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5FC - MCKEE BRIANA

This book endeavours to highlight the untapped potential of Smart Agriculture for the innovation and expansion of the agriculture sector. The sector shall make incremental progress as it learns from associations between data over time through Artificial Intelligence, deep learning and Internet of Things applications. The farming industry and Smart agriculture develop from the stringent limits imposed by a farm's location, which in turn has a series of related effects with respect to supply chain management, food availability, biodiversity, farmers' decision-making and insurance, and environmental concerns among others. All of the above-mentioned aspects

will derive substantial benefits from the implementation of a data-driven approach under the condition that the systems, tools and techniques to be used have been designed to handle the volume and variety of the data to be gathered. Contributions to this book have been solicited with the goal of uncovering the possibilities of engaging agriculture with equipped and effective profound learning algorithms. Most agricultural research centres are already adopting Internet of Things for the monitoring of a wide range of farm services, and there are significant opportunities for agriculture administration through the effective implementation of Machine Learning, Deep Learning, Big Data and IoT structures. This book presents the proceedings of four

conferences: The 16th International Conference on Frontiers in Education: Computer Science and Computer Engineering + STEM (FECS'20), The 16th International Conference on Foundations of Computer Science (FCS'20), The 18th International Conference on Software Engineering Research and Practice (SERP'20), and The 19th International Conference on e-Learning, e-Business, Enterprise Information Systems, & e-Government (EEE'20). The conferences took place in Las Vegas, NV, USA, July 27-30, 2020 as part of the larger 2020 World Congress in Computer Science, Computer Engineering, & Applied Computing (CSCE'20), which features 20 major tracks. Authors include academics, researchers, professionals, and students. This book con-

tains an open access chapter entitled, "Advances in Software Engineering, Education, and e-Learning". Presents the proceedings of four conferences as part of the 2020 World Congress in Computer Science, Computer Engineering, & Applied Computing (CSCE'20); Includes the tracks Computer Engineering + STEM, Foundations of Computer Science, Software Engineering Research, and e-Learning, e-Business, Enterprise Information Systems, & e-Government; Features papers from FEC-S'20, FCS'20, SERP'20, EEE'20, including one open access chapter.

The Photon is an open source, inexpensive, programmable, WiFi-enabled module for building connected projects and prototypes. Powered by an ARM Cortex-M3 microcontroller and a Broadcom WiFi chip, the Photon is just as happy plugged into a hobbyist's breadboard as it is into a product rolling off of an assembly line. While the Photon--and its accompanying cloud platform--is designed as a ready-to-go foundation for product developers and manufacturers, it's great for Maker projects, as you'll see in this book. You'll learn how to get started with the free development tools, deploy your sketches over Wi-

Fi, and build electronic projects that take advantage of the Photon's processing power, cloud platform, and input/output pins. What's more, the Photon is backward-compatible with its predecessor, the Spark Core.

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

Use Service Workers to Turbocharge Your Web Apps "You have made an excellent decision in picking up this book. If I was just

starting on my learning path to mastery of Progressive Web Apps, there are not many folks I would trust more to get me there than John." —Simon MacDonald, Developer Advocate, Adobe Software developers have two options for the apps they build: native apps targeting a specific device or web apps that run on any device. Building native apps is challenging, especially when your app targets multiple system types—i.e., desktop computers, smartphones, televisions—because user experience varies dramatically across devices. Service Workers—a relatively new technology—make it easier for web apps to bridge the gap between native and web capabilities. In *Learning Progressive Web Apps*, author John M. Wargo demonstrates how to use Service Workers to enhance the capabilities of a web app to create Progressive Web Apps (PWA). He focuses on the technologies that enable PWAs and how to use those technologies to enhance your web apps to deliver a more native-like experience. Build web apps a user can easily install on their local system and that work offline or on low-quality networks Utilize caching strategies that give you control over which app resources are cached and

when Deliver background processing in a web application Implement push notifications that enable an app to easily engage with users or trigger action from a remote server Throughout the book, Wargo introduces each core concept and illustrates the implementation of each capability through several complete, operational examples. You'll start with simple web apps, then incrementally expand and extend them with state-of-the-art features. All example source code is available on GitHub, and additional resources are available on the author's companion site, learningpwa.com. Register your book for convenient access to downloads, updates, and/or corrections as they become available. See inside book for details.

This book addresses a broad range of topics, from newly proposed techniques in Artificial Intelligence (AI) and Machine Learning to various applications such as decision-making, pattern classification for data, image and signals, robotics, and control systems. Big data applications are discussed, while improved methods and wholly new methods for using deep learning technologies are also presented. The topics covered are comprehensive and reflect

a wide range of technologies in the area. In particular, the latest methods in deep learning approaches and applications are discussed in many parts of the book, providing a better understanding of these new technologies. The book's general scope includes the latest methods in the areas of Artificial Intelligence and Machine Learning for use in distributed computing as well as decision support systems. As the book covers a rather wide area, its intended readership ranges from those working in AI and machine learning technologies to those working on applications utilizing these technologies, researchers new to these areas who need background information on the technologies and applications, and more experienced researchers looking for new methods and applications.

*Simplified way to understand IoT Product Development*Easy to learn and quick to understand.*Programming concepts with Explanation and Circuit Diagram*Logic box explains key fundamentals of each program.*Particle Electron and Photon programming reference guide.*Lots of real-life programs along with output screenshot.*Quickly and user-friendly guideline to develop IoT products.

