

## Building An Iot Node For Less Than 15 Nodemcu Esp8266

*The Special Issue Distributed Energy Resources Management 2018 includes 13 papers, and is a continuation of the Special Issue Distributed Energy Resources Management. The success of the previous edition shows the unquestionable relevance of distributed energy resources in the operation of power and energy systems at both the distribution level and at the wider power system level. Improving the management of distributed energy resources makes it possible to accommodate the higher penetration of intermittent distributed generation and electric vehicle charging. Demand response programs, namely the ones with a distributed nature, allow the consumers to contribute to the increased system efficiency while receiving benefits. This book addresses the management of distributed energy resources, with a focus on methods and techniques to achieve an optimized operation, in order to aggregate the resources namely in the scope of virtual power players and other types of aggregators, and to remunerate them. The*

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*integration of distributed resources in electricity markets is also addressed as an enabler for their increased and efficient use. Get familiar with the building blocks of IoT solutions using off-the-shelf IoT platforms. Key Features Work with various trending IoT platforms such as AWS IoT, Azure IoT, Google IoT, IBM Watson IoT, and Kaa IoT Gain hands-on knowledge working with Cloud-based IoT platforms, IoT Analytics, and so on. A practical guide that will help you build IoT strategies for your organization*

*Book Description There is a lot of work that is being done in the IoT domain and according to Forbes the global IoT market will grow from \$157B in 2016 to \$457B by 2020. This is an amazing market both in terms technology advancement as well as money. In this book, we will be covering five popular IoT platforms, namely, AWS IoT, Microsoft Azure IoT, Google IoT Core, IBM Watson IoT, and Kaa IoT middleware. You are going to build solutions that will use a Raspberry Pi 3, a DHT11 Temperature and humidity sensor, and a dashboard to visualize the sensor data in real-time. Furthermore, you will also explore various components of each of the platforms that are needed to achieve the desired solution. Besides building solutions,*

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*you will look at how Machine Learning and IoT go hand in hand and later design a simple predictive web service based on this concept. By the end of this book, you will be in a position to implement an IoT strategy best-fit for your organization What you will learn Connect a Temperature and Humidity sensor and see how these two can be managed from various platforms Explore the core components of AWS IoT such as AWS Kinesis and AWS IoT Rules Engine Build a simple analysis dashboard using Azure IoT and Power BI Understand the fundamentals of Google IoT and use Google core APIs to build your own dashboard Get started and work with the IBM Watson IoT platform Integrate Cassandra and Zeppelin with Kaa IoT dashboard Review some Machine Learning and AI and get to know more about their implementation in the IoT domain. Who this book is for This book is targeted at IoT architects and engineers, or any stakeholders working with IoT solutions in an organization. This book will also help decision makers and professionals from small- and medium-sized enterprises build an IoT strategy for their venture.*

*This book presents a step by step design approach to develop and implement an IoT*

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*system starting from sensor, interfacing to embedded processor, wireless communication, uploading measured data to cloud including data visualization along with machine learnings and artificial intelligence. The book will be extremely useful towards a hands-on approach of designing and fabricating an IoT system especially for upper undergraduate, master and PhD students, researchers, engineers and practitioners. The growth of Internet use and technologies has increased exponentially within the business sector. When utilized properly, these applications can enhance business functions and make them easier to perform. Exploring the Convergence of Big Data and the Internet of Things is a pivotal reference source featuring the latest empirical research on the business use of computing devices to send and receive data in conjunction with analytic applications to reduce maintenance costs, avoid equipment failures, and improve business operations. Including research on a broad range of topics such as supply chain, aquaculture, and speech recognition systems, this book is ideally designed for researchers, academicians, and practitioners seeking current research on various technology uses in business.*

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*JavaScript Robotics*

*Concepts, Methodologies, Tools, and Applications*

*Management of IOT Open Data Projects in Smart Cities*

*Advanced Cybersecurity Technologies*

*Internet of Things with Raspberry Pi 3*

*Create a powerful Industrial IoT infrastructure using Industry 4.0*

As populations have continued to grow and expand, many people have made their homes in cities around the globe. With this increase in city living, it is becoming vital to create intelligent urban environments that efficiently support this growth and simultaneously provide friendly and progressive environments to both businesses and citizens alike. *Smart Cities and Smart Spaces: Concepts, Methodologies, Tools, and Applications* is an innovative reference source that discusses social, economic, and environmental issues surrounding the evolution of smart cities. Highlighting a range of topics such as smart destinations, urban planning, and intelligent communities, this multi-volume book is designed for

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engineers, architects, facility managers, policymakers, academicians, and researchers interested in expanding their knowledge on the emerging trends and topics involving smart cities.

These transactions publish research in computer-based methods of computational collective intelligence (CCI) and their applications in a wide range of fields such as the semantic web, social networks, and multi-agent systems. TCCI strives to cover new methodological, theoretical and practical aspects of CCI understood as the form of intelligence that emerges from the collaboration and competition of many individuals (artificial and/or natural). The application of multiple computational intelligence technologies, such as fuzzy systems, evolutionary computation, neural systems, consensus theory, etc., aims to support human and other collective intelligence and to create new forms of CCI in natural and/or artificial systems. This thirty-first issue presents 12 selected papers from the 3rd Seminar on Quantitative Methods of Group Decision Making which was held in

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November 2017 at the WSB University in Wroclaw.

