
The Internet Of Things From Rfid To The Next Generation Pervasive Networked Systems Wireless Networks And Mobile Communications

Technology, Middleware and Applications
Enabling the Internet of Things
From Data to Insight
Successful IoT Device/Edge and Platform Security Deployment
Internet of Things A to Z
Internet of Things From Hype to Reality
Technologies and Applications for a New Age of Intelligence
Principles, Paradigms and Applications of IoT
Fundamentals of Internet of Things for Non-Engineers
Internet of Things (IoT)
Architecting the Internet of Things
Smart Connected World
Principles and Paradigms
Learning Internet of Things
The Internet of Things
Internet of Things (IoT)
Analytics for the Internet of Things (IoT)
Connecting Sensors and Microcontrollers to the Cloud
Security and Privacy in the Internet of Things
Powering the Internet of Things With 5G Networks
From RFID to the Next-Generation Pervasive Networked Systems
The Internet of Things
Internet of Things: A Hands-On Approach
Design and create your own IoT applications using Raspberry Pi 3
The Internet of Things
Programming the Internet of Things
What Everyone Needs to Know®
From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence
Protocols and Applications for the Industrial Internet of Things
Fundamentals of Internet of Things
The Internet of Things
A Scalable Approach to Connecting Everything
Technologies, Applications, Challenges and Solutions
Abusing the Internet of Things
The Road to Digitization

Rethinking the Internet of Things
The Real Internet of Things
Technology, Applications and Standardization

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Technology, Middleware and Applications Springer

This book offers the first comprehensive view on integrated circuit and system design for the Internet of Things (IoT), and in particular for the tiny nodes at its edge. The authors provide a fresh perspective on how the IoT will evolve based on recent and foreseeable trends in the semiconductor industry, highlighting the key challenges, as well as the opportunities for circuit and system innovation to address them. This book describes what the IoT really means from the design point of view, and how the constraints imposed by applications translate into integrated circuit requirements and design guidelines. Chapter contributions equally come from industry and academia. After providing a system perspective on IoT nodes, this book focuses on state-of-the-art design techniques for IoT applications, encompassing the fundamental sub-systems encountered in Systems on Chip for IoT: ultra-low power digital architectures and circuits low- and zero-leakage memories (including emerging technologies) circuits for hardware security and authentication System on Chip design methodologies on-chip power management and energy harvesting ultra-low power analog interfaces and analog-digital conversion short-range radios miniaturized battery technologies packaging and assembly of IoT integrated systems (on silicon and non-silicon substrates). As a common thread, all chapters conclude with a prospective view on the foreseeable evolution of the related technologies for IoT. The concepts developed throughout the book are exemplified by two IoT node system demonstrations from industry. The unique balance between breadth and depth of this book: enables expert readers quickly to develop an understanding of the specific challenges and state-of-the-art solutions for IoT, as well as their evolution in the foreseeable future provides non-experts with a comprehensive introduction to integrated circuit design for IoT, and serves as an

excellent starting point for further learning, thanks to the broad coverage of topics and selected references makes it very well suited for practicing engineers and scientists working in the hardware and chip design for IoT, and as textbook for senior undergraduate, graduate and postgraduate students (familiar with analog and digital circuits).

Enabling the Internet of Things Academic Press

The internet of things (IoT) has drawn great attention from both academia and industry, since it offers a challenging notion of creating a world where all things around us are connected to the internet and communicate with each other with minimal human intervention. Another component for helping IoT to succeed is cloud computing. The combination of cloud computing and IoT will enable new monitoring services and powerful processing of sensory data streams. These applications, alongside implementation details and challenges, should also be explored for successful mainstream adoption. IoT is also fueled by the advancement of digital technologies, and the next generation era will be cloud-based IoT systems. Integration and Implementation of the Internet of Things Through Cloud Computing studies, analyzes, and presents cloud-based IoT-related technologies, protocols, and standards along with recent research and development in cloud-based IoT. It also presents recent emerging trends and technological advances of cloud-based IoT, innovative applications, and the challenges and implications for society. The chapters included take a strong look at the societal and social aspects of this technology along with its implementations and technological analyses. This book is intended for IT specialists, technologists, practitioners, researchers, academicians, and students who are interested in the next era of IoT through cloud computing.