Simplified way to understand IoT Product Development Programming concepts with Explanation and Circuit Diagram Easy to learn and quick to understand. Logic box explains key fundamentals of each program. Particle Electron and Photon programming reference guide Lots of real-life programs along with output screenshot Quickly and user-friendly guideline to develop IoT products.

The Internet of things (IoT) is a network of connected physical objects or things that are working along with sensors, wireless transceiver modules, processors, and software required for connecting, processing, and exchanging data among the other devices over the Internet. These objects or things are devices ranging from simple handheld devices to complex industrial heavy machines. A thing in IoT can be any living or non-living object that can be provided capabilities to sense, process, and exchange data over a network. The IoT provides people with the ability to handle their household works to industrial tasks smartly and efficiently without the intervention of another human. The IoT provides smart devices for home automation

as well as business solutions for delivering insights into everything from real-time monitoring of working systems to supply chain and logistics operations. The IoT has become one of the most prominent technological inventions of the 21st century. Due to the versatility of IoT devices, there are numerous real-world applications of the IoT in various domains such as smart home, smart city, health care, agriculture, industry, and transportation. The IoT has emerged as a paradigm-shifting technology that is influencing various industries. Many companies, governments, and civic bodies are shifting to IoT applications to improve their works and to become more efficient. The world is slowly transforming toward a "smart world" with smart devices. As a consequence, it shows many new opportunities coming up in the near "smart" future for IoT professionals. Therefore, there is a need to keep track of advancements related to IoT applications and further investigate several research challenges related to the applicability of IoT in different domains to make it more adaptable for practical and industrial use. With this goal, this book provides the most recent and prominent applications of IoT in

different domains as well as issues and challenges in developing IoT applications for various new domains.

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

create your own networked festive display lights Create a simple machine learning application and build a parking automation system using Raspberry Pi Learn how to work with AWS cloud services and connect your home automation to the cloud Learn how to work with Windows IoT in Raspberry Pi 3 and build your own Windows IoT Face Recognition door locking system In Detail Raspberry Pi 3 Home Automation Projects addresses the challenge of applying real-world projects to automate your house using Raspberry Pi 3 and Arduino. You will learn how to customize and program the Raspberry Pi 3 and Arduino-based boards in several home automation projects around your house, in order to develop home devices that will really rejuvenate your home. This book aims to help you integrate different microcontrollers like Arduino, ESP8266 Wi-Fi module, Particle Photon and Raspberry Pi 3 into the real world, taking the best of these boards to develop some exciting home automation projects. You will be able to use these projects in everyday tasks, thus making life easier and comfortable. We will start with an interesting project creating a Raspberry Pi-Powered smart mirror and

move on to Automated Gardening System, which will help you build a simple smart gardening system with plant-sensor devices and Arduino to keep your garden healthy with minimal effort. You will also learn to build projects such as CheerLights into a holiday display, a project to erase parking headaches with OpenCV and Raspberry Pi 3, create Netflix's "The Switch" for the living room and lock down your house like Fort Knox with a Windows IoT face recognition-based door lock system. By the end of the book, you will be able to build and automate the living space with intriguing IoT projects and bring a new degree of interconnectivity to your world. Style and approach End to end home automation projects with Raspberry Pi 3.

Design, build, and program your own remarkable robots with JavaScript and open source hardware About This Book Learn how to leverage Johnny-Five's Read, Eval, Print Loop, and Event API to write robot code with JavaScript Unlock a world of exciting possibilities by hooking your JavaScript-programmed robots up to the internet and using external data and APIs Move your project code from the Arduino Uno to a multitude of other robotics plat-

forms Who This Book Is For If you've worked with Arduino before or are new to electronics and would like to try writing sketches in JavaScript, then this book is for you! Basic knowledge of JavaScript and Node.js will help you get the most out of this book. What You Will Learn Familiarise yourself with Johnny-Five Read, Eval, and Print Loop (REPL) to modify and debug robotics code in real time Build robots with basic output devices to create projects that light up, make noise, and more Create projects with complex output devices, and employ the Johnny-Five API to simplify the use of components that require complex interfaces, such as I2C Make use of sensors and input devices to allow your robotics projects to survey the world around them and accept input from users Use the Sensor and Motor objects to make it much easier to move your robotics projects Learn about the Animation API that will allow you to program complex movements using timing and key frames Bring in other devices to your Johnny-Five projects, such as USB devices and remotes Connect your Johnny-Five projects to external APIs and create your own Internet of Things! In Detail There has been a rapid rise in the use

of JavaScript in recent times in a variety of applications, and JavaScript robotics has seen a rise in popularity too. Johnny-Five is a framework that gives NodeBots a consistent API and platform across several hardware systems. This book walks you through basic robotics projects including the physical hardware builds and the JavaScript code for them. You'll delve into the concepts of Johnny-Five and JS robotics. You'll learn about various components such as Digital GPIO pins, PWM output pins, Sensors, servos, and motors to be used with Johnny-Five along with some advanced components such as I2C, and SPI. You will learn to connect your Johnny-Five robots to internet services and other NodeBots to form networks. By the end of this book, you will have explored the benefits of the Johnny-Five framework and the many devices it unlocks. Style and approach This step-by-step guide to the Johnny-Five ecosystem is explained in a conversational style, packed with examples and tips. Each chapter also explores the Johnny-Five documentation to enable you to start exploring the API on your own. Current hype aside, the Internet of Things will ultimately become as fundamental as