The book entitled "Advancements in Smart City and Intelligent Building" is the Proceedings of the International Conference on Smart City and Intelligent Building (ICSCIB 2018) held in Hefei, China, September 15-16, 2018. It contains 58 papers in total categorized into 8 different tracks, on Building Energy Efficiency, Construction Robot and Automation, Intelligent Community and Urban Safety, Intelligentization of Heating Ventilation Air Conditioning System, Information Technology and Intelligent Transportation Systems, New Generation Intelligent Building Platform Techniques, Smart Home and Utility, and Smart Underground Space, which cover a wide range areas of smart cities and intelligent buildings. ICSCIB2018 provided an international forum for professionals, academics, and researchers to present the latest developments from interdisciplinary theoretical studies, computational algorithm developments and engineering applications in smart cities and smart

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buildings. This academic event featured many opportunities to network with colleagues from around the world in a wonderful environment. Its program covered invitation and presentations from scientists, researchers, and practitioners who have been working in the related areas to establish platforms for collaborative research projects in these fields. The conference invited leaders from industry and academia to exchange and share their experiences, present research results, explore collaborations and to spark new ideas, with the aim of developing new projects and exploiting new technology in these fields, and bridge theoretical studies and emerging applications in various science and engineering branches. This book addresses the recent development and achievement in the field of smart city and intelligent building. It is primarily intended for researchers and students for undergraduate and postgraduate programs in the background of multiple disciplines including computer science, information systems, information technology, automatic

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control and automation, electrical and electronic engineering, and telecommunications who wish to develop and share their ideas, knowledge and new findings in smart city and intelligent building.

This book introduces a new approach to embedded development, grounded in modern, industry-standard JavaScript. Using the same language that powers web browsers and Node.js, the Moddable SDK empowers IoT developers to apply many of the same tools and techniques used to build sophisticated websites and mobile apps. The Moddable SDK enables you to unlock the full potential of inexpensive microcontrollers like the ESP32 and ESP8266. Coding for these microcontrollers in C or C++ with the ESP-IDF and Arduino SDKs works for building basic products but doesn't scale to handle the increasingly complex IoT products that customers expect. The Moddable SDK adds the lightweight XS JavaScript engine to those traditional environments, accelerating development with JavaScript while keeping the performance benefits of a native SDK.

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Building user interfaces and communicating over the network are two areas where JavaScript really shines. IoT Development for ESP32 and ESP8266 with JavaScript shows you how to build responsive touch screen user interfaces using the Pui framework. You'll learn how easy it is to securely send and receive JSON data over Wi-Fi with elegant JavaScript APIs for common IoT protocols, including HTTP/HTTPS, WebSocket, MQTT, and mDNS. You'll also learn how to integrate common sensors and actuators, Bluetooth Low Energy (BLE), file systems, and more into your projects, and you'll see firsthand how JavaScript makes it easier to combine these diverse technologies. If you're an embedded C or C++ developer who has never worked in JavaScript, don't worry. This book includes an introduction to the JavaScript language just for embedded developers experienced with C or C++. What You'll Learn Building, installing, and debugging JavaScript projects on the ESP32 and ESP8266 Using modern JavaScript for all aspects of embedded development with the Moddable SDK

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Developing IoT products with animated user interfaces, touch input, networking, BLE, sensors, actuators, and more Who This Book Is For Professional embedded developers who want the speed, flexibility, and power of web development in their embedded software work Makers who want a faster, easier way to build their hobby projects Web developers working in JavaScript who want to extend their skills to hardware products Rethinking the Internet of Things Building the Web of Things IoT as a Service Effectively manage connected devices on the AWS cloud using services such as AWS Greengrass, AWS button, predictive analytics and machine learning MODERN SCIENCE AND PRACTICE IoT Development for ESP32 and ESP8266 with JavaScript Learn IoT Programming Using Node-RED Managing the Web of Things: Linking the Real World to the Web presents a consolidated and holistic coverage of engineering, management, and analytics of the Internet of Things. The web has gone through many transformations, from

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traditional linking and sharing of computers and documents (i.e., Web of Data), to the current connection of people (i.e., Web of People), and to the emerging connection of billions of physical objects (i.e., Web of Things). With increasing numbers of electronic devices and systems providing different services to people, Web of Things applications present numerous challenges to research institutions, companies, governments, international organizations, and others. This book compiles the newest developments and advances in the area of the Web of Things, ranging from modeling, searching, and data analytics, to software building, applications, and social impact. Its coverage will enable effective exploration, understanding, assessment, comparison, and the selection of WoT models, languages, techniques, platforms, and tools. Readers will gain an up-to-date understanding of the Web of Things systems that accelerates their research. Offers a comprehensive and systematic presentation of the methodologies, technologies, and applications that enable efficient and effective management of the Internet of Things Provides an in-depth analysis on the state-of-the-art Web of Things modeling and searching technologies,

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including how to collect, clean, and analyze data generated by the Web of Things Covers system design and software building principles, with discussions and explorations of social impact for the Web of Things through real-world applications Acts as an ideal reference or recommended text for graduate courses in cloud computing, service computing, and more Use a low-code programming approach to create event-driven applications from scratch by wiring together hardware devices, APIs, and online services Key Features Discover how you can automate the Internet of Things (IoT) without writing huge blocks of code Learn how to wire together flows using a browser-based visual editor Handle IoT data with little to no coding knowledge Book Description Node-RED is a free and open source flow-based programming tool used to handle IoT data that allows programmers of any level to interconnect physical I/O, cloud-based systems, databases, and APIs to build web applications without code. Practical Node-RED Programming is a comprehensive introduction for anyone looking to get up to speed with the Node-RED ecosystem in no time. Complete with hands-on tutorials, projects, and self-assessment questions, this easy-to-follow guide will help you to

