

Iot Raspberry Pi Course Details B M Embedded

This book introduces the problems facing Internet of Things developers and explores current technologies and techniques to help you manage, mine, and make sense of the data being collected through the use of the world's most popular database on the Internet - MySQL. The IoT is poised to change how we interact with and perceive the world around us, and the possibilities are nearly boundless. As more and more connected devices generate data, we will need to solve the problem of how to collect, store, and make sense of IoT data by leveraging the power of database systems. The book begins with an introduction of the MySQL database system and storage of sensor data. Detailed instructions and examples are provided to show how to add database nodes to IoT solutions including how to leverage MySQL high availability, including examples of how to protect data from node outages using advanced features of MySQL. The book closes with a comparison of raw and transformed data showing how transformed data can improve understandability and help you cut through a clutter of superfluous data toward the goal of mining nuggets of useful knowledge. In this book, you'll learn to: Understand the crisis of vast volumes of data from connected devices Transform data to improve reporting and reduce storage volume Store and aggregate your IoT data across multiple database servers Build localized, low-cost MySQL database servers using small and inexpensive computers Connect Arduino boards and other devices directly to MySQL database servers Build high availability MySQL solutions among low-power computing devices Send and receive messages with the MQTT protocol for your IoT solutions. About This Book Make your connected devices less prone to attackers by understanding practical security mechanisms Dive deep into one of IoT's extremely lightweight machines to enable connectivity protocol with some real-world examples Learn to take advantage of the features included in MQTT for IoT and Machine-to-Machine communications with complete real-life examples Who This Book Is For This book is a great resource for developers who want to learn more about the MQTT protocol to apply it to their individual IoT projects. Prior knowledge of working with IoT devices is essential. What You Will Learn Understand how MQTTv3.1 and v3.1.1 works in detail Install and secure a Mosquitto MQTT broker by following best practices Design and develop IoT solutions combined with mobile and web apps that use MQTT messages to communicate Explore the features included in MQTT for IoT and Machine-to-Machine communications Publish and receive MQTT messages with Python, Java, Swift, JavaScript, and Node.js Implement the security best practices while setting up the MQTT Mosquitto broker In Detail This step-by-step guide will help you gain a deep understanding of the lightweight MQTT protocol. We'll begin with the specific vocabulary of MQTT and its working modes, followed by installing a Mosquitto MQTT broker. Then, you will use best practices to secure the MQTT Mosquitto broker to ensure that only authorized clients are able to publish and receive messages. Once you have secured the broker with the appropriate configuration, you will develop a solution that controls a drone with Python. Further on, you will use Python on a Raspberry Pi 3 board to process commands and Python on Intel Boards (Joule, Edison and Galileo). You will then connect to the MQTT broker, subscribe to topics, send messages, and receive messages in Python. You will also develop a solution that interacts with sensors in Java by working with MQTT messages. Moving forward, you will work with an asynchronous API with callbacks to make the sensors interact with MQTT messages. Following the same process, you will develop an iOS app with Swift 3, build a website that uses WebSockets to connect to the MQTT broker, and control home automation devices with HTML5, JavaScript code, Node.js and MQTT messages Style and approach This step-by-step guide describes the MQTT protocol for your IoT projects

This book discusses online engineering and virtual instrumentation, typical working areas for today's engineers and inseparably connected with areas such as Internet of Things, cyber-physical systems, collaborative networks and grids, cyber cloud technologies, and service architectures, to name just a few. It presents the outcomes of the 14th International Conference on Remote Engineering and Virtual Instrumentation (REV2017), held at Columbia University in New York from 15 to 17 March 2017. The conference addressed fundamentals, applications and experiences in the field of online engineering and virtual instrumentation in the light of growing interest in and need for teleworking, remote services and collaborative working environments as a result of the globalization of education. The book also discusses guidelines for education in university-level courses for these topics.

This book gathers papers addressing state-of-the-art research in all areas of information and communication technologies and their applications in intelligent computing, cloud storage, data mining and software analysis. It presents the outcomes of the Fourth International Conference on Information and Communication Technology for Intelligent Systems, which was held in Ahmedabad, India. Divided into two volumes, the book discusses the fundamentals of various data analysis techniques and algorithms, making it a valuable resource for researchers and practitioners alike.