From Data to Insight Academic Press

This book provides a comprehensive study of the security and privacy research advancements in Internet of Things (IoT). The book lays the context for discussion by introducing the vulnerable intrinsic features of IoT. By providing a comprehensive discussion of the vulnerable features, the book highlights the problem areas

of IoT related to security and privacy. • Covers all aspects of security • Algorithms, protocols and technologies used in IoT have been explained and the security flaws in them analyzed with solutions • Discusses ways for achieving better access control and trust in the IoT ecosystem • Contributes exhaustive strategic plans to deal with security issues of IoT • Gathers contributions from leading-edge researchers from academia and industry Graduates, researchers, people from the industry and security professionals who want to explore the IoT security field will find this book useful. The book will give an in-depth insight in to what has happened, what new is happening and what opportunities exist in the field.

Packt Pub Limited

Internet of Things (IoT) refers to physical and virtual objects that have unique identities and are connected to the internet to facilitate intelligent applications that make energy, logistics, industrial control, retail, agriculture and many other domains "smarter". Internet of Things is a new revolution of the Internet that is rapidly gathering momentum driven by the advancements in sensor networks, mobile devices, wireless communications, networking and cloud technologies. Experts forecast that by the year 2020 there will be a total of 50 billion devices/things connected to the internet. This book is written as a textbook on Internet of Things for educational programs at colleges and universities, and also for IoT vendors and service providers who may be interested in offering a broader perspective of Internet of Things to accompany their own customer and developer training programs. The typical reader is expected to have completed a couple of courses in programming using traditional high-level languages at the college-level, and is either a senior or a beginning graduate student in one of the science, technology, engineering or mathematics (STEM) fields. Like our companion book on Cloud Computing, we have tried to write a comprehensive book that transfers knowledge through an immersive "hands on" approach, where the reader is provided the necessary guidance and knowledge to develop working code for real-world IoT applications. Additional support is available at the

book's website: www.internet-of-things-book.com Organization

The book is organized into 3 main parts, comprising of a total of 11 chapters. Part I covers the building blocks of Internet of Things (IoT) and their characteristics. A taxonomy of IoT systems is proposed comprising of various IoT levels with increasing levels of complexity. Domain specific Internet of Things and their real-world applications are described. A generic design methodology for IoT is proposed. An IoT system management approach using NETCONF-YANG is described. Part II introduces the reader to the programming aspects of Internet of Things with a view towards rapid prototyping of complex IoT applications. We chose Python as the primary programming language for this book, and an introduction to Python is also included within the text to bring readers to a common level of expertise. We describe packages, frameworks and cloud services including the WAMP-AutoBahn, Xively cloud and Amazon Web Services which can be used for developing IoT systems. We chose the Raspberry Pi device for the examples in this book. Reference architectures for different levels of IoT applications are examined in detail. Case studies with complete source code for various IoT domains including home automation, smart environment, smart cities, logistics, retail, smart energy, smart agriculture, industrial control and smart health, are described. Part III introduces the reader to advanced topics on IoT including IoT data analytics and Tools for IoT. Case studies on collecting and analyzing data generated by Internet of Things in the cloud are described.

Successful IoT Device/Edge and Platform Security Deployment
BoD - Books on Demand

This book provides an overview of the emerging smart connected world, and discusses the roles and the usage of underlying semantic computing and Internet-of-Things (IoT) technologies. The book comprises ten chapters overall, grouped in two parts. Part I "Smart Connected World: Overview and Technologies" consists of seven chapters and provides a holistic overview of the smart connected world and its supporting tools and technologies. Part II "Applications and Case Studies" consists of three chapters that describe applications and case studies in manufacturing, smart cities, health, and more. Each chapter is self-contained and can be read independently; taken together, readers get a bigger picture of the technological and application landscape of the smart connected world. This book is of interest for researchers,

lecturers, and practitioners in Semantic Web, IoT and related fields. It can serve as a reference for instructors and students taking courses in hybrid computing getting abreast of cutting edge and future directions of a connected ecosystem. It will also benefit industry professionals like software engineers or data scientists, by providing a synergy between Web technologies and applications. This book covers the most important topics on the emerging field of the smart connected world. The contributions from leading active researchers and practitioners in the field are thought provoking and can help in learning and further research. The book is a valuable resource that will benefit academics and industry. It will lead to further research and advancement of the field. Bharat K. Bhargava, Professor of Computer Science, Purdue University, United States