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become well versed in the foundations of Node-RED. You'll learn how to use Node-RED to handle IoT data and build web applications without having to write complex code. Once you've covered the basics, you'll explore various visual programming techniques and find out how to make sample flows as you cover web development, IoT development, and cloud service connections, and finally build useful real-world applications. By the end of this book, you'll have learned how to use Node-RED to develop a real-world application from scratch, which can then be implemented in your business. What you will learn

Understand the history of Node-RED and why you need to learn a flow-based programming tool  
Use Node-RED to build Node.js-based applications  
Handle data for IoT devices using Node-RED flows  
Explore advanced Node-RED features such as connecting repositories and customizing the flow editor  
Find out what the MQTT protocol is and how it relates to Node-RED  
Create and publish your own nodes and flows using the Node-RED library

Who this book is for  
This Node-RED book is for web developers and IoT engineers with some background in JavaScript and Node.js. Although not necessary, familiarity with the concepts of electronics will help you

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to make the most out of this book. Apress is proud to announce that Rethinking the Internet of Things was a 2014 Jolt Award Finalist, the highest honor for a programming book. And the amazing part is that there is no code in the book. Over the next decade, most devices connected to the Internet will not be used by people in the familiar way that personal computers, tablets and smart phones are. Billions of interconnected devices will be monitoring the environment, transportation systems, factories, farms, forests, utilities, soil and weather conditions, oceans and resources. Many of these sensors and actuators will be networked into autonomous sets, with much of the information being exchanged machine-to-machine directly and without human involvement. Machine-to-machine communications are typically terse. Most sensors and actuators will report or act upon small pieces of information - "chirps". Burdening these devices with current network protocol stacks is inefficient, unnecessary and unduly increases their cost of ownership. This must change. The architecture of the Internet of Things must evolve now by incorporating simpler protocols toward at

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the edges of the network, or remain forever inefficient. Rethinking the Internet of Things describes reasons why we must rethink current approaches to the Internet of Things. Appropriate architectures that will coexist with existing networking protocols are described in detail. An architecture comprised of integrator functions, propagator nodes, and end devices, along with their interactions, is explored. Cybersecurity is an extremely important area which is rapidly evolving, necessarily, to meet current and future threats. Anyone who studies within this domain requires a particular skillset and way of thinking, balancing technical knowledge and human insight. It is vital to recognize both sides of this complex area and integrate the two. This book looks at the technical fields progressively, building up in layers before expanding into more advanced topics. Each area is looked at succinctly, describing the main elements and problems in each area and reinforcing these concepts with practical coding examples, questions and ideas for further research. The book builds on an overview of basic architecture of systems and networks, setting a context for how information is

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vulnerable. Cryptography is explained in detail with examples, showing the steady progress in this area over time through to the possibilities of quantum encryption. Steganography is also explained, showing how this can be used in a modern-day context through multimedia and even Virtual Reality. A large section of the book is given to the technical side of hacking, how such attacks occur, how they can be avoided and what to do after there has been an intrusion of some description. Cyber countermeasures are explored, along with automated systems of defense, whether created by the programmer or through firewalls and suchlike. The human aspect of cyber security is detailed along with the psychology and motivations for launching attacks. Social engineering is focused on and with the various techniques looked at - revealing how an informed individual, organization or workplace can protect themselves against incursions and breaches. Finally, there is a look the latest developments in the field, and how systems, such as the IoT are being protected. The book is intended for advanced undergraduate and postgraduate courses on cybersecurity but is also useful for those studying IT or Computer Science more generally.

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IoT System Design

12th Asian Conference, ACIIDS 2020, Phuket, Thailand, March 23-26, 2020, Proceedings

Proceedings of the 11th International Conference on Computer Engineering and Networks

Build end-to-end IoT solutions using popular IoT platforms

Second EAI International Conference, IoT-Care 2021, Virtual Event, October 18-19, 2021, Proceedings, Part I

Using Web Technologies to Build Connected Devices

Select Proceedings of AdMet 2021

***Summary A hands-on guide that will teach how to design and implement scalable, flexible, and open IoT solutions using web technologies. This book focuses on providing the right balance of theory, code samples, and practical examples to enable you to successfully connect all sorts of devices to the web and to expose their services and data over REST APIs. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Because the Internet of Things is still new, there is no universal application protocol. Fortunately, the IoT can take advantage of the web, where IoT protocols connect applications thanks to universal and open APIs. About the Book Building the Web of Things is a guide to using cutting-edge web technologies to build the IoT. This step-***

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*by-step book teaches you how to use web protocols to connect real-world devices to the web, including the Semantic and Social Webs. Along the way you'll gain vital concepts as you follow instructions for making Web of Things devices. By the end, you'll have the practical skills you need to implement your own web-connected products and services. What's Inside Introduction to IoT protocols and devices Connect electronic actuators and sensors (GPIO) to a Raspberry Pi Implement standard REST and Pub/Sub APIs with Node.js on embedded systems Learn about IoT protocols like MQTT and CoAP and integrate them to the Web of Things Use the Semantic Web (JSON-LD, RDFa, etc.) to discover and find Web Things Share Things via Social Networks to create the Social Web of Things Build a web-based smart home with HTTP and WebSocket Compose physical mashups with EVERYTHING, Node-RED, and IFTTT About the Reader For both seasoned programmers and those with only basic programming skills. About the Authors Dominique Guinard and Vlad Trifa pioneered the Web of Things and cofounded EVERYTHING, a large-scale IoT cloud powering billions of Web Things. Table of Contents PART 1 BASICS OF THE IOT AND THE WOT From the Internet of Things to the Web of Things Hello, World Wide Web of Things Node.js for the Web of Things Getting started with embedded systems Building networks of Things PART 2 BUILDING THE WOT Access: Web APIs for Things Implementing Web Things Find: Describe and discover*