the Internet itself, with lots of opportunities and trials along the way. To help you navigate these choppy waters, this practical guide introduces a dedicated methodology for businesses preparing to transition towards IoT-based business models. With a set of best practices based on case study analysis, expert interviews, and the authors' own experience, the Ignite | IoT Methodology outlined in this book delivers actionable guidelines to assist you with IoT strategy management and project execution. You'll also find a detailed case study of a project fully developed with this methodology. This book consists of three parts: Illustrative case studies of selected IoT domains, including smart energy, connected vehicles, manufacturing and supply chain management, and smart cities The Ignite | IoT Methodology for defining IoT strategy, preparing your organization for IoT adoption, and planning and executing IoT projects A detailed case study of the IIC Track & Trace testbed, one of the first projects to be fully developed according to the Ignite | IoT Methodology

The ultimate power-packed crash course in building Arduino-based projects in just

10 days! About This Book A carefully designed 10-day crash course, covering major project/device types, with 20+ unique hands-on examples Get easy-to-understand explanations of basic electronics fundamentals and commonly used C sketch functions This step-by-step guide with 90+ diagrams and 50+ important tips will help you become completely self-reliant and confident Who This Book Is For This book is a beginner's crash course for professionals, hobbyists, and students who are tech savvy, have a basic level of C programming knowledge, and basic familiarity with electronics, be it for embedded systems or the Internet of Things. What You Will Learn Write Arduino sketches and understand the fundamentals of building prototype circuits using basic electronic components, such as resistors, transistors, and diodes Build simple, compound, and standalone devices with auxiliary storage (SD card), a DC battery, and AC power supplies Deal with basic sensors and interface sensor modules by using sensor datasheets Discover the fundamental techniques of prototyping with actuators Build remote-controlled devices with infrared (IR), radio frequency (RF), and telephony with GSM

Learn IoT edge device prototyping (using ESP8266) and IoT cloud configuration In Detail This book is a quick, 10-day crash course that will help you become well acquainted with the Arduino platform. The primary focus is to empower you to use the Arduino platform by applying basic fundamental principles. You will be able to apply these principles to build almost any type of physical device. The projects you will work through in this book are self-contained micro-controller projects, interfacing with single peripheral devices (such as sensors), building compound devices (multiple devices in a single setup), prototyping standalone devices (powered from independent power sources), working with actuators (such as DC motors), interfacing with an AC-powered device, wireless devices (with Infrared, Radio Frequency and GSM techniques), and finally implementing the Internet of Things (using the ESP8266 series Wi-Fi chip with an IoT cloud platform). The first half of the book focuses on fundamental techniques and building basic types of device, and the final few chapters will show you how to prototype wireless devices. By the end of this book, you will have become acquainted with the funda-

mental principles in a pragmatic and scientific manner. You will also be confident enough to take up new device prototyping challenges. Style and approach This step-by-step guide will serve as a quick, 10-day crash course to help you become well acquainted with the Arduino platform.

Learn best practices for building bots by focusing on the technological implementation and UX in this practical book. You will cover key topics such as setting up a development environment for creating chatbots for multiple channels (Facebook Messenger, Skype, and KiK); building a chatbot (design to implementation); integrating to IFTT (If This Then That) and IoT (Internet of Things); carrying out analytics and metrics for chatbots; and most importantly monetizing models and business sense for chatbots. Build Better Chatbots is easy to follow with code snippets provided in the book and complete code open sourced and available to download. With Facebook opening up its Messenger platform for developers, followed by Microsoft opening up Skype for development, a new channel has emerged for brands to acquire, engage, and service customers on chat with chatbots. What You Will Learn Work with the

bot development life cycle Master bot UX design Integrate into the bot ecosystem Maximize the business and monetization potential for bots Who This Book Is For Developers, programmers, and hobbyists who have basic programming knowledge. The book can be used by existing chatbot developers to gain a better understanding of analytics and the business side of bots.

A fully updated guide to quickly and easily programming Arduino Thoroughly revised for the new Arduino Uno R3, this best-selling guide explains how to write well-crafted sketches using Arduino's modified C language. You will learn how to configure hardware and software, develop your own sketches, work with built-in and custom Arduino libraries, and explore the Internet of Things—all with no prior programming experience required! Electronics guru Simon Monk gets you up to speed quickly, teaching all concepts and syntax through simple language and clear instruction designed for absolute beginners. Programming Arduino: Getting Started with Sketches, Second Edition, features dozens of easy-to-follow examples and high-quality illustrations. All of the sample sketches featured in the book can be used as-is or

modified to suit your needs. An all-new chapter teaches programming Arduino for Internet of Things projects Screenshots, diagrams, and source code illustrate each technique All sample programs in the book are available for download

