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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 is a practical book how to implement a simple Wireless Sensor Networks (WSN) with ESP32 over LoRa network. The following is a list of highlight topics in this book.
 * Preparing Development Environment * Set up ESP32 LoRa * Sending and Receiving Data over ESP32 LoRa * Handling LoRa Receiver Interrupt * Broadcast Messages over LoRa Network * Building WSN Application Based ESP32 LoRa

This book explores how to work with XBee Wi-Fi programming using Python. The following is a highlight topic list: * Preparing Development Environment * Setting up XBee Wi-Fi on Computer * XBee Wi-Fi AT Command * XBee Wi-Fi Programming * XBee Wi-Fi Digital I/O and ADC * Working with Sleep Mode * XBee Wi-Fi Networking * XBee Wi-Fi Cloud * XBee Wi-Fi and Arduino Get ready to create distributed sensor systems and intelligent interactive devices using the ZigBee wireless networking protocol and Series 2 XBee radios. By the time you're halfway through this fast-paced, hands-on guide, you'll have built a series of useful projects, including a complete Zig-

Bee wireless network that delivers remotely sensed data. Radio networking is creating revolutions in volcano monitoring, performance art, clean energy, and consumer electronics. As you follow the examples in each chapter, you'll learn how to tackle inspiring projects of your own. This practical guide is ideal for inventors, hackers, crafters, students, hobbyists, and scientists. Investigate an assortment of practical and intriguing project ideas Prep your ZigBee toolbox with an extensive shopping list of parts and programs Create a simple, working ZigBee network with XBee radios in less than two hours -- for under \$100 Use the Arduino open source electronics prototyping platform to build a series of increasingly complex projects Get familiar with XBee's API mode for creating sensor networks Build fully scalable sensing and actuation systems with inexpensive components Learn about power management, source routing, and other XBee technical nuances Make gateways that connect with neighboring networks, including the Internet

Get the practical knowledge you need to set up and deploy XBee modules with this hands-on, step-by-step series of experiments The only book to cover XBee in practical fashion; enables you to get up and running quickly with step-by-step tutorials. Provides insight into the product data sheets, saving you time and helping you get straight to the information you need. Includes troubleshooting and testing information, plus downloadable configuration files and fully-documented source code to illustrate and explain operations. The Hands-on XBee Lab Manual takes the reader through a range of experiments, using a hands-on approach. Each section demonstrates module set up and configuration, explores module functions and capabilities, and, where applicable, introduces the necessary microcontrollers and software to control and communicate with the modules. Experiments cover simple setup of modules, establishing a network of mod-

ules, identifying modules in the network, and some sensor-interface designs. This book explains, in practical terms, the basic capabilities and potential uses of XBee modules, and gives engineers the know-how that they need to apply the technology to their networks and embedded systems. The only book to cover XBee in practical fashion; enables you to get up and running quickly with step-by-step tutorials. • Provides insight into the product data sheets, saving you time and helping you get straight to the information you need. • Includes troubleshooting and testing information, plus downloadable configuration files and fully-documented source code to illustrate and explain operations.

The two-volume set LNAI 12033 and 11034 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 105 full papers accepted for publication in these proceedings were carefully reviewed and selected from 285 submissions. The papers of the first volume are organized in the following topical sections: Knowledge Engineering and Semantic Web, Natural Language Processing, Decision Support and Control Systems, Computer Vision Techniques, Machine Learning and Data Mining, Deep Learning Models, Advanced Data Mining Techniques and Applications, Multiple Model Approach to Machine Learning. The papers of the second volume are divided into these topical sections: Application of Intelligent Methods to Constrained Problems, Automated Reasoning with Applications in Intelligent Systems, Current Trends in Artificial Intelligence, Optimization, Learning, and Decision-Making in Bioinformatics and Bioengineering, Computer Vision and Intelligent Systems, Data Modelling and Processing for Industry 4.0, Intelligent Applications of Internet of Things and Data Analysis Technologies, Intelligent and Contextual Systems, Intelligent Systems and Algorithms in Information Sciences, Intelligent Supply Chains and e-Commerce, Pri-

vacy, Security and Trust in Artificial Intelligence, Interactive Analysis of Image, Video and Motion Data in LifeSciences.