Digital integration is the driving force of teaching and learning at all levels of education. As more non-traditional students seek credentialing, certification, and degrees, institutions continue to push the boundaries of innovative practices to meet the needs of diverse students. Programs and faculty have moved from merely using technology and learning management systems to unique and innovative ways to engage learners. The Handbook of Research on Innovative Digital Practices to Engage Learners is an essential scholarly publication that offers theoretical frameworks, delivery models, current guidelines, and digital design techniques for integrating technological advancements in education contexts to enforce student engagement and positive student outcomes. Featuring a wide range of topics such as gamification, wearable technologies, and distance education, this book is ideal for teachers, curriculum developers, instructional designers, principals, deans, administrators, researchers, academicians, education professionals, and students.

This book focuses on all the technologies involved in improving the teaching and learning process of some of the sensor-based IoT topics, such as virtual sensors, simulated data acquisition, virtual and remote labs for IoT sensing, gamification experiences and innovative teaching materials, among others. In particular, the articles inside the book show excellent works about hot topics, such as: - Remote labs for IoT teaching, including the full development cycle. - Practical guides for IoT cybersecurity. - Innovative multimodal learning analytics architecture that builds on software-defined networks and network function virtualization principles. - Problem-based learning experiences using designed complex sensor-based IoT ecosystems with sensors, actuators, microcontrollers, plants, soils and irrigation systems. - Block-based programming extensions to facilitate the creation of mobile apps for smart learning experiences. The articles published in this book present only some of the most important topics about sensor-based IoT learning and teaching. However, the selected papers offer significant studies and promising

environments.

This book examines research topics in IoT and Cloud and Fog computing. The contributors address major issues and challenges in IoT-based solutions proposed for the Cloud. The authors discuss Cloud smart and energy efficient services in applications such as healthcare, traffic, and farming systems. Targeted readers are from varying disciplines who are interested in designing and deploying the Cloud applications. The book can be helpful to Cloud-based IoT service providers, Cloud-based IoT service consumers, and Cloud service developers in general for getting the state-of-the-art knowledge in the emerging IoT area. The book also provides a strong foundation for researchers to advance further in this domain. Presents a variety of research related to IoT and Cloud computing; Provides the industry with new and innovative operational ideas; Pertinent to academics, researchers, and practitioners around the world.

This book discusses and assesses the latest trends in the interactive mobile field, and presents the outcomes of the 12th International Conference on Interactive Mobile Communication Technologies and Learning (IMCL2018), which was held in Hamilton, Canada on October 11 and 12, 2018. Today, interactive mobile technologies are at the core of many – if not all – fields of society. Not only does the younger generation of students expect a mobile working and learning environment, but also the new ideas, technologies and solutions coming out practically every day are further strengthening this trend. Since its inception in 2006, the conference has been devoted to highlighting new approaches in interactive mobile technologies with a focus on learning. The IMCL conferences have since established themselves as a valuable forum for exchanging and discussing new research results and relevant trends, as well as practical experience and best-practice examples. This book contains papers in the fields of: Interactive Collaborative Mobile Learning Environments Mobile Health Care Training Game-based Learning Design of Internet of Things (IoT) Devices and Applications Assessment and Quality in Mobile Learning. Its potential readership includes policymakers, educators and researchers in pedagogy and learning theory, schoolteachers, the learning industry, further education lecturers, etc.

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

Java—from first steps to first apps Knowing Java is a must-have programming skill for any programmer. It's used in a wide array of programming projects—from enterprise apps and mobile apps to big data, scientific, and financial uses. The language regularly ranks #1 in surveys of the most popular language based on number of developers, lines of code written, and real-world usage. It's also the language of choice in AP Computer Science classes taught in the U.S. This guide provides an easy-to-follow path from understanding the basics of writing Java code to applying those skills to real projects. Split into eight minibooks covering core aspects of Java, the book introduces the basics of the Java language and object-oriented programming before setting you on the path to building web apps and databases. • Get up to speed on Java basics • Explore object-oriented programming • Learn about strings, arrays, and collections • Find out about files and databases Step-by-step instructions are provided to ensure that you don't get lost at any point along the way.