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

The first book of its kind to highlight the unique capabilities of laser-driven acceleration and its diverse potential, Applications of Laser-Driven Particle Acceleration presents the basic understanding of acceleration concepts and envisioned prospects for selected applications. As the main focus, this new book explores exciting and diverse application possibilities, with emphasis on those uniquely enabled by the laser driver that can also be meaningful and re-

alistic for potential users. It also emphasizes distinction, in the accelerator context, between laser-driven accelerated particle sources and the integrated laser-driven particle accelerator system (all-optical and hybrid versions). A key aim of the book is to inform multiple, interdisciplinary research communities of the new possibilities available and to inspire them to engage with laser-driven acceleration, further motivating and advancing this developing field. Material is presented in a thorough yet accessible manner, making it a valuable reference text for general scientific and engineering researchers who are not necessarily subject matter experts. Applications of Laser-Driven Particle Acceleration is edited by Professors Paul R. Bolton, Katia Parodi, and Jörg Schreiber from the Department of Medical Physics at the Ludwig-Maximilians-Universität München in München, Germany. Features: Reviews the current understanding and state-of-the-art capabilities of laser-driven particle acceleration and associated energetic photon and neutron generation Presents the intrinsically unique features of laser-driven acceleration and particle bunch yields Edited by internationally renowned researchers, with

chapter contributions from global experts This book comprises select proceedings of the International Conference on Smart Cities: Opportunities and Challenges (ICSC 2019). The book contains chapters based on urban planning and design, policies and financial management, environment, energy, transportation, smart materials, sustainable development, information technologies, data management and urban sociology reflecting the major themes of the conference. The contents focus on current research towards improved governance and efficient management of infrastructure such as water, energy, transportation and housing for sustainable development, economic growth, and improved quality of life, especially for developing nations. This book will be useful for academicians, researchers, and policy makers interested in designing, developing, planning, managing, and maintaining smart cities. Explore the Internet of Things and build useful, functioning Photon projects Quickly learn to construct your own electronics devices and control them over the Internet with help from this DIY guide. Programming the Photon: Getting Started with the Internet of Things features clear explana-

tions and step-by-step examples that use inexpensive, easy-to-find components. Discover how to connect to Wi-Fi networks, attach hardware to I/O ports, write custom programs, and work from the cloud. You will learn how to troubleshoot and tweak your Photon creations—even interface with social media sites! · Set up your Photon board and connect to the Particle cloud · Start constructing and programming custom IoT projects · Learn the syntax of both the C and Arduino languages · Incorporate switches, sensors, and other input devices · Control hardware through the Photon's outputs · Control your creations through the Internet · Add functions with Particle shields and add-on boards · Link real-time data to your board via the IFTTT Web Service · Integrate with websites—Facebook, Twitter, Gmail, and more! Leverage the WiFi chip to build exciting Quadcopters Key Features Learn to create a fully functional Drone with Arduino and ESP8266 and their modified versions of hardware. Enhance your drone's functionalities by implementing smart features. A project-based guide that will get you developing next-level drones to help you monitor a particular area with mobile-like de-

vices. Book Description With the use of drones, DIY projects have taken off. Programmers are rapidly moving from traditional application programming to developing exciting multi-utility projects. This book will teach you to build industry-level drones with Arduino and ESP8266 and their modified versions of hardware. With this book, you will explore techniques for leveraging the tiny WiFi chip to enhance your drone and control it over a mobile phone. This book will start with teaching you how to solve problems while building your own WiFi controlled Arduino based drone. You will also learn how to build a Quadcopter and a mission critical drone. Moving on you will learn how to build a prototype drone that will be given a mission to complete which it will do it itself. You will also learn to build various exciting projects such as gliding and racing drones. By the end of this book you will learn how to maintain and troubleshoot your drone. By the end of this book, you will have learned to build drones using ESP8266 and Arduino and leverage their functionalities to the fullest. What you will learn Includes a number of projects that utilize different ESP8266 and Arduino capabilities, while inter-

facing with external hardware Covers electrical engineering and programming concepts, interfacing with the World through analog and digital sensors, communicating with a computer and other devices, and internet connectivity Control and fly your quadcopter, taking into account weather conditions Build a drone that can follow the user wherever he/she goes Build a mission-control drone and learn how to use it effectively Maintain your vehicle as much as possible and repair it whenever required Who this book is for If you are a programmer or a DIY enthusiast and keen to create a fully functional drone with Arduino and ESP8266, then this book is for you. Basic skills in electronics and programming would be beneficial. This book is not for the beginners as it includes lots of ideas not detailed how you can do that. If you are a beginner, then you might get lost here. The prerequisites of the book include a good knowledge of Arduino, electronics, programming in C or C++ and lots of interest in creating things out of nothing.

Develop a variety of projects and connect them to microcontrollers and web servers

using the lightweight messaging protocol MQTT Key FeaturesLeverage the power of MQTT to build a pet food dispenser, e-ink to-do list, and a productivity cubeLearn about technologies like laser cutting, 3D printing, and PCB production for building robust prototypesExplore practical uses cases to gain an in-depth understanding of MQTTBook Description MQ Telemetry Transport (MQTT) is a lightweight messaging protocol for smart devices that can be used to build exciting, highly scalable Internet of Things (IoT) projects. This book will get you started with a quick introduction to the concepts of IoT and MQTT and explain how the latter can help you build your own internet-connected prototypes. As you advance, you'll gain insights into how microcontrollers communicate, and you'll get to grips with the different messaging protocols and techniques involved. Once you are well-versed with the essential concepts, you'll be able to put what you've learned into practice by building three projects from scratch, including an automatic pet food dispenser and a smart e-ink to-do display. You'll also discover how to present your own prototypes professionally. In addition to this, you'll learn

how to use technologies from third-party web service providers, along with other rapid prototyping technologies, such as laser cutting, 3D printing, and PCB production. By the end of this book, you'll have gained hands-on experience in using MQTT to build your own IoT prototypes. What you will learn

Explore MQTT programming with Arduino

Discover how to make your prototypes talk to each other

Send MQTT messages from your smartphone to your prototypes

Discover how you can make websites interact with your prototypes

Learn about MQTT servers, libraries, and apps

Explore tools such as laser cutting and 3D printing in order to build robust prototype cases

Who this book is for

If you are an IoT developer or enthusiast who wants to start building IoT prototypes using MQTT, this book is for you. Basic knowledge of programming with Arduino will be useful.

