehensive, authoritative one-stop guide to better serving the youngest library users at the catalog.

Quantifying exergy losses in the energy supply system of buildings reveals the potential for energy improvement, which cannot be discovered using conventional energy analysis.

Thermoeconomics combines economic and thermodynamic analysis by applying the concept of cost (an economic concept) to exergy, as exergy is a thermodynamic property fit for this purpose, in that it combines the quantity of energy with its quality factor. Exergy Analysis and Thermoeconomics of Buildings applies exergy analysis methods and thermoeconomics to the built environment. The mechanisms of heat transfer throughout the envelope of buildings are analyzed from an exergy perspective and then to the building thermal installations, analyzing the different components, such as condensing boilers, absorption refrigerators, microgeneration plants, etc., including solar installations and finally the thermal facilities as a whole. A detailed analysis of the cost formation process is presented, which has its physical roots firmly planted in the second law of thermodynamics. The basic principles and the rules of cost allocation, in energy units (exergy cost), in monetary units (exergoeconomic cost), and in CO₂ emissions (exergoenvironmental cost), based on the so-called Exergy Cost Theory are presented and applied to thermal installations of buildings. Clear and rigorous in its exposition, Exergy Analysis and Thermoeconomics of Buildings discusses exergy analysis and

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thermoeconomics and the role they could play in the analysis and design of building components, either the envelope or the thermal facilities, as well as the diagnosis of thermal installations. This book moves progressively from introducing the basic concepts to applying them. Exergy Analysis and Thermoeconomics of Buildings provides examples of specific cases throughout this book. These cases include real data, so that the results obtained are useful to interpret the inefficiencies and losses that truly occur in actual installations; hence, the assessment of their effects encourages the manner to improve efficiency. Applies exergy analysis methods for the installation of building thermal facilities equipment components, including pipes, valves, heat exchangers, boilers and heat pumps Helps readers determine the operational costs of heating and cooling building systems Includes exergy analysis methods that are devoted to absorption refrigerators, adsorption cooling systems, basic air conditioning processes, ventilation systems and solar systems, either thermal and PV Discusses the direct application of exergy analysis concepts, including examples of buildings with typical heating, DHW and air conditioning installations

BACnetThe Global Standard for Building Automation and Control NetworksSustainable Energy Giving you a combination of general principles, applied practice and information on the state-of-the-art, this book will give you the information you need to incorporate the latest systems and technologies into your building projects. It focuses on a number of important issues, such as: Network communication protocols and standards, including the application of the internet. The integration and interfacing of building automation subsystems and multiple building systems. Local and supervisory control strategies for typical building services systems. The automation system configuration and technologies for air-conditioning control, lighting system control,

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security and access control, and fire safety control. Whether you're a project manager or engineer planning the systems set-up for a high value building, or a building engineering or management student looking for a practical guide to automation and intelligent systems, this book provides a valuable introduction and overview.

This book constitutes the revised selected papers of the Third International Conference on Information Systems Security and Privacy, ICISSP 2017, held in Porto, Portugal, in February 2017. The 13 full papers presented were carefully reviewed and selected from a total of 100 submissions. They are dealing with topics such as vulnerability analysis and countermeasures, attack patterns discovery and intrusion detection, malware classification and detection, cryptography applications, data privacy and anonymization, security policy analysis, enhanced access control, and socio-technical aspects of security.

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