

Internet of Things

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Product Description

Internet of Things

This comprehensive textbook, Internet of Things (IoT), serves as an essential guide to the disruptive technological network that is reshaping the physical and digital worlds. Moving beyond simple connectivity, the book provides a robust, unit-by-unit exploration of the entire IoT ecosystem, from the foundational hardware components to the advanced data analytics that drive decision-making.

The core theme is the intelligent integration and automation achieved by linking physical objects via sensors, actuators, and communication protocols. Its purpose is to equip readers with both theoretical knowledge—covering complex topics like reference architecture, protocols (MQTT, CoAP), and cloud service models (IaaS, PaaS, SaaS)—and practical, real-world application insights. Readers will learn how IoT transforms industries through technical optimization, waste reduction, and enhanced customer engagement.

The target audience includes undergraduate and graduate students in Computer Science, Electronics, and Information Technology, as well as researchers and industry professionals seeking to design, implement, or manage scalable IoT solutions. With dedicated sections on Big Data Analytics, Industry 4.0 concepts, and hands-on projects using platforms like Raspberry Pi and Arduino, this book offers a complete and engaging framework for understanding the future of interconnected technology.

Salient Features

- **Foundational Concepts**: Provides a solid grounding by exploring the evolution from Machine-to-Machine (M2M) communication to the full Internet of Things, detailing key benefits like technical optimization and waste reduction.
- **System Architecture**: Offers a comprehensive, layered reference architecture covering the Device, Communication, Aggregation, and Data Analysis layers, along

with lightweight protocols like MQTT and CoAP.

- **Embedded Components**: Focuses on the physical layer, including the function and use of various sensors and actuators, alongside the crucial design of embedded systems and gateways for IoT devices.
- **Cloud Integration**: Discusses the convergence of IoT and Cloud Computing (IaaS, PaaS, SaaS) for scalable data management, featuring in-depth analysis of major platforms like AWS IoT and IBM Watson.
- **Big Data Analytics**: Contains a dedicated unit on managing the high Volume, Variety, and Velocity of IoT data, covering general data architecture and practical data visualization tools.
- **Development Boards**: Includes practical guidance on implementing projects using popular hardware platforms like Raspberry Pi, Arduino, and Intel Galileo, catering to hands-on learning and prototyping.
- **Business & Industry 4.0**: Outlines the vast business scope of IoT, covering concepts like Industry 4.0, economic transformation, and the new Information-Driven Global Value Chain (I-GVC).
- **Security & Threats**: Addresses critical challenges such as security threats (e.g., DDoS attacks) and the need for robust Identity and Access Management within the distributed and scalable IoT ecosystem.

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