Photon kit is a tiny Wi-Fi development kit to build an Internet of Things programs. This board has built-in WiFi Module. This book helps you to get started with Photon kit development. The following is highlight of the book:

- * Preparing Development Environment
- * Setting Up The Photon Develop-

ment: Particle Build, Particle Dev, Particle CLI, GNU GCC ARM * GPIO Programming * UART * PWM and Analog Input * Working with I2C * SPI * Working with EEPROM * Building Internet of Things * Photon and Microsoft Azure

Summary

JavaScript on Things is your first step into the exciting and downright entertaining world of programming for small electronics. If you know enough JavaScript to hack a website together, you'll be making things go bleep, blink, and spin faster than you can say "nodebot." Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications.

About the Technology

Are you ready to make things move? If you can build a web app, you can create robots, weather stations, and other funky gadgets! In this incredibly fun, project-based guide, JavaScript hardware hacker Lyza Danger Gardner takes you on an incredible journey from your first flashing LED through atmospheric sensors, motorized rovers, Bluetooth doorbells, and more. With JavaScript, some easy-to-get hardware, and a bit of creativity, you'll be beeping, spinning, and glowing in no time.

About the Book

JavaScript on Things intro-

duces the exciting world of programming small electronics! You'll start building things immediately, beginning with basic blinking on Arduino. This fully illustrated, hands-on book surveys JavaScript toolkits like Johnny-Five along with platforms including Raspberry Pi, Tessel, and Beagle-Bone. As you build project after interesting project, you'll learn to wire in sensors, hook up motors, transmit data, and handle user input. So be warned: once you start, you won't want to stop.

What's Inside

Controlling hardware with JavaScript

Designing and assembling robots and gadgets

A crash course in electronics

Over a dozen hands-on projects!

About the Reader

Written for readers with intermediate JavaScript and Node.js skills. No experience with electronics required.

About the Author

Lyza Danger Gardner has been a web developer for over 20 years. She's part of the NodeBots community and a contributor to the Johnny-Five Node.js library.

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Develop applications on one of the most popular platforms for IoT using Particle Photon and Electron with this fast-paced guide About This Book Get an introduction to IoT architecture, command-line build tools and applications of IoT devices and sensors Design and develop connected IoT applications using Particle Photon and Electron in a step-by-step manner, gaining an entry point into the field of IoT Get tips on troubleshooting IoT applications Who This Book Is For This book is for developers, IoT enthusiasts and hobbyists who want to enhance their knowledge of IoT machine-to-machine architecture using Particle Photon and Electron, and implement cloud-based IoT projects. What You Will Learn Setup the Particle Photon and Electron on the cloud using the command-line tools Build

and deploy applications on the Photon and Electron using the Web-based IDE Setup a local cloud server to interact with Particle Photon and Electron Connect various components and sensors to Particle Photon and Electron Tinker with the existing firmware and deploy a custom firmware on the Photon and Electron Setup communication between two or more Particle Photon and Electron Debug and troubleshoot Particle Photon and Electron projects Use webhooks to communicate with various third-party server applications In Detail IoT is basically the network of physical devices, vehicles, buildings and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.. The number of connected devices is growing rapidly and will continue to do so over years to come. By 2020, there will be more than 20 billion connected devices and the ability to program such devices will be in high demand. Particle provides prototyping boards for IoT that are easy to program and deploy. Most importantly, the boards provided by Particle can be connected to the Internet very easily as they include Wi-Fi or a GSM module. Starting

with the basics of programming Particle Photon and Electron, this book will take you through setting up your local servers and running custom firmware, to using the Photon and Electron to program autonomous cars. This book also covers in brief a basic architecture and design of IoT applications. It gives you an overview of the IoT stack. You will also get information on how to debug and troubleshoot Particle Photon and Electron and set up your own debugging framework for any IoT board. Finally, you'll tinker with the firmware of the Photon and Electron by modifying the existing firmware and deploying them to your boards. By the end of this book, you should have a fairly good understanding of the IoT ecosystem and you should be able to build standalone projects using your own local server or the Particle Cloud Server. Style and approach This project-based guide contains easy-to-follow steps to program Particle Photon and Electron. You will learn to build connected applications with the help of projects of increasing complexity, and with each project, a new concept in IoT is taught.

Provides information on building native mo-

mobile applications using PhoneGap.

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 individu-

als 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.