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***Web Things Share: Securing and sharing Web Things Building an Iot Node for Less Than 15 \$Nodemcu & Esp8266***

***The book Security of Internet of Things Nodes: Challenges, Attacks, and Countermeasures® covers a wide range of research topics on the security of the Internet of Things nodes along with the latest research development in the domain of Internet of Things. It also covers various algorithms, techniques, and schemes in the field of computer science with state-of-the-art tools and technologies. This book mainly focuses on the security challenges of the Internet of Things devices and the countermeasures to overcome security vulnerabilities. Also, it highlights trust management issues on the Internet of Things nodes to build secured Internet of Things systems. The book also covers the necessity of a system model for the Internet of Things devices to ensure security at the hardware level. Build a strong and efficient IoT infrastructure at industrial and enterprise level by mastering Industrial IoT network Key FeaturesGain hands-on experience working with industrial architectureExplore the potential of cloud-based Industrial IoT platforms, analytics, and protocolsImprove business models and transform your workforce with Industry 4.0Book Description We live in an era where advanced automation is used to achieve accurate results. To set up an automation environment, you need to first configure a network that can be accessed anywhere and by any***

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*device. This book is a practical guide that helps you discover the technologies and use cases for Industrial Internet of Things (IIOT). Hands-On Industrial Internet of Things takes you through the implementation of industrial processes and specialized control devices and protocols. You'll study the process of identifying and connecting to different industrial data sources gathered from different sensors. Furthermore, you'll be able to connect these sensors to cloud network, such as AWS IoT, Azure IoT, Google IoT, and OEM IoT platforms, and extract data from the cloud to your devices. As you progress through the chapters, you'll gain hands-on experience in using open source Node-Red, Kafka, Cassandra, and Python. You will also learn how to develop streaming and batch-based Machine Learning algorithms. By the end of this book, you will have mastered the features of Industry 4.0 and be able to build stronger, faster, and more reliable IoT infrastructure in your Industry. What you will learn*

*Explore industrial processes, devices, and protocols*

*Design and implement the I-IoT network flow*

*Gather and transfer industrial data in a secure way*

*Get to grips with popular cloud-based platforms*

*Understand diagnostic analytics to answer critical workforce questions*

*Discover the Edge device and understand Edge and Fog computing*

*Implement equipment and process management to achieve business-specific goals*

*Who this book is for* If you're an IoT architect, developer, or stakeholder working with

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*architectural aspects of Industrial Internet of Things, this book is for you.*

*Node.js for Embedded Systems*

*Flow Architectures*

*A Practical Guide to XS and the Moddable SDK*

*Intelligent Information and Database Systems*

*Learn powerful visual programming techniques and best practices for the web and IoT*

*Managing the Web of Things*

*Smart Cities and Smart Spaces: Concepts,*

*Methodologies, Tools, and Applications*

The Building Cognitive Applications with IBM Watson Services series is a seven-volume collection that introduces IBM® Watson™ cognitive computing services. The series includes an overview of specific IBM Watson® services with their associated architectures and simple code examples. Each volume describes how you can use and implement these services in your applications through practical use cases. The series includes the following volumes: Volume 1 Getting Started, SG24-8387 Volume 2 Conversation, SG24-8394 Volume 3 Visual Recognition, SG24-8393 Volume 4 Natural Language Classifier, SG24-8391 Volume 5 Language Translator, SG24-8392 Volume 6 Speech to Text and Text to Speech, SG24-8388 Volume 7 Natural Language Understanding, SG24-8398 Whether you are a beginner or an experienced developer, this collection provides

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the information you need to start your research on Watson services. If your goal is to become more familiar with Watson in relation to your current environment, or if you are evaluating cognitive computing, this collection can serve as a powerful learning tool. This IBM Redbooks® publication, Volume 2, describes how the Watson Conversation service can be used to create chatbots and user agents that understand natural-language input and communicate with your users simulating a real human conversation. It introduces the concepts that you need to understand in order to use the Watson Conversation service. It provides examples of applications that integrate the Watson Conversation service with other IBM Bluemix® services, such as the IBM IoT Platform, Text to Speech, Speech to Text, and Weather Company® Data, to implement practical use cases. You can develop and deploy the sample applications by following along in a step-by-step approach and using provided code snippets. Alternatively, you can download an existing Git project to more quickly deploy the application.

Program edge devices by learning low-code programming and essentials of IoT systems. **KEY FEATURES**

- In-depth practical demonstration of the IoT architecture with numerous examples.
- Includes graphical illustrations and uses of popular full-stack tools.
- Access to hardware components and software packages to build

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powerful IoT systems. **DESCRIPTION** Learn IoT Programming with Node-RED is an excellent source of practical knowledge for developing a successful Internet of Things system, starting with the very first step of programming a Raspberry Pi, and using numerous open-source software development tools. To begin, the book will provide you with a practical experience of visual programming, fundamentals of Node-RED, and the architecture of an Internet of Things system. The book covers data collecting capabilities and the development of real-time streaming functionalities. The book describes how to set up an Internet of Things infrastructure, manage software development, and integrate physical devices. The book provides IoT projects based on temperature and humidity data recorded as time series. It teaches you how to design the software using a simulated model of the hardware and use the same code to execute it in the actual hardware. Node-RED, Pusher, InfluxDB, and Grafana are some of the professional tools you will learn in this book. After reading the book, you will gain the knowledge to create your own applications that will be connected to the physical environment by means of a range of sensors.