An all-in-one reference to the major Home Area Networking, Building Automation and AMI protocols, including 802.15.4 over radio or PLC, 6LowPAN/RPL, ZigBee 1.0 and Smart Energy 2.0, Zwave, LON, BACNet, KNX, ModBus, mBus, C.12 and DLMS/COSEM, and the new ETSI M2M system level standard. In-depth coverage of Smart-grid and EV charging use cases. This book describes the Home Area Networking, Building Automation and AMI protocols and their evolution towards open protocols based on IP such as 6LowPAN and ETSI M2M. The authors discuss the approach taken by service providers to interconnect the protocols and solve the challenge of massive scalability of machine-to-machine communication for mission-critical applications, based on the next generation machine-to-machine ETSI M2M architecture. The authors demonstrate, using the example of the smartgrid use case, how the next generation utilities, by interconnecting and activating our physical environment, will be able to deliver more energy (notably for electric vehicles) with less impact on our natural resources. Key Features: Offers a comprehensive overview of major existing M2M and AMI protocols Covers the system aspects of large scale M2M and smart grid applications Focuses on system level architecture, interworking, and nationwide use cases Explores recent emerging technologies: 6LowPAN, ZigBee SE 2.0 and ETSI M2M, and for existing technologies covers recent developments related to interworking Relates ZigBee to the issue of smartgrid, in the more general context of carrier grade M2M applications Illustrates the benefits of the smartgrid concept based on real examples, including business cases This book will be a valuable guide for project managers working on smartgrid, M2M, telecommunications and utility projects, system engineers and developers, networking companies, and home automation companies. It will also be of use to senior academic researchers, students, and policy makers and regulators.

This book is about connecting sensors and radio transceivers to an Arduino so that you can monitor the sensor readings from a distance. You can put the Arduino sensor package miles away from the receiving station, in your front or back yard, or even in your home like your basement or attic. Although the techniques described in this book will work with any type of sensor input, the book will focus on sensors that detect potentially dangerous or disruptive conditions. These will include intruders,

fires, flammable gas leaks and other toxic gases like pollution, power failures, floods (including minor "floods" like a pipe bursting), and other hazards. For the radio communications, we will use the nRF24L01 transceiver chip. This inexpensive chip (usually around \$1.00 on EBay) interfaces easily with the Arduino and can both transmit and receive data. It has an advertised range of 100 meters (about 328 feet) for the basic unit, although in actual practice it may be closer to 30 meters (about 98 feet). However, with an optional antenna the range is reported to be 1,000 meters (1 km, about .6 miles). In the first five chapters, I explain the hardware and software aspects of this handy transceiver, enabling you to set up the communications. I even explain how to set up repeater transmitters that can relay the signal from locations beyond the 1 km range. In the chapters after these five chapters, I discuss attaching and operating various analog and digital sensors, explaining how to set them up and integrate them into the transmission software. The chapters will be divided by hazards you can monitor, not specific sensors, so one chapter may include several different types of sensors that can be used to detect the same hazard.

Learn the art of bringing the Internet of Things into your projects with the power of JavaScript About This Book- This is a practical guide to help you configure and build a complete distributed IoT system from scratch using JavaScript- Utilize the power of Node and HTML5 to develop web services and a centralized web server, enabling high-level communication between connected devices- Control all your connected devices from the browser by setting up a common dashboard Who This Book Is For This book is for developers who are interested in learning how to communicate with connected devices in JavaScript to set up an IoT system. Some basic knowledge of JavaScript is expected. Hobbyists who want to explore the potential of IoT in JavaScript will also find this book useful. What You Will Learn- Develop the skills to connected devices prepared the field to interact with the devices in a network system Internet of Things- Find out how to connect sensors and actuators to the devices- Send data to a web server connected devices- Understand Internet of things using web services and database- Configure a dashboard using HTML5 and JavaScript- Control devices connected from a dashboard- Monitor different devices from the dashboard- Build an app for a smartphone to control different devices In Detail The Internet of Things (IoT) is an en-

tirely new platform for developers and engineers, but one thing that remains consistent as we move into this new world, are the programming languages. JavaScript is the most widely used language over the Internet, and with IoT gaining momentum, you will learn how to harness the power of JavaScript to interact with connected devices. This book will teach you how to interact with endpoint devices by developing web services in JavaScript and also set up an interface to control all connected devices. This book begins with setting up a centralized web server that serves as a hub for all connected devices. The book then progresses further towards building web services to facilitate high-level communication between connected devices. Using Arduino and Raspberry Pi Zero as endpoint devices, the book will show you how devices can communicate with each other, perform a wide range of tasks, and also be controlled from a centralized location using JavaScript. The book ends with creating a hybrid app to control the devices that can be run from a browser or installed on a smartphone. Style and approach This book offers step-by-step guidance on how to set up a distributed IoT system using JavaScript. It will teach you how to interact with endpoint devices by developing web services in JavaScript and also set up an interface for controlling all connected devices.