The BlackBerry smartphone is today's #1 mobile platform for the enterprise and also a huge hit with consumers. Until now, it's been difficult for programmers to find everything they need to begin developing new applications for BlackBerry devices. BlackBerry Development Fundamentals is the solution: the first single-source guide to all aspects of development for the BlackBerry platform. This book thoroughly reviews the BlackBerry's unique capabilities and limitations, helps you optimize your upfront design choices, and covers native rich-client applications and Web-based mobile applications for both business and consumer environments. In addition, it is an excellent study guide for the BlackBerry Certified Application Developer exam

(BCX-810). Coverage includes The "hows," "whys," and best practices of BlackBerry development. Planning for and managing the BlackBerry platform's restrictions. Selecting the correct development platform for your BlackBerry applications. Describing the different paths any application can take to get to the data it needs. Explaining the capabilities provided by the BlackBerry Mobile Data System (MDS). Pushing application data to both enterprise and consumer BlackBerry devices using MDS, Web Signals, and the BlackBerry Push APIs. Dealing with both the special capabilities and limitations of the BlackBerry browser. Building, testing, and debugging BlackBerry browser applications. Understanding the tools available to Java developers. Using Research In Motion's Java development tools to build, test, and debug BlackBerry Java applications. Deploying BlackBerry Java applications.

Summary. Grokking Deep Learning teaches you to build deep learning neural networks from scratch! In his engaging style, seasoned deep learning expert Andrew Trask shows you the science under the hood, so you grok for yourself every detail of training neural networks. Purchase of the print

book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Deep learning, a branch of artificial intelligence, teaches computers to learn by using neural networks, technology inspired by the human brain. Online text translation, self-driving cars, personalized product recommendations, and virtual voice assistants are just a few of the exciting modern advancements possible thanks to deep learning. About the Book Grokking Deep Learning teaches you to build deep learning neural networks from scratch! In his engaging style, seasoned deep learning expert Andrew Trask shows you the science under the hood, so you grok for yourself every detail of training neural networks. Using only Python and its math-supporting library, NumPy, you'll train your own neural networks to see and understand images, translate text into different languages, and even write like Shakespeare! When you're done, you'll be fully prepared to move on to mastering deep learning frameworks. What's inside The science behind deep learning Building and training your own neural networks Privacy concepts, including federated learning Tips for continuing

your pursuit of deep learning About the Reader For readers with high school-level math and intermediate programming skills. About the Author Andrew Trask is a PhD student at Oxford University and a research scientist at DeepMind. Previously, Andrew was a researcher and analytics product manager at Digital Reasoning, where he trained the world's largest artificial neural network and helped guide the analytics roadmap for the Synthesys cognitive computing platform. Table of Contents Introducing deep learning: why you should learn it Fundamental concepts: how do machines learn? Introduction to neural prediction: forward propagation Introduction to neural learning: gradient descent Learning multiple weights at a time: generalizing gradient descent Building your first deep neural network: introduction to back-propagation How to picture neural networks: in your head and on paper Learning signal and ignoring noise: introduction to regularization and batching Modeling probabilities and nonlinearities: activation functions Neural learning about edges and corners: intro to convolutional neural networks Neural networks that understand language: king - man + woman == ? Neu-

ral networks that write like Shakespeare: recurrent layers for variable-length data Introducing automatic optimization: let's build a deep learning framework Learning to write like Shakespeare: long short-term memory Deep learning on unseen data: introducing federated learning Where to go from here: a brief guide

Unleash the power of the Raspberry Pi 3 board to create interesting IoT projects Key Features Learn how to interface various sensors and actuators with the Raspberry Pi 3 and send this data to the cloud. Explore the possibilities offered by the IoT by using the Raspberry Pi to upload measurements to Google Docs. A practical guide that will help you create a Raspberry Pi robot using IoT modules. Book Description This book is designed to introduce you to IoT and Raspberry Pi 3. It will help you create interesting projects, such as setting up a weather station and measuring temperature and humidity using sensors; it will also show you how to send sensor data to cloud for visualization in real-time. Then we shift our focus to leveraging IoT for accomplishing complex tasks, such as facial recognition using the Raspberry Pi

camera module, AWS Rekognition, and the AWS S3 service. Furthermore, you will master security aspects by building a security surveillance system to protect your premises from intruders using Raspberry Pi, a camera, motion sensors, and AWS Cloud. We'll also create a real-world project by building a Wi-Fi – controlled robot car with Raspberry Pi using a motor driver circuit, DC motor, and a web application. This book is a must-have as it provides a practical overview of IoT's existing architectures, communication protocols, and security threats at the software and hardware levels—security being the most important aspect of IoT. What you will learn Understand the concept of IoT and get familiar with the features of Raspberry Pi Learn to integrate sensors and actuators with the Raspberry Pi Communicate with cloud and Raspberry using communication protocols such as HTTP and MQTT Build DIY projects using Raspberry Pi, JavaScript/node.js and cloud (AWS) Explore the best practices to ensure the security of your connected devices Who this book is for If you're a developer or electronics engineer and are curious about the Internet of Things, then this is the book for you. With only a rudimen-

tary understanding of electronics, the Raspberry Pi, or similar credit-card sized computers, and some programming experience, you will be taught to develop state-of-the-art solutions for the Internet of Things in an instant.

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.