**WHAT YOU WILL LEARN**

- Create IoT systems with NodeRED visual programming.
- Learn to transfer data from IoT devices to machines for analysis using Pusher, a free platform.
- Store time-series data streams to InfluxDB.
- Use

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NodeRED to process data and execute statistical calculations on the remote machine. ● Create user-friendly Grafana dashboards for environmental monitoring. WHO THIS BOOK IS FOR IoT engineers, roboticists, and embedded system programmers who are interested in learning low-code development and programming hardware devices may benefit from this book. Prior knowledge of Linux and Raspberry Pi may be helpful. TABLE OF CONTENTS 1. Introduction to IoT Applications and Their Software Architecture 2. Getting Started with NodeRED 3. Data Acquisition and Real-time Streaming 4. Real-time Data Processing with NodeRED 5. Storing and Graphing Data Streams with InfluxDB and Grafana 6. The IoT Hardware Package 7. The IoT Software Package

This reference presents information about different facets of IoT and blockchain systems that have been recently proposed for practical situations. Chapters provide knowledge about how these technologies are applied in functions related to trust management, identity management, security threats, access control and privacy. Key Features: - Introduces the reader to fundamental concepts of IoT and blockchain technology - reports advances in the field of IoT, ubiquitous computing and blockchain computing - includes the applications of different frameworks - explains the role of blockchains in improving IT security - provides examples of smart grids, data

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transmission models, digital business platforms, agronomics and big data solutions - Includes references for further reading Blockchain Applications for Secure IoT Frameworks Technologies Shaping the Future is a handy reference for information technology professionals and students who want updated information about applications of IoT and blockchains in secure operational and business processes.

This two-volume set of LNICST 414 and 415 constitutes the refereed post-conference proceedings of the 2nd International Conference on IoT and Big Data Technologies for Health Care, IoT CARE 2021, which took place in October 2021. Due to COVID-19 pandemic the conference was held virtually. The 79 revised full papers were carefully reviewed and selected from 165 submissions. The papers are arranged thematically as follows: Integrating healthcare with IoT; Information fusion for the devices of IoT; AI-based internet of medical things.

Leverage the power of Raspberry Pi 3 and JavaScript to build exciting IoT projects  
Open-Source Electronics Platforms  
Security of Internet of Things Nodes  
Enterprise Internet of Things Handbook  
With examples in Node.js and Raspberry Pi  
Develop a Fully Flexible and Scalable Internet of Things Platform in 24 Hours  
IoT and Big Data Technologies for Health Care

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How can we build bridges from the digital world of the Internet to the analog world that surrounds us? By bringing accessibility to embedded components such as sensors and microcontrollers, JavaScript and Node.js might shape the world of physical computing as they did for web browsers. This practical guide shows hardware and software engineers, makers, and web developers how to talk in JavaScript with a variety of hardware platforms. Authors Patrick Mulder and Kelsey Breseman also delve into the basics of microcontrollers, single-board computers, and other hardware components. Use JavaScript to program microcontrollers with Arduino and Espruino Prototype IoT devices with the Tessel 2 development platform Learn about electronic input and output components, including sensors Connect microcontrollers to the Internet with the Particle Photon toolchain Run Node.js on single-board computers such as Raspberry Pi and Intel Edison Talk to embedded devices with Node.js libraries such as Johnny-Five, and remotely control the devices with Bluetooth Use MQTT as a message broker to connect devices across networks Explore ways to use robots as building blocks for shared experiences This book presents the select proceedings of the 7th National Conference on Advances in Metrology (AdMet 2021) organized by Maharaja Surajmal Institute of Technology, New Delhi, India. The main theme of the conference was "Sensors and Advance Materials for Measurement and Quality Improvement". The book highlights and discusses the technological developments in the areas of sensor technology, measurement, advance material for industrial application, automation and quality control. This book is aimed for all the personnel engaged in conformity assessment, quality system management, calibration and testing in all sectors of industry.

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The book will be a valuable reference for metrologists, scientists, engineers, academicians and students from research institutes and industrial establishments to explore the future directions in the areas of sensors, advance materials, measurement and quality improvement.

Discover how every solution that is in some way related to the IoT needs a platform and how to create that platform. This book is about being agile and reducing your time to market without breaking the bank. It is about designing something that you can scale incrementally without a lot of rework and potentially disrupting the current work. So, the key questions are: What does it take? How long does it take? And, how much does it take to build your own IoT platform? This book answers these questions and provides you with a step-by-step guidance on how to build your own IoT platform. In this book, the author bursts the bubble and highlights how the core of an IoT platform looks like. There are always some must-haves and some nice-to-haves. This book will distinguish the two and focus on how to build the must-haves. Building your IoT platform is not only the biggest cost saver but can also be a satisfying learning experience. In this edition, we will undertake a sample project to further clarify the concepts we learn; additional chapters would show you the hardware interface. What You Will Learn:

- Learn how to architect an interconnected system.
- Learn how to develop flexible architecture.
- Learn to prioritize system requirements with a bottom-up approach.
- Be able to create a redundant communications platform.
- Be able to create an end-to-end application using the guidelines in this book.