This book gathers selected high-quality research papers presented at the Sixth International Congress on Information and Communication Technology, held at Brunel University, London, on February 25-26, 2021. 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 book is presented in four volumes.

This is one of the most significant military books of the twentieth century. By an outstanding soldier of independent mind, it pushed forward the evolution of land warfare and was directly responsible for German armoured supremacy in the early years of the Second World War. Published in 1937, the result of 15 years of careful study since his days on the German General Staff in the First World War, Guderian's book argued, quite clearly, how vital the proper use of tanks and supporting armoured vehicles would be in the conduct of a future war. When that war came, just two years later, he proved it, leading his

Panzer with distinction in the Polish, French and Russian campaigns. Panzer warfare had come of age, exactly as he had forecast. This first English translation of Heinz Guderian's classic book - used as a textbook by Panzer officers in the war - has an introduction and extensive background notes by the modern English historian Paul Harris.

This book includes key insights that reflect 'Advances in Computer and Computational Sciences' from upcoming researchers and leading academics around the globe. It gathers high-quality, peer-reviewed papers presented at the International Conference on Computer, Communication and Computational Sciences (IC4S 2018), which was held on 20-21 October, 2018 in Bangkok. The book covers a broad range of topics, including intelligent hardware and software design, advanced communications, intelligent computing techniques, intelligent image processing, and web and informatics. Its goal is to familiarize readers from the computer industry and academia with the latest advances in next-generation computer and communication technology, which they can subsequently integrate into real-world applications.

DFRobot Romeo V2 is development board based Arduino Leonardo and designed for Robot development. This book helps you to get started with DFRobot Romeo V2 development. The following is a list of highlight topics: * Preparing Development Environment * Setting Up DFRobot Romeo V2 * Writing and Reading Digital Data * Serial Communication (UART) * PWM and Analog Input * Working with I2C * Working with SPI * Accessing EEPROM * Wireless Network with XBee IEEE 802.15.4 * Controlling DC Motor

Learn the art of building enticing projects by unleashing the potential of Raspberry Pi 3 using Java About This Book Explore the small yet powerful mini computer in order to run java applications Leverage Java libraries to build exciting projects on home automation, IoT, and Robotics by leveraging Java libraries Get acquainted with connecting electronic sensors to your Raspberry Pi 3 using Java APIs. Who This Book Is For The book is aimed at Java programmers who are eager to get their hands-on Raspberry Pi and build interesting projects using java. They have a very basic knowledge of Raspberry Pi. What You Will Learn Use presence detection using the integrated bluetooth chip Automatic light switch using presence detection Use a centralized IoT service to publish data using RPC Control a robot by driving motors using PWM Create a small web service capable of performing actions on the Raspberry Pi and

supply readings Image capture using Java together with the OpenCV framework In Detail Raspberry Pi is a small, low cost and yet very powerful development platform. It is used to interact with attached electronics by the use of it's GPIO pins for multiple use cases, mainly Home Automation and Robotics. Our book is a project-based guide that will show you how to utilize the Raspberry Pi's GPIO with Java and how you can leverage this utilization with your knowledge of Java. You will start with installing and setting up the necessary hardware to create a seamless development platform. You will then straightaway start by building a project that will utilize light for presence detection. Next, you will program the application, capable of handling real time data using MQTT and utilize RPC to publish data to adafruit.io. Further, you will build a wireless robot on top of the zuma chassis with the Raspberry Pi as the main controller. Lastly, you will end the book with advanced projects that will help you to create a multi-purpose IoT controller along with building a security camera that will perform image capture and recognize faces with the help of notifications. By the end of the book, you will be able to build your own real world usable projects not limited to Home Automation, IoT and/or Robotics utilizing logic, user and web interfaces. Style and approach The book will contain projects that ensure a java programmer gets started with building interesting projects using the small yet powerful Raspberry Pi 3. We will start with brushing up your Raspberry Pi skills followed by building 5-6 projects