Internet of Things A to Z CRC Press

Provides comprehensive coverage of the current state of IoT, focusing on data processing infrastructure and techniques Written by experts in the field, this book addresses the IoT technology stack, from connectivity through data platforms to end-user case studies, and considers the tradeoffs between business needs and data security and privacy throughout. There is a particular emphasis on data processing technologies that enable the extraction of actionable insights from data to inform improved decision making. These include artificial intelligence techniques such as stream processing, deep learning and knowledge graphs, as well as data interoperability and the key aspects of privacy, security and trust. Additional aspects covered include: creating and supporting IoT ecosystems; edge computing; data mining of sensor datasets; and crowd-sourcing, amongst others. The book also presents several sections featuring use cases across a range of application areas such as smart energy, transportation, smart factories, and more. The book concludes with a chapter on key considerations when deploying IoT technologies in the enterprise, followed by a brief review of future research directions and challenges. The Internet of Things: From Data to Insight Provides a comprehensive overview of the Internet of Things technology stack with focus on data driven aspects from data modelling and processing to presentation for decision making Explains how IoT technology is applied in practice and the benefits being delivered. Acquaints readers that are new to the area with concepts, components, technologies, and verticals related to and enabled

by IoT Gives IoT specialists a deeper insight into data and decision-making aspects as well as novel technologies and application areas Analyzes and presents important emerging technologies for the IoT arena Shows how different objects and devices can be connected to decision making processes at various levels of abstraction The Internet of Things: From Data to Insight will appeal to a wide audience, including IT and network specialists seeking a broad and complete understanding of IoT, CIOs and CIO teams, researchers in IoT and related fields, final year undergraduates, graduate students, post-graduates, and IT and science media professionals.

Internet of Things From Hype to Reality Oxford University Press

Ubiquitous and pervasive technologies such as RFID and smart computing promise a world of networked and interconnected devices. Everything from tires to toothbrushes could soon be in communications range, heralding the dawn of an era in which today's Internet of People gives way to tomorrow's Internet of Things- where billions of obje

Technologies and Applications for a New Age of Intelligence IGI Global

What is the Internet of Things? It's billions of embedded computers, sensors, and actuators all connected online. If you have basic programming skills, you can use these powerful little devices to create a variety of useful systems—such as a device that waters plants when the soil becomes dry. This hands-on guide shows you how to start building your own fun and fascinating projects. Learn to program embedded devices using the .NET Micro Framework and the Netduino Plus board. Then connect your devices to the Internet with Pachube, a cloud platform for sharing real-time sensor data. All you need is a Netduino Plus, a USB cable, a couple of sensors, an Ethernet connection to the Internet—and your imagination. Develop programs with simple outputs (actuators) and inputs (sensors) Learn about the Internet of Things and the Web of Things Build client programs that push sensor readings from a device to a web service Create server programs that allow you to control a device over the Web Get the .NET classes and methods needed to implement all of the book's examples

Principles, Paradigms and Applications of IoT John Wiley & Sons

The term IoT, which was first proposed by Kevin Ashton, a British technologist, in 1999 has the potential to impact everything from new product opportunities to shop floor optimization to factory worker efficiency gains, that will power top-line and bottom-line gains. As IoT technology is being put to diversified use, the current technology needs to be improved to enhance privacy and built secure devices by adopting a security-focused approach, reducing the amount of data collected, increasing transparency and providing consumers with a choice to opt out. Therefore, the current volume has been compiled, in an effort to draw the various issues in IoT, challenges faced and existing solutions so far. Key Points:

- Provides an overview of basic concepts and technologies of IoT with communication technologies ranging from 4G to 5G and its architecture.
- Discusses recent security and privacy studies and social behavior of human beings over IoT.
- Covers the issues related to sensors, business model, principles, paradigms, green IoT and solutions to handle relevant challenges.
- Presents the readers with practical ideas of using IoT, how it deals with human dynamics, the ecosystem, the social objects and their relation.
- Deals with the challenges involved in surpassing diversified architecture, protocol, communications, integrity and security.