Who Is This Book For IoT developers with basic-to-intermediate programming skills would benefit from this book.

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Management of IoT Open Data Projects in Smart Cities demonstrates a key project management methodology for the implementation of Smart Cities projects: Principles and Regulations for Smart Cities (PaRSC). This methodology adopts a basis in classic Scrum soft management methods with carefully considered expansions. These include design principals for high-level architecture design and recommendations for design at the level of project teams. This approach enables the deployment of rule-based linguistic models for IoT project management, supporting the design of high-level architecture and providing rules for Scrum Smart Cities team. After reading this book, the reader will have a thorough grounding in IoT nodes and methods of their design, the acquisition and use of open data, and the use of project management methods to collect open data and build business models based on them. Presents a unified method for smart urban interventions based on the adjustment of Scrum to the complexity of smart city projects Establishes a key model for intelligent systems verification in Smart Cities projects Demonstrates how practitioners can gain from the adoption of rule-based linguistic models

Advancements in Smart City and Intelligent Building

Bringing your home to life using Raspberry Pi 3, Arduino, and ESP8266

Learning AWS IoT

Transactions on Computational Collective Intelligence XXXI

Begin to Code Full Stack IoT Apps and Edge Devices with Raspberry Pi, NodeJS, and Grafana

Nodemcu & Esp8266

Challenges, Attacks, and Countermeasures

JavaScript Robotics is on the rise. Rick Waldron, the lead

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author of this book and creator of the Johnny-Five platform, is at the forefront of this movement. Johnny-Five is an open source JavaScript Arduino programming framework for robotics. This book brings together fifteen innovative programmers, each creating a unique Johnny-Five robot step-by-step, and offering tips and tricks along the way. Experience with JavaScript is a prerequisite.

Open-source electronics are becoming very popular, and are integrated with our daily educational and developmental activities. At present, the use open-source electronics for teaching science, technology, engineering, and mathematics (STEM) has become a global trend. Off-the-shelf embedded electronics such as Arduino- and Raspberry-compatible modules have been widely used for various applications, from do-it-yourself (DIY) to industrial projects. In addition to the growth of open-source software platforms, open-source electronics play an important role in narrowing the gap between prototyping and product development. Indeed, the technological and social impacts of open-source electronics in teaching, research, and innovation have been widely recognized.

This conference proceeding is a collection of the papers accepted by the CENet2021 – the 11th International Conference on Computer Engineering and Networks held on October 21-25, 2021 in Hechi, China. The topics focus but are not limited to Internet of Things and Smart Systems, Artificial Intelligence and Applications, Communication System Detection, Analysis and Application, and Medical Engineering and Information Systems. Each part can be used as an excellent reference by industry practitioners, university faculties, research fellows and undergraduates as well as graduate students who need to build a knowledge base of the most current advances and state-of-practice in the topics covered by this conference proceedings. This will enable them

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to produce, maintain, and manage systems with high levels of trustworthiness and complexity.

Interoperability in IoT for Smart Systems discusses the different facets of interoperability issues among the IoT devices and their solutions, the scalability issues in an IoT network, and provides solutions for plug-n-play of new devices with the existing IoT system. It also addresses the possible usage of interoperable and plug-n-play IoT networks in different systems to make them smarter. Aimed at researchers and graduate students in computer science, computer engineering, computer networks, electronics engineering, this book Exclusively covers interoperability of IoT systems in parallel with their use towards the development of smart systems Discusses the requirements of interoperability in smart IoT systems and their solutions Reviews IoT applications in different smart and intelligent systems Explores dealing with interoperability of heterogeneous participating devices Provides different case studies and open problems related to interoperability in IoT systems

Blockchain Applications for Secure IoT Frameworks:  
Technologies Shaping the Future

A Scalable Approach to Connecting Everything

Exploring the Convergence of Big Data and the Internet of Things

Hands-On Industrial Internet of Things

Proceedings of the International Conference on Smart City and Intelligent Building (ICSCIB 2018)

Recent Advances in Metrology

Experiments with Real-World Applications

*This volume constitutes the refereed proceedings of the 12th Asian Conference on Intelligent Information and Database Systems,*

*ACIIDS 2020, held in Phuket, Thailand, in March 2020. The total of 50 full papers accepted for publication in these proceedings were carefully reviewed and selected from 180 submissions. The papers*

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*are organized in the following topical sections: ?advanced big data, machine learning and data mining; industry applications of intelligent methods and systems; artificial intelligence, optimization, and databases in practical applications; intelligent applications of internet of things; recommendation and user centric applications of intelligent systems.*

*Unleash the power of the Raspberry Pi 3 board to create interesting IoT projects*

*Key Features*

*Learn how to interface various sensors and actuators with the Raspberry Pi 3 and send this data to the cloud. Explore the possibilities offered by the IoT by using the Raspberry Pi to upload measurements to Google Docs. A practical guide that will help you create a Raspberry Pi robot using IoT modules.*

*Book Description*

*This book is designed to introduce you to IoT and Raspberry Pi 3. It will help you create interesting projects, such as setting up a weather station and measuring temperature and humidity using sensors; it will also show you how to send sensor data to cloud for visualization in real-time. Then we shift our focus to leveraging IoT for accomplishing complex tasks, such as facial recognition using the Raspberry Pi camera module, AWS Rekognition, and the AWS S3 service. Furthermore, you will master security aspects by building a security surveillance system to protect your premises from intruders using Raspberry Pi, a camera, motion sensors, and AWS Cloud. We'll also create a real-world project by building a Wi-Fi – controlled robot car with Raspberry Pi using a motor driver circuit, DC motor, and a web application. This book is a must-have as it provides a practical overview of IoT's existing architectures, communication protocols, and security threats at the software and hardware levels—security being the most important aspect of IoT. What you will learn*