There are numerous publications which introduce and discuss the Internet of Things (IoT). In the midst of these, this work has several unique characteristics which should change the reader's perspective, and in particular, provide a more profound understanding of the impact of the IoT on society. Dependable IoT for Human and Industry covers the main aspects of Internet of Things and IoT based systems such as global issues of applications, modeling, development and implementation of dependable IoT for different human and industry domains. Technical topics discussed in the book include: Introduction in Internet of vital and trust ThingsModelling and assessment techniques for dependable and secure IoT systemsArchitecting and development of IoT systemsImplementation of IoT for smart cities and drone fleets; business and blockchain, transport and industryTraining courses and education experience on Internet and Web of Thing Developing countries are persistently looking for efficient and cost-effective methods for transforming their communities into smart cities. Unfortunately, energy crises have increased in these regions due to a lack of awareness and proper utilization of technological methods. These communities must explore and implement innovative solutions in order to enhance citizen enrollment, quality of government, and city intelligence. IoT Architectures, Models, and Platforms for Smart City Applications provides emerging research exploring the theoretical and practical aspects of transforming cities into intelligent systems using IoT-based design models and sustainable development projects. This publication looks at how cities can be built as smart cities within limited resources and existing advanced technologies. Featuring coverage on a broad range of topics such as cloud computing, human machine interface, and ad hoc networks, this book is ideally designed for urban planners, engineers, IT specialists, computer engineering students, research scientists, academicians, technology developers, policymakers, researchers, and designers seeking current research on smart applications within urban development.

This book constitutes the proceedings of the 8th International Workshop on Design, Modeling, and Evaluation of Cyber Physical Systems, CyPhy 2018 and 14th International Workshop on Embedded and Cyber-Physical Systems Education, WESE 2018, held in conjunction with ESWeek 2018, in Torino, Italy, in October 2018. The 13 full papers presented together with 1 short paper in this volume were carefully reviewed and selected from 18 submissions. The conference presents a wide range of domains including Modeling, simulation, verification, design, cyber-physical systems, embedded systems, real-time systems, safety, and reliability.

This book reports on cutting-edge research and best practices in developing innovative service systems. It covers issues concerning the suitability of a given system for human use, human

services, and excellent human experiences. It explores a wide range of ways in which human factors in engineering, ergonomics, human-computer interaction (HCI), cognitive engineering, and many other disciplines can contribute to the design and management of service systems. It considers aspects related to cost effectiveness, ethics, and privacy, among others, and covers applications in many areas, from healthcare to education, transportation, and the economy. Based on the AHFE 2021 Conference on the Human Side of Service Engineering, held virtually on 25-29 July, 2021, from USA, this book provides readers with a comprehensive overview of current research and future challenges in the field of service engineering, together with practical insights into the development of innovative services for various kinds of organizations.

Learn to build software and hardware projects featuring the Raspberry Pi! Congratulations on becoming a proud owner of a Raspberry Pi! Following primers on getting your Pi up and running and programming with Python, the authors walk you through 16 fun projects of increasing sophistication that let you develop your Raspberry Pi skills. Among other things you will: Write simple programs, including a tic-tac-toe game Re-create vintage games similar to Pong and Pac-Man Construct a networked alarm system with door sensors and webcams Build Pi-controlled gadgets including a slot car racetrack and a door lock Create a reaction timer and an electronic harmonograph Construct a Facebook-enabled Etch A Sketch-type gadget and a Twittering toy Raspberry Pi Projects is an excellent way to dig deeper into the capabilities of the Pi and to have great fun while doing it.