This book explores how to work with MicroPython development for ESP8266 modules and boards such as NodeMCU, SparkFun ESP8266 Thing and Adafruit Feather HUZAZH with ESP8266 WiFi. The following is highlight topics in this book * Preparing Development Environment * Setting Up MicroPython * GPIO Programming * PWM and Analog Input * Working with I2C * Working with UART * Working with SPI * Working with DHT Module

Suppose I am a blind man, and I use a stick. I go tap, tap, tap. Where do I start? Is my mental system bounded at the handle of the stick? Is it bounded by my skin? Does it start halfway up the stick? Does it start at the tip of the stick? (Bateson, 1972:459; Form, Substance and Difference) One of the most amazing capacities of the human mind is its ability to go beyond its boundaries. The well-known example of the blind man by Gregory Bateson helps us understand how our mind is able to expand its potentiality thanks to the use of a tool. This famous example demonstrates two specific features that character-

ize the relationship between the human mind and the use of tool. From a neuropsychological point of view, the tool is integrated in near space, extending it to the end point of the instrument. From a phenomenological point of view, we are present in the tool because we can use it in an intuitive way to realize our intentions. As Riva and Mantovani suggested, there is also another type of relationship between mind and technology, namely the second-order mediated action. In this case, the subject uses the body to control a distal tool that controls a different one to exert an action upon an external object. An example of a second-order mediated action is what happens with Virtual Reality (VR): I use my body to move an avatar (a distal tool) to exert an action upon an external object (a virtual environment). On one side, the outcome of this process further extends the space of action. From an experiential viewpoint, when interacting in a virtual space, we are also present in the distal virtual environment. On these theoretical bases, it is clear what makes VR development distinctively important is that it represents more than a simple technology in different domains of human society. In recent years, the field of VR has grown immensely. Practical applications for the use of this advanced technology encompasses many fields, from personnel training supported by interactive 3D images in industrial centers, to the use of interactive virtual environments for marketing purposes. One of the newest fields to benefit from the advances in VR technology is medicine and healthcare. Impressive advances in technology, coupled with a reduction in the economic costs have supported the development of more usable, useful, and accessible VR systems that can uniquely target a range of physical, psychological, and cognitive clinical targets and research questions. The aim of the book Virtual Reality-Technologies, Medical Applications, and Challenges is twofold: (1) to provide a critical overview of the most interesting medical applications of VR technologies and (2) to reflect on the future challenges in this growing field.

This book discusses recent advances in computer and computational sciences from upcoming researchers and leading academics around the globe. It presents high-quality, peer-reviewed papers presented at the International Conference on Computer, Communication and Computational Sciences (IC4S 2019), which was held on 11–12 October 2019 in Bangkok. Covering a broad range of topics, including intelligent hardware and software design, advanced communications, intelligent com-

puting techniques, intelligent image processing, the Web and informatics, it offers readers from the computer industry and academia key insights into how the advances in next-generation computer and communication technologies can be shaped into real-life applications.

"Having been born a freeman, and for more than thirty years enjoyed the blessings of liberty in a free State—and having at the end of that time been kidnapped and sold into Slavery, where I remained, until happily rescued in the month of January, 1853, after a bondage of twelve years—it has been suggested that an account of my life and fortunes would not be uninteresting to the public." -an excerpt

Want to create devices that interact with the physical world? This cookbook is perfect for anyone who wants to experiment with the popular Arduino microcontroller and programming environment. You'll find more than 200 tips and techniques for building a variety of objects and prototypes such as IoT solutions, environmental monitors, location and position-aware systems, and products that can respond to touch, sound, heat, and light. Updated for the Arduino 1.8 release, the recipes in this third edition include practical examples and guidance to help you begin, expand, and enhance your projects right away—whether you're an engineer, designer, artist, student, or hobbyist. Get up to speed on the Arduino board and essential software concepts quickly Learn basic techniques for reading digital and analog signals Use Arduino with a variety of popular input devices and sensors Drive visual displays, generate sound, and control several types of motors Connect Arduino to wired and wireless networks Learn techniques for handling time delays and time measurement Apply advanced coding and memory-handling techniques