*Understand the concept of IoT and get familiar with the features of Raspberry Pi*

*Learn to integrate sensors and actuators with the Raspberry Pi*

*Communicate with cloud and Raspberry using communication protocols such as HTTP and MQTT*

*Build DIY projects using Raspberry Pi, JavaScript/node.js and cloud (AWS)*

*Explore the best*

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*practices to ensure the security of your connected devices Who this book is for If you're a developer or electronics engineer and are curious about the Internet of Things, then this is the book for you. With only a rudimentary understanding of electronics, the Raspberry Pi, or similar credit-card sized computers, and some programming experience, you will be taught to develop state-of-the-art solutions for the Internet of Things in an instant.*

*Internet-of-Things (IoT) Analytics are an integral element of most IoT applications, as it provides the means to extract knowledge, drive actuation services and optimize decision making. IoT analytics will be a major contributor to IoT business value in the coming years, as it will enable organizations to process and fully leverage large amounts of IoT data, which are nowadays largely underutilized. The Building Blocks of IoT Analytics is devoted to the presentation the main technology building blocks that comprise advanced IoT analytics systems. It introduces IoT analytics as a special case of BigData analytics and accordingly presents leading edge technologies that can be deployed in order to successfully confront the main challenges of IoT analytics applications. Special emphasis is paid in the presentation of technologies for IoT streaming and semantic interoperability across diverse IoT streams. Furthermore, the role of cloud computing and BigData technologies in IoT analytics are presented, along with practical tools for implementing, deploying and operating non-trivial IoT applications. Along with the main building blocks of IoT analytics systems and applications, the book presents a series of practical applications, which illustrate the use of these technologies in the scope of pragmatic applications. Technical topics discussed in the book include: Cloud Computing and BigData for IoT analytics Searching the Internet of Things Development Tools for IoT Analytics Applications IoT Analytics-as-a-Service Semantic Modelling and Reasoning for IoT Analytics IoT analytics for Smart Buildings IoT analytics for Smart Cities Operationalization of IoT analytics Ethical aspects of IoT analytics This book contains both*

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*research oriented and applied articles on IoT analytics, including several articles reflecting work undertaken in the scope of recent European Commission funded projects in the scope of the FP7 and H2020 programmes. These articles present results of these projects on IoT analytics platforms and applications. Even though several articles have been contributed by different authors, they are structured in a well thought order that facilitates the reader either to follow the evolution of the book or to focus on specific topics depending on his/her background and interest in IoT and IoT analytics technologies. The compilation of these articles in this edited volume has been largely motivated by the close collaboration of the co-authors in the scope of working groups and IoT events organized by the Internet-of-Things Research Cluster (IERC), which is currently a part of EU's Alliance for Internet of Things Innovation (AIOTI).*

*Learn to use AWS IoT services to build your connected applications with the help of this comprehensive guide. Key Features Gets you started with AWS IoT and its functionalities Learn different modules of AWS IoT with practical use cases. Learn to secure your IoT communication Book Description The Internet of Things market increased a lot in the past few years and IoT development and its adoption have showed an upward trend. Analysis and predictions say that Enterprise IoT platforms are the future of IoT. AWS IoT is currently leading the market with its wide range of device support SDKs and versatile management console. This book initially introduces you to the IoT platforms, and how it makes our IoT development easy. It then covers the complete AWS IoT Suite and how it can be used to develop secure communication between internet-connected things such as sensors, actuators, embedded devices, smart applications, and so on. The book also covers the various modules of AWS: AWS Greengrass, AWS device SDKs, AWS IoT Platform, AWS Button, AWS Management consoles, AWS-related CLI, and API references, all with practical use cases. Near the end, the book supplies security-related best practices to make bi-*

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*directional communication more secure. When you've finished this book, you'll be up-and-running with the AWS IoT Suite, and building IoT projects. What you will learn Implement AWS IoT on IoT projects Learn the technical capabilities of AWS IoT and IoT devices Create IoT-based AWS IoT projects Choose IoT devices and AWS IoT platforms to use based on the kind of project you need to build Deploy AWS Greengrass and AWS Lambda Develop program for AWS IoT Button Visualize IoT AWS data Build predictive analytics using AWS IoT and AWS Machine Learning Who this book is for This book is for anyone who wants to get started with the AWS IoT Suite and implement it with practical use cases. This book acts as an extensive guide, on completion of which you will be in a position to start building IoT projects using AWS IoT platform and using cloud services for your projects.*

*Project Based Approach*

*Practical Node-RED Programming*

*7th EAI International Conference, IoTaaS 2021, Sydney, Australia, December 13–14, 2021, Proceedings*

*Distributed Energy Resources Management 2018*

*Raspberry Pi 3 Home Automation Projects*

*Building Arduino Projects for the Internet of Things*

*Interoperability in IoT for Smart Systems*

*Chapter 6: The Message Broker; What Is MQTT?;*

*Publish and Subscribe Paradigm; Other Features of a Message Broker and MQTT; Quality of*