This book brings to readers thirteen chapters with contributions to the benefits of using IoT and Cloud Computing to agro-ecosystems from a multi-disciplinary perspective. IoT and Cloud systems have prompted the development of a Cloud digital ecosystem referred to as Cloud-to-thing continuum computing. The key success of IoT computing and the Cloud digital ecosystem is that IoT can be integrated seamlessly with the physical environment and therefore has the potential to leverage innovative services in agro-ecosystems. Areas such as ecological monitoring, agriculture, and biodiversity constitute a large area of potential application of IoT and Cloud technologies. In contrast to traditional agriculture systems that have employed aggressive policies to increase productivity, new agro-ecosystems aim to increase productivity but also achieve efficiency and competitiveness in modern sustainable agriculture and contribute, more broadly, to the green economy and sustainable food-chain industry. Fundamental research as well as concrete applications from various real-life scenarios, such as smart farming, precision agriculture, green agriculture, sustainable livestock and sow farming, climate threat, and societal and environmental impacts, is presented. Research issues and challenges are also discussed towards envisioning efficient and scalable solutions to agro-ecosystems based on IoT and Cloud technologies. Our fundamental belief is that we can collectively trigger a new revolution that will transition agriculture into an equitable system that not only feeds the world, but also contributes to mitigating the climate change and biodiversity crises that our historical actions have triggered. Learn Raspberry Pi 2 with Linux and Windows 10 will tell you everything you need to know about working with Raspberry Pi 2 so you can get started doing amazing things. You'll learn how to set up your new Raspberry Pi 2 with a monitor, keyboard and mouse, and how to install both Linux and Windows on your new Pi 2. Linux has always been a great fit for the Pi, but it can be a steep learning curve if you've never used it before. With this book, you'll see how easy it is to install Linux and learn how to work with it, including how to become a Linux command line pro. You'll learn that what might seem unfamiliar in Linux is actually very familiar. And now that Raspberry Pi also supports Windows 10, a chapter is devoted to setting up Windows 10 for the Internet of Things on a Raspberry Pi. Finally, you'll learn how to create these Raspberry Pi projects with Linux: Making a Pi web server: run LAMP on your own network Making your Pi wireless: remove all the cables and retain all the functionality Making a Raspberry Pi-based security cam and messenger service Making a Pi media center: stream videos and music from your Pi

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

Introduction to Sensors in IoT and Cloud Computing Applications provides information about sensors and their applications. Readers are first introduced to the concept of small instruments and their application as sensors. The chapters which follow explain Internet of Things (IoT) architecture while providing notes on the implementation, demonstration and related issues of IoT systems. The book continues to explore the topic by providing information about sensor-cloud infrastructure, mobile cloud, fog computing (an extension of cloud computing that takes cloud computing to the cutting-edge of networking where data is produced) and integration of IoT devices with cloud computing. The book also presents notes on the taxonomy of fog-computing systems. The six chapters in this book provide essential information for general readers, and students of computer science to understand the basics of cloud computing networks, related concepts and applications.

This book constitutes extended and revised papers from the 19th International Conference on Enterprise Information Systems, ICEIS 2017, held in Porto, Portugal, in April 2017. The 28 papers presented in this volume were carefully reviewed and selected for inclusion in this book from a total of 318 submissions. They were organized in topical sections named: databases and information systems integration; artificial intelligence and decision support systems; information systems analysis and specification; software agents and internet computing; human-computer interaction; and enterprise architecture.

This book contains a selection of articles from The 2016 World Conference on Information Systems and Technologies (WorldCIST'16), held between the 22nd and 24th of March at Recife, Pernambuco, Brazil. WorldCIST is a global forum for researchers and practitioners to present and discuss recent results and innovations, current trends, professional

experiences and challenges of modern Information Systems and Technologies research, together with their technological development and applications. The main topics covered are: Information and Knowledge Management; Organizational Models and Information Systems; Software and Systems Modeling; Software Systems, Architectures, Applications and Tools; Multimedia Systems and Applications; Computer Networks, Mobility and Pervasive Systems; Intelligent and Decision Support Systems; Big Data Analytics and Applications; Human-Computer Interaction; Health Informatics; Information Technologies in Education; Information Technologies in Radiocommunications.

This book is a printed edition of the Special Issue "Raspberry Pi Technology" that was published in Electronics

This book gathers selected high-quality research papers presented at the Fifth International Congress on Information and Communication Technology, held at Brunel University, London, on February 20-21, 2020. It discusses emerging topics pertaining to information and communication technology (ICT) for managerial applications, e-governance, e-agriculture, e-education and computing technologies, the Internet of Things (IoT) and e-mining. Written by respected experts and researchers working on ICT, the book offers a valuable asset for young researchers involved in advanced studies.

The two-volume set LNICST 169 and 170 constitutes the thoroughly refereed post-conference proceedings of the Second International Internet of Things Summit, IoT 360° 2015, held in Rome, Italy, in October 2015. The IoT 360° is an event bringing a 360 degree perspective on IoT-related projects in important sectors such as mobility, security, healthcare and urban spaces. The conference also aims to coach involved people on the whole path between research to innovation and the way through to commercialization in the IoT domain. This volume contains 62 revised full papers at the following four conferences: The International Conference on Safety and Security in Internet of Things, SaSelIoT, the International Conference on Smart Objects and Technologies for Social Good, GOODTECHS, the International Conference on Cloud, Networking for IoT systems, CN4IoT, and the International Conference on IoT Technologies for HealthCare, HealthyIoT.