How can we build bridges from the digital world of the Internet to the analog world that surrounds us? By bringing accessibility to embedded components such as sensors and microcontrollers, JavaScript and Node.js might shape the world of physical computing as they did for web browsers. This practical guide shows hardware and software engineers, makers, and web developers how to talk in JavaScript with a va-

riety of hardware platforms. Authors Patrick Mulder and Kelsey Breseman also delve into the basics of microcontrollers, single-board computers, and other hardware components. Use JavaScript to program microcontrollers with Arduino and Espruino Prototype IoT devices with the Tessel 2 development platform Learn about electronic input and output components, including sensors Connect microcontrollers to the Internet with the Particle Photon toolchain Run Node.js on single-board computers such as Raspberry Pi and Intel Edison Talk to embedded devices with Node.js libraries such as Johnny-Five, and remotely control the devices with Bluetooth Use MQTT as a message broker to connect devices across networks Explore ways to use robots as building blocks for shared experiences

Learn to design, implement and secure your IoT infrastructure Key Features Build a complete IoT system that is the best fit for your organization Learn about different concepts, technologies, and tradeoffs in the IoT architectural stack Understand the theory, concepts, and implementation of each element that comprises IoT design—from sensors to the cloud Implement

best practices to ensure the reliability, scalability, robust communication systems, security, and data analysis in your IoT infrastructure. **Book Description** The Internet of Things (IoT) is the fastest growing technology market. Industries are embracing IoT technologies to improve operational expenses, product life, and people's well-being. An architectural guide is necessary if you want to traverse the spectrum of technologies needed to build a successful IoT system, whether that's a single device or millions of devices. This book encompasses the entire spectrum of IoT solutions, from sensors to the cloud. We start by examining modern sensor systems and focus on their power and functionality. After that, we dive deep into communication theory, paying close attention to near-range PAN, including the new Bluetooth® 5.0 specification and mesh networks. Then, we explore IP-based communication in LAN and WAN, including 802.11ah, 5G LTE cellular, SigFox, and LoRaWAN. Next, we cover edge routing and gateways and their role in fog computing, as well as the messaging protocols of MQTT and CoAP. With the data now in internet form, you'll get an understanding of cloud and fog architec-

tures, including the OpenFog standards. We wrap up the analytics portion of the book with the application of statistical analysis, complex event processing, and deep learning models. Finally, we conclude by providing a holistic view of the IoT security stack and the anatomical details of IoT exploits while countering them with software defined perimeters and blockchains. What you will learn Understand the role and scope of architecting a successful IoT deployment, from sensors to the cloud Scan the landscape of IoT technologies that span everything from sensors to the cloud and everything in between See the tradeoffs in choices of protocols and communications in IoT deployments Build a repertoire of skills and the vernacular necessary to work in the IoT space Broaden your skills in multiple engineering domains necessary for the IoT architect Who this book is for This book is for architects, system designers, technologists, and technology managers who want to understand the IoT ecosphere, various technologies, and tradeoffs and develop a 50,000-foot view of IoT architecture.

The Arduino is a cheap, flexible, open

source microcontroller platform designed to make it easy for hobbyists to use electronics in homemade projects. With an almost unlimited range of input and output add-ons, sensors, indicators, displays, motors, and more, the Arduino offers you countless ways to create devices that interact with the world around you. In *Arduino Workshop*, you'll learn how these add-ons work and how to integrate them into your own projects. You'll start off with an overview of the Arduino system but quickly move on to coverage of various electronic components and concepts. Hands-on projects throughout the book reinforce what you've learned and show you how to apply that knowledge. As your understanding grows, the projects increase in complexity and sophistication. Among the book's 65 projects are useful devices like:

- A digital thermometer that charts temperature changes on an LCD
- A GPS logger that records data from your travels, which can be displayed on Google Maps
- A handy tester that lets you check the voltage of any single-cell battery
- A keypad-controlled lock that requires a secret code to open

You'll also learn to build Arduino toys and games like:

- An electronic ver-

sion of the classic six-sided die – A binary quiz game that challenges your number conversion skills – A motorized remote control tank with collision detection to keep it from crashing
 Arduino Workshop will teach you the tricks and design principles of a master craftsman. Whatever your skill level, you'll have fun as you learn to harness the power of the Arduino for your own DIY projects. Uses the Arduino Uno board

The book presents the proceedings of two conferences: the 16th International Conference on Data Science (ICDATA 2020) and the 19th International Conference on Information & Knowledge Engineering (IKE 2020), which took place in Las Vegas, NV, USA, July 27-30, 2020. The conferences are part of the larger 2020 World Congress in Computer Science, Computer Engineering, & Applied Computing (CSCE'20), which features 20 major tracks. Papers cover all aspects of Data Science, Data Mining, Machine Learning, Artificial and Computational Intelligence (ICDATA) and Information Retrieval Systems, Information & Knowledge Engineering, Management and Cyber-Learning (IKE). Authors include academics, researchers, professionals, and students. Presents the proceedings of the

16th International Conference on Data Science (ICDATA 2020) and the 19th International Conference on Information & Knowledge Engineering (IKE 2020); Includes papers on topics from data mining to machine learning to informational retrieval systems; Authors include academics, researchers, professionals and students.