*Service; Keep Alive Period; Last Will and*

*Testament; The Retained Message; The Best Part:*

*WebSocket; Are We Using the Best Message*

*Broker Option?; When to Utilize a Message Broker*

*and When Not To; Installing a Message Broker;*

*Securing a Message Broker; Summary; Chapter 7:*

*Building the Critical Components; Creating a Time-*

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*Series Core Database; Installing Required Nodes in Node-RED; Creating First Flow for Our Platform; Adding MQTT Publish Capability*

*“With futuristic homes on the rise, learn to control and automate the living space with intriguing IoT projects.” About This Book Build exciting (six) end-to-end home automation projects with Raspberry Pi 3, Seamlessly communicate and control your existing devices and build your own home automation system, Automate tasks in your home through projects that are reliable and fun Who This Book Is For This book is for all those who are excited about building home automation systems with Raspberry Pi 3. It's also for electronic hobbyists and developers with some knowledge of electronics and programming. What You Will Learn Integrate different embedded microcontrollers and development boards like Arduino, ESP8266, Particle Photon and Raspberry Pi 3, creating real life solutions for day to day tasks and home automation Create your own magic mirror that lights up with useful information as you walk up to it Create a system that intelligently decides when to water your garden and then goes ahead and waters it for you Use the Wi-fi enabled Adafruit ESP8266 Huzzah to create your own networked festive display lights Create a simple machine learning application and build a parking automation system using Raspberry Pi*

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*Learn how to work with AWS cloud services and connect your home automation to the cloud Learn how to work with Windows IoT in Raspberry Pi 3 and build your own Windows IoT Face Recognition door locking system In Detail Raspberry Pi 3 Home Automation Projects addresses the challenge of applying real-world projects to automate your house using Raspberry Pi 3 and Arduino. You will learn how to customize and program the Raspberry Pi 3 and Arduino-based boards in several home automation projects around your house, in order to develop home devices that will really rejuvenate your home. This book aims to help you integrate different microcontrollers like Arduino, ESP8266 Wi-Fi module, Particle Photon and Raspberry Pi 3 into the real world, taking the best of these boards to develop some exciting home automation projects. You will be able to use these projects in everyday tasks, thus making life easier and comfortable. We will start with an interesting project creating a Raspberry Pi-Powered smart mirror and move on to Automated Gardening System, which will help you build a simple smart gardening system with plant-sensor devices and Arduino to keep your garden healthy with minimal effort. You will also learn to build projects such as CheerLights into a holiday display, a project to erase parking headaches with OpenCV and Raspberry Pi 3, create Netflix's "The*

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*Switch" for the living room and lock down your house like Fort Knox with a Windows IoT face recognition-based door lock system. By the end of the book, you will be able to build and automate the living space with intriguing IoT projects and bring a new degree of interconnectivity to your world. Style and approach End to end home automation projects with Raspberry Pi 3.*

*Gain a strong foundation of Arduino-based device development, from which you can go in any direction according to your specific development needs and desires. You'll build Arduino-powered devices for everyday use, and then connect those devices to the Internet. You'll be introduced to the building blocks of IoT, and then deploy those principles to by building a variety of useful projects. Projects in the books gradually introduce the reader to key topics such as internet connectivity with Arduino, common IoT protocols, custom web visualization, and Android apps that receive sensor data on-demand and in realtime. IoT device enthusiasts of all ages will want this book by their side when developing Android-based devices. If you're one of the many who have decided to build your own Arduino-powered devices for IoT applications, then Building Arduino Projects for the Internet of Things is exactly what you need. This book is your single resource--a guidebook for the eager-to-learn Arduino*

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*enthusiast--that teaches logically, methodically, and practically how the Arduino works and what you can build with it. Written by a software developer and solution architect who got tired of hunting and gathering various lessons for Arduino development as he taught himself all about the topic. For Arduino enthusiasts, this book not only opens up the world of IoT applications, you will also learn many techniques that likely would not be obvious if not for experience with such a diverse group of applications*

*What You'll Learn*

- Create an Arduino circuit that senses temperature*
- Publish data collected from an Arduino to a server and to an MQTT broker*
- Set up channels in Xively*
- Using Node-RED to define complex flows*
- Publish data visualization in a web app*
- Report motion-sensor data through a mobile app*
- Create a remote control for house lights*
- Set up an app in IBM Bluematrix*

*Who This Book Is For*

*IoT device enthusiasts of all ages will want this book by their side when developing Android-based devices. Software development today is embracing events and streaming data, which optimizes not only how technology interacts but also how businesses integrate with one another to meet customer needs. This phenomenon, called flow, consists of patterns and standards that determine which activity and related data is communicated between parties over the internet. This book explores*

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*critical implications of that evolution: What happens when events and data streams help you discover new activity sources to enhance existing businesses or drive new markets? What technologies and architectural patterns can position your company for opportunities enabled by flow? James Urquhart, global field CTO at VMware, guides enterprise architects, software developers, and product managers through the process. Learn the benefits of flow dynamics when businesses, governments, and other institutions integrate via events and data streams Understand the value chain for flow integration through Wardley mapping visualization and promise theory modeling Walk through basic concepts behind today's event-driven systems marketplace Learn how today's integration patterns will influence the real-time events flow in the future Explore why companies should architect and build software today to take advantage of flow in coming years*

*Building Blocks for IoT Analytics*  
*Building Cognitive Applications with IBM Watson Services: Volume 2 Conversation*  
*Building NodeBots with Johnny-Five, Raspberry Pi, Arduino, and BeagleBone*  
*Build Your Own IoT Platform*  
*Building an Iot Node for Less Than 15 \$*  
*Linking the Real World to the Web*

Abstracts of XV International

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Scientific and Practical Conference  
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