The education system is constantly growing and developing as more ways to teach and learn are implemented into the classroom. Recently, there has been a growing interest in teaching computational thinking with schools all over the world introducing it to the curriculum due to its ability to allow students to become proficient at problem solving using logic, an essential life skill. In order to provide the best education possible, it is imperative that computational thinking strategies, along with programming skills and the use of robotics in the classroom, be implemented in order for students to achieve maximum thought processing skills and computer competencies. The Research Anthology on Computational Thinking, Programming, and Robotics in the Classroom is an all-encompassing reference book that discusses how computational thinking, programming, and robotics can be used in education as well as the benefits and difficulties of implementing these elements into the classroom. The book includes strategies for preparing educators to teach computational thinking in the classroom as well as design techniques for incorporating these practices into various levels of school curriculum and within a variety of subjects. Covering topics ranging from decomposition to robot learning, this book is ideal for educators, computer scientists, administrators, academicians, students, and anyone interested in learning more about how computational thinking, programming, and robotics can change the current education system.

This book offers the latest research and new perspectives on Interactive Collaborative Learning and Engineering Pedagogy. We are currently witnessing a significant transformation in education, and in order to face today's real-world challenges, higher education has to find innovative ways to quickly respond to these new needs. Addressing these aspects was the chief aim of the 21st International Conference on Interactive Collaborative Learning (ICL2018), which was held on Kos Island, Greece from September 25 to 28, 2018. Since being founded in 1998, the conference has been devoted to new approaches in learning, with a special focus on collaborative learning. Today the ICL conferences offer a forum for exchanging information on relevant trends and research results, as well as sharing practical experiences in learning and engineering pedagogy.

This book includes papers in the fields of: * New Learning Models and Applications * Pilot Projects: Applications * Project-based Learning * Real-world Experiences * Remote and Virtual Laboratories * Research in Engineering Pedagogy * Technical Teacher Training It will benefit a broad readership, including policymakers, educators, researchers in pedagogy and learning theory, school teachers, the learning industry, further education lecturers, etc.

Defending IoT Infrastructures with the Raspberry Pi Monitoring and Detecting Nefarious Behavior in Real Time Apress

This two-volume set (LNAI 11055 and LNAI 11056) constitutes the refereed proceedings of the 10th International Conference on Collective Intelligence, ICCCI 2018, held in Bristol, UK, in September 2018. The 98 full papers presented were carefully reviewed and selected from 240 submissions. The conference focuses on knowledge engineering and semantic web, social network analysis, recommendation methods and recommender systems, agents and multi-agent systems, text processing and information retrieval, data mining methods and applications, decision support and control systems, sensor networks and internet of things, as well as computer vision techniques.

This provides a comprehensive overview of the key principles of security concerns surrounding the upcoming Internet of Things (IoT), and introduces readers to the protocols adopted in the IoT. It also analyses the vulnerabilities, attacks and defense mechanisms, highlighting the security issues in the context of big data. Lastly, trust management approaches and ubiquitous learning applications are examined in detail. As such, the book sets the stage for developing and securing IoT applications both today and in the future.

"Learn how we implemented deep learning object detection models on Raspberry Pi and accelerated them with Intel Movidius Neural Compute Stick. When we first got started in deep learning particularly in computer vision, we were really excited at the possibilities of this technology to help people. The only problem is, that image classification and object

detection run just fine on our expensive, power consuming and bulky deep learning machines. However, not everyone can afford or implement AI for their practical applications. This is when we went searching for an affordable, compact, less power hungry alternative. Generally, if we'd want to shrink our IoT and automation projects, we'd often look to the Raspberry Pi which is a versatile computing solution for numerous problems. This made us ponder about how we can port out deep learning models to this compact computing unit. Not only that but how could we run it at close to real-time? Amongst the possible solutions, we arrived at using the raspberry pi in conjunction with an AI Accelerator USB stick that was made by Intel to boost our object detection frame-rate. However, it was not so simple to get it up and running. Implementing the documentation, we landed up with a series of bugs after bugs, which became a bit tedious. After endless posts on forums, tutorials and blogs, we have documented a seamless guide in the form of this course; which will show you, step-by-step, on how to implement your own Deep Learning Object Detection models on video and webcam without all the wasteful debugging. So essentially, we've structured this training to reduce debugging, speed up your time to market and get you results sooner."--Resource description page.