Develop interactive Arduino-based Internet projects with Ethernet and WiFi About This Book Build Internet-based Arduino devices to make your home feel more secure Learn how to connect various sensors and actuators to the Arduino and access data from Internet A project-based guide filled with schematics and wiring diagrams to help you build projects incrementally Who This Book Is For This book is intended for those who want to learn more about Arduino and make Internet-based interactive projects with Arduino. If you are an experienced software developer who understands the basics of electronics, then you can quickly learn how to build the Arduino projects explained in this book. What You Will Learn Make a powerful Internet controlled relay with an embedded web server to monitor and control your home electri-

cal appliances Build a portable Wi-Fi signal strength sensor to give haptic feedback about signal strength to the user Measure 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 a garage door light with your Twitter feed Control infrared enabled devices with IR remote and Arduino In Detail Arduino is a small single-chip computer board that can be used for a wide variety of creative hardware projects. The hardware consists of a simple microcontroller, board, and chipset. It comes with a Java-based IDE to allow creators to program the board. Arduino is the ideal open hardware platform for experimenting with the world of the Internet of Things. This credit card sized Arduino board can be used via the Internet to make more useful and interactive Internet of things projects. Internet of Things with Arduino Blueprints is a project-based book that begins with projects based on IoT and cloud computing concepts. This book covers 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. It explains how wired and wireless Internet connections can be used with projects and the use of various sensors and actuators. The main aim of this book is to teach you how Arduino can be used for Internet-related projects so that users are able to control actuators, gather data from various kinds of sensors, and send and receive data wirelessly across HTTP and TCP protocols. Finally, you can use these projects as blueprints for many other IoT projects and put them to good use. By the end of the book, you will be an expert in the use of IoT with Arduino to develop a set of projects that can relate very well to IoT applications in the real world. Style and approach Every chapter in this book clearly explains how to assemble components through easy-to-follow steps on while laying out important concepts, code snippets, and expected output results so that you can easily end up with a successful project where you can also enhance or modify the project according to your requirements.

The theory of probability is a powerful tool that helps electrical and computer engineers to explain, model, analyze, and design the technology they develop. The text

begins at the advanced undergraduate level, assuming only a modest knowledge of probability, and progresses through more complex topics mastered at graduate level. The first five chapters cover the basics of probability and both discrete and continuous random variables. The later chapters have a more specialized coverage, including random vectors, Gaussian random vectors, random processes, Markov Chains, and convergence. Describing tools and results that are used extensively in the field, this is more than a textbook; it is also a reference for researchers working in communications, signal processing, and computer network traffic analysis. With over 300 worked examples, some 800 homework problems, and sections for exam preparation, this is an essential companion for advanced undergraduate and graduate students. Further resources for this title, including solutions (for Instructors only), are available online at www.cambridge.org/9780521864701.

Leverage the powerful Arduino and XBee platforms to monitor and control your surroundings About This Book Build your own low-power, wireless network using ready-made Arduino and XBee hardware Create a complex project using the Arduino prototyping platform A guide that explains the concepts and builds upon them with the help of examples to form projects Who This Book Is For This book is targeted at embedded system developers and hobbyists who have some working knowledge of Arduino and who wish to extend their projects using wireless connectivity. What You Will Learn Interact with XBee boards using the XCTU program on Windows, OS X, or Linux Make your Arduino boards communicate wirelessly, using XBee modules in the advanced API mode Centrally collect and store measured sensor data, in the cloud or your own database Connect the coordinator Arduino to the Internet and send data to web services Control your environment automatically, based on sensor input from your network Interact with off-the-shelf ZigBee Home Automation devices Make your devices battery-powered and let them sleep to get months or even years of battery life In Detail Arduino has been established as the de facto standard microcontroller programming platform, being used for one-off do-it-yourself projects as well as prototypes for actual products. By providing a myriad of libraries, the Arduino community has made it very easy to interact with pretty much any piece of hardware out there. XBee offers a great range of low-power wireless solutions that are easy to work with, by taking all of the complexity of wireless (mesh) networking out of your hands and letting you focus on

what to send without worrying about the how. Building wireless sensor networks is cost-effective as well as efficient as it will be done with Arduino support. The book starts with a brief introduction to various wireless protocols, concepts, and the XBee hardware that enables their use. Then the book expands to explain the Arduino boards to you, letting them read and send sensor data, collect that data centrally, and then even control your home from the Internet. Moving further more advanced topics such as interacting through the standard Zigbee Home Automation protocol, or making your application power-efficient are covered. By the end of the book, you will have all the tools needed to build complete, real-world solutions. Style and approach A hands-on guide, featuring a single home automation project that can be built as described or with endless variations. Every step is illustrated with complete examples and screenshots, allowing you to build the examples swiftly.