Internet of Things: Challenges, Advances, and Applications provides a comprehensive introduction to IoT, related technologies, and common issues in the adoption of IoT on a large scale. It surveys recent technological advances and novel solutions for challenges in the IoT environment. Moreover, it provides detailed discussion of the utilization of IoT and its underlying technologies in critical application areas, such as smart grids, healthcare, insurance, and the automotive industry. The chapters of this book are authored by several international researchers and industry experts. This book is composed of 18 self-contained chapters that can be read, based on interest. Features: Introduces IoT, including its history, common definitions, underlying technologies, and challenges Discusses technological advances in IoT and implementation considerations

Proposes novel solutions for common implementation issues Explores critical application domains, including large-scale electric power distribution networks, smart water and gas grids, healthcare and e-Health applications, and the insurance and automotive industries The book is an excellent reference for researchers and post-graduate students working in the area of IoT, or related areas. It also targets IT professionals interested in gaining deeper knowledge of IoT, its challenges, and application areas.

Get to grips with key structural changes in TensorFlow 2.0 Key Features Explore TF Keras APIs and strategies to run GPUs, TPUs, and compatible APIs across the TensorFlow ecosystem Learn and implement best practices for building data ingestion pipelines using TF 2.0 APIs Migrate your existing code from TensorFlow 1.x to TensorFlow 2.0 seamlessly Book Description TensorFlow is an end-to-end machine learning platform for experts as well as beginners, and its new version, TensorFlow 2.0 (TF 2.0), improves its simplicity and ease of use. This book will help you understand and utilize the latest TensorFlow features. What's New in TensorFlow 2.0 starts by fo-

ocusing on advanced concepts such as the new TensorFlow Keras APIs, eager execution, and efficient distribution strategies that help you to run your machine learning models on multiple GPUs and TPUs. The book then takes you through the process of building data ingestion and training pipelines, and it provides recommendations and best practices for feeding data to models created using the new `tf.keras` API. You'll explore the process of building an inference pipeline using TF Serving and other multi-platform deployments before moving on to explore the newly released AIY, which is essentially do-it-yourself AI. This book delves into the core APIs to help you build unified convolutional and recurrent layers and use TensorBoard to visualize deep learning models using what-if analysis. By the end of the book, you'll have learned about compatibility between TF 2.0 and TF 1.x and be able to migrate to TF 2.0 smoothly. What you will learn

Implement `tf.keras` APIs in TF 2.0 to build, train, and deploy production-grade models

Build models with Keras integration and eager execution

Explore distribution strategies to run models on GPUs and TPUs

Perform what-if analysis with TensorBoard

across a variety of models

Discover Vision Kit, Voice Kit, and the Edge TPU for model deployments

Build complex input data pipelines for ingesting large training datasets

Who this book is for

If you're a data scientist, machine learning practitioner, deep learning researcher, or AI enthusiast who wants to migrate code to TensorFlow 2.0 and explore the latest features of TensorFlow 2.0, this book is for you. Prior experience with TensorFlow and Python programming is necessary to understand the concepts covered in the book.

Connect things to create amazing IoT applications in minutes

Key Features

Use Blynk cloud and Blynk server to connect devices

Build IoT applications on Android and iOS platforms

A practical guide that will show how to connect devices using Blynk and Raspberry Pi 3

Book Description

Blynk, known as the most user-friendly IoT platform, provides a way to build mobile applications in minutes. With the Blynk drag-and-drop mobile app builder, anyone can build amazing IoT applications with minimal resources and effort, on hardware ranging from prototyping platforms such as Arduino and Raspberry Pi 3 to industrial-grade

ESP8266, Intel, Sierra Wireless, Particle, Texas Instruments, and a few others. This book uses Raspberry Pi as the main hardware platform and C/C++ to write sketches to build projects. The first part of this book shows how to set up a development environment with various hardware combinations and required software. Then you will build your first IoT application with Blynk using various hardware combinations and connectivity types such as Ethernet and Wi-Fi. Then you'll use and configure various widgets (control, display, notification, interface, time input, and some advanced widgets) with Blynk App Builder to build applications. Towards the end, you will learn how to connect with and use built-in sensors on Android and iOS mobile devices. Finally you will learn how to build a robot that can be controlled with a Blynk app through the Blynk cloud and personal server. By the end of this book, you will have hands-on experience building IoT applications using Blynk. What you will learn

Build devices using Raspberry Pi and various sensors and actuators

Use Blynk cloud to connect and control devices through the Blynk app builder

Connect devices to Blynk cloud and server

through Ethernet and Wi-Fi Make applications using Blynk app builder on Android and iOS platforms Run Blynk personal server on the Windows, MAC, and Raspberry Pi platforms Who this book is for This book is targeted at any stakeholder working in the IoT sector who wants to understand how Blynk works and build exciting IoT projects. Prior understanding of Raspberry Pi, C/C++, and electronics is a must. Interest in big data has swelled within the

scholarly community as has increased attention to the internet of things (IoT). Algorithms are constructed in order to parse and analyze all this data to facilitate the exchange of information. However, big data has suffered from problems in connectivity, scalability, and privacy since its birth. The application of deep learning algorithms has helped process those challenges and remains a major issue in today's digital world. Advanced Deep Learn-

ing Applications in Big Data Analytics is a pivotal reference source that aims to develop new architecture and applications of deep learning algorithms in big data and the IoT. Highlighting a wide range of topics such as artificial intelligence, cloud computing, and neural networks, this book is ideally designed for engineers, data analysts, data scientists, IT specialists, programmers, marketers, entrepreneurs, researchers, academicians, and students.