Explore and learn about Internet of Things to develop interactive Arduino-based Internet projects
About This Book- Learn the capabilities and differences between popular protocols and communication patterns and how they can be used, and should not be used, to create secure and interoperable services and things- Build Internet-based Arduino devices to make your home feel more secure- Learn to protect cyber-physical systems and utilize forensic data analysis to beat vulnerabilities in your IoT ecosystem- Learn best practices to secure your data from device to the cloud
Who This Book Is For
If you're a developer or electronics engineer who is curious about Internet of Things, then this is the course for you. 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 will be helpful. Business analysts and managers will also find this course useful.
What You Will Learn - Know the capabilities and limitations of the HTTP, UPnP, CoAP, MQTT, and XMPP protocols- Use important communication patterns, such as the request/respond, publish/subscribe, event subscription, asynchronous messaging, and multicasting patterns- Build a portable Wi-Fi signal strength sensor to give haptic feedback about signal strength to the user- Measure the water flow speed and volume with liquid flow sensors and record real-time readings- Secure your home with motion-activated Arduino security cameras and upload images to the cloud- Implement real-time data logging of a solar panel voltage with Arduino cloud connectors- Track locations with GPS and upload location data to the cloud- Control infrared-enabled devices with IR remote and Arduino- Use Systems Security Engineering and Privacy-by-design principles to design a secure IoT ecosystem
In Detail
The IoT: Building Arduino-Based Projects course will take you on a journey to become an expert in the use of IoT by developing a set of projects and finally guide you onto securing your IoT environment. The course begins with exploring the popular HTTP, UPnP, CoAP, MQTT, and XMPP protocols. In the first module Learning Internet of Things, you will learn how protocols and patterns can put limitations on network topology and how they affect the direction of communication and the use of firewalls. This module gives you a practical overview of the existing protocols, communication patterns, architectures, and security issues important to Internet of Things. The second module, Internet of Things with Arduino Blueprints provides you up to eight projects that will allow devices to communicate with each other, access information over the Internet, store and retrieve data, and interact with users' creating smart, pervasive, and always-connected environments. You can use these projects as blueprints for many other IoT projects and put them to good use. It has become critical to ensure that cyber security threats are contained to a minimum when implementing new IoT services and solutions. Thus, our third module, Practical Internet of Things Security provides a set of guidelines to architect and deploy a secure IoT in your Enterprise. The aim is to showcase how the IoT is implemented in early adopting industries and describe how lessons can be learned and shared across diverse industries to support a secure IoT.
Style and approach
This course introduces you to the Internet of Things architecture, helps you build Arduino projects based on IoT and cloud computing concepts, create smart, pervasive and always-connected environments, and finally guide you onto securing your IoT environment. Each of these has been covered in individual modules so that you develop your skill after the completion of a module and get ready for the next

These proceedings gather papers presented at the Cyber Security Education Stream and Cyber Security Technology Stream of The National Cyber Summit's Research Track, and report on the latest advances in areas ranging from software security to cyber attack detection and modeling; the use of machine learning in cyber security; legislation and policy; surveying small businesses; cyber competition, and so on. Understanding the latest capabilities in cyber security is the best way to prepare users and organizations for potential negative events. Consequently, this book will be of interest to cyber security researchers, educators and practitioners, as well as students who want to learn about cyber security.

This book discusses data communication and computer networking, communication technologies and the applications of IoT (Internet of Things), big data, cloud computing and healthcare informatics. It explores, examines and critiques intelligent data communications and presents inventive methodologies in communication technologies and IoT. Aimed at researchers and academicians who need to understand the importance of data communication and advanced technologies in IoT, it offers different perspectives to help readers increase their knowledge and motivates them to conduct research in the area, highlighting various innovative ideas for future research.