Fundamentals of Internet of Things for Non-Engineers The Internet of Things

Internet of Things: Principles and Paradigms captures the state-of-the-art research in Internet of Things, its applications, architectures, and technologies. The book identifies potential future directions and technologies that facilitate insight into numerous scientific, business, and consumer applications. The Internet of Things (IoT) paradigm promises to make any electronic devices part of the Internet environment. This new paradigm opens the doors to new innovations and interactions between people and things that will enhance the quality of life and utilization of scarce resources. To help realize the full potential of IoT, the book addresses its numerous challenges and develops the conceptual and technological solutions for tackling them. These challenges include the development of scalable architecture, moving from closed systems to open systems, designing interaction protocols, autonomic management, and the privacy and ethical issues around data sensing, storage, and processing. Addresses the main concepts and features of the IoT

paradigm Describes different architectures for managing IoT platforms Provides insight on trust, security, and privacy in IoT environments Describes data management techniques applied to the IoT environment Examines the key enablers and solutions to enable practical IoT systems Looks at the key developments that support next generation IoT platforms Includes input from expert contributors from both academia and industry on building and deploying IoT platforms and applications

Internet of Things (IoT) CRC Press

The Internet of Things (IoT) usually refers to a world-wide network of interconnected heterogeneous objects (sensors, actuators, smart devices, smart objects, RFID, embedded computers, etc) uniquely addressable, based on standard communication protocols. Beyond such a definition, it is emerging a new definition of IoT seen as a loosely coupled, decentralized system of cooperating smart objects (SOs). A SO is an autonomous, physical digital object augmented with sensing/actuating, processing, storing, and networking capabilities. SOs are able to sense/actuate, store, and interpret information created within themselves and around the neighbouring external world where they are situated, act on their own, cooperate with each other, and exchange information with other kinds of electronic devices and human users. However, such SO-oriented IoT raises many in-the-small and in-the-large issues involving SO programming, IoT system architecture/middleware and methods/methodologies for the development of SO-based applications. This Book will specifically focus on exploring recent advances in architectures, algorithms, and applications for an Internet of Things based on Smart Objects. Topics appropriate for this Book include, but are not necessarily limited to: - Methods for SO development - IoT Networking - Middleware for SOs - Data Management for SOs - Service-oriented SOs - Agent-oriented SOs - Applications of SOs in Smart Environments: Smart Cities, Smart Health, Smart Buildings, etc. Advanced IoT Projects.

Architecting the Internet of Things Academic Press

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 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 *Smart Connected World* CRC Press

Cellular Internet of Things: From Massive Deployments to Critical 5G Applications, Second Edition, gives insights into the recent and rapid work performed by the 3rd Generation Partnership Project (3GPP) and the Multefire Alliance (MFA) to develop systems for the Cellular IoT. Beyond the technologies, readers will learn what the mMTC and cMTC market segments look like, deployment options and expected performance in terms of system capacity,

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

Principles and Paradigms IGI Global

Securing the Internet of Things provides network and cybersecurity researchers and practitioners with both the theoretical and practical knowledge they need to know regarding security in the Internet of Things (IoT). This booming field, moving from strictly research to the marketplace, is advancing rapidly, yet security issues abound. This book explains the fundamental concepts of IoT security, describing practical solutions that account for resource limitations at IoT end-node, hybrid network architecture, communication protocols, and application characteristics. Highlighting the most important potential IoT security risks and threats, the book covers both the general theory and practical implications for people working in security in the Internet of Things. Helps researchers and practitioners understand the security architecture in IoT and the state-of-the-art in IoT security countermeasures Explores how the threats in IoT are different from traditional ad hoc or infrastructural networks Provides a comprehensive discussion on the security challenges and solutions in RFID, WSNs, and IoT Contributed