Discover how to build your own Intelligent Internet of Things projects and bring a new degree of interconnectivity to your world. About This Book Build intelligent and unusual IoT projects in just 7 days, Create home automation, smart home, and robotic projects and allow your devices to do smart work Build IoT skills through enticing projects and leverage revolutionary computing hardware through the RPi and Arduino. Who This Book Is For If you're a developer, IoT enthusiast, or just someone curious about Internet of Things, then this book is for you. A basic understanding of electronic hardware, networking, and basic programming skills would do wonders. What You Will Learn Learn how to get started with intelligent IoT projects Explore various pattern recognition and machine learning algorithms to make IoT projects smarter. Make decisions on which devices to use based on the kind of project to build. Create a simple machine learning application and implement decision system concepts Build a smart parking system using Arduino and Raspberry Pi Learn how to work with Amazon Echo and to build your own smart speaker machine Build multi-robot cooperation using swarm intelligence. In Detail Intelligent IoT Projects in 7 days is about creating smart IoT projects in just 7 days. This book will help you to overcome the challenge of analyzing data from physical devices. This book aims to help you put together some of the most exciting IoT projects in a short span of time. You'll be able to use these in achieving or automating everyday tasks—one project per day. We will start with a simple smart gardening system and move on to a smart parking system, and then we will

make our own vending machine, a smart digital advertising dashboard, a smart speaker machine, an autonomous fire fighter robot, and finally look at a multi-robot cooperation using swarm intelligence Style and approach A clear step-by-step instruction guide to completing fully-fledged projects in just 7 days

IEEE 802.15.4 is a standard protocol to build WPAN network. This book helps you how to get started with IEEE 802.15.4 programming through XBee IEEE 802.15.4 device. Sample codes are given to illustrate how to work with XBee. The following is a highlight topic list in this book. * Preparing Development Environment * Getting started with XBee IEEE 802.15.4 * XBee AT Command * XBee Programming using Python * XBee Digital I/O and ADC * Working with Sleep Mode * XBee IEEE 802.15.4 Networking * Integrating XBee with Arduino, Raspberry Pi and TI MSP430 Launch-Pad

This book presents recent developments in statistical methodologies with particular relevance to applications in forestry and environmental sciences. It discusses important methodologies like ranked set sampling, adaptive cluster sampling, small area estimation, calibration approach-based estimators, design of experiments, multivariate techniques, Internet of Things, and ridge regression methods. It also covers the history of the implementation of statistical techniques in Indian forestry and the National Forest Inventory of India. The book is a valuable resource for applied statisticians, students, researchers, and practitioners in the forestry and environment sector. It includes real-world examples and case studies to help readers apply the techniques discussed. It also motivates academicians and researchers to use new technologies in the areas of forestry and environmental sciences with the help of software like R, MATLAB, Statistica, and Mathematica.

Until the late 1980s, information processing was associated with large mainframe computers and huge tape drives. During the 1990s, this trend shifted toward information processing with personal computers, or PCs. The trend toward miniaturization continues and in the future the majority of information processing systems will be small mobile computers, many of which will be embedded into larger products and interfaced to the physical environment. Hence, these kinds of systems are called embedded systems. Embedded systems together with their physical environment are called cyber-physical systems. Examples include systems such as transportation and fabrication equipment. It is expected