Build DIY wireless projects using the Raspberry Pi Zero W board
About This Book
Explore the functionalities of the Raspberry Pi Zero W with exciting projects
Master the wireless features (and extend the use cases) of this \$10 chip
A project-based guide that will teach you to build simple yet exciting projects using the Raspberry Pi Zero W board
Who This Book Is For
If you are a hobbyist or an enthusiast and want to get your hands on the latest Raspberry Pi Zero W to build exciting wireless projects, then this book is for you. Some prior programming knowledge, with some experience in electronics, would be useful.
What You Will Learn
Set up a router and connect Raspberry Pi Zero W to the internet
Create a two-wheel mobile robot and control it from your Android device
Build an automated home bot assistant device
Host your personal website with the help of Raspberry Pi Zero W
Connect Raspberry Pi Zero to speakers to play your favorite music
Set up a web camera connected to the Raspberry Pi Zero W and

add another security layer to your home automation In Detail The Raspberry Pi has always been the go-to, lightweight ARM-based computer. The recent launch of the Pi Zero W has not disappointed its audience with its \$10 release. "W" here stands for Wireless, denoting that the Raspberry Pi is solely focused on the recent trends for wireless tools and the relevant use cases. This is where our book—Raspberry Pi Zero W Wireless Projects—comes into its own. Each chapter will help you design and build a few DIY projects using the Raspberry Pi Zero W board. First, you will learn how to create a wireless decentralized chat service (client-client) using the Raspberry Pi's features?. Then you will make a simple two-wheel mobile robot and control it via your Android device over your local Wi-Fi network. Further, you will use the board to design a home bot that can be connected to plenty of devices in your home. The next two projects build a simple web streaming security layer using a web camera and portable speakers that will adjust the playlist according to your mood. You will also build a home server to host files and websites using the board. Towards the end, you will create free Alexa voice recognition software and an FPV Pi Camera, which can be used to monitor a system, watch a movie, spy on something, remotely control a drone, and more. By the end of this book, you will have developed the skills required to build exciting and complex projects with Raspberry Pi Zero W. Style and approach A step-by-step guide that will help you design and create simple yet exciting projects using the Raspberry Pi Zero W board.

This book shows you how to build real-time image processing systems all the way through to house automation. Find out how you can develop a system based on small 32-bit ARM processors that gives you complete control through voice commands. Real-time image processing systems are utilized in a wide variety of applications, such as in traffic monitoring systems, medical image processing, and biometric security systems. In Real-Time IoT Imaging with Deep Neural Networks, you will learn how to make use of the best DNN models to detect object in images using Java and a wrapper for OpenCV. Take a closer look at how Java scripting works on the Raspberry Pi while preparing your Visual Studio code for remote programming. You will also gain insights on image and video scripting. Author Nicolas Modrzyk shows you how to use the Rhasspy voice platform to add a powerful voice assistant and completely run and control your Raspberry Pi from your computer. To get your voice intents for house automation ready, you will explore how Java connects to the MQTT and handles parametrized Rhasspy voice commands. With your voice-controlled system ready for operation, you will be able to perform simple tasks such as detecting cats, people, and coffee pots in your selected environment. Privacy and freedom are essential, so priority is given to using open source software and an on-device voice environment where you have full control of your data and video streams. Your voice commands are your own—and just your own. With recent advancements in the Internet of Things and machine learning, cutting edge image processing systems provide complete process automation. This practical book teaches you to build such a system, giving you complete control with minimal effort. What You Will Learn: Show mastery by creating OpenCV filters Execute a YOLO DNN model for image detection Apply the best Java scripting on Raspberry Pi 4 Prepare your setup for real-time remote programming Use the Rhasspy voice platform for handling voice commands and enhancing your house automation setup Who This Book Is For:Engineers, and Hobbyists wanting to use their favorite JVM to run Object Detection and Networks on a Raspberry Pi

Written by all-star security experts, Practical IoT Hacking is a quick-start conceptual guide to testing and exploiting IoT systems and devices. Drawing from the real-life exploits of five highly regarded IoT security researchers, Practical IoT Hacking teaches you how to test IoT systems, devices, and protocols to mitigate risk. The book begins by walking you through common threats and a threat modeling framework. You'll develop a security testing methodology, discover the art of passive reconnaissance, and assess security on all layers of an IoT system. Next, you'll perform VLAN hopping, crack MQTT authentication, abuse UPnP, develop an mDNS poisoner, and craft WS-Discovery attacks. You'll tackle both hardware hacking and radio hacking, with in-depth coverage of attacks against embedded IoT devices and RFID systems. You'll also learn how to:

- Write a DICOM service scanner as an NSE module
- Hack a microcontroller through the UART and SWD interfaces
- Reverse engineer firmware and analyze mobile companion apps
- Develop an NFC fuzzer using Proxmark3
- Hack a smart home by jamming wireless alarms, playing back IP camera feeds, and controlling a smart treadmill