material by Dr. Imed Romdhani

Learning Internet of Things BoD – Books on Demand

A guided tour through the Internet of Things, a networked world of connected devices, objects, and people that is changing the way we live and work. We turn on the lights in our house from a desk in an office miles away. Our refrigerator alerts us to buy milk on the way home. A package of cookies on the supermarket shelf suggests that we buy it, based on past purchases. The cookies themselves are on the shelf because of a “smart” supply chain. When we get home, the thermostat has already adjusted the temperature so that it's toasty or bracing, whichever we prefer. This is the Internet of Things—a networked world of connected devices, objects, and people. In this book, Samuel Greengard offers a guided tour through this emerging world and how it will change the way we live and work. Greengard explains that the Internet of Things (IoT) is still in its early stages. Smart phones, cloud computing, RFID (radio-frequency identification) technology, sensors, and miniaturization are converging to make possible a new generation of embedded and immersive technology. Greengard traces the origins of the IoT from the early days of personal computers and the Internet and examines how it creates the conceptual and practical framework for a connected world. He explores the industrial Internet and machine-to-machine communication, the basis for smart manufacturing and end-to-end supply chain visibility; the growing array of smart consumer devices and services—from Fitbit fitness wristbands to mobile apps for banking; the practical and technical challenges of building the IoT; and the risks of a connected world, including a widening digital divide and threats to privacy and security. Finally, he considers the long-term impact of the IoT on society, narrating an eye-opening “Day in the Life” of IoT connections circa 2025.

The Internet of Things Packt Publishing Ltd

A Systematic Approach to Learn the Principles, Paradigms and Applications of Internet of Things DESCRIPTION In this book, Principles, Paradigm frameworks, and Applications of IoT (Internet of Things) in the modern era are presented. It also provides a sound understanding of the IoT concepts, architecture, and applications, and improves the awareness of readers about IoT technologies and application areas. A key objective of this book is to provide a systematic source of reference for all aspects of IoT. This book comprises nine chapters with close co-operation and

contributions from four different authors, spanning across four countries and providing a global, broad perspective on major topics on the Internet of Things. KEY FEATURES - IoT applications in various sectors like Education, Smart City, Politics, Healthcare, Agriculture, etc. - Adoption of the IoT technology and strategies for various sectors - To present case studies and innovative applications of the IoT - To analyze and present the state of the art of the IoT and related technologies and methodologies - To propose new models, practical solutions and technological advances of the IoT WHAT WILL YOU LEARN - Become aware of the IoT components, their connectivity to form the IoT altogether, and future possibilities with IoT. - Understand how the various components of cloud computing work together to form the basic architecture of cloud computing. - Examine the relationship between the various layers in the IoT architecture. - Understand the programming framework for the Internet of Things (IoT) and various programming paradigms. WHO THIS BOOK IS FOR This book is intended for professionals, researchers, instructors, and designers of a smart system, who will benefit from reading this book. TABLE OF CONTENTS 1. IoT Introduction 2. IoT Architectures and Protocols 3. Programming Framework for IoT 4. Virtualization and IoT 5. Security, Privacy and Challenges in IoT 6. IoT Applications Areas 7. IoT and Cloud 8. Smart City Using IoT integration 9. Case Studies 10. Important Key Terms 11. References

Internet of Things (IoT) Springer

This book comprehensively describes an end-to-end Internet of Things (IoT) architecture that is comprised of devices, network, compute, storage, platform, applications along with management and security components. It is organized into five main parts, comprising of a total of 11 chapters. Part I presents a generic IoT reference model to establish a common vocabulary for IoT solutions. This includes a detailed description of the Internet protocol layers and the Things (sensors and actuators) as well as the key business drivers to realize the IoT vision. Part II focuses on the IoT requirements that impact networking protocols and provides a layer-by-layer walkthrough of the protocol stack with emphasis on industry progress and key gaps. Part III introduces the concept of Fog computing and describes the drivers for the technology, its constituent elements, and how it relates and differs from Cloud computing. Part IV discusses the IoT services