that the total market volume of embedded systems will be significantly larger than that of traditional information processing systems such as PCs and mainframes. Embedded systems share a number of common characteristics. For example, they must be dependable, efficient, meet real-time constraints and require customized user interfaces (instead of generic keyboard and mouse interfaces). Therefore, it makes sense to consider common principles of embedded system design. Embedded System Design starts with an introduction into the area and a survey of specification models and languages for embedded and cyber-physical systems. It provides a brief overview of hardware devices used for such systems and presents the essentials of system software for embedded systems, like real-time operating systems. The book also discusses evaluation and validation techniques for embedded systems. Furthermore, the book presents an overview of techniques for mapping applications to execution platforms. Due to the importance of resource efficiency, the book also contains a selected set of optimization techniques for embedded systems, including special compilation techniques. The book closes with a brief survey on testing. Embedded System Design can be used as a text book for courses on embedded systems and as a source which provides pointers to relevant material in the area for PhD students and teachers. It assumes a basic knowledge of information processing hardware and software. Courseware related to this book is available at <http://ls12-www.cs.tu-dortmund.de/~marwedel>.

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

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.

Power Quality and Electromagnetic Compatibility, High Voltage Engineering and Insulations Technology, Power Generation Technology, Power System Dynamic, Stability and Control, Power System Protection, Reliability and Security, Electric Power Transmissions and Distributions, Power Electronic Converter Topologies, Design and Control, Switch Mode Power Supplies and UPS, Electric Drives and Electrical Machines, Renewable Energy and Smart Grid Technology, Energy Storage System and Technology, Biomedical Engineering, Microelectronic Circuits and Systems, Measurement and Instrumentations, Nano Technology, Micro Electro Mechanical System, Sensor, RFID, and Electronic Design, Material and Device, Wireless and Mobile Communications, Telecommunication, Information modelling, Knowledge acquisition and accumulation, Knowledge discovery, Knowledge management, Information systems and applications, Human computer interaction and Modelling Social media engineering, E Learning and educational

Learn how to take full advantage of all of Raspberry Pi's amazing features and functions—and have a blast doing it! Congratulations on becoming a proud owner of a Raspberry Pi, the credit-card-sized computer! If you're ready to dive in and start finding out what this amazing little gizmo is really capable of, this ebook is for you. Taken from the forthcoming Raspberry Pi Projects, Raspberry Pi Hardware Projects 1 contains three cool hardware projects that let you have fun with the Raspberry Pi while developing your Raspberry Pi skills. The authors - PiFace inventor, Andrew

Robinson and Raspberry Pi For Dummies co-author, Mike Cook - show you how to build: Reaction timer Twittering toy Disco Lights The ebook also includes a brief guide to setting up the Raspberry Pi for those very new to its unique ways and a bonus project, the Insult Generator, which will teach you simple Python programming while making you laugh. With Raspberry Pi Hardware Projects 1 you'll learn everything you need to know to program the Raspberry Pi and build cool, automated and interactive gadgets in no time.

Presents an introduction to the open-source electronics prototyping platform. Leverage .NET and Sketch in your Arduino development implementation and integrate it into your .NET program. There are many Arduino models and compatible shields that can be used in Arduino boards. Integrating between an Arduino platform and .NET technology or Sketch can produce more advantages. Arduino Programming using .NET and Sketch shows readers how to do so with practical Arduino projects, such as preparing a development environment, performing sensing and actuating with external devices, implementing Windows Remote Arduino and building a simple IoT program. Use this quick reference to learn the basics of the Arduino platform for multiple models and start your Arduino programming in .NET and Sketch today. What You'll Learn: Learn the basics of the Arduino platform Prepare and set up an Arduino development environment Develop an Arduino program using .NET and Sketch Implement Windows Remote Arduino Build a simple IoT program Who This Book Is For: .NET and Sketch developers who want to learn Arduino programming.

This book constitutes the refereed proceedings of the 13th Asian Conference on Intelligent Information and Database Systems, ACIIDS 2021, held in Phuket, Thailand, in April 2021.* The 67 full papers accepted for publication in these proceedings were carefully reviewed and selected from 291 submissions. The papers of the first volume are organized in the following topical sections: data mining methods and applications; machine learning methods; decision support and control systems; natural language processing; cybersecurity intelligent methods; computer vision techniques; computational imaging and vision; advanced data mining techniques and applications; intelligent and contextual systems; commonsense knowledge, reasoning and programming in artificial intelligence; data modelling and processing for industry 4.0; innovations in intelligent systems. *The conference was held virtually.