The tools and devices you'll use are affordable and readily available, so you can easily practice what you learn. Whether you're a security researcher, IT team member, or hacking hobbyist, you'll find Practical IoT Hacking indispensable in your efforts to hack all the things

REQUIREMENTS: Basic knowledge of Linux command line, TCP/IP, and programming

Apply a methodology and practical solutions for monitoring the behavior of the Internet of Things (IoT), industrial control systems (ICS), and other critical network devices with the inexpensive Raspberry Pi. With this book, you will master passive monitoring and detection of aberrant behavior, and learn how to generate early indications and warning of attacks targeting IoT, ICS, and other critical network resources. Defending IoT Infrastructures with the Raspberry Pi provides techniques and scripts for the discovery of dangerous data leakage events emanating from IoT devices. Using Raspbian Linux and specialized Python scripts, the book walks through the steps necessary to monitor, detect, and respond to attacks targeting IoT devices. There are several books that cover IoT, IoT security, Raspberry Pi, and Python separately, but this book is the first of its kind to put them all together. It takes a practical approach, providing an entry point and level playing field for a wide range of individuals, small companies, researchers, academics, students, and hobbyists to participate. What You'll Learn Create a secure, operational Raspberry Pi IoT sensor Configure and train the sensor using "normal" IoT behavior Establish analytics for detecting aberrant activities Generate real-time alerts to preempt attacks Identify and report data-leakage events originating from IoT devices Develop custom Python applications for cybersecurity Who This Book Is For Cybersecurity specialists, professors teaching in undergraduate and graduate programs in cybersecurity, students in cybersecurity and computer science programs, software developers and engineers developing new cybersecurity defenses, incident response teams, software developers and engineers in general, and hobbyists wanting to expand the application of Raspberry Pi into both IoT and cybersecurity

This book presents an overview of education technology and its use in schools, with a primary emphasis on best practices of technology enhanced learning; how new technologies such as mobile, augmented and wearable technologies affect instructional design strategies; and the content curriculum development process. Providing insights into the future of education and the upcoming pedagogies that will be applied in schools, it helps educators and other stakeholders make innovations for the new generations of learners in the 21st century. The use of emerging technologies such as mobile and ubiquitous technologies, context-aware technology, augment-reality, and virtual reality is contributing to making education adaptive and smarter. With the ever-changing technologies, how to equip teachers with these digital skills and transform their teaching style is also important to ensure that school education is more individualised and customised for students. Offering a global perspective with integrated practical cases, this timely book is of interest to educators, teachers, and education policymakers. And although most of the authors are from the academia, it provides non-experts with a novel view of what future schools will be like with the help of technology.

This book presents the proceedings of the International Conference on Computing Networks, Big Data and IoT [ICCB I 2019], held on December 19–20, 2019 at the Vaigai College of Engineering, Madurai, India. Recent years have witnessed the intertwining development of the Internet of Things and big data, which are increasingly deployed in computer network architecture. As society becomes smarter, it is critical to replace the traditional technologies with modern ICT architectures. In this context, the Internet of Things connects smart objects through the Internet and as a result generates big data. This has led to new computing facilities being developed to derive intelligent decisions in the big data environment. The book covers a variety of topics, including information management, mobile computing and

applications, emerging IoT applications, distributed communication networks, cloud computing, and healthcare big data. It also discusses security and privacy issues, network intrusion detection, cryptography, 5G/6G networks, social network analysis, artificial intelligence, human-machine interaction, smart home and smart city applications.

Dive into key topics in network architecture and Go, such as data serialization, application level protocols, character sets and encodings. This book covers network architecture and gives an overview of the Go language as a primer, covering the latest Go release. Beyond the fundamentals, Network Programming with Go covers key networking and security issues such as HTTP and HTTPS, templates, remote procedure call (RPC), web sockets including HTML5 web sockets, and more. Additionally, author Jan Newmarch guides you in building and connecting to a complete web server based on Go. This book can serve as both as an essential learning guide and reference on Go networking. What You Will Learn Master network programming with Go Carry out data serialization Use application-level protocols Manage character sets and encodings Deal with HTTP(S) Build a complete Go-based web server Work with RPC, web sockets, and more Who This Book Is For Experienced Go programmers and other programmers with some experience with the Go language.

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