platform, the cornerstone of the solution followed by the Security functions and requirements. Finally, Part V provides a treatment of the topic of connected ecosystems in IoT along with practical applications. It then surveys the latest IoT standards and discusses the pivotal role of open source in IoT. "Faculty will find well-crafted questions and answers at the end of each chapter, suitable for review and in classroom discussion topics. In addition, the material in the book can be used by engineers and technical leaders looking to gain a deep technical understanding of IoT, as well as by managers and business leaders looking to gain a competitive edge and understand innovation opportunities for the future." Dr. Jim Spohrer, IBM "This text provides a very compelling study of the IoT space and achieves a very good balance between engineering/technology focus and business context. As such, it is highly-recommended for anyone interested in this rapidly-expanding field and will have broad appeal to a wide cross-section of readers, i.e., including engineering professionals, business analysts, university students, and professors." Professor Nasir Ghani, University of South Florida

Analytics for the Internet of Things (IoT) John Wiley & Sons
If you're a developer or electronics engineer who is curious about Internet of Things, then this is the book for you. With only a rudimentary understanding of electronics, Raspberry Pi, or similar credit-card sized computers, and some programming experience using managed code such as C# or Java, you will be taught to develop state-of-the-art solutions for Internet of Things in an instant.

[Connecting Sensors and Microcontrollers to the Cloud](#)
Createspace Independent Publishing Platform

The IoT is the next manifestation of the Internet. The trend started by connecting computers to computers, progressed to connecting people to people, and is now moving to connect everything to everything. The movement started like a race—with a lot of fanfare, excitement, and cheering. We're now into the work phase, and we have to figure out how to make the dream come true. The IoT will have many faces and involve many fields as it progresses. It will involve technology, design, security, legal policy, business, artificial intelligence, design, Big Data, and forensics; about any field that exists now. This is the reason for this book. There are books in each one of these fields, but the focus was always "an inch wide and a mile deep." There's a need for a book that will introduce the IoT to non-engineers and allow them to dream of the possibilities and explore the work venues in this area. The book had to be "a mile wide and a few inches deep." The editors met this goal by engaging experts from a number of fields and asking them to come together to create an introductory IoT book. Fundamentals of Internet of Things for Non-Engineers Provides a comprehensive view of the current fundamentals and the anticipated future trends in the realm of Internet of Things from a practitioner's point of view Brings together a variety of voices with subject matter expertise in these diverse topical areas to provide leaders, students, and lay persons with a fresh worldview of the Internet of Things and the background to succeed in related technology decision-making Enhances the reader's experience through a review of actual applications of Internet of Things end points and devices to solve business and civic problems along with notes on lessons learned Prepares readers to embrace the Internet of Things era and

address complex business, social, operational, educational, and personal systems integration questions and opportunities
[Security and Privacy in the Internet of Things](#) Apress
The Internet of Things (IoT) networks have revolutionized the world and have innumerable real-time applications on automation. A few examples include driverless cars, remote monitoring of the elderly, remote order of tea or coffee of your choice from a vending machine, and home/industrial automation amongst others. Fundamentals of Internet of Things build the foundations of IoT networks by leveraging the relevant concepts from signal processing, communications, net-works, and machine learning. The book covers two fundamental components of IoT networks, namely, the Internet and Things. In particular, the book focuses on networking concepts, protocols, clustering, data fusion, localization, energy harvesting, control optimization, data analytics, fog computing, privacy, and security including elliptic curve cryptography and blockchain technology. Most of the existing books are theoretical and without many mathematical details and examples. In addition, some essential topics of the IoT networks are also missing in the existing books. Features: • The book covers cutting-edge research topics • Provides mathematical understanding of the topics in addition to relevant theory and insights • Includes illustrations with hand-solved numerical examples for visualization of the theory and testing of understanding • Lucid and crisp explanation to lessen the study time of the reader The book is a complete package of the fundamentals of IoT networks and is suitable for graduate-level students and researchers who want to dive into the world of IoT networks.

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