The last decade has witnessed a rapid surge of interest in new sensing and monitoring devices for wellbeing and health-care. One key development in this area is wireless, wearable and implantable in vivo monitoring and intervention. A myriad of platforms are now available from both academic institutions and commercial organisations. They permit the management of patients with both acute and chronic symptoms, including diabetes, cardiovascular diseases, treatment of epilepsy and other debilitating neurological disorders. Despite extensive developments in sensing technologies, there are significant research issues related to system integration, sensor miniaturisation, low-power sensor interface, wireless telemetry and signal processing. In the 2nd edition of this popular and authoritative reference on Body Sensor Networks (BSN), major topics related to the latest technological developments and potential clinical applications are discussed, with contents covering. Biosensor Design, Interfacing and Nanotechnology Wireless Communication and Network Topologies Communication Protocols and Standards Energy Harvesting and Power Delivery Ultra-low Power Bio-inspired Processing Multi-sensor Fusion and Context Aware Sensing Autonomic Sensing Wearable, Ingestible Sensor Integration and Exemplar Applications System Integration and Wireless Sensor Microsystems The book also provides a comprehensive review of the current wireless sensor development platforms and a step-by-step guide to developing your own BSN applications through the use of the BSN development kit.

This book offers an overview of geospatial technologies in land resource mapping, monitoring and management. It consists of four main parts: geospatial technology principles and applications; geospatial technologies in land resources mapping; geospatial technologies in land resources monitoring; and geospatial technologies in land resources management. Each part is divided into detailed chapters that include illustrations and tables. The authors, from leading institutes, such as the ICAR-NBSS&LUP, IIT, NRSC, ICRISAT, share their experiences and offer case studies to provide advanced insights into the field. It is a valuable resource for the scientific community, the teaching community, extension scientists at research institutes and agricultural universities and colleges as well as those involved in planning and managing land resources for sustainable agriculture and livelihood security.

Beginning Sensor Networks with Arduino and Raspberry Pi teaches you how to build sensor networks with Arduino, Raspberry

Pi, and XBee radio modules, and even shows you how to turn your Raspberry Pi into a MySQL database server to store your sensor data! First you'll learn about the different types of sensors and sensor networks, including how to build a simple XBee network. Then you'll walk through building an Arduino-based temperature sensor and data collector, followed by building a Raspberry Pi-based sensor node. Next you'll learn different ways to store sensor data, including writing to an SD card, sending data to the cloud, and setting up a Raspberry Pi MySQL server to host your data. You even learn how to connect to and interact with a MySQL database server directly from an Arduino! Finally you'll learn how to put it all together by connecting your Arduino sensor node to your new Raspberry Pi database server. If you want to see how well Arduino and Raspberry Pi can get along, especially to create a sensor network, then *Beginning Sensor Networks with Arduino and*

Raspberry Pi is just the book you need.

This book is designed to everyone who want to get started with XBee3 Zigbee 3 development. Demo scenarios are provided to accelerate your learning with step-by-step approach. This book uses Python as programming language. The following is a list of highlight topics in this book: * Preparing Development Environment * Set up Digi XBee3 Zigbee 3 * XBee3 Zigbee AT Command * XBee3 Zigbee 3 Programming * XBee3 ZigBee Digital I/O and ADC * Working with Sleep Mode * XBee3 ZigBee Networking

Explore how to develop and implement wireless server networks (WSN) using Contiki-NG, branded as the operating system for the IoT. The book explains Contiki-NG's advantages in sensing, communication, and energy optimization and enables you to begin solving problems in automation with WSN. *Practical Contiki-NG* is a guide to getting started with Contiki-NG programming featuring projects that demonstrate

a variety of applications. This book takes a practical and content-driven approach to the latest technologies, including Raspberry Pi, IoT and cloud servers. Readers will go through step-by-step guides and sample scenarios such as sensing, actuating, connectivity, building middleware, and utilizing IoT and cloud-based technologies. If you're looking to go from zero to hero in using Contiki-NG to build Wireless Sensor Network (WSN) applications then this is the book for you. **What You'll Learn** Prepare and set up Contiki-NG development Review the basics of the Contiki-NG platform to build Wireless Sensor Networks (WSN) Develop your own Contiki-NG program Perform sensing and actuating on the Contiki-NG platform Implement a middleware for Contiki-NG motes Build a simple IoT program using the Contiki-NG environment **Who This Book Is For** Developers, students, researchers and anyone who has an interest in Wireless Sensor Network